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# The Canadian Patent Office Record and Mechanics Magazine

Vol. 3. NOVEMBER, 1875. No. 11.


## THE PROVINCIAL EXHIBITION.

In the October number we gave an illustration of the main building erected at Ottawa for the Provincial Exhibition of Canada, which was open to exhibitors from all Countries. We now furnish our readers with a full account of those departments in which articles were exhibited which come especially within the province of this MAGAZINE to describe.

In affording a full page illustration of the Exhibition Building itself, another of the ground plan, shewing the disposition of the various buildings erected for the cattle, machinery, horticulture, &c., we have incurred no small expense in affording information for the gratification of such of our readers who were not present, and who may feel interested in these matters, but in order to show that we are in thorough earnest to make this MAGAZINE the record of everything taking place in the Dominion which may prove of service to the manufacturer and the mechanic, as well as to every branch of science, we have incurred the additional expense of giving illustrations of many of those articles for which first prizes were received, as well as many others which our representative deemed worthy of special notice.

### THE EXHIBITION GROUNDS

Are situated upon the west side of the Rideau Canal about 1½ miles from the City of Ottawa, and were admirably adapted for the purpose. The buildings could be approached by three roads leading from the City, and also by the Rideau Canal, on which plied several Propellers bearing thousands to the spot during each day. A new and beautiful line of road has just been completed to the grounds, being a continuation of Bank Street, along which a pathway was laid, four planks wide, up to the very gates of the enclosure, which afforded great pleasure to pedestrians; this road winds along the south west side of the Rideau Canal, it there enters into a beautiful copse of wood about a mile from the city, and suddenly debouches into the open space on which are erected the Exhibition Buildings. Much credit is due both to the City and County for the construction of this new road in time for the fair.

#### THE PLAN OF THE GROUNDS

Shows the position of the different buildings, none of which, except the main structure require any particular description. The peninsula upon which the machinery was exhibited was, with its groups of trees, a charming spot, and altogether so was the scenery around the building. The rising banks of the Canal clad with dark pine trees, over the tops of which rose the roofs of gothic villas, the little indented bays prettily wooded on each side, amid which peeped out from between the foliage of beautiful trees on the higher ground portions of handsome cottages, with here and there on the meadow land a graceful group of feathered elms, and maples fast fading into their rich autumnal tints; then a fine view of the gothic towers and spires of Ottawa glittering in the distance and standing out in sharp relief against a rich warm sky as the sun disappeared behind them, all combined, rendered the location most lovely and attractive. Unfortunately the first days of the Exhibition were cold and raw, and many from a distance, on that account, abandoned their intentions of visiting the Capital, but the last three days were all that could be desired.

#### THE MAIN BUILDING

Is an Octagonal structure two stories high and partially lighted from the roof. It is 92 feet in diameter, and the same height from the floor to the top of the dome, and altogether 137 feet from the floor to the truck of the flag pole. From each of its sides ar extended wings 60 feet in length by 30 in width, and 36 feet high from the ground to the ridge pole. These wings have no second story; the distance from the gable end of one wing to the

gable end of the other on the opposite octagon, is 212 feet. The total area of floor space is 29,000 superficial feet. There are eight wide entrances through the ends of these wings. The Building was constructed from an original design by Mr. James Mathers, architect, of Ottawa, and completed under his superintendence. Messrs. White and Black were the contractors for the carpenters' work, and Messrs. Keough and Strang for the painting. The whole work was brought to a very satisfactory completion and in good time.

### THE OTHER BUILDINGS

consist of the Horticultural-hall, Poultry-hall, Machinery-shed, Stables, Cattlesheds, Sheep-pen, and Pigstyes; also a Police office, Telegraph office, Directors, Secretary and Treasurer's rooms, and a brick cottage on the ground which was set apart for the use of ladies and the Directors' friends. The sizes of all these buildings are marked on plan.

### THE TOTAL COST

of all the buildings, including the brick houses already erected, exceeds $30,000, while the land purchased reaches a similar sum.

### CASH RECEIPTS.

The number of persons who visited the grounds amounted to about 60,000, and the sum total collected reached about $20,000. Had the weather been finer at the commencement, it would probably have been more.

The entrance price was 25 cents, and ten self-registering turnstiles were erected for the admission of the public. The fare by steamer or omnibus was ten cents.

## ARTICLES EXHIBITED.

### FINE ARTS DEPARTMENT.—PICTURES.

We do not feel competent to pass an opinion on this high Art; it is a delicate subject to touch upon, considering that its votaries are the most sensitive of human beings. There were certainly many pictures of a very high order of art, a great many of fair mediocrity, and a few unworthy of criticism.

Few are capable of judging of the merits of a really good picture; with many judges it is a mere matter of taste and not art judgment or keen criticism that influences their decision. We have no doubt but that many of the prizes were injudiciously awarded, still we would by no means infer that partiality was shown. More dissatisfaction was expressed at the decision of the judges on this branch of art than on any other that was exhibited. Altogether there were too many copies. We would sooner award a prize for an original drawing of medium merit than to one that was a copy from a painting of high order; the first is the effort of genius, the latter only the manipulation of the brush, and the blending of colors already selected for guidance.

### MACHINERY.

In deciding on the merits of Machinery, the superior finish of many of the machines seems to have had great weight with the judges. Messrs. Bartley & Co., of the St. Lawrence Iron Works, Montreal, were the contractors for supplying steam power, which was effectively done. A good deal of the machinery, however, was never tested, although awarded first prizes. This firm exhibited amongst other machinery *Patent Internal Clamp Coupling for Shafting*, deserving of particular notice, of which we will give an illustration in our next Number.

Messrs. Frothingham & Workman, of Montreal, exceeded all others in the extent, variety, value, utility, and superior quality of goods exhibited, which were admirably and tastefully arranged by Mr. Perry.

Among several articles of machinery we particularly noticed, Safety Valves, Flower's Stop Valves, and Portable Furnaces, of which we have given illustrations on pages 328 and 329.

Messrs. Kennedy & Sons, of Owen Sound, exhibited a very substantial and cheap *Running Gear* for circular saws; connected with the working of this saw were many arrangements of great practical use. They also showed *bevel mortise wheels* and a double *turbine wheel*.

Scott, Cayley & Cayley, of Ottawa, had some very superior *leather machine belting*.

This Firm are sole representatives of Messrs. J. A. Fay & Co., of Cincinnati. The machines manufactured by this Company have been awarded over 200 prizes and medals at all the prominent exhibitions in the world. They exhibit at Ottawa at the present Provincial Exhibition, a splendidly constructed *planer* and *matcher*, a *patent 3-side moulder*, a *patent mortiser with compound bed*, a *cabinet* and *spoke tenoner*, a *carriage cutting-off saw* and some *mill saws* made by "American Saw Co."

J. Hay & Co., of New York, also exhibited a very fine assortment of *Leather Machine Belting*.

In this Department also, The Canadian Rubber Co., of Montreal, had an excellent assortment of *India Rubber Belting, Engine Hose, &c.*

The Bowmanville Manufacturing Co. exhibited a large *planing* and *matching machine*, as well as several other contrivances, but as they were not running, the belting not having been put on, their properties could not be estimated.

Cant, Gourlay & Co., of Galt, Ont., showed a very fine lot of *planers, moulding machines, tenoning machines, blind machines, morticers*, and new *sawers*. Both this and the Bowmanville Co. were unable to run their machines owing to not having them in place in time.

The Dundas Tool Works.—Messrs. McKechnie & Bertram's manufactures from the Canada Tool Works, Dundas, Ont., occupy a prominent place in the Machinery Department. The firm showed a splendid *Planing and Matching Machine*, which planes both sides of a board at one operation, a large size four side *Moulding Machine*, a *Gig Saw* running at 1,000 evolutions per minute, an improved *Wood Shaping Machine*, a *Compound Iron Planing* and *Shaping Machine*, and a twelve-inch *Drilling Machine*.

A *Lath Machine* exhibited by the Massey Manufacturing Co., Newcastle, Ont., seemed to be a very powerful machine and one not likely to get out of order. It cuts laths and pickets at the same time, and whilst cutting the laths indents them so as to give a better adherence to mortar.

Mr. John G. Bricker, of Waterloo, exhibited an invention or improved machine for upsetting and shrinking tires, braces, &c. It took an extra prize, also a small *Emery wheel*, bevelled each way from the centre in its circumference for grinding the teeth of machines upon the field.

Ontario Nut Works, Paris, Ont. Some beautifully made square and *Hexagon Hot Pressed Nuts* were exhibited by this firm.

A very fine Engine called the *Chaudière* was exhibited, but we have omitted to record the makers' name in our note-book.

### SAWS.

In this line Mr. James Robertson, of Montreal, as usual took the first prize, as also in everything else he exhibited. His *Saws* have a great reputation throughout the whole Dominion.—(See illustration, page 332.)

### THRESHING MACHINES.

There were several first class *Threshing Machines*, among those exhibited we noticed.

*Threshing Machines* and other agricultural implements from the "Fingal & Clinton Agricultural Works."

The *Little Grain Thresher* and *Separator* manufactured by the "Sherman & Forster Manufacturing Co.," Stratford, appears very simple in its construction and will thresh all kinds of grain and peas. It is a good machine, particularly for small farmers.

The Joseph Hall Manufacturing Co., of Oshawa, exhibited their *Champion Threshing Machine* of which we afford an illustration.

From Messrs. Secher, Sandon & Co., Rideau Foundry, and Agricultural Works, Smiths Falls, were exhibited a *Buckley's Force Feed Drill*, very simple in its construction and strongly made, and the Improved *Albany Feed Thresher* of from 8 to 10 horse power. Also a *bevel gear* for grist and *saw mills*, a *plough*, &c.

Mr. John Elliot, of London, exhibited a combined *Reaper and Mower* styled the *Meadow Lark*, a very serviceable and compact machine, and requiring but little draft power.

Frost & Wood, of Smiths Falls, exhibited perhaps the largest collection of farming implements upon the grounds, among which we noticed their *Harvest Reaper* and *Mower combined*. The *Dodge combined Mower and Reaper*, also their celebrated *Johnston Reaper*, *Model Mower*, and No 1 *Buckeye Harvest Mower*, claimed as one of the leading machines in the Dominion. They also exhibited their *Four-Horse Thresher and Separator*, said to be capable of threshing about, on an average, 400 bushels of oats per day, and three hundred bushels of wheat. We noticed also their *Empire Self-Dumping Rake* and their wheeled cultivator adapted by a simple contrivance for any kind of ground, and a variety of other farming implements.

Messrs. Cossitt Bros., of the "Brockville Agricultural Implement Works," exhibited several machines *A Drag Cut Cross-saw*, a *Ten-horse power*, with *Thresher* and *Cleaner*, and a model *Buckeye Mower*, all first-class work and said to be very efficient.

A. Howell, Brantford, Ont., had on the grounds his improved *Sulkey Horse Rake* with *Self-dump*, which only requires a few ounces of pressure to operate it. Not likely to get out of order, as it has no springs, gearing, clutches or friction attachments.

The Brampton Agricultural Works exhibited several excellent agricultural implements. Among so many excellent *Reapers* upon the ground the Judges must have had much difficulty in deciding upon their merits.

The Thornson & Williams' Manufacturing Co., Stratford, Ont., exhibited some excellent *Harvesters*, particularly their *Self-Raking Reaper*. This Company has already received several prizes. We particularly noted a *lever* for raising the table at the grain side, which seemed to have a particular advantage.

The *Champion Reaper*, manufactured by Joseph Hall Manufacturing Co., Oshawa, is a very fine machine, and according to the victories claimed in the Company's Circular, it certainly deserves its name. The name of the firm alone ought to be a good warrant for its excellence.

*Johnston's Self-Raking Reaper*, manufactured by Brown & Patterson Manufacturing Co., Whitby, Ontario, we certainly thought stood about first on the ground. In fact all the agricultural implements manufactured by this Company were of a very superior class.

## FANNING MILLS.

Messrs Borthel & Birch, of Stratford, exhibited an improved *fanning mill*. Its special advantage is its ability to separate everything from the pure grain. It has a working capacity of 25 bushels per hour.

Mr. James Sheridan, of Playfair, exhibited a very good *fanning mill*, which took second prize.

Leslie Johnson, of London, had a *Pea Harvester* deserting of especial notice.

A *Pea Cleaner* was exhibited by Messrs. Ivke & Folton Bros., Guelph, to which a shaft carrier was attached, claimed to be a most useful machine.

The Paris Foundry & Agricultural Works, Ont., exhibited several very fine Agricultural implements, amongst which we noted a *Straw cutter*, combined *Feed Mill*, *Pitts Horse Powers*, *Grain Crushers*, *Grain Drill* and double action *Root Cutter*.

Geo. Gillies, of Gananoque, exhibited Collard's flexible *iron harrow*, flexible *iron cultivator* and Patent *iron Horse Hoe*.

The Massey Manufacturing Co., of Newcastle, had one the finest exhibitions of *mowers and reapers* upon the ground, manufactured on the celebrated "*Wood*" principle which carried off five of the *World's* highest prizes. The *Decoration* of the *Imperial Cross* of the *Legion of Honour*, the *Decoration* of the *Imperial Order of Francis-Joseph*, besides several gold medals. What can we say further in commendation of their agricultural implements?

The *Warrior Mower* exhibited by the "Warrior Mowing Machine Company," manufactured at Prescott, is really a substantial and cheap machine, and we have no doubt but that it does its work well. The *Randall Harrow* was also exhibited by this firm.

L. D Sawyer & Co., of Hamilton, exhibited some very superior *Agricultural Machines and Farming Implements*, amongst which we particularly noticed a new *reaper and mower*, with a *self-racking attachment*. The *racking attachment* is very light and strong, and the shafting is of steel.

The *Hamilton Agricultural Works* are worthy of especial notice.

## CIDER MILLS.

Mr. H. Selle, of Vienna, Ont., exhibited a number of *Cider Mills* which have been awarded several prizes, and said to grind very rapidly and easily. There is said to be no discoloring of fruit. They were the only ones shown.

## HARDWARE.

Under this heading the Firm of Frothingham & Workman, of Montreal, had the most extensive and creditable show in the building, and well arranged, consisting of *nails* of all kinds, *spades*, *car lamps*, *planing tools*, *Machinery*, *and self-testing Steam guages* of all descriptions.

We particularly noticed the new *Patent nail* exhibited by Mutholland & Baker, of Montreal. Sections were shewn in wood of the effect produced by the ordinary *cut nail*, which lacerates the grain, and of course its tensive qualities are considerably weakened, besides leaving an opening for moisture to enter and thus in time destroy the nail by oxidation.—See page 343.

The *Stacy chisel pointed nails* make a clean cut before the point, compressing the wood on each side as it inters. There are also a greater number of nails to the pound, rendering it more economical. It can be used either as a finishing nail or for ordinary purposes.

## LOCKS.

A variety of *locks* were exhibited by Messrs. J. & J. Taylor. The *double chronometer bank locks*, the *magnetic* and *automatic bank and safe locks* with revolving bolts, &c.

## BELLS.

Messrs. James Bros. exhibited two medium-sized *bells*, which gave a very clear musical sound.

Mr. P. Thompson, of Rock Island, also represented *bells*, *pumps*, &c.

J. & S. Vessor's combined *Sower*, *Harrow and Roller* is a very valuable machine, particularly for small farmers.

The *Empire Grain Drill* was exhibited by J. O. Wisner & Son, Brantford. It has a *Tube Lifter* and *Grass Seeder* and *Feed Runner*, the latter one admirably arranged.

Mr. Peter Robertson, of the Chaudiere, had a very fine display of lumbermen's tools and other goods in that line, also stonecutters' tools. His goods are all of excellent make and quality.

Mr. G. Chapleau, of Montreal, shows a collection of stone cutters' tools second to none.

## METALS.

Under this head Messrs. E. P. G. Taylor & Co., Toronto, exhibited *Thurber's Royal Antifriction Metal for Journal Bearings and Machinery* of all kinds. It would appear from testimonials to possess many advantages over other metals.

## LUMBERMEN'S TOOLS.

Mr. Robertson, of Chaudiere, exhibited a very complete set of *Tools* and of superior workmanship for which he well deserved an extra prize.

Messrs. Ahearn & Walsh, of Ottawa, exhibited a set of lumbermen's tools of splendid make and superior quality. They were examined by many persons, who pronounced them the best of the kind ever seen in this or any other city. Messrs. Ahearn and Walsh have been requested to take these articles to the Philadelphia Exposition, where no doubt they will take first prize.

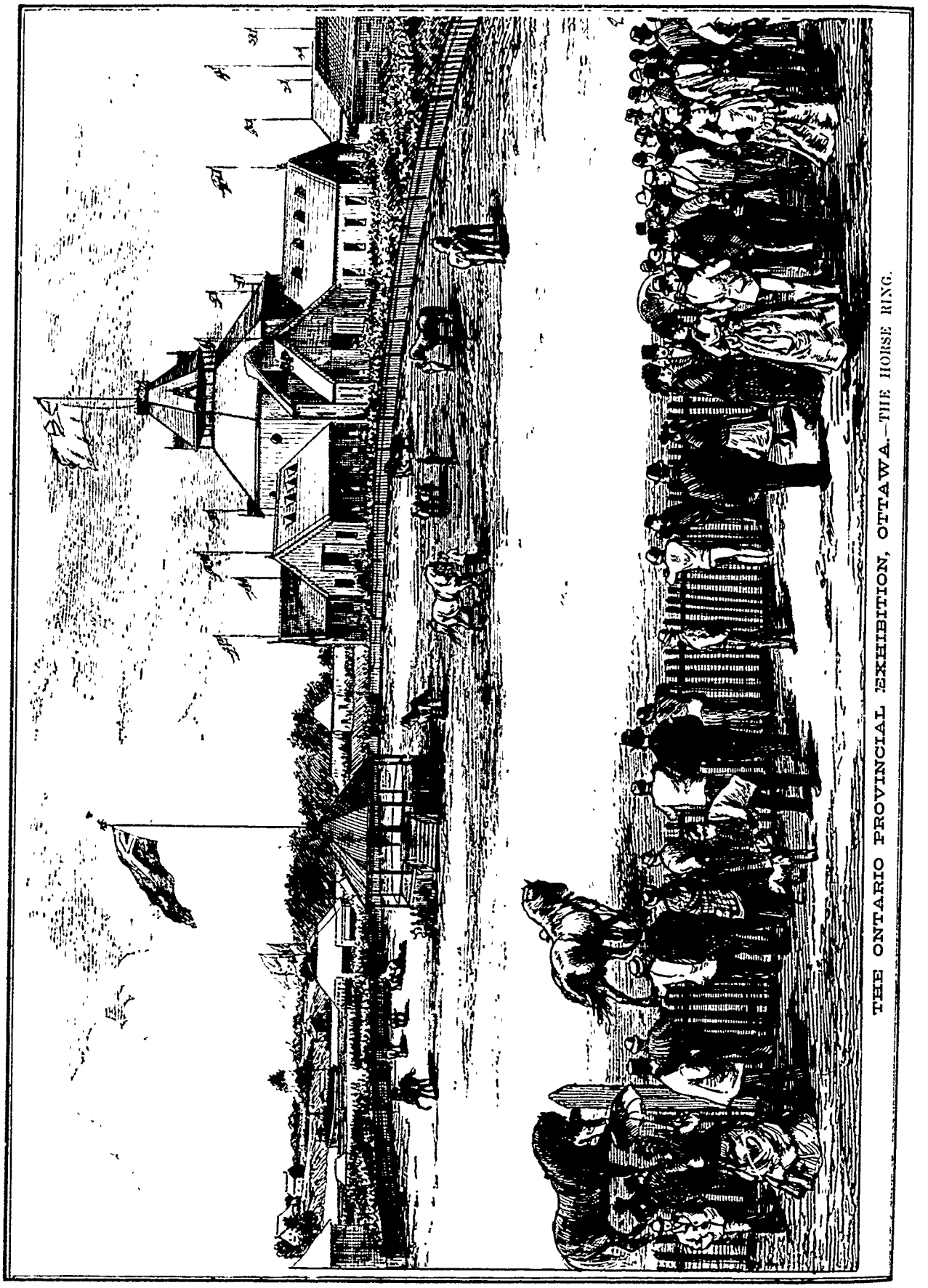
## WASHERS & WRINGERS.

Messrs. Dillingham and Berg, of Quebec, showed a very compact and portable washing machine, easy of operation and one that will not get out of order; also the Eureka Wringer, equally commendable for its work.

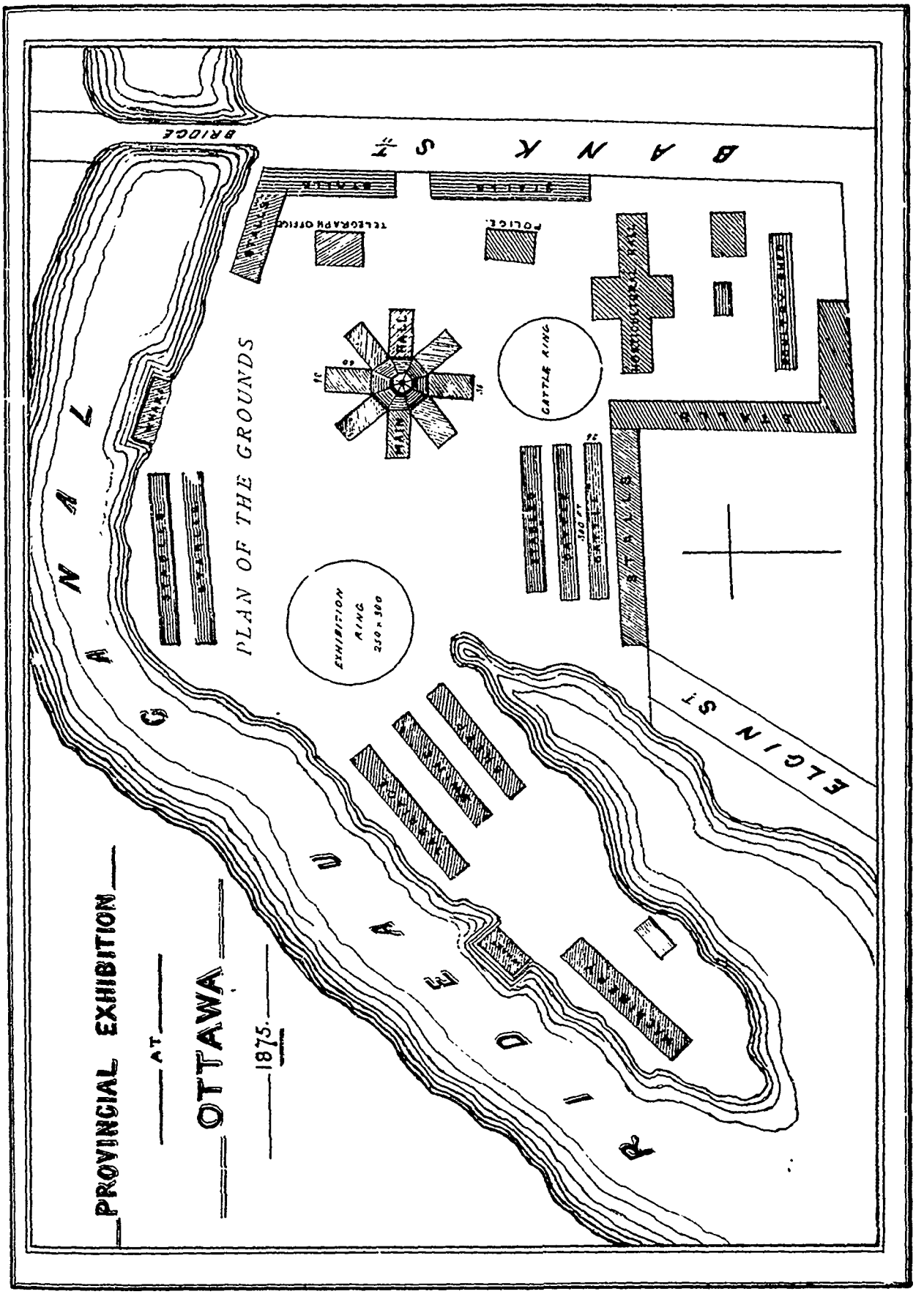
A noticeable article in this line was a Machine shown by Mr. A. G. Rowan, of Ottawa. It is peculiar in construction as there is no machinery seen but two rollers and a folding handle.

A. R. Giles, of Ottawa exhibited a Washing Machine that could roll part and squeeze, without any rubbing being required.

Graver Bros., of Ottawa, exhibited a neat revolving Washer.



THE ONTARIO PROVINCIAL EXHIBITION, OTTAWA.—THE HORSE RING.


PROVINCIAL EXHIBITION
AT
OTTAWA
1875.
PLAN OF THE GROUNDS
CANAL
RIDEAU
BANK ST
BRIDGE
MAIN HALL
CATTLE RING
EXHIBITION RING 250 × 300
HORTICULTURAL HALL
STALLS
ELGIN ST

A. H. LAING had a Washing Machine of considerable merit.

MORRISON & BROS., Hamilton, had on the grounds a Washing Machine with rubber rollers, giving a pressure of 95 lbs., with malleable iron sides, and extension rod to fit any tub.

E. R. SHOREY & Co., of Napanee, Ont., exhibited *Odell's Royal Canadian Clothes Wringer*, also an excellent *Churning Machine.*

There was a self-acting *Shingle Machine* exhibited by H. SWEENY, which was very highly thought of.

### CHURNS.

Among several *Churns* exhibited we particularly noted an oscillating or swinging *Patent Churn*, patented by J. M. CAMPBELL, of Almonte, Ont. We formed a very high opinion of this simple, but we have no doubt, efficient *Churn*. A child could work it simply by keeping it swinging. If once set in motion, like the pendulum of a clock, a very little power will keep it going. It is entirely free from machinery or anything to get out of order, and as easily washed out as a tin bucket.

### PATENT BREAD CUTTER.

This is the invention of MR. MORRIS AHEARN, and is an article that should be in every hotel and boarding-house. It can be worked by a child, and cuts bread very neatly, and any thickness. With it a great saving of the staff of life is effected.

### BRICK MACHINES.

MESSRS BULMER & SHEPPARD'S. - "*Canada*" *Self-acting Machine* This is a very superior machine, one not likely to get out of order, simple in construction, not costly, and capable of producing 13,000 pressed bricks daily. The bricks made by this machine when kiln burnt are about $8 \times 4 \times 2\frac{1}{2}$.

There was a very compact brick machine exhibited by MR. JOSEPH CLOSE, of Woodstock, so constructed as to clear itself of any stones or other impediment getting in the moulds, and other valuable points. The bricks turned out by this machine are larger than those made by the Bulmer machine.

The CANADIAN OIL CABINET COMPANY, of Montreal, Charles Drake, Agent, Montreal, was the only exhibitor in this line. No store or private house should be without one. They are made of all sizes.

### BUILDING MATERIALS.

J. A. EGGENTON, Montreal.—Some very fine specimens of *cut glass* for door lights.

G. & S. FARRAR, St. Johns, exhibited the best assortment of pottery to be found in the building.—Some excellent imitations of this nature in the form of vases, &c., were shown.

R. MCGREGOR, of Napean, also had a fine assortment of pottery.

P. S. BRUMMOND. — *Rockland Slate*, for roofing purposes, shelves, &c.

W. MCKAY, of Ottawa, exhibited *hydraulic cement* for building purposes ; it has an excellent reputation.

Mr. GEORGE RUSSELL, of Ottawa, also exhibited *Canadian cement mouldings*, some of them of very superior workmanship.

*White bricks* were exhibited by SEALES BROS., Perth, and also by LEONARD PEARS, of Yorkville. *Red bricks* by F. H. WILLIAMS, of Billings' Bridge.

Mr. W. S. WILSON, 768 Craig st., Montreal, is the manufacturer of *Ruthven's Improved Gas Machine*, which he has on exhibition. It appears to be a very remarkable machine throughly automatic, and gives a brilliant light. It requires no attendance but winding up and changing it occasionally with petroleum. It is stated to give the cheapest gas light made. The machine can be made of any dimensions say from five to one thousand lights. The gas furnished by this machine is a mixture of atmospheric air with carborated hydrogen. It seems very similar to the Paris machine illustrated in our October number.

### SASH-FASTENER.

MR. KINNEY had an *automatic sash fastener* claimed to be burglar-proof.

### WIRE WORK.

MR. RICE, of Montreal, made a very creditable display of *wire work*. We gave a long article on, and several illustrations of, *wire work* made at the Birmingham Factories in our October number.

*Wire work* is coming more generally into use for various domestic purposes.

### HOT AIR FURNACES AND IRON BEDSTEADS.

This class of goods was most favorably represented by the firm of MEADOWS & Co., of Ottawa. We regret that our space will not admit of entering into the merits of these furnaces. The *Lawson Drummond flu hot air furnace* has already become celebrated They also exhibited the *Pearl self feeding furnace*. But the most prominent article they exhibited was the *Splendid*, a *fireplace heater*. It is a combination of a grate and stove intended to heat a room and the chamber above. There are many arrangements about it which makes and gives it a great advantage over similar heaters. The casting is beautiful and the finish of the whole represents worthily the place where it was manufactured, Troy, N. Y.

### BASE BURNERS.

Some very elegant *Base Burners* were exhibited by MESSRS. BUCK, Brantford, Ontario. There are several improvements in the construction of these stoves which will be much appreciated by all who buy them.

MR. WILLIAM BUCK, of Brantford, exhibited largely on this line and deserves great credit for their superior finish and perfection in the castings. The "Radiant Home" was much admired and is said to be a first-class heater. There are many merits which he claims for it which we are unable for space to enter into. No doubt but that it will be much patronized.

### FURNITURE.

A great attraction to the multitude in this line was the magnificent and complete *Bedroom set of Furniture* and a *Sideboard* exhibited by the ALMONTE FURNITURE COMPANY. The style was termed "Greco-Italian." The wood was black walnut richly ornamented with French veneers, carvings, and other artistic ornamentation The *Sideboard* was universally admired as a work of the greatest merit and artistic taste, chas e design, and exquisite finish ; it was sold on the spot for $500. Such a superior specimen of workmanship is exceeding creditable and encouraging, as it shows what could be done in the Dominion if our manufacturers had a field for the sale of such superior work.

MESSRS. GIBBARD & SON, of Napanee, also exhibited a very elegant and highly finished Gothic bedroom set which is valued at $400. The firm is one of long standing, and well-known for having one of the largest *Furniture Ware-Rooms* in the Dominion, and their work is always first-class.

MESSRS. TEES BROS., Montreal, had perhaps the best display of useful Furniture at the exhibition, the workmanship extremely strong, but neat and of tasteful design. Their walnut barrel self-looking revolving desks, which are now so much called for, were much admired.

MR. FLECK, of Ottawa, had a fine lot of *Wooden Bedsteads.*

MR. REINHART, of Montreal, exhibited his *Spring Bottom Bedstead*, all iron, a very neat article.

W. WHITESIDE, Montreal, exhibited his comfortable *Patent Spring Beds* which are well known everywhere now for their excellence.

We must not omit to mention that ROBERT E. DALE, Ottawa, who has been deprived of sight since he was six years of age, exhibited a beautifully worked office *Desk* with *Drawers* and *Apartments*, a wonderful work ; it is to be hoped it will be purchased, by a general contribution, and sent to the Philadelphia Exhibition.

MR. DUFFY, Ottawa, exhibited some very find *Scroll Sawing.*

MR. LAADAM, of Ottawa, also exhibited fine workmanship in this line.

MR. A. ROE, of Ottawa, exhibited some very fine *Carving on Wood.*

MR. THOS. WEIR, of Ottawa, also made a fine display of *Decorative Wood Carving.*

### SAFES.

Mr. Chapleau, of Montreal, had a very fine *Fire Proof Safe* on view. Inside is a frame work containing drawers and apartments for books. There is a space between this apartment and the inner casing, which is claimed to be of great advantage. Instead of hinges, wrought iron centres turning on pivots are used. Mr. Chapleau is also an extensive manufacturer of iron girders, &c. He took the first prize for Safes at the last exhibition and received the first prize also at this one.

Mr. Lang also exhibited a very superior safe, very suitable for private office.

### PAINTS AND VARNISH.

Mr. J. E. Dion exhibited specimens of *Star glass, Paint, Star glass oil, Black varnish* and *putty.*

### DECORATIVE HOUSE PAINTING.

In the representation of grained wood of every description, Mr. Kimber bore off the palm; his doors were particularly admired, as specimens of art. His glass signs, marble panels, frescoed screens, embossed glass, &c., were all work of high merit.

### CARPENTRY.

In this branch M. Currier, of Ottawa, stood out prominently in specimens of machines, wrought mouldings, doors, sashes, black walnut newels and balusters, scroll works, &c., &c., in great variety. First prize for flooring and mouldings, and two first prizes and one second prize for other woodwork.

### HOLLOW WOODEN WARE.

Mr. G. Newell, of Hull, also exhibited some very superior turned work in the shape of newels, balusters, pillars, &c., also a great variety of hollow wooden ware, brackets, wooden balls, &c.

### COFFINS.

A great variety of metallic and wood *Coffins, Caskets and Hearses* where exhibited by the following parties Messrs. S. Rogers and John Barton, of Ottawa. We remarked, however, that those manufactured in the United States have a superior finish, both in graining and varnishing, to those manufactured in Canada, but we are making rapid advances towards excellence.

### MARQUETRY.

This beautiful kind of flooring which is now coming into general use in halls and passages of public and private buildings, was exhibited by Mr. Jas. Wright, of Montreal, in great variety. A first prize for this description of work should certainly have been given to Mr. Wright. We commend it to the attention of all architects.

### INLAID WOOD MOSAIC.

A most elaborate piece of work was exhibited by Mr. J. A. B. Hannum, of Hull. This is a table inlaid on top and sides with nineteen different kinds of wood nearly all of Canadian growth. The entire number is 120,000 pieces. It is entirely the work of hand, without stain or paint. Mr. Hannum spent five years in completing it, working at it late and early, after and before his hours of daily labour, as he is an employee. The top of the table is a representation of Mr. Eddy's manufactories at Hull. The exhibitor was his own draughtsman and cabinet maker; and says he never took a drawing lesson in his life. It is to be regretted that he did not obtain a draughtsman to put his buildings in perspective which would have added materially to their appearance and effect. He also exhibited a *lady's work box*, inlaid with 6,564 pieces of wood. We understand he asked a very high price for this elaborate piece of work.

### MARBLE WORKS.

W. M. Somerville, Ottawa, made a fine display of *marble mantel pieces* and a *marble cross* stone, sewerage drain pipes, vases, &c.

Messrs. Hearn & Harrison, of Montreal, had a large display of *optical and mathematical instruments* of every description. This is such a well-known firm for the superiority of its implements that further comment upon their excellence is unnecessary.

George Gale, of Smiths' Falls, exhibited a very superior *toise mattress* which was subjected to a severe test.

A Calendar Clock, manufactured at Ithica, N. Y.

It indicates, with certainty, the hour, day of the week, day of the month, and month of the year.—See page 337.

Mr. T. R. G. Taylor, of Toronto, made a fine display of *calendar clocks*, which change for leap year. It is claimed that they will go for many years without requiring to be repaired.

H. J. Smith, 105, Queen street, Toronto, exhibited some superior soda water fountains.

FIRE PROOF SAFE.—1st Prize.

Manufactured by Godfroi Chapleau, Montreal.

### FIRE EXTINGUISHER.

1st Prize.

Messrs. A. A. Murphy & C. C. Healle, of Montreal, exhibited the *Pneumatic Fire Extinguisher*, which they represent as superior to anything of the kind in use. The principle involved in the construction of the *Extinguisher* is an exceedingly simple one, and depends upon the compression of air. The patentees claim many advantages for their invention over any other machine for extinguishing incipient fires, while it can also be put to other uses, such as cleaning windows, watering gardens, &c., and last but not least, it is much lower in price than any other in the market.

A Montreal Company was represented by one of their *gas machines* in operation which attracted a good deal of attention. It is said to be absolutely safe and automatic in its action. There is no gas in the machine proper, and no gasoline used or stored in the building. The gas is made in tanks under ground.

### NICKEL-PLATING.

In this Mr. Clark, of Montreal, had a great display and appeared as if they could not be surpassed in durability and finish. *Horse bits, stirrups, steam whistles, hinges, pistols, water cocks,* &c., are among the goods exhibited.

### TINNED WARE.

J. M. William & Co., of Hamilton, occupy a large portion of a wing with their *japanned tin ware & plain tin ware*, also stamped re-tinned ware, all excellent.

Mr. James Smart, of Brockville, exhibited a great variety of *castings*, such as *clothes-hooks, hinges, brackets, book-presses, patent-augers, hand mortising machines, jack screws*, and a variety of other machinery. Mr. Smart is one of our most enterprising manufacturers, and his department was most creditably and worthily represented.

### BOOK-BINDING.

In this art Mr. W. R. Burrage, of Toronto, exhibited some very fine specimens of Books and *book-binding*, particularly *Zell's Encyclopedia*. The judges awarded him a 1st prize.

### SODA FOUNTAINS.

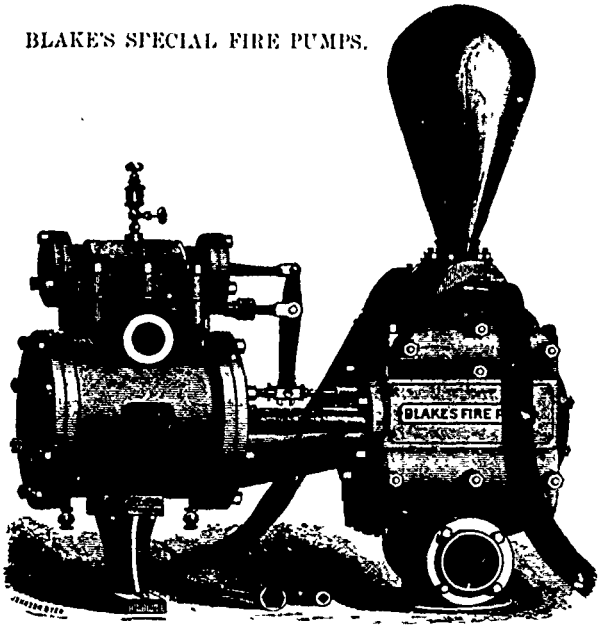
Mr Smith, of Toronto, exhibited some of very elegant design and workmanship.

# PROVINCIAL EXHIBITION.

MACHINERY EXHIBITED BY MESSRS. FROTHINGHAM AND WORKMAN, MONTREAL.

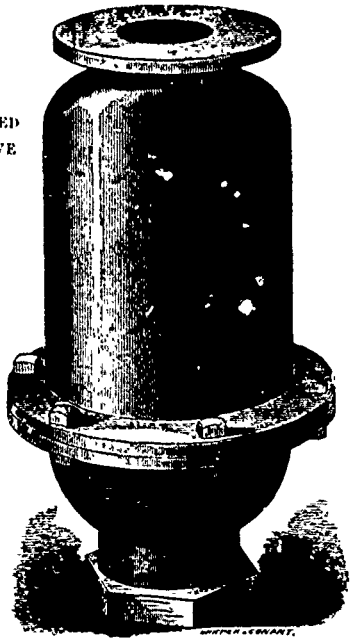
1st Prize.

BLAKE'S SPECIAL FIRE PUMPS.




(This Cut Represents Size, 14 in. Steam Cyl., 7 in. Water Cyl., 12 in. Stroke.)

NICKLE-SEATED SAFETY-VALVE FIG. 1.



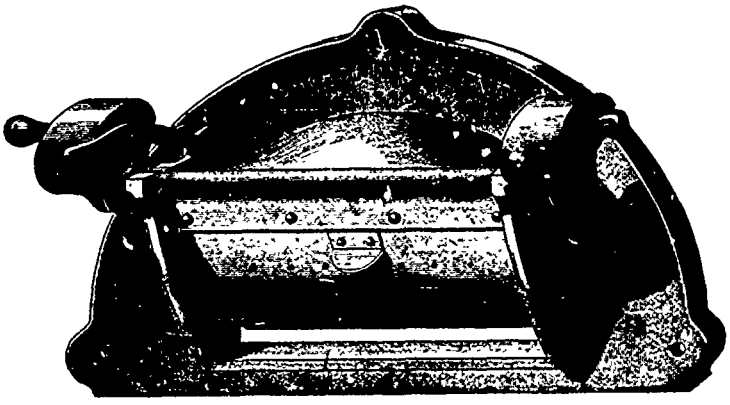
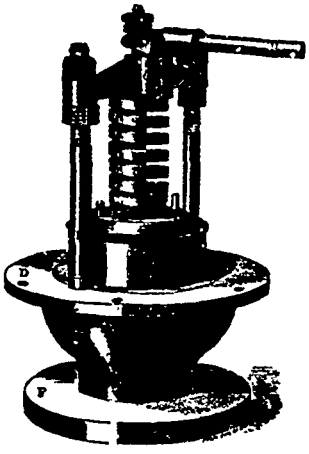
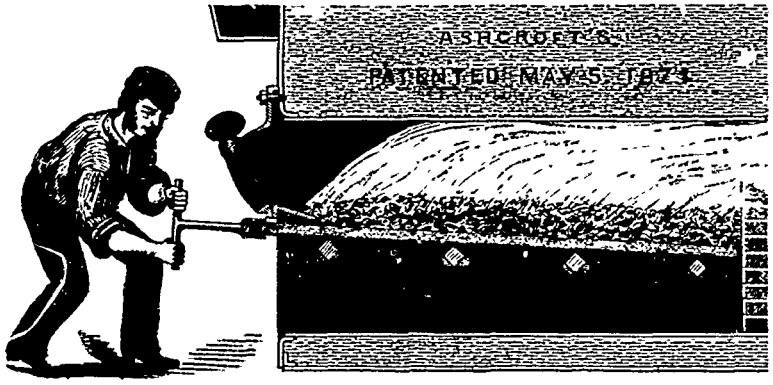
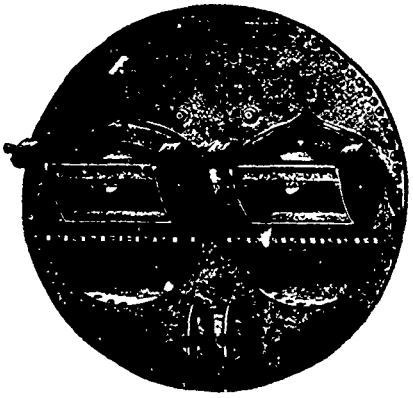


FIG. 2.



BALANCED FURNACE DOORS.



☞ *Cleaning the Bars Without Opening the DOOR.* ☜

# PROVINCIAL EXHIBITION.

MACHINERY EXHIBITED BY MESSRS. FROTHINGHAM AND WORKMAN, MONTREAL.
1st. Prize.

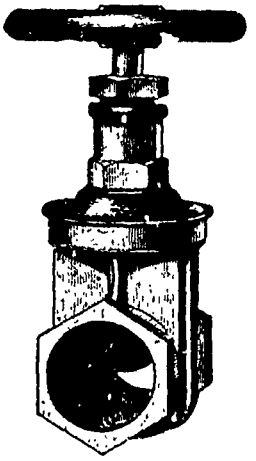


Figure 1.

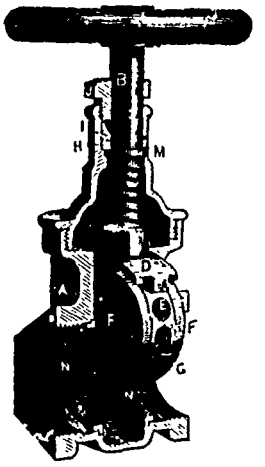



Figure 2.

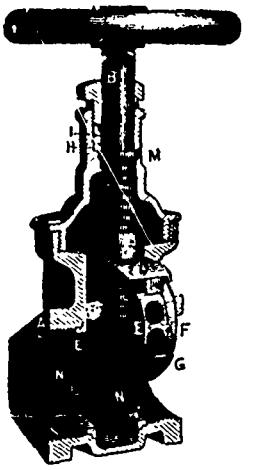



Figure 3.

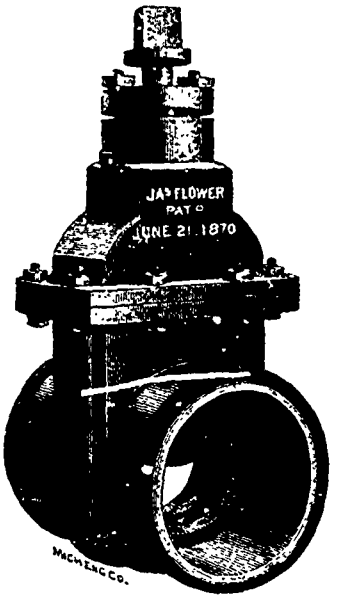



Figure 4.

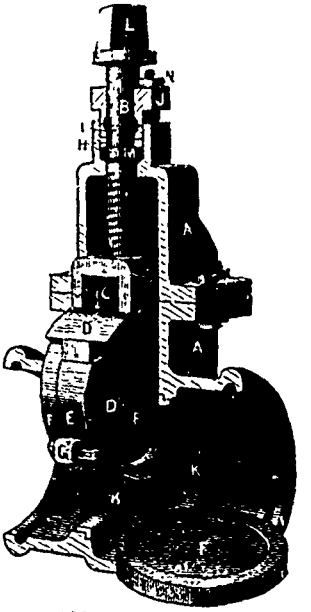



Figure 6.

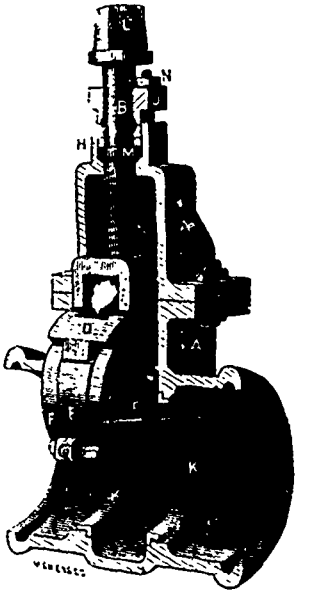
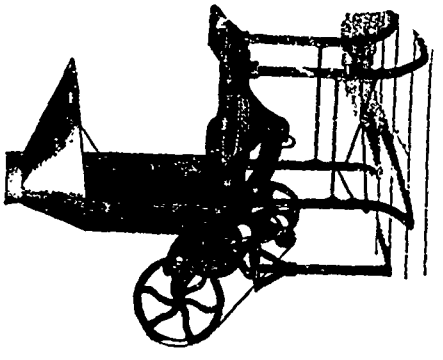
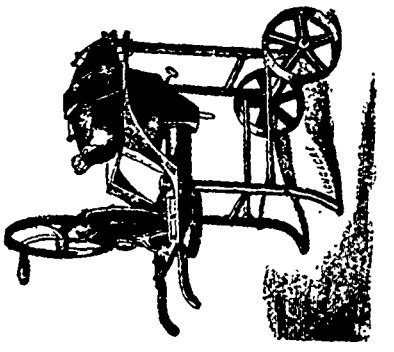



Figure 5.

PORTABLE FURNACES.





### BAG FILLER.

We remarked an excellent invention for holding a grain bag open while being filled. It is a steel hook attached to an iron arm that can be raised or depressed to suit any bag; the hoop holds the mouth of the bag open, and is quickly adjusted we afford a cut of it. J. JAMES, Forest, Ontario, is the patentee.

A. HARRIS, SON & Co., Manufacturers, Brantford, Ont., exhibited some excellent specimens of *mowing and reaping machines*. Their *combined mower and reaper* passes over all obstructions without injury to the machine and is well adapted for rough land. This machine has taken prizes at many exhibitions. The *New Kirby* is worthy of especial mention.

### SEWING MACHINES.

Of these indispensable domestic and manufacturing necessities there were several exhibited, but for some reason we did not hear explained, no prizes were offered. We particularly noticed the excellence of the following: "American Singer Sewing Machine." "The Williams Manufacturing Co." "The Gardner's Sewing Machine." "The Reice Sewing Machine." "The Wheeler & Wilson's Manufacturing Co. Machines and others, but where all were so busily at work, and all worked so well, it was a difficult matter to give a decided preference to any one machine.

### SEWING MACHINE NEEDLES.

MR. HARVEY E. MOLE, exhibited the finest needles, they were of all sizes and of great fineness, smoothness, and temper.

THE SEWING & MACHINE NEEDLES Co., exhibited by H. E. MOLE, received an extra first prize.

### PRINTING PRESSES.

G. L. COLLENDER & SON, Port Hope, exhibited in this line the *Pearl Printing Press* for which they are agents and of which we give an illustration.

### LEAD PIPES, SHOT, PAINTS, &c.

Under this head, MR. JAS. ROBERTSON also had a great display. Mr. ROBERTSON ranks, amongst our most enterprizing manufacturers, all his goods are manufactured in Montreal and are noted for their excellence. They formed quite a striking group, the arrangement of which was conducted by MR. MCPHAIL.

### RAILROAD COUPLINGS.

Exhibited by Colonel CHATTERTON, of Cobourg. We cannot do better than quote the remarks of the Ottawa *Free Press* on this patent method of coupling cars, adding our own conviction of the merits of such a patent car. Had it been in general use the sad accident at Sorel last month, by which 10 men were killed and twenty wounded could not have happened, as the shock would have been so gradually resisted that the cars would not have been capsized or thrown off the track.

"Colonel CHATTERTON, does not occupy much space with his goods, but nevertheless he has an invention which may, at no distant day, revolutionize matters on railways, and be the means of saving thousands of lives. We here refer to what he calls the "collision draw bar." It is a very simple but very ingenious construction, and is so arranged with levers and springs, that in case of the collision of two trains, no serious consequences may result. It is fixed in the coupling bar, and is said to possess a spring resistance of one hundred and fifty tons. Certainly if the Colonel's invention is equal to all that is claimed for it, the sooner it is introduced on every railroad the better. Colonel CHATTERTON also exhibits a *patent car coupler*, which is a simple and manifestly excellent improvement. It is now in use on the Cobourg and Peterboro Railroad, and works admirably. It has only to be adjusted so that when the car is backed up against the one with which it is intended to connect the coupling takes place of its own accord. The Colonel's inventions are very valuable ones."

### FIRE AND BURGLAR PROOF SHUTTERS.

MR. GEORGE CAMPBELL of Toronto, exhibited *fire* and *burglar proof shutters*. The patent was issued last year. They are made entirely of iron, and can easily be opened and shut from inside the building without the necessity of opening a window.

*Iron revolving shutters* are coming very much into use in England, but these are made somewhat similar to our ordinary shutters. The iron slats clasp over each other making them also rain proof.

### CARRIAGES.

In this Department there was a very fine display of vehicles of every description finished in that superior style for which Canadian Carriage Manufacturers have gained renown, the following we particularly noticed.

*Phæton*, by W. GREY, of Chatham, gold mounted, basket body lined with light colored morrocco, also some superior buggies.

*Phæton*, by D. AUCKLAND, of Almonte, richly but plainly finished, a serviceable piece of workmanship.

*Phæton*, by C. & J. GRAHAM, of Lyon, a three spring phæton strong and serviceable, workmanship very superior.

*Children's Carriages*, TRUDELLE, of Montreal, of numerous designs and got up with much care and attention to the comforts of both nurses and children.

*Phæton*, by DUHAMEL, of Ottawa, exhibited among carriages a very handsome pony phæton lined with rich blue satin, also a double seated covered buggy with top lined with rich puce colored cloth.

*Hack Carriage*, by P. BUCKLEY, of Ottawa, had on show a remarkably fine Hack Carriage, made in the best manner, also a very superior double Sleigh.

*Market Wagon*, by G. BROWN, of Kingston, a very superior article. He also exhibited several sets of patent wheels very light but strong, similar to American wheels, if an accident happens to a spoke it can be taken out and replaced without disturbing the tire.

*Phætons*, MR. COGHILL, of Toronto, exhibited two phætons of very superior workmanship, tastefully got up and neat in appearance.

J. B. ARMSTRONG & Co., Guelph. This firm had quite a large display of vehicles all well got up and evidently made for work. Among other vehicles we noticed a very neat racing buggy which weighed only 155 lbs. He also exhibited some fine specimens of steel carriages.

S. & F. TURNER, of London, Ont., exhibited two open *Diamond Phætons* of a very elegant design, also two *Basket Pattern Phætons* with a handsome silk lined umbrella top. He also exhibited two excellent pleasure *Carriages*.

The MCGLORY, THOMISON CARRIAGE COMPANY, of London, had a great number of vehicles on the ground a *Landeau* and *Landeaubeth* combined, a *Landeau Carriage*, a handsome *English Brett*, a family carriage, *Phætons*, *Buggies* and a trotting *Sulky* and *Waggons*, also *Sleighs*, and several sets of very fine wheels, all his vehicles were of superior workmanship.

BROWN & ST. CHARLES, of Belleville, showed two *Park Phætons* and a *Single Cutter* beautifully finished.

H. A. MANDERSON, of Baradventure. A *sleigh and waggon* which by a very simple contrivance can be raised from the ground and placed upon wheels, useful for travelling during the commencement of winter on the breaking of the snow on spring.

MR. MORGAN, of Uxbridge, Ontario, exhibited a *pleasure sleigh*, furnished with *Conroys patent turn-down seat*, by which it can be converted into a single or double seated sleigh at pleasure.

ALBERT SMITH, of London, Ontario. A collection of *fifth wheels and carriage furnishing*.

TITUS, of Ottawa, exhibited over twenty vehicles among which we noticed a handsome *black carriage* lined with maroon leather and finished with heavy gold mounting, a *family baroucche*, a *dog cart*, *phaeton*, *two buggies*, besides other vehicles and sleighs, all constructed for durability and of fine finish.

S. & H. BORBRIDGE, of Ottawa, exhibited a fine display of *harness;* we do not pretend to be a judge of these articles, but heard them much admired.

# PRIZE LIST.

## ARTS AND MANUFACTURER'S DEPARTMENT.

(Open to the World.)

### CLASS XLI.—FINE ARTS, IN OIL.

Professional or Amateur — (Originals)

JUDGES.—J. Bruce, Toronto; W. Kingsford, Ottawa; J. Spooner, Toronto.

Any subject, $20, W. N. Cresswell, Seaforth; 2nd. $12, J. C. Forbes, Toronto; 3rd. $6, C. Chapman, London.
Animals, from life, $12, W. N. Cresswell; 2nd. $8, Thos. M. Martin, York Mills.
Flowers, grouped or single, $10, Jas. Griffiths, London; 2nd. $6, Mrs. Chamberlain, New Edinburgh.
Figure subject, $12, J. C. Forbes; 2nd. $8, M. Matthews, Toronto.
Landscape, Canadian subject, $15, W. N. Cresswell; 2nd. $10, T. A. Verner, Toronto; 3rd. $6, M. Matthews.
Landscape or marine painting, not Canadian subject, $10, W. N. Cresswell; 2nd. $6, R. Bagent, Toronto.
Marine painting, Canadian subject, $12, W. N. Cresswell; 2nd. $8, T. A. Verner.
Portrait, $10, J. C. Forbes; 2nd. $7, T. A. Verner.
Still life, $10, C. Chapman, London; 2nd. $6, J. M. Martin, York Mills.

### AMATEUR LIST—OIL (COPIES.)

Any subject, $10, M. L. Bate, Ottawa; 2nd. $6, W. R. O'Keen, Ottawa; 3rd. $4, Geo. Hay, Ottawa.
Animals for life, $8, Miss McLaren, Buckingham; 2nd. $5, Miss Bate, Ottawa.
Figure subject, $8, Miss Strickland, Oshawa.
Flowers, grouped or single, 2nd. $5, Miss Armstrong, Toronto.
Landscape or Marine view, Canadian subject, $8, Miss Armstrong, Toronto.
Portrait, $8, Jno. Davidson, Toronto.
Still life, $7, Miss Strickland, Oshawa.
Commended: three paintings by Miss McLaren, Buckingham.

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### CLASS XLII—FINE ARTS IN WATER COLORS, CRAYON, ETC,

JUDGES: Mrs. Frost, Smith's Falls; Otto Klotz, Preston; Jas. Spooner, Toronto.

*Professional Lists—(Originals.)— Water Colors.*

Any subject, $15, Dan Fowler, Amherst Island; 2nd. $10, L. R O'Brien, Toronto; 3rd. $6, W. N. Cresswell, Seaforth.
Animals from life, $8, W. N. Cresswell, Seaforth; 2nd. $6, C. Chapman, London.
Flowers, grouped or single, $7, D. Fowler; 2nd. $5, J. Griffiths, London.
Figure subject, $3, D. Fowler; 2nd. $6, J. M. Bellsmith.
Landscape, Canadian subject, $12, L. R. O'Brien; 2nd. $8, W. N. Cresswell; 3rd. $4, D. Fowler.
Landscape or marine view, not Canadian subject, $8, W. N. Cresswell; 2nd. $6, N. Matthews.
Marine view, Canadian subject, $8, W. N. Cresswell; 2nd. $6, J. N. Verner; 3rd. $4, D. Fowler.
Portrait, $8, N. Matthews, Toronto.
Still life, $7, Jas. Griffiths; 2nd. $5, D. Fowler.

*Pencil, Crayons, &c.*

Crayon, colored $6, Thomas Griffiths; 2nd. $4, D. Fowler.
Crayon, plain $6, Verner; 2nd. $4, Fowler.
Crayon or pencil portrait, $6, T. Marten, York Mills.
Pen and ink sketch $6, A. M. Edmonds, Antprior; 2nd. $4, Griffiths.
Pencil drawing $6, Fowler; 2nd. $4, Griffiths.
Sepia drawing $6, Griffiths; 2nd. $4, Matthews.

*Amateur List — (Originals.)*

*Water Colors.*

Flowers, grouped or single $6, Miss G. Fitzgibbon, New Edinburgh; 2nd. $4, Miss Strickland, Oshawa.

*Pencil, Crayon, &c.*

Crayon, colored $5, Miss Strickland; 2nd. $3, Matthews
Pencil drawing, 2nd. $3, Miss E. Drake, Grafton.
Pen and ink sketch, 2nd. $3, Miss Strickland.
Sepia $5, Miss Fitzgibbon; 2nd. $3, Miss Strickland.

*Amateur List — (Copies.)*

*Water Colors.*

Animals, grouped or single, 2nd. $3, Miss Strickland.
Flowers, grouped or single $5, Miss Cox, Ottawa; 2nd. $3, Miss Strickland.
Figure subject $5, Miss Lamb, Toronto; 2nd. $3, Mrs. Throburn, Ottawa.
Landscape $5, Miss Lamb; 2nd. $3, Miss Strickland.
Marine view $5 Miss Lamb; 2nd. $3, Miss Strickland.
Still life, $5, Miss Rainbone, Toronto; 2nd. $3, Mrs. James Armstrong, Toronto.

*Pencil, Crayon, &c.*

Crayon, colored $4, Miss Jackson, Toronto; 2nd. $2, Miss Gale, Quebec.
Crayon, plain $4, Miss Cox, Ottawa; 2nd. $2, Miss Borthwick, Ottawa.
Crayon or pencil portrait $4, Thos. Beale; 2nd. $2, Miss Gale, Quebec.
Pencil drawing $4, Miss Strickland; 2nd. $2, Miss Armstrong.
Sepia, $4, Mrs. Neville, Ottawa; 2nd. $2, Miss Lambe.

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### CLASS XLIII.—STATUARY.

*Professional or Amateur.—(Originals.)*

*Figure subjects.*

JUDGES. — W. R. Billings, Ottawa; D. R. Bell, Ottawa; F. Partridge, Galt.

Carving in wood, $12, Mr. Harold, Kingston, commended.
Model in clay or wax, with plaster cast, $10, J. Webster, Ottawa.
Modelling in plaster, $6, Geo. Russell, Ottawa.

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### CLASS XLIV. — PHOTOGRAPHY, ARCHITECTURAL AND MECHANICAL DRAWINGS, ENGRAVINGS, ETC.

*Photography.*

Collection of photograph landscape and views, $8, R.W. Barron, Kingston.
Photograph portrait, finished in oil, $8, Miss Strickland; 2nd. $5, Miss J. Armstrong.
Photograph portrait, finished in Indian ink, $6, F. M. Bell Smith, Toronto; 2nd. $4, M. Mathers, Toronto.
Photograph portrait, finished in water colors, $6, F. M. Bell Smith; 2nd. $4, M. Matthews.

*Architectural and Mechanical Drawings, Engravings, Lithography, &c.*

Drawings, architectural, geometrical and perspective view, $10, W. Irving, Toronto; 2nd. $6, M. E. Eady, Ottawa.
Engraving on wood, with proof, $6, Rolph Smith & Co., Toronto.
Engraving on copper, with proof, $6, Rolph Smith & Co., Toronto; 2nd. $4, Woodman, Grant & Co., Toronto.
Lithographic drawing, plain, $6, Rolph Smith & Co.
Lithographic drawing, colors printed, $6, Grant & Co., Toronto; 2nd. $4, Rolph Smith & Co.
Lithographic commercial work, in black or colors, $6, Grant & Co., 2nd. $4, Rolph Smith & Co.
Stained glass, collection of specimens, $12, Joseph McCausland Toronto.
Sign writing, $5, W. R. Bevitt, St. Thomas; 2nd. $3, Jas. Kimber, Montreal.

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### CLASS LIII. — BUILDING MATERIALS AND CONSTRUCTIONS, WORK IN MARBLE, POTTERY, ETC.

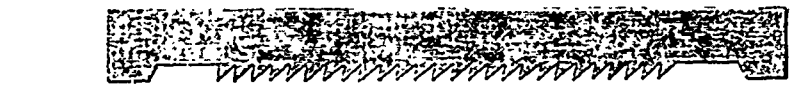
Brick pressed, 1 doz, $2, one entry only, L. Pease, Yorkville.
Brick, kiln burnt, 1 doz, $2, J. B. Wickwere & Bro, Walford.
Cements, best assortment for building purposes, W. McKay, Ottawa.

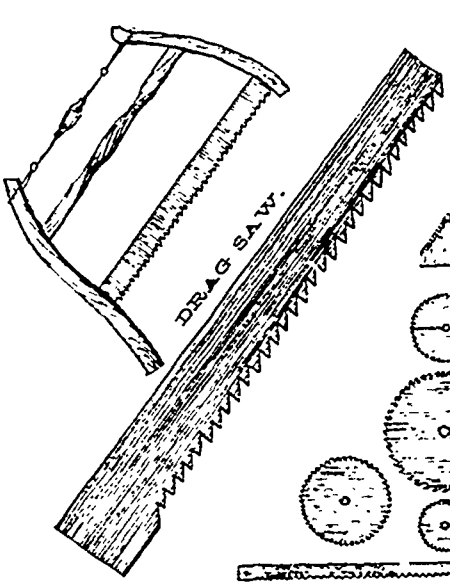
# PROVINCIAL EXHIBITION.

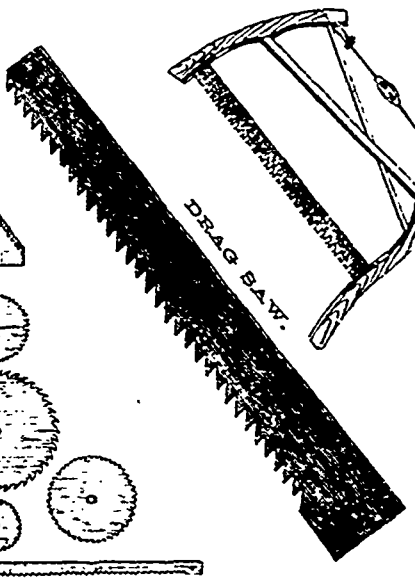
SAWS EXHIBITED BY JAMES ROBERTSON, MANUFACTURER, MONTREAL.

1st. Prize for Saws.—1st. Prize for Lead pipes, Paints, Shot and Putty.

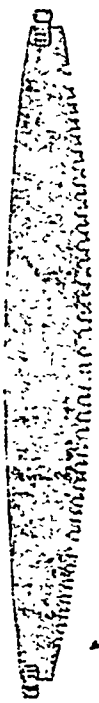
MILL SAW.



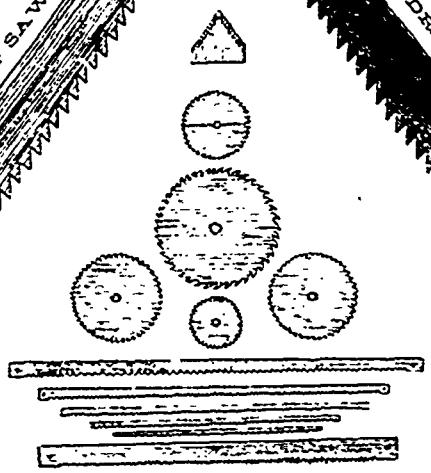


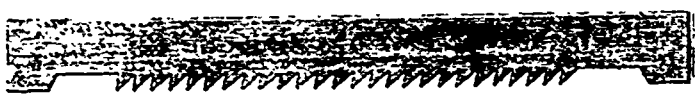

LIGHTNING TOOTH.



TUTTLE'S PATENT.



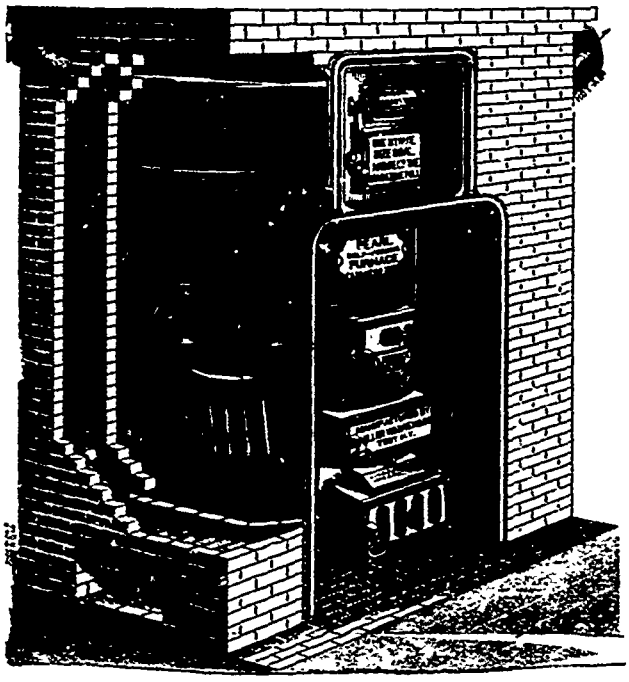
MILL SAW.




# PROVINCIAL EXHIBITION.

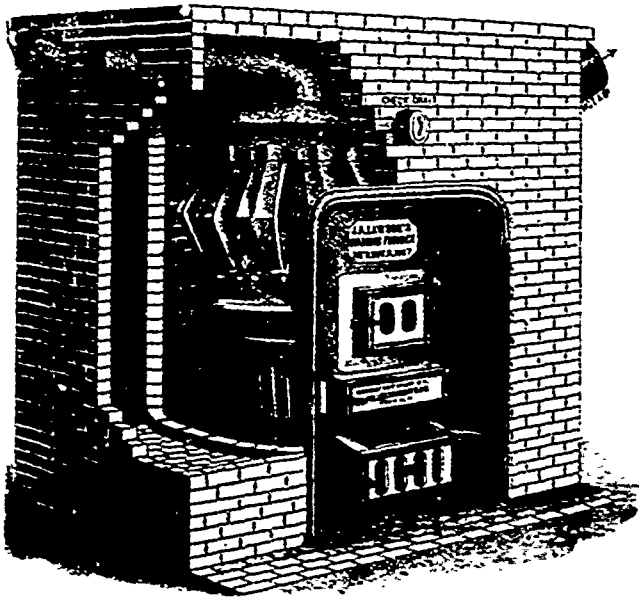
## THE PEARL SELF-FEEDING FURNACE.

EXHIBITED BY H. MEADOWS & CO., OTTAWA.

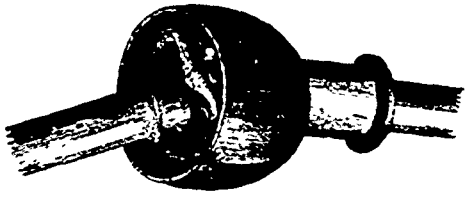


## DIAMOND FURNACE.

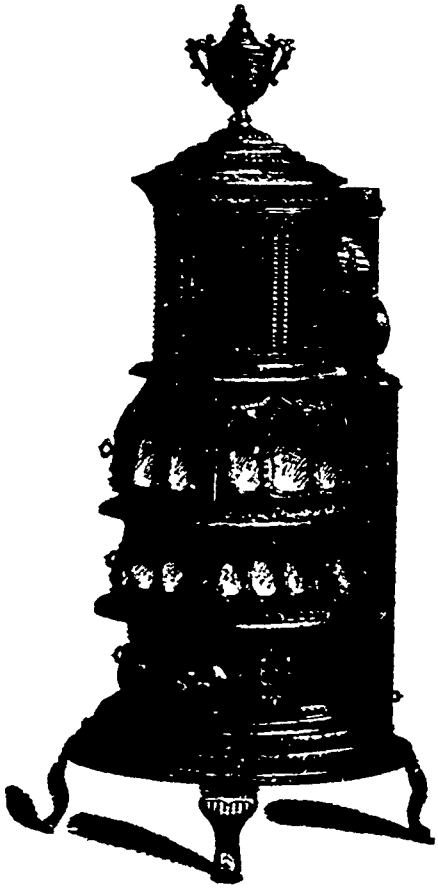
The Most Powerful Heating Apparatus Ever Made.



EXHIBITED BY H. MEADOWS & CO., OTTAWA.



*PATENT SAFETY COUPLING.*



RADIANT HOME with REVERTIBLE FLUE. DOUBLE BOTTOM 1875

EXHIBITED BY W. BUCK, BRANTFORD.
1st. Prize for parlor wood stove.

Decorative house painting, $6, J. Kimber, Montreal.
Mantle-piece in marble, $10, W. M. Somerville, Ottawa; 2nd. $8, A. A. Mills, Ottawa.
Marbles, Canadian polished, specimens of, $6, A. A. Mills. Ottawa.
Monumental headstone, $8, W. M. Somerville, Ottawa.
Pottery, assortment of, $6, P. McGregor, Nepean; 2nd. $1, G. L. Farrar, St. John.
Sewerage pipe, stoneware, assortment of sizes, $8, W. M. Somerville, Ottawa.
Slates for roofing, $6, C. S. Drummond, Montreal.
Stench traps for draining, stoneware, $3, W. M. Somerville, Ottawa.
Stoneware, an assortment of, $8, W. E. Weeding, Brantford.

EXTRA ENTRIES.

Cement mouldings, 1st. prize, G. Russell, Ottawa. Cut glass for vestibule, 1st. prize, J. Egginston, Montreal. Chimney sweeping machines, 1st. prize, W. Morris, Ottawa. Lime, 1st. prize, P. Lavallé, Carleton Place.

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CLAS LIV.—MACHINERY, CASTINGS AND TOOLS.

JUDGES.—Peter Hay, Galt; T. M. Blaisdell, Ottawa, Jno. Fensome, Toronto.

Fire engine, steam, in operation on the ground, $25, Capt. Kane, Ottawa, (Chaudiere Co.); 2nd. $15, F. G. Blade, Boston.
Self-acting or chemical fire extinguisher, $12, A. A. Murphy, Montreal; 2nd. $8, Geo. Reiffenstein, Ottawa.
Knitting machine, family, $6, Mrs. F. J. Heath, Ottawa.
Machine for drilling metals, $22, Scott, Cayley and Cayley, Ottawa; 2nd. $8, McKechnie & Bertram, Dundas.
Planing machine for metals, $12, Bowmanville Machine Co.; 2nd. $8, McKechnie & Bertram.
Compound planer for metals, $12, McKechnie & Bertram.
Printing press, $8, G. L. Calendar, Port Hope.
Pump in metal, $5, Alex. Fleck, Ottawa, 1st, and steam extra commended.
An assortment of saws, $10, Jas. Robertson, Montreal; 2nd. $6, Scott, Cayley & Cayley, Ottawa.
Sash and moulding machines, $8, Cant, Gourlay & Co., Gault; 2nd. $5, McKechnie & Bertram; 3rd. Scott, Cayley & Cayley.
Scales, platform, $5, C. Wilson & Sons, Toronto. The only entry.
Scales, counter, $3, C. Wilson & Sons, Toronto.
Single-splitting machine, $6, H. Seury, Barrio.
Assortment of tools for working, in metals, $12, McKechnie & Bertram; 2nd. $7, Bowmanville Machine Co.
Turning lathe, $8, Bowmanville Machine Co.; 2nd. $5, McKechnie & Bertram.
Water-wheel, $8, W. Kennedy & Son, Owen Sound.
Surface planer for wood work, $8, Cant, Gourlay & Co., Galt; 2nd. $5, Bowmanville Co.
Power morticing machine, $6, Cant, Gourlay & Co., Galt; 2nd. $4, J. & A. Fay & Co., Cincinnati, O.
Hand morticing machine, $5, Jas. Smart, Brockville.
Tennoning machine, $5, Cant, Gourlay & Co.; 2nd. $3, McKechnie & Bertram.
Mitreing machine, $5, Cant, Gourlay & Co.; 2nd. $3, Jas. Smart.
Jig saw, $5, Cant, Gourlay & Co.; 2nd. $3, McKechnie & Bertram.
Band saw, $6, Bowmanville Co.; 2nd. $4, F. A. Fay & Co.
Resawing machine, $5, Cant, Gourlay & Co.; 2nd. $3, Bowmanville Co.
Wood planing and matching machine, $12, Cant, Gourlay & Co.; 2nd. $8, McKechnie & Co.
Collection of wood working machinery, $15, Cant, Gourlay & Co.; 2nd. $ — , Bowmanville Co.
Best assortment church and school bells, $6, J. S. Jones & Bro., Markham.

EXTRA ENTRIES.

Among the extra entries that took prizes were the following: Lumbermen's and stone-cutter's tools, Peter Robinson, Ottawa; Lumbermen's tools, Ahearn & Welsh, Ottawa; also first for Bread Slicer; Canadian Gas Lighting Co., highly commended; Slide Rest for turning lathe, C. J Ripley, Ottawa.
There were in all 75 entries from different parts of the country.

CLASS LV.—METAL WORK (MISCELLANEOUS) INCLUDING STOVES.

JUDGES — Henry Landon, Smith's Fall; J. Byers, Carleton Place.

An assortment of coppersmith's work, $8, Copp Bros., Hamilton.
An assortment of engineer's brass work, $8, E. H. Asheraft, Boston, Mass.
An assortment of enamelled hollow ware, $5, Copp Bros., Hamilton; 2nd. $3, A. Laidlow & Co., Hamilton.
An assortment of fire-arms, $8, Westley, Richards & Son, London, Eng.
Fire proof office, $8, Geo. Chapleau, Montreal; 2nd. $8, A. W. Lang, Ottawa.
Gold and silver leaf, $4, C. H. Hubbard, Toronto; this was chiefly for dentist's work.
Iron fencing and gate, ornamental, $8, Chown & Cunningham, Kingston.
Iron from the hammer, ornamental, $7, Frothingham & Workman, Montreal.
Lock, combination bank, $8, J. & J. Taylor, Toronto.
An assortment of locksmith's work, $8, William Griffith, Toronto.
Nails, 20 lbs. cuts, $6, Mulholland & Baker, Montreal; 2nd. $4, Frothingham & Workman, Montreal.
Picture frame, ornamental gilt, $8, R.W. Laird, Toronto.
An assortment of plumbers' works, $8, Butterworth & Co., Ottawa; 2nd. $5, Blyth & Kerr, Ottawa.
Rifle, breech-loader, $8, W. J. Rawbone, Toronto.
Show case for goods, $8, W. Millichamp, Toronto.
An assortment of tinsmith's work; 2nd. $4, J. M. Williams, Hamilton.
An assortment of wire work, $6, T. G., Montreal.
Cooking stove for wood, $6, James Smart, Brockville; 2nd. $4, Copp Bros., Hamilton.
Cooking stove for coal, $6, Copp Bros., Hamilton; 2nd. $4, J. Smart, Brockville.
Furniture for cooking stove, one set, $5, McClary Manufacturing Co., London; 2nd. $3, Copp Bros., Hamilton.
Hall stove for wood, $5, McClary Manufacturing Co., London; 2nd. $3, Chown & Cunningham.
Hall stove for wood, $5, Copp Bros.: 2nd. $3, Woodstock Ironware Co.
Parlor stove for wood, $5, W. Buck, Brantford; 2nd. $3, Copp Bros.
Parlor Stove for coal, $5, J. Smart; 2nd. $3, W. Buck.
Parlor fire place, complete, including setting of grate so as to economize fuel, and arrangement for ventilating room, $10, W. M. Somerville, Ottawa.

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CLASS XXII.—SLEIGH.

Best farm sleigh, 1st. J. Joyce & Sons, Ottawa; 2nd. A. Titus, Ottawa.
Best brick-making machine, 1st. Bulmer & Sheppard, Montreal; 2nd. J. Close, Woodstock.
Best two-horse power for general purposes, for farmers' use, 1st. Jno. Watson, Aylmer; 2nd. D. Maxwell, Paris.
Best drag saw, 1st. Cossit & Bros., Brockville; 2nd. D. Maxwell, Paris.

EXTRA ENTRIES COMMENDED.

Root pulper, D. Maxwell, Paris; Iron jack, D. Maxwell; Pair of equalizing draughts, J. Bowman, Gloucester; Drill grubber, J. Bowman; Wine mill, and press, Hugh Sells, Vienna. Dog power for churn, Andrew Wilson, Ramsay; Combined grain cracker and straw cutter, D. Maxwell; Lumber waggon, J. Joyce & Sons, Ottawa; Model horse-power, J. G. Marley, Montreal; Lumber waggon, Thomas G. Alexander, Andersonville.

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## AGRICULTURAL IMPLEMENTS.

CLASS XXVII—AGRICULTURAL IMPLEMENTS AND MACHINES FOR EXHIBITION ONLY.

In this class the following articles were entered for Exhibition only, and not in competion for prizes:—
Grain drill.
Seed drill for sowing two or more drills of turnips; mangels, or other seeds.

Broad-cast grain and other seed sower.
Mowing machine.
Combined mower and reaper.
Self-binding reaper.
Horse-power thresher and separator.
Vibrator thresher and separator.
Smut machine.
Clover cleaning machine.
Best field or two-horse cultivator, iron.
Best two-horse cultivator, wood.

CLASS XXVIII.—IMPLEMENTS FOR CULTIVATING AND SOWING THE SOIL.

*Horse, Steam or other Power.*

Best two-furrow plough, $30, Geo. Wilkinson, Aurora. 2nd. 20, Geo. Armand, Stewarton.

Best iron plough, diploma and $15, Thomas Yeandle, Stratford. 2nd. $10, G. Wilkinson, Aurora. 3rd. $5, J. Lowrie, Sarnia.

Best wooden plough, diploma and $12, J. Lowrie, Sarnia. 2nd. $8, G. Morley, Thorold. 3rd. $4, T. Hurlburt, Prescott.

Best iron-beam plough, with steel mould board and wood handles, $15, G. Wilkinson, Aurora. 2nd. $10, G. Morley, Thorold. 3rd. $5, D. McArthur, Osgoode, (Frost & Wood, Smith's Falls.)

Best subsoil plough, diploma and $12, G. Morley, Thorold.

Best double-shear trench plough, $10, Thomas Yeandle, Stratford. 2nd. $7, James Lowrie, Sarnia. 3rd. $4, S. Hurlburt, Prescott.

Best double-mould plough £10, George Morley, Thorold. 2nd. $7, Jas. Jeffrey, Montreal. 3rd. $4, Thos Smith, Aylmer.

Best gang plough, $12, Geo. Wilkinson, Aurora.

Best horse-hoe, or single-horse cultivator, iron, $4, Geo. Gillies, Gananoque. 2nd. $3, T. Smith, Aylmer.

Best horse-hoe, or single-horse cultivator, wood, $4, Frost & Wood, Smith's Falls. 2nd. $3, Copp. Bros., Hamilton.

Best cylinder cultivator, $10, A. S. McDonald, Osgoode.

Best land presser, $8, Frost & Wood, Smith's Falls.

Best pair of iron harsows, $10, Geo. Gillies, Gananoque. 2nd. $8, Thos. Smith, Aylmer. 3rd. $6, Ed. Millar, Ottawa.

Best pair of wood harrows, $6, Thos. Smith, Aylmer.

Best wooden roller, $10, Chown & Cunningham, Kingston.

Extra entries commended: Jno. Elliott, London, sulky plough; Jno. J. Smith, Gloucester, stone lifting machine; Copp. Bros., Hamilton, one horse plough.

CLASS XXIX—IMPLEMENTS AND MACHINES FOR HARVESTING, PREPARING PRODUCTS FOR USE, CARRIAGE, ETC.

*Horse or other power.*

Best sulky horse rake, $8, Cossitt Bros., Brockville. 2nd. $6, Alex. Howell, Brantford. 3rd. $4, Masson Manufacturing Co., Oshawa.

Best horse pitchfork and tackle, $6, Peter Grant, Clinton. 2nd. $4, Thos. Smith, Aylmer.

Best implements or machine for cutting, pulling or otherwise harvesting peas, $15, Luke & Folton Bros., Guelph. 2nd. $10, Leslie, Johnston, London.

Best potato digger, $10, Rosamond, Miller & Scott, Almonte. 2nd. $5, John Bowman, Gloucester.

Best straw cutter, $8, D. Maxwell, Paris. 2nd. $6, Haggart Bros., Brampton. 3rd. $4, Luke & Folton Bros., Guelph.

Best machine for cutting roots, $8, D. Maxwell, Paris.

Best grain cracker, $8, D. Maxwell, Paris. 2nd. $6, Frost & Wood, Smith's Falls. 3rd. $4, Massey Manufacturing Company Newcastle.

Best cider mill and press, $8, Hugh Selles, Vienna. 2nd. $4, do.

Best two horse team wagon, $12, A. Baldwin Inkerman: 2nd. $8, A. Situs, Ottawa. 3rd. $4, J. Joyce & Sons, Ottawa.

Best two horse spring market waggon, $10, A. Situs, Ottawa; 2nd. $7, Geo. Brown & Sons, Kingston. 3rd, $4, Wm. Montgomery, Marlborough.

Best one horse light market waggon, $9, M. Bishoprick, Ottawa. 2nd. $6, A. Situs, Ottawa. 3rd. 3, J. Joyce & Sons, Ottawa.

Best horse cart, $6, Wm. Angus, Billings' Bridge. 2nd. $4, J. Joyce & Sons, Ottawa. 3rd. $2, Thomas Smith, Aylmer

## BELTING.

India Rubber Belting, Engine Hose, &c., $8, Canadian Rubber Company, Montreal.

Leather machine belting, an assortment, $8, Scott, Cayley and Cayley, Ottawa; 2nd. J. B. Hay & Co., New York.

CLASS LI.—CABINET WARE AND OTHER WOOD AND HAIR MANUFACTURES.

JUDGES: J. H. Flagg, Mitchel; A. J. Wight, Whitby; S. F. Dremion, Kingston.

*Cabinet Ware.*

Set of bedroom furniture, $15, Almonte Manufacturing Co. 2nd S. Gibbard & Son, Napanee.

Carving in wood, decorative, not connected with any other article on exhibition, $10, W. Bell. 2nd, $6, W. Harold.

Centre table, $8, J. B. Hannum, Hull. 2nd. $4, Lewis McCompte, Montreal.

Sideboard, $10, Almonte Manufacturing Co.

Veneers from Canadian woods, undressed, $8, W. Clements.

Sideboard, 1st, Almonte manufacturing Company.

Buttons, an assortment of, 1st, Miss. C. Sandham.

Clothes Wringer, C. R. Shorey & Co.; 2nd, W. T. Bunnell, Ottawa.

Coopers' work, 1st, J. M. T. Ballantyne, Ottawa.

Joiners' work, assortment of, E. B. Eddy, Hull; 2nd, T. W. Currier & Co., Ottawa.

Machine wrought moulding and flooring, 100 feet of each, 1st, T. W. Currier & Co.; 2nd, E. B. Eddy.

Mangle, E. R. Shorey & Co.

Turning in wood, collection of specimens, 1st, T. W. Currier & Co., Ottawa; 2nd, G. Newell, Hull.

Turned hollow wooden ware, specimens of, 1st, Geo. Newell.

Washing machine, 1st, Morrisson, Bros. & Co., Hamilton; 2nd, P. Gruchy, Hull.

Wash tubs and pails, factory made, three of each; 1st, E. B. Eddy, Hull.

EXTRAS.—Of these there were a large number.

CLASS LVI.—SEWING MACHINES, FOR EXHIBITION ONLY.

[The prizes in this class have been discontinued, by request of the manufacturers.]

No judgment given.

CLASS LVII.—SADDLE, ENGINE HOSE, TRUNKMAKER'S WORK, LEATHER, &c.

JUDGES: W. Porter, Bowmanville; Hugh Thompson, Watertown; Hugh Finlayson, Paris.

An assortment of collars, $5, W. Fahey, Forest. 2nd, $3, Geo. Lucas, Sarnia.

Harness, set of double carriage, $8, S. & H. Borbridge, Ottawa. 2nd, $5, J. B. Seneeal, Montreal.

Harness, set or single carriage, $7, S. & H. Borbridge, Ottawa; 2nd, $4, R. Birch, Nepean.

Harness, set of team, $6, S. & H. Borbridge, Ottawa.

Harness, set of cart, $5, S. & H. Borbridge, Ottawa. 2nd, $3, J. B. Seneeal, Montreal.

An assortment of India rubber belting, engine hose, &c., $8, Canada Rubber Company, Montreal.

MISCELLANEOUS.

Books and Book-binding, W R, Burrage, Toronto, 1st, prize.

An assortment of buttons, $6, Miss. C. Sandham, Ottawa.

Clothes wringer, $3, E. R. Shorey & Co. 2nd. $1, W. F. Bunnell, Ottawa

Coopers' work, $6, J. & T. Ballantyne, Ottawa.

Assortment of joiners' work, $10, E. B. Eddy. 2nd, $6, T. W. Currier & Co., Ottawa.

Highly commended:—J. Wright, Marquetry.

Machine-wrought moulding and flooring, 110 feet of each, $6, E. B. Eddy. 2nd, $3, T. W. Currier & Co.

Mangle, 3, E. R. Showrey & Co., Napance.

Turning in wood, collection of specimens, $6, I. W. Currier & Co. 2nd, $3, G. Newal, Hull.

Assortment of turned hollow wooden ware, $6, G. Newall, Hull.

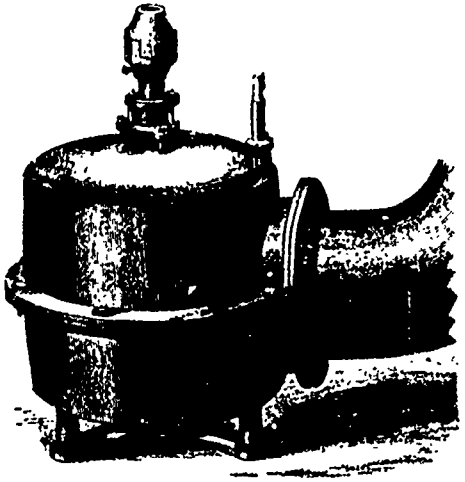
Washing machine, $3, Morrison Bros., Hamilton. 2nd, $1, P. Gruchy, Hull.

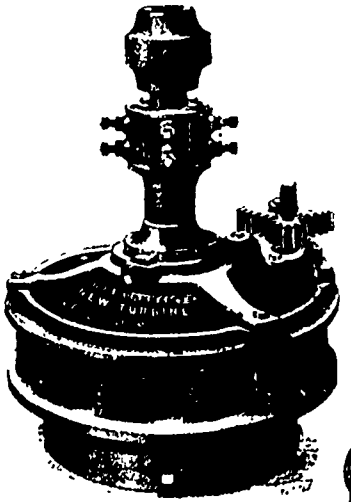
Wash tubs and pails, factory made, three of each, $4, E. B. Eddy, Hull. 2nd, $2, do.

41 extra entries of different kinds in this class.

# PROVINCIAL EXHIBITION.

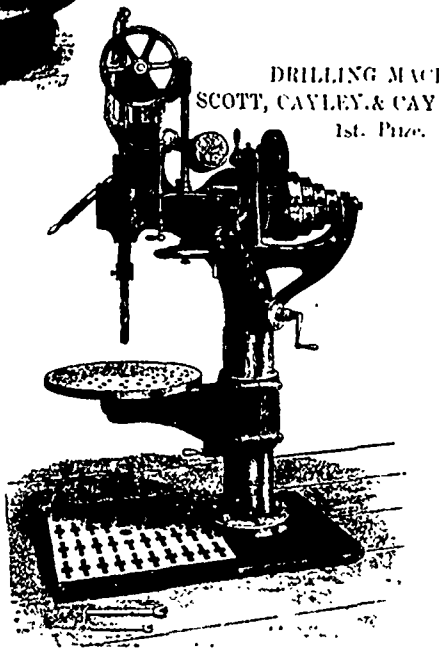
BURNHAM'S TURBINE WATER WHEEL.
EXHIBITED BY THOMSON AND WILLIAMS, MITCHELL, ONT.



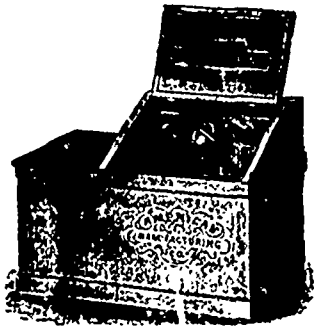


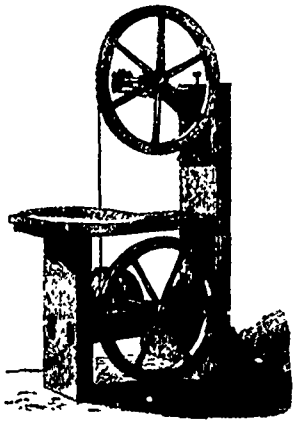
EXHIBITED BY BUCHANAN, WARE & CO., MONTREAL.
1st. Prize.
**The Patent Lateral Saw Gummer and Grinder.**

DRILLING MACHINE,
SCOTT, CAYLEY & CAYLEY, OTTAWA
1st. Prize.

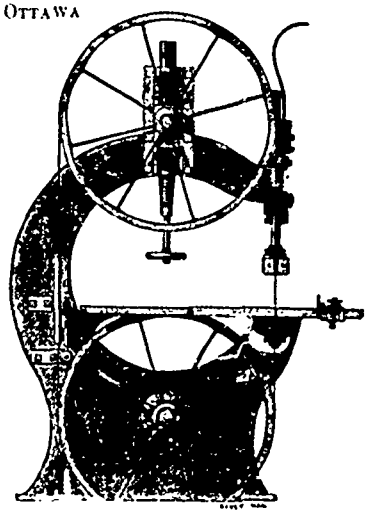


CABINET OIL SAFE.
EXHIBITED BY C. DRAKE, MONTREAL.





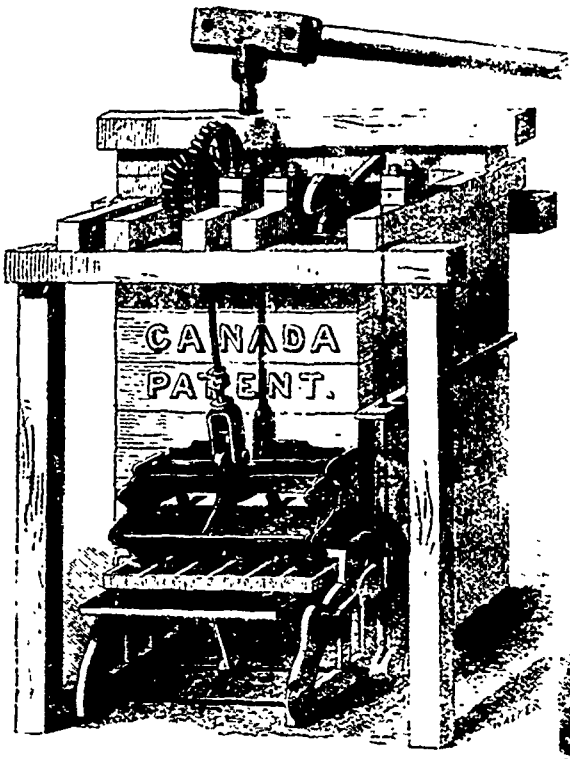
BAND SAW, F. A. FAY & CO.
2nd Prize.



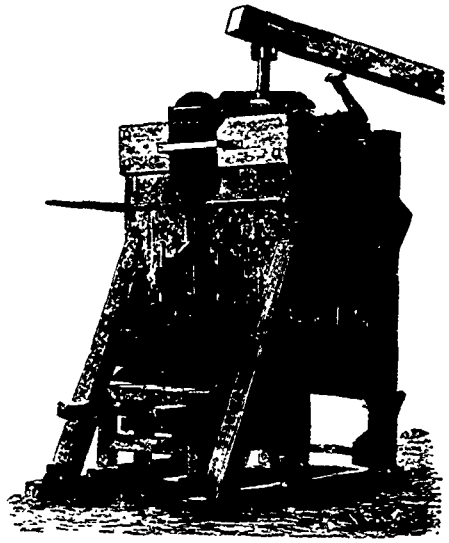
BAND SAW, BOWMANVILLE, & CO
1st Prize.

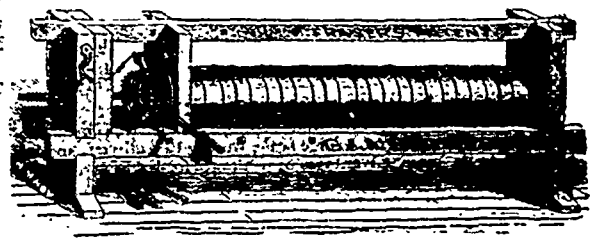
# PROVINCIAL EXHIBITION.

"CANADA," SELF ACTING BRICK MACHINE.
EXHIBITED BY BULMER AND SHEPPARD, MONTREAL.
1st. Prize.

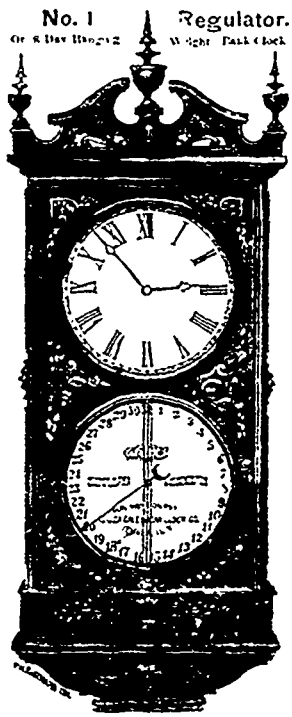



BRICK MACHINE.
EXHIBITED BY J. CLOSE, WOODSTOCK.
2nd. Prize.





CHEESE HOOPS.
EXHIBITED BY ASHLEY AND HAZZARD,
BELLEVILLE.




CALENDER CLOCK.
MANUFACTURED BY ITHICA CLOCK & CO. N. Y.
Extra Prize.


GROUP OF STEAMSHIP INSTRUMENTS.
EXHIBITED BY FROTHINGHAM AND WORKMAN, MONTREAL.
Extra Prize.

CLASS XXX.—AGRICULTURAL TOOLS AND IMPLEMENTS, CHIEFLY FOR HAND USE.

Best machine for making drain tiles, diploma and $20. Jas. Close, Woodstock.

Best set draining tools, 1st, Frothingham & Workman, Montreal.

Best half dozen spades, 1st, Frothingham & Workman, Montreal.

Best half dozen steel shovels, 1st, Frothingham & Workman, Montreal.

Best half dozen grain scoops, 1st, Frothingham & Workman, Montreal.

Best machine for sowing grass seeds, 1st, L. M. Bissell, Addison.

Best garden, walk, or lawn roller, 1st, Massey Manufacturing Co., Newcastle; 2nd, $8, Anthony Copp, Hamilton.

Best fanning mill, diploma and $10, Thos. J. Birch, Stratford; 2nd, $8, James Sheriden, Dalhousie.

Best straw cutter, 1st, John Elliott, London; 2nd, $3, David Maxwell, Paris; 3rd, $2, Haggart Bros., Brampton.

Best Machine for cutting roots for stock, 1st, D. Maxwell, Paris.

Best cheese press, 1st, Aspley & Hayard, Belleville.

Best churn, 1st, E. Huntington, Montreal; 2nd, John Campbell, Almonte; 3rd, Mark Bishoprick, Ottawa.

Best set horse shoes, John Percy, Bowmanville; 2nd, John Percy, Bowmanville; 3rd, Kehoe and Colligan, Ottawa.

Best farm gate, C. H. Hodgin Whitby.

Best specimens farm fence wood, N. A. Asseltine, Ernestown.

EXTRAS.—Entries commended.

Improved cheese hoops, Aspley and Hayard, Belleville. Grass seeder, attachment to sulky rake, Loverin and Smith, Addison. Root pulper, David Maxwell, Paris. 1st set 3 horse whipple trees, John Bowman, Gloucester. Machine for grinding, reaping and mowing, John G. Bricker, Waterloo. Dog power for churning, Wm. Wilson, Ramsay. Seed sower and cultivator combined, A. Copp, Hamilton. Coal scoops, Frothingham and Workman, Montreal. Grain bag holder, Jos. Jas. Forest.

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CLASS XII.—CARRIAGES AND SLEIGHS, AND PARTS THEREOF.

Axle, wrought iron, 1st, Thos. Smith, Aylmer.

Buggy, double seated, covered, 1st, A. Titus, Ottawa; H. Gray, Chatham; 3rd, B. Armstrong & Co., Guelph.

Buggy, double seated, uncovered, 1st, M. C. C. Thompson, London; 2nd, S. H. Turner, London.

Buggy, single seated, covered, 1st, A. Titus, Ottawa; 2nd, W. Gray, Chatham.

Buggy, single seated, uncovered, 1st, A. Titus, Ottawa, 2nd. W. Gray, Chatham.

Buggy, trotting, 1st, M. C. C. Thompson, London, 2nd, H. Byrne, Ottawa.

Carriage, hack, 1st, A. Titus, Ottawa, 2nd, J. P. Bronguy, Hamilton.

Carriole, two-horse, pleasure, 1st, A. Titus, Ottawa; 2nd, J. P. Bronguy, Hamilton.

Carriage, one-horse, pleasure, 1st, M. C. C. Thompson, 2nd, S. H. Turner, London.

Carriage, child's (perambulator,) 1st, A. Tindel, Montreal.

Carriage and buggy, woodwork, assortment of, 1st, Hunt, James & Co., St. Catharines.

Dog cart, 1st, A. Titus.

Express waggon, 1st, A. Titus.

Phæton, pony, 1st, W. Gray, Chatham, 2nd, J B. Armstrong and Co., Guelph.

Rims, or felloes, one dozen, 1st, Hunt, Cairns and Co.

Sleigh, two horse, pleasure, 1st, M. C. C. Thompson; 2nd, A. Titus.

Sleigh, one-horse, pleasure, 1st, A. Titus; 2nd, W. Gray.

Sleigh, hack, 1st, M. C. C. Thompson; 2nd, A. Titus.

Spokes, carriage, machine-made, 1st, Hunt, Cairns and Co.

Springs, one set steel carriage, 1st, J. B. Armstrong & Co.

Sulky, trotting, 1st, Geo. Brown & Son, Kingston, 2nd, M. C. C. Thompson & Co.

Wheels, one pair of carriage, unpainted, 1st, M. C. C. Thompson & Co.

There was a large display of extras from Chatham, Guelph, London and Ottawa, which were highly commended. The judges also recommend that Messrs. Titus, M. C. Thompson & Co., and Wm. Gray, be awarded diplomas. The judges in this department were Henry Jinkle, Newburg; J. Holmes, St. Catharines, and Jas. R. Lake, Napanee.

The prizes given in other classes not of a mechanical nature, we do not mention.

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## MACHINERY EXHIBITED AT THE PROVINCIAL EXHIBITION, OTTAWA,

BY MESSRS. FROTHINGHAM & WORKMAN, MONTREAL.

ON PAGES 328 and 329, we furnish illustrations of some of the machinery exhibited by MESSRS. FROTHINGHAM & WORKMAN at the PROVINCIAL EXHIBITION, as being worthy of more than ordinary notice. The subjects given consist of a SPECIAL FIRE PUMP, SAFETY VALVES, STOP VALVES, BALANCED FURNACE DOORS and PORTABLE FURNACES.

### SPECIAL FIRE PUMPS.

These Pumps are of different dimensions, are heavy, strong, compact and equal to any emergency, however severe. By the use of the Patent Valve Motion, they can be driven to any speed, *without thumping*, having made over 500 feet of piston per minute, with the most brilliant results. The water valves, valve openings and water passages are large, so that friction is reduced to a minimum when running at high speed—an important and necessary feature.

### NICKLE-SEATED SAFETY-VALVE.

The Nickel-Seated Safety-Valve, Fig. 1, is perfectly automatic in its action, capable of discharging all the steam generated in a steam boiler, in excess of a given limit; and its bearing surfaces, which are made of nickel, will not corrode, gives absolute immunity against explosion. Such a Valve will secure the boiler from injury, and protect the lives of the people employed about it; and, *if desired, it may be locked up.* A lock-up Safety-Valve, if it is a *Safety*-Valve in *fact*, as well as in name, not only gives immunity from explosions, but also adds greatly to the duration of boilers, preventing a dangerous increase of pressure, by venting the steam as fast as generated, obviating the frequent necessity of opening the furnace doors, which is a prolific cause of injury, as it admits to the highly heated metallic surfaces a perfect hurricane of cold air (it may be at a temperature below zero), causing a sudden contraction of the most exposed parts, and a consequent strain upon the flues, which experience has shown to be most destructive.

### FLOWER'S STOP VALVE.

All the Valves constructed of brass, for steam and other purposes, are proved on both sides before leaving the factory by hydraulic pressure to (200) two hundred pounds per square inch, and the IRON-BODY Valves to (300) three hundred pounds per square inch. By this means none are sent out that are defective in any way.

All parts of the Valve are made by machinery constructed and patented for that purpose. The "valves" and "faces" are not ground, as in valves of other manufacture, but are perfect fitting upon leaving the machine. These valves are so simple in construction, and so strongly built, that they cannot fail to give satisfaction. They are packed, ready for use, with a PATENT METALLIC PACKING—the collar on stem being ground to a perfect joint—so that *they do not require any re-packing for a period of two years or more*, thus saving a great deal of annoyance in this one point alone.—All the Valves now manufactured by us have SQUARE THREADS ON THE STEM which is known will outlast three stems with "V" threads.

They further claim for this Valve the following advantages, viz:

1st. A straight, open passage-way the full size of pipe.

2nd. The Valve is double-faced, with two loose disc-valves setting loose in a cage, allowing the Valves to adjust themselves to the Valve-seats.

3rd. The Valve-seats are not parallel, but divergent, and allow the Valves to form a wedge-shape; and are held to their seats by Equalizing bars in cage, which bear against the backs of the Valves when closed.

4th. The Valves do not drag, or rub, on Valve-faces in working.

5th. The Valve-seats being divergent, and the Valves loose in the cage, there is no sticking of Valves when opening under pressure.

6th. All parts of the Valves are made interchangeable by machinery, so that any part can be replaced at once, on giving us the size of Valve and name of part, which can be ordered by the reference letter on the cuts.

Fig. 1, page 329 is an outside elevation · and figures 2 and 3 is a vertical section of our Brass Valves, for steam or water-purposes, in which A represents the body of the Valve ; F F the Valves, partly opened , N (or K in figs. 5 and 6, the Valve-seats inclined to one another ; D the cage which carries the discs F F, and which are perfectly loose in the same, E is the Equalizing Bars, —one on each side of cage D, which allows the Valves or Discs F F to seat themselves truly on the seats N (or K in figs. 5 and 6); the cage D, with the discs F F, are elevated or depressed by the square threaded screw B, which in the Iron-body-Valves shown in Figs. 5 and 6, works in a loose brass nut C, contained in a chamber cast on top of cage D The stem B has a collar M cast upon it, which is tapered and ground to a perfect-fitting joint, (steam tight), upon which is a "thrust collar" of brass, H, which fits on a shoulder in the Stuffing Box, allowing the stem to be loose enough to rotate, but not to lift. Upon this is placed a "Patent Metallic Packing," I, in the hollow of which is wound a little hemp ; the gland J is then screwed down, and everything is secure.

### BALANCED FURNACE DOORS.

Possess the greatest command over Furnaces for Preventing Smoke. As they are balanced, and work from the top instead of the side, they will swing either inwards or outwards, and remain in whatever position they are placed When set in the position shown by the Engravings, they cause the air to enter at the lower part only, and to mix with the gases that are evolved during the process of combustion, causing them to become perfectly developed into flame before leaving the furnace, and consequently preventing the emission of smoke. The Patent Doors work with greater facility than ordinary ones, and are more durable under heavy service. They are made of all sizes and forms, to suit either iron or brickwork.

## STAINING WOOD RECEIPTS.

Cheap Black Walnut Stain. — Burnt umber, 2 parts, rose pink, 1 part, glue, 1 part, water sufficient ; heat all together and dissolve completely, apply to the work first with a sponge then go over it with a brush, and varnish over with shellac.

Ebony Stain.—Drop black, 2 parts, rose pink, 1 part, turpentine, a sufficient quantity.

Extra Black Stain for Wood.—Pour 2 quarts boiling water over 1 oz. of powdered extract of logwood, and, when the solution is effected, 1 dr. of yellow chromate of potash is added, and the whole well stirred. It is then ready for use as a wood-stain, or for writing ink. When rubbed on wood, it produces a pure black. Repeat with 2, 3, or 4 applications, till a deep black is produced, which acquires the highest beauty when polished or stained.

Imitation of Mahogany. — Let the first coat of painting be white lead, the second, orange, and the last, burnt-umber or sienna imitating the veins according to your taste and practice.

To Imitate Wainscot.—Let the first coat be white ; the second, half white and half yellow ochre ; and the third, yellow ochre only ; shadow with umber or sienna.

To Imitate Satin Wood.—Take white for your first coating, light blue for the second, and dark blue or dark green for the third.

Best Cement for Aquaria.—It is the same as that used in constructing the tanks of the Zoological Gardens, London. One part, by measure, say a gill of litharge ; 1 gill of plaster of Paris ; 1 gill of dry, white sand, ½ a gill of finely powdered resin Sift, and keep corked tight until required for use, when it is to be made into a putty by mixing in boiled oil (linseed) with a little patent drier added. Never use it after it has been mixed (that is, with the oil) over fifteen hours. This cement can be use for marine as well as fresh water aquaria as it resists the action of salt water. The tank can be used immediately, but it is best to give it three or four hours to dry.

## ECONOMICAL HEATING OF BUILDINGS.

(Page 341.)

In the same way that water from a reservoir on the top of a house may be distributed to its various rooms by means of proper pipes and other arrangements, so as to save the labor of carrying it up to the different apartments, the heat from a heat-generator or furnace in the cellar may be distributed to the various rooms by means of proper flues and other arrangements, so as to save the still greater labor of carrying up fuel to keep stoves burning.

Among the furnaces for heating buildings, the Gothic Furnace of Mr. Alex. M. Lesley, of 226 West 23d street, New York, stands among the best. It is represented in our engraving, with the front brick wall removed, so as to show the interior structure. Two prominent features strike the eye, first, the prismatic iron cap D, of triangular section, which stands over the fire-box, and serves to receive the heat of the fire under it, which circulates in its interior and heats its sides, while the corrugated form of the same is very effectively radiating this heat into the air-chamber around it. In order to give this air chamber still more the benefit of the heat otherwise lost by ascending into the chimney, two bent tubes E E are placed at the sides, while the hot gases and smoke of the furnace are compelled to pass through them before reaching the chimney ; these tubes therefore being also hot, add their radiating heat to that of the cap, while even the smoke-pipe, seen inside near the top, adds its share to this. It is thus seen how the heat is greatly economized in this furnace ; but this is not all, even the heat of the walls surrounding the hot air chamber is economised by causing them to give some of their heat to the cold air entering the furnace, so that this cold air, by entering near the top, as seen in the figure, and passing over the furnace and downward between the double walls L L M, is already moderately heated before entering the hot-air chamber, by the openings seen below. A man-door I gives easy access to the interior of the air-chamber. For the purpose of cleaning, the curved pipes E E are provided with doors H H, which project beyond the front wall, the same as the furnace door C, and the ash-pit door below.

We ought to mention, as important details of improvements applied, the dumping-grate, which is also adapted to being shaken around its center, and will not only discharge ashes, but grind all clinkers to dust by its toothed circumference. A special kind of fire-box is also made when the furnace is intended to burn wood, of which pieces 4 feet in length can be used.

A special advantage of this furnace is that its total height is such that it can be placed in a cellar or basement with quite a low ceiling, where no other style of furnace would find room, or at least would not secure a sufficiently ascending incline for those hot-air tubes that have to be led sideways, so as to secure a draught for this hot air. Many furnaces fail in the latter respect, for the reason that parts of some of the hot air tubes are entirely or nearly horizontal below the ceiling of the cellar where the furnace is placed ; in such a case the hot air will ascend by preference through the tubing having the straightest upward incline, and thus heat the rooms more immediately above the furnace excessively, at the expense of the rooms situated in a more sideward direction. Now if the furnace is low, as the one here described, all the tubes may have a direction more equally slanting upward, and thus secure a more equal distribution of heat to the various rooms to be heated. As a whole, there is no doubt that this furnace secures all that may be desired from a hot air furnace—economy as well as effectiveness.

Substitute for Plaster of Paris.—Best whitening, 2 lbs ; glue, 1 lb. ; linseed oil, 1 lb. Heat all together, and stir thoroughly. Let the compound cool, and then lay it on a stone covered with powdered whitening, and heat it well till it becomes of a tough and firm consistence ; then put it by for use, covering with wet cloths to keep it fresh. When wanted for use, it must be cut in pieces adapted to the size of the mould, into which it is forced by a screw press. The ornament may be fixed to the wall, picture-frame, &c., with glue or white lead. It becomes in time as hard as stone itself.

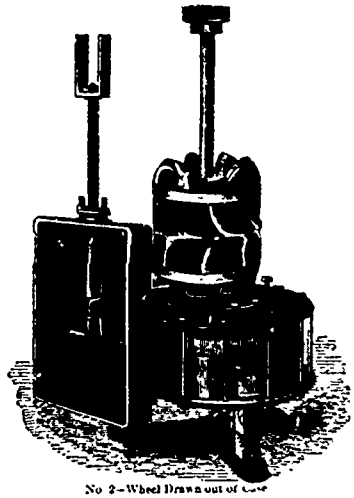
Turner's Cement.—Bees' wax, 1 oz. ; resin, ½ oz. ; pitch, ½ oz. ; melt, and stir in fine brick dust.

# PROVINCIAL EXHIBITION.

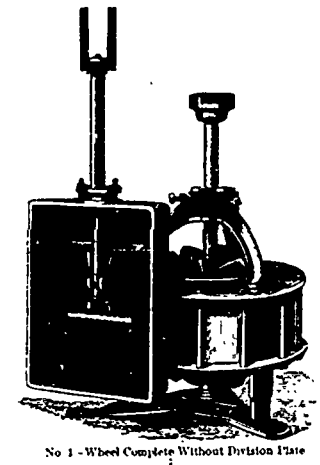
"LITTLE GIANT," TURBINE WATER WHEEL.

MANUFACTURED BY GEO. H. JONES, MOUNTAIN MILLS, PICTON, ONT.

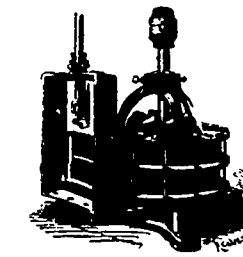
Extra Prize. (Arrived too late for entry.)

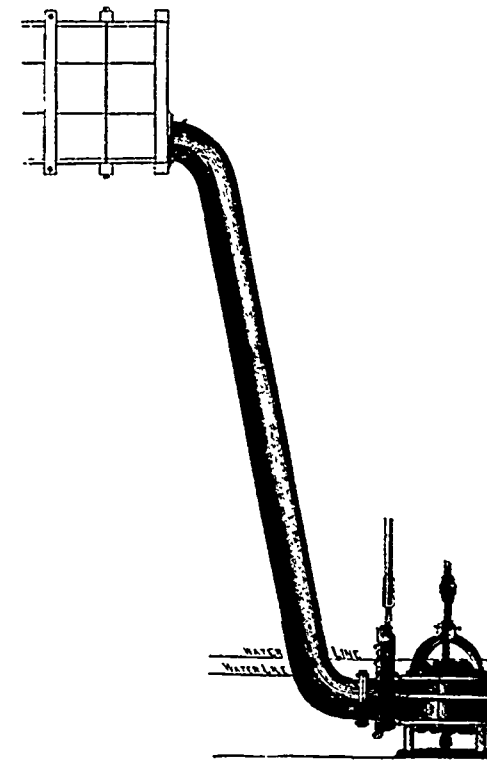


No 2—Wheel Drawn out of Case



No 1—Wheel Complete Without Division Plate






WHEELS FOR HIGH HEADS—

MOORES PULLEY BLOCK.

FIG. 1

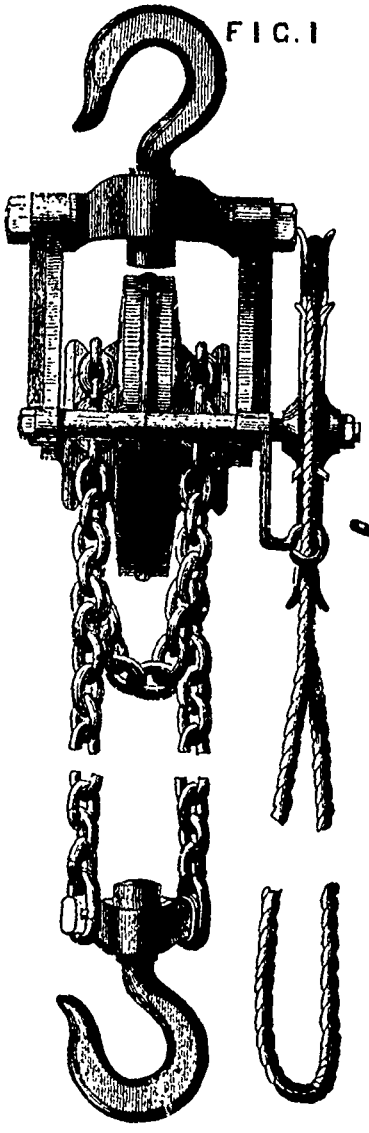
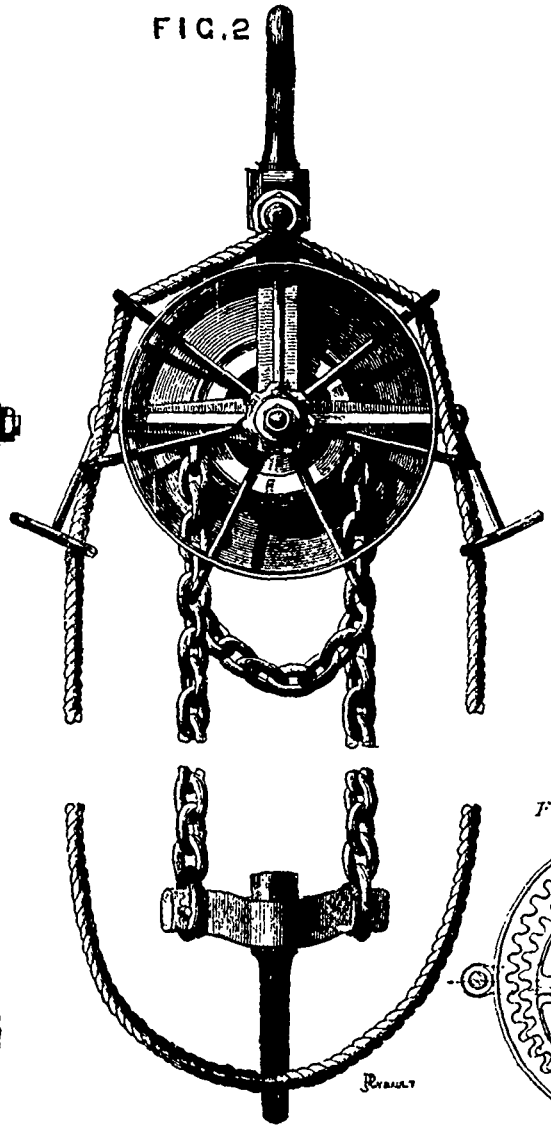
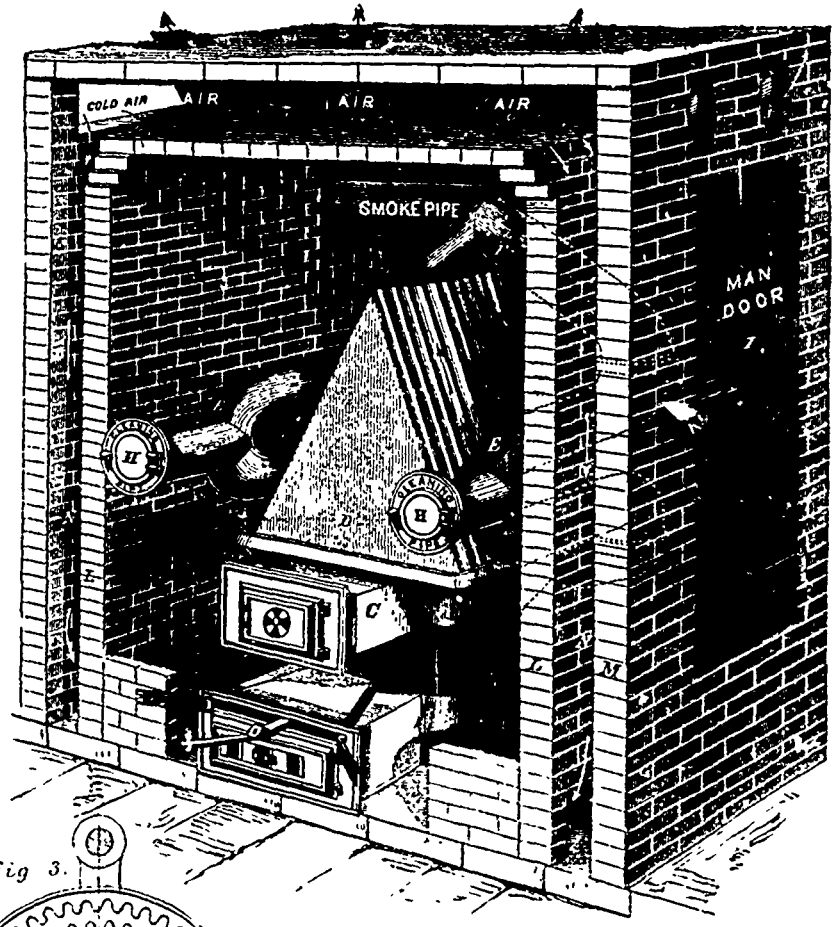


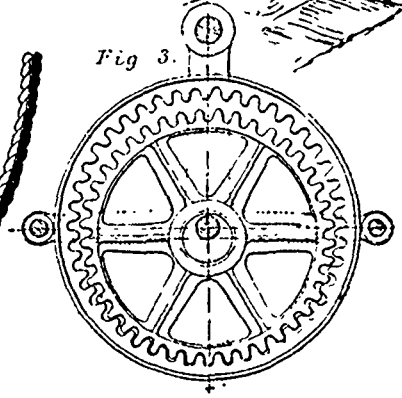
FIG. 2






LESLIES HOT AIR FURNACE.

*Fig 3.*



## MOORE'S PULLEY BLOCK.

(See page 341.)

We annex illustrations of one of Moore's 7½-ton pulley blocks, constructed by Messrs. Head, Wrightson & Co., of Stockton-on-Tees, and with which two men can lift a load of 8 tons. Figs. 1 and 2 represent front and side views respectively of the apparatus, Fig. 3, showing the internal gearing, which is 20 in. outside diameter. In these blocks two revolving discs are mounted face to face upon a shaft. The meeting face of each disc is dished out, and the periphery of each dished recess is formed into an internal toothed wheel. One disc has a tooth less in number than the other, but both have the same pitch diameter. When the discs are mounted on the shaft the space formed by the meeting of the two recesses is occupied by a pinion of smaller pitch diameter than that of the internal discs wheels. This pinion is mounted loose upon an eccentric forged in one with the shaft passing through the discs, and is carried round by the revolution of the shaft and eccentric. In revolving, the pinion rolls round the periphery of the internal wheels, and in one complete orbit the faces of the two discs move a distance equal to the pitch of one of the disc teeth, owing to the gradual displacement of the odd tooth. A chain wheel is cast on the back of each disc, and from the cross-head and hook to which the weight to be lifted is attached two chains, pass, one to the right side and one to the left side of either disc chain wheel. The loose ends pass over and are connected at a convenient distance below the block, forming a loop, which rises as the weight is lowered, and *vice-versâ*. The eccentric shaft is made to revolve by a hand chain wheel keyed to it, the wheel being worked by an endless hand chain, and the machine is supported in a frame with a suspending hook at the top, to attach to a beam or other means of support. The differential power is obtained by the gradual displacement of the odd tooth in the revolution of the pinion. The discs are perfectly free to move either way round in the frame, but the weight coming half on the right side and half on the left, perfectly balances the block and keeps the lifting chain plumb and fair under the centre of the block. One advantage of this system amongst many which it possesses, is that the weight cannot run down when left suspended.

## IMPROVED PORTABLE STEAM-ENGINE.

(See page 345.)

The Erie City Iron Works, of Erie, Pa., manufacture a portable steam-engine, of which we give a representation in the adjoined engraving. It is made of various dimensions, in eight different sizes, from 6 to 30 horse-power, the cylinders being 6 by 6 to 12 by 15 inches, and making from 200 to 140 revolutions per minute. The diameters of the pulleys vary from 24 to 72 inches, while the diameters of the tubular fire-box boilers range from 26 to 42 inches, and the tube are from 54 to 108 inches long. The weight, when complete, is 2,800 pounds for the smallest and 13,000 pounds for the largest size, and we are satisfied that for neatness of design, simplicity, durability, and ease of management they cannot be surpassed. The manufacturers do not claim numerous patents or new inventions, but have succeeded in building a simple durable, and efficient engine, capable of doing as much work, with the same size cylinder, as any engine built in this country.

It is well-known that the rated horse-power in these and all other manufacturers' lists is arbitrary, but the real power is determined by the size and strength of the engine and the capacity of the boiler for generating steam. If the boiler is too small a great waste of fuel is made in forcing the fires, and the supply of steam is insufficient and irregular. This is a fact to which we have called special attention in our series of articles on the "Theory of Steam Engineering," and we advise all those intending to buy engines to compare prices and capacities of different lists, and to look carefully to the specifications of the boilers. These boilers are all tested, inspected, and insured for one year by the Hartford Steam-Boiler Inspection and Insurance Co., and the policy of insurance made payable to the purchaser of the engine. This is a new feature in the trade that cannot fail to commend itself to all purchasers.

The boilers are tested with hydraulic pressure of 150 pounds to the square inch, afterward fired up, and the engines run until known to be perfect and complete in all their parts. They are supplied with smoke-pipe, governor, heater, pump, steam-gauge whistle, safety-valve, gauge-cocks, and oil-cups.

For the convenience of the trade, a branch house has been established at Charlotte, N. C., under the management of Mr. Wm. C. Morgan.

## EXPENDITURE ON THE UNPAVED FOOTPATHS IN CAMBERWELL.

The Camberwell Vestry are about to expend the sum of 11,000*l.* in paving and kerbing the public foothpaths within the parish, and at a meeting of the Vestry held last week, the subject was discussed at great length, on a recommendation by the General Purposes Committee that the sum in question be expended at once. Mr. Dresser Rogers, in moving the adoption of the recommendation, made some statements as to the extent of these foothpaths, remarking that there were 108 miles of them within the parish, and that of these 108 miles 45 miles had been tar paved, 33 miles York paved, and 30 miles gravelled. With reference to streets, he stated that 149 had been taken to under the 105th section of the Act, and that in addition to those 149 new streets, there were at the present time 25 new streets being proceeded with. The length of these new streets was 17 miles, and the work had been done at an approximate cost of 23,000*l.* What they had done was to pave as quickly as possible the poorer neighbourhoods, where fever and illness might have arisen from a want of paving and kerbing the footpaths throughout the parish, he observed that they knew the work was an important one, and that the sooner it could be proceeded with the better it would be. Camberwell was now in a good position. He remarked that some five years ago there were some 2,000 empty houses in the parish, whereas now, with the exception of passing tenants, there was scarcely an empty house in the entire parish. All this meant a large amount of rates, and it meant, too, that great improvements had taken place in the parish generally. The recommendation was ultimately carried unanimously, and the works are to be immediately proceeded with. 5,000*l.* of the amount required are to be borrowed, and repaid in ten annual instalments.—*The Builder.*

Worthy the attention of our City Council.—Ed.

## HOW TO GET CLEAR SKY IN OUTDOOR NEGATIVES.

Since my early days in photography I have examined photographic journals many times to find something that would throw light on this subject. Most architectural photographs have their skies worked out mechanically. The leading photographic writers urge strong objections against this practice; but when cloud effects cannot be obtained I am of the opinion that a clear blank sky is better than a uniformly dark one, which generally tends to make prints look flat.

This subject has been my special study for a year past. Experience has led me to the following conclusion: If the sky appear uniformly dark blue to our eyes, or if there be any haze in the atmosphere, it will surely come out dark in the prints; on the other hand, if it be light blue, or if there are white clouds of any kind, it will act strongly on the negative, and the result is a clear, if not a perfectly white, sky in the photograph. Hence it is advisable not to attempt architecture in hazy days, unless you are going to paint out the sky. Another thing tends to help the getting of clear skies. Use as little acid as possible in your silver, and expose while the sun is obscured by a white cloud, which will remove harsh contrasts; and if the negatives lack intensity they certainly will gather some if you dry them in the sum before fixing. Try it.

In architectural photography swing-backs (both ways) are indispensable, yet there are still a few who have never used a swing-back camera-box. If you are troubled with the building taking pyramidal inclinations when the camera is inclined either upwards or downwards an adjustment of the vertical swing will at once correct it. The lateral swing will help in getting the distance into focus with the foreground without necessitating the use of a small stop. Especially is this the case when you have to take street scenes, when it is impossible to take those parts *near* the instrument into focus with those receding with a non-swing-back box.

Green.—On Wool, or Silk, with Oak Bark.—Make a strong yellow dye of yellow oak and hickory bark in equal quantities. Add the extract of indigo, or chemic, 1 tablespoon at a time, until you get the shade of color desired.

## STACY'S CHISEL POINTED NAILS.

MANUFACTURED BY MULHOLLAND & BAKER, MONTREAL.

(See page 345.)

This Nail is said to as far excel the ordinary Cut Nail as the Gimblet-Pointed Screw surpasses the old blunt screw, and its superior merits are becoming more and more appreciated. The following are some of its advantages.

1st. It cuts the grain of the wood instead of mutilating it, and beds itself in the solid wood almost as firmly as a Screw Nail.

2nd. It is not surrounded by broken fibres like the common Nail which allows water to penetrate and rot the wood.

3rd. From the above causes its holding power is double that of the common Nail.

4th. It drives straighter, and will penetrate hard wood better than the ordinary blunt nail of the same size.

5th. It will not split the smallest moulding, and can be driven at the extreme edge or end of a board, and it makes a finishing Nail immensely superior to the one heretofore used.

6th. For Barns and other outside work such as Clap-boarding, Shingling and Fencing, it is particularly adapted, as there is no space around the nail for the water to penetrate and rot the wood, thereby allowing the nail, after a time, to draw through, and it prevents the board from warping.

7th. The Chisel-point allows a nail to be made with straight sides, and it is well known the straighter the sides the greater the holding power, the more the taper the less the holding power.

8th. There are a greater number of nails to the pound, and a much less number are required for the same effect; it is, therefore, doubly economical.

## THE MAHOMEDAN CEMETERY, MALTA.

(See page 352.)

Our engraving illustrates the new Mahomedan Cemetery, built in Malta at the expense of the Imperial Ottoman Government, on the suggestion of the Chevalier Naoum Duhany, Ottoman Consul-General in that island, who, when the demolition of the ancient cemetery had been determined upon, entered into negotiations with the local Government for the grant of a plot of ground for the formation on it of the new cemetery. A site, accordingly, at a short distance from the wharfs of the Great Harbour extension, and not far from the Roman Catholic Cemetery lately constructed, was granted to the Ottoman Government, who entrusted M. E. L. Galizia, the Government architect of that island, with the task of planning, preparing, and carrying out the design of the new cemetery.

This cemetery, rectangular in plan, is double the extent of the old one lately demolished. It has four lofty ornamented minarets in the angles of the boundary wall, with pilasters, surmounted by finials starting at equal intervals along the wall. The chief carriage-entrance from the road is through a porch, surmounted by a dome, with four minarets and spires at the angles, and two windows on each side with iron grating, surmounted also by lofty finials. The Sultan's escutcheon, in white marble, has been fixed in the centre of the fan-light over the carriage-gate. In the inside (which is planted with palm-trees and laid out in walks), and at the further end of the cemetery, two large square rooms, each roofed over with a dome, and separated by a covered arcade, are allotted the one as a mosquée for burial service, and the other as a lodge for cemetery-keeper. In the centre of the arcade, fronting the principal entrance, a large marble tablet has been fixed with a suitable inscription in French.

The cemetery, which is surrounded on the outside with trees, is enclosed on three of its sides by a passage, and by a dwarf wall regularly built in masonry, and by an iron railing and gate on the side overlooking the road.

This building is constructed entirely of sandstone from the best quarries of Malta, carved throughout, and the style of architecture, being the "Morisco," is a novelty in the island.

CEMENT FOR ELECTRICAL MACHINES AND GALVANIC TROUGHS.—Melt together 5 lbs. of resin and 1 lb. of bee's-wax, and stir in 1 lb of red ochre (highly dried and still warm) and 4 oz. of plaster of Paris, continuing the heat a little above 212°, and stirring constantly till all frothing ceases, or (for troughs) rosin, 6 lbs.; dried red ochre, 1 lb.; calcined plaster of Paris, ½ lb.; linseed oil, ½ lb.;

## NOTRE-DAME AT HALL.

(See page 344.)

We copy an illustration from the *London Builder* of this strikingly beautiful and valuable example of perfected gothic of the fourteenth century. Only the Western Tower is shown. See the *Builder* of 4 Sept 1875, for description of the interior of the Church.

## STEAM-CAR INCIVILITY.

There is one place where our people are fast losing their really finest quality. It is in our railway cars. Here the inborn courtesy of the American is sadly lacking. Generous and considerate, and truly polite everywhere else, he is fast becoming selfish and boorish in the extreme here. Within a week we have witnessed such a scene as this: an ingress of eight or ten persons—nearly all of them ladies and children—into a car not more than three-fourths filled with passengers. The incomers slowly walking down the aisle, seeking places for themselves among the half-occupied seats. They pass six or more men who hold their place at the outer end of the seats as if to bar all entrance. They pass two or three quite lady-like dressed women who manage to fill an entire seat, one of them having wedged her back and feet between the two arms. Others there were who had beflanked themselves with valises or bundles, holding a sort of squatter sovereignty over the entire domain. There were in all some sixteen seats thus occupied. Not one of the occupants was entitled to but one sitting. There was not a movement nor expression from any one of them all toward the party of ladies and children who stood waiting long after the train was in motion. When at last the gentleman of the party began to assert his right to the unfilled seats, there was an uttered lie from one man who claimed the place by his side for "a friend" who never appeared, looks of defiance, and scowls of dissent from the ladies, and a reluctant, protesting movement from each one who was forced to make way for these others' rights. . . .

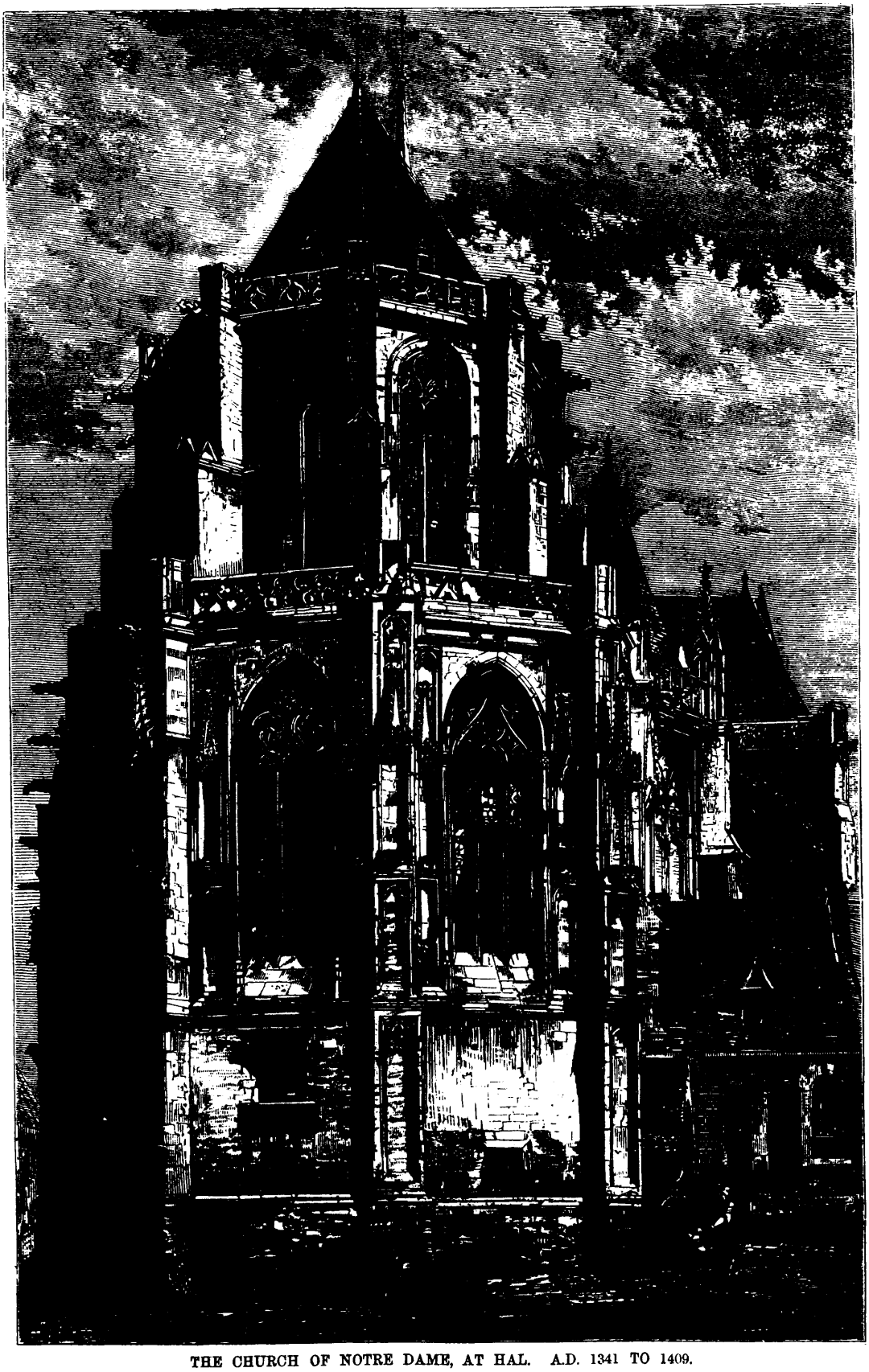
What is there in or about the steam-car that nourishes into life such incivility? We never saw it in the old-fashioned stage-coach. We do not meet with it in the street-car. . . . Unless it can be proved that steam has nothing to do with the matter, by our showing that we can be as kind, and civil, and polite in a railway car as we now are in a horse-car, then we shall plead most strongly for the breaking up of our engines, and the relinquishment of steam as a motive power. Civility is better than haste.—From the *Watchman* and *Reflector*.

We regret to say that the above remarks are also very apposite to many passengers on Canadian Railways.—ED. C. M. M.

## ABOUT WASHING DISHES.

Mrs. C. S. R., Mansfield, O., writes: The dislike to dish-washing, so common among housekeepers and girls, arises mainly from the fact that it is so injurious to the hands. It is a serious objection to the work, as in the minds of many the preservation of a pretty hand is of more importance than many cups and platters. By the use of what we call a swab, we have so far obviated the difficulty, that the washing of the dishes is preferred to any other household work. The swab may be made on any smooth round stick, about a foot long, and an inch in diameter. About two inches from one end cut a groove; take candle-wicking, white carpet-chain, or even strips of strong cotton cloth, and cut or fold about eight inches in length; tie this material firmly into the groove at the middle, and turn down and tie firmly at the end of the stick, and you will have a "machine," which will last many weeks, and go into boiling soap-suds, or even lye, without cringing. In washing the dishes we have a vessel of hot soap-suds, and another, not scalding hot, of clear water. We wash and rinse the dishes, placing them to dry on a cloth spread on some convenient shelf or table. By inverting a few cups at first, the other dishes can be leaned upon them loosely, and more conveniently, and with less injury to the edges, than upon a rack; when dry they will be brighter and smoother, than by any amount of rubbing. [It would appear from Mrs. R.'s note that the dish-swab is not generally known; they are kept in all house-furnishing-stores, and we give an engraving of the kind sold there, but of course a home-made one will answer quite as well.—ED.]

STONE CEMENT.—River sand, 20 parts; litharge, 2 parts; quicklime, 1 part; mix with linseed oil.

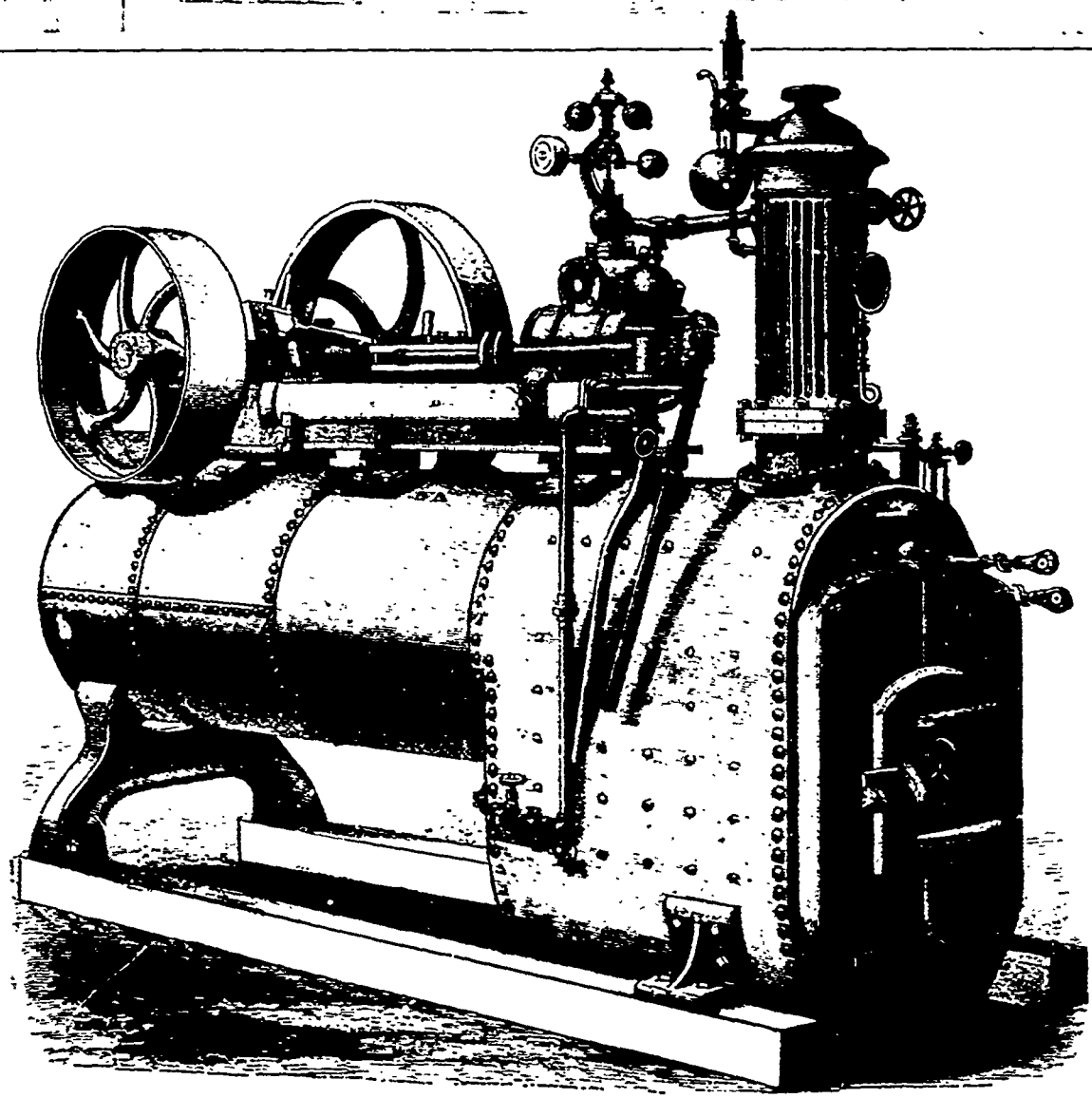


THE CHURCH OF NOTRE DAME, AT HAL. A.D. 1341 TO 1409.

STACY'S CHISEL POINTED NAILS.

EXHIBITED AT PROVINCIAL EXHIBITION BY MESSRS. MULHOLLAND AND BAKER, MONTREAL.

1st. Prize.



IMPROVED PORTABLE STEAM ENGINE.

## AMATEUR FOOT-LATHE.

(See page 348.)

BUILT FOR THE EDITOR OF THE "AMERICAN ARTISAN" BY THE STUDENTS OF THE SIBLEY COLLEGE OF MECHANIC ARTS, FROM THE DESIGN OF PROF. JOHN E. SWEET, DIRECTOR CORNELL UNIVERSITY MACHINE-SHOP, ITHACA, N. Y.

The dimensions and capacity of this lathe are as follows: 4 ft. bed, 10 ins. swing, turns straight and taper, 6 ins. in diameter over slide-rest, and 26 inches long; and three speeds of automatic feed instantly changed in direction; cuts with eleven change wheels, twenty-six different pitch screws, both right and left hand, from four to sixty-four to the inch; turns and bores conical pins and holes, the angle determined in degrees by an accurately graduated circle, turns spheres and hand-wheel rims accurately. The slide-rest is changed and fixed in all positions instantly, and made fast for facing in a most simple and convenient manner.

The slide-rest may be removed and an improved hand-rest substituted by the use of one hand only, and that in the most simple manner. The tool-post is provided with a lever arrangement, by which the tool can be withdrawn three-sixteenths of an inch, and returned to the same place for screw-cutting and other purposes.

The head-stock is provided with a three-lift cone and internal back gear, changed by a single action, a hollow mandrel and graduated face plate. The friction feed is changed quickly and thrown out of gear by the action of throwing the screw cutting in, and *vice-versâ*. The screw is thoroughly protected, is in the best possible position, and works in an open nut three times the usual length.

The slide-rest is gibbed, has more than twice the usual length, is provided with oil-chambers leading to the ways, and a spring bolt for securing the hand and cross slide-rests.

The foot-stock is secured by a single movement of a handle, is offset for turning taper by operating a single screw, and the foot-spindle made fast by a cone. The screw is provided with a safety-guard to prevent wedging when the handle is turned the wrong way, and the oil-reservoir is placed in better position than usual, as it is better protected.

A shelf and rack for tools and change-wheels are arranged under the shelf.

The leg at the foot of the lathe is pivoted to the bed in such a manner that the bed will not be affected by an uneven floor, the driving-wheel bearings are of unusual length, and embraced in a self-contained structure. The disc crank admits of the crank-pin being changed to change the lift of the treadle. The crank-pin is of unusual length, and that and the main bearings have liberal end-play. The slotted connection permits the treadles being raised or stopped up. The rock-shaft of the treadle is pivoted on tempered steel knife-edges, or scale beam-joints, and the power is transmitted to the connecting-rod by the same device. The joints work frictionless, and need no oil. The rock-shaft is set high, so as to give the acting foot of the operator an easy and natural direction; the lever and connection to the crank are so arranged and proportioned as to give *more* than a half revolution of the main wheel during the *down*, and *less* than a half revolution on the *up* stroke, and so as to have the change from down to up take place *slowly*, and from up to down *quickly* —all necessary elements in an easy action for the operator. The treadle is provided with an automatic catch, so that when the lathe is set going fast and the feet removed, the treadle is caught up and remains up until released, which is readily done by placing the foot below and releasing the catch with the ankle.

The lathe is provided with a novel and extremely simple centre-set. In all places where changes need to be frequently made, a fixed handle is provided, and where changes are occasionally necessary, each screw-head or box-nut is made to receive the one single wrench that fits the tool-post screw.

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COMMON PASTE.—To a table spoonful of flour add gradually ½ pt. of cold water, and mix till quite smooth. add a pinch of powdered alum, some add a small pinch of powdered rosin, and boil for a few minutes, stirring constantly. The addition of a little brown sugar and a few grains of corrosive sublimate, will preserve it for years.

## MACHINE FOR CUTTING OFF HOT IRON.

(See page 348.)

The London *Engineering* of May 14, 1875, contains the illustration of a neat, compact machine for cutting off iron, constructed by Messrs. Richards, London and Kelley, engineers, at Philadelphia. The employment of circular saws for cutting off hot iron bars being old and well-known, reference in these columns will be made only to the machine shown by the engraving, which merits notice from its simplicity and symmetry of design.

It will be proper to state that this firm, although known as wood-machine manufacturers, do a regular engineering business, having made stone-cutting and planing machinery, sugar-cutting machines, and a large variety of special machines for working wood, iron, and other materials Such being the nature of their business, they were not unfrequently called upon to discuss the processes for cutting iron and steel, and in the course of business gave the matter some thought and attention. They were finally induced to build the machine by one of their old customers, Mr. J. A. Durgin, of the Pittsburgh Locomotive Works, who was visiting London last fall, where he saw a variety of machines cutting both iron and steel successfully. Feeling greatly the want of such a machine, he immediately visited the office of Messrs. Richards, London and Kelley, at No. 10 John street, Adelphi, London, where he met Mr. Richards, and requested a machine for the Pittsburgh Locomotive Works; the result of Mr. Durgin's request is now before us as it left the hands of the designer.

The machine shown has one claim which is of considerable importance; there are no sliding surfaces, and no chance of derangement from iron scales or iron dust. The saw-spindle is mounted in a pivoted frame, and as there is no friction or other resistance than the cutting action, an operator will feel the operation of the saw as it is pressed against the iron, a matter of some importance, and necessary to protect the saws from injury, which often occurs when the feed is not sensibly felt. A number of the supporting brackets are fitted on a rod three to four feet long, so long as to be set up in the position shown, or dropped down out of the way as the length of the iron being cut may require. Adjustable gauges for determining the length of the pieces cut are provided on the opposite side of the machine from the one shown in the engraving. The belt coming down from a shaft above becomes slightly tightened as the saw is pressed forward to the iron, and loosened again when the saw returns to the position shown. The purpose of this arrangement is to avoid unnecessary strain upon the saw-spindle when the machine is not in use, and to permit it to run continuously—a matter of convenience when a number of workmen use the same machine, as it saves stopping and starting each time a piece is to be cut.

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## PLATE-SHEARING MACHINE WITH REVOLVING CUTTERS.

(See page 349.)

Messrs. Shaw, Hossack, & Co., of Openshaw, near Manchester, show at the Cheetham Hill Exhibition, Manchester, their plate shearing machine with revolving cutters, of which we give an engraving above. The machine is provided with an adjustable grooved table and sliding bar, with a stud on the latter, for shearing plates to different radii. A special feature in the machine is that the top cutter shaft is mounted in eccentric bushes, so that by turning these bushes it can be brought nearer the bottom shaft, so as to take up the wear of the cutters. The eccentric bushes are graduated on the edges, so that the two may be turned equally, and the two shafts be thus maintained parallel. The machine will shear plates up to $\frac{3}{16}$ in. thick, and it is altogether of a neat and good design.

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WHY THE COMPASS POINTS TO THE NORTH. — There are many wild and vague theories to account for this direction of the needle; but nothing, appears to settles the question so ably as the rotation of electrical currents around the earth, and the consequent declination of the needle, as any one may have perceived who has sat several hours together, and watching the varied movements of the needle around the circuit or under different conditions of current.

## FRAME FOR GRINDING TOOLS.

(See page 349.)

It is rarely that tools upon the farm are ground in the best manner; even the tools of mechanics are sometimes found with faulty and ill-ground edges. Instead of a perfect bevel parallel as to heel and edge, and of a proper angle, the majority of cutting tools, such as plane irons, chisels of all kinds, and draw knives, are found on examination by a critical person, to have either a convex or a concave bevel which, at the same time, is wider from heel to edge on one side than on the other, not at right angles with the side of the tool, and with the angle of the bevel, too short in soft wood cutting tools, and too long in those for working hard wood or iron. This irregularity comes from unsteadiness in holding the tool while it is being ground, from holding it in a wrong position, and from having the stone uneven, although this last trouble is the necessary consequence of the first. The first requisite in grinding a tool properly is to have the stone hung and balanced truly. The next is to have the stone turned evenly on the face. This is best done by means of an old file used upon a solid rest as in turning in a lathe. The next is to have a contrivance for holding the tool to be sharpened in such a manner that it will be ground to the proper angle, and meanwhile is held rigidly and immovable to the surface of the stone. It is impossible to do this by hand without some help. When the operator must turn the stone himself, his case is hopeless, unless he can have some mechanical aid. Such aid may be secured by the help of the simple device here illustrated, which is shown separately in Fig. 1. It is a frame of wood furnished with clamps of light half-round or flat bar iron, which are tightened by nuts or thumb screws at the back. The tool to be ground is fixed firmly in the clamps. The frame is pivoted by the arms to the grind-stone frame by means of movable pins. There are several pin-holes by the use of which the angle at which the tool is presented to the stone may be changed. In Fig. 2, the frame is seen in use as the operator presses the tool to the stone while he turns it by the treadle. This contrivance may be modified in numberless ways to meet different requirements, but the principle will be always the same. For instance, and it is a very extreme case, to grind a cutting bar for a mower or reaper, we would use a stone with a double beveled face ground purposely for this work, as shown in Fig. 3. The bar would be clamped in the frame by using a piece of stout inch-board and placing the bar between this and the frame, and screwing the clamp tightly. To sustain the end of the bar steadily, a support should be used, consisting of a sliding-rod with a cross-bar at the top, which may be fixed by a wedge at the proper hight for use. If a scythe is to be ground, the frame may be fixed so as to form a rest upon which the tool may be steadied, also when grinding broad tools, as the knives of planing machines or edgers for shingle machines, it may be fixed in the same manner. By changing the manner of using the device or adding to it in this way, it may be made very serviceable.

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INGENIOUS ROBBERY.—A case before the Croydon Petty Sessions this week explains to some extent how recent robberies at railway stations have been effected. The suspicions of two detectives at the Victoria station having been aroused by the movements of a couple of well-dressed men, they were watched and followed to Norwood Junction, where they took tickets for Brighton. Just as the train drew up luggage was missed, and the two men, who had got into a first-class carriage, were arrested. Their portmanteaus were found to contain false bottoms fitted with springs for clutching anything over which they were placed. The missing articles were found attached to the bottoms of the portmanteaus, and the two "well-dressed persons" were remanded.

---

CRACKS IN CAST IRON.—In order to close cracks in cast-iron stoves good wood ashes are to be sifted through a fine sieve, to which is to be added the same quantity of clay finely pulverised, together with a little salt. The mixture is to be moistened with water enough to make a paste, and the crack of the stove filled with it. The cement does not peel off or break away, and assumes an extreme degree of hardness after being heated. The stove must be cool when the application is made. The same substance may be used in setting the plates of a stove, or in fitting stove-pipes, serving to render all the joints perfectly tight.

## GATEWAYS.

(See page 349.)

There are perhaps no contrivances in general use that are so unsatisfactory as our gates. We find these the most frequently out of order of any of the surroundings of a house. We have borrowed our illustrations from Woodwards "Country Homes." The principles of these gates are built upon is the same as that of span roofs. Fig. 1, shows the simplest form of a gate of this kind. Within a simple frame there are eight braces crossing each other, and also five iron rods, the heads of which are let into the upper rail of the gate, and the lower ends are furnished with a screw and nut, by means of which they may be fastened. The braces are halved together where they cross each other; they are not tenoned into the frames of the gate, but are held in position by tightening the nuts. The ends of the braces that bear against the rods have a groove in each to admit the ends. The principle of construction here shown being adhered to, a gate of this kind may be ornamented in various ways. One of these is in the rustic gate Fig. 2, where the whole is made of cedar sticks and iron rods. Three other rails besides the upper and lower one are fastened to the braces by means of carriage bolts. In this gate the iron rod at one end is made to answer as a very simple and permanent hinge. It is prolonged at each end beyond the portion upon which the nut is screwed, the upper end moves in a strong iron eye screwed into the gate post, while the lower end is strapped into a stone placed to receive it. The hinges to the gate in Fig. 1, are strong and very simple, the rod which holds the upper post of the gate passes through the upper plates of the hinge, which is further secured to the gate by means of carriage bolts. In the lower corner the iron rod passes through the lower plate of the hinge, and is there fastened by the nut. The hinge may, if desired, be counter sunk, to present less iron-work to view.—*Manufacturer and Builder.*

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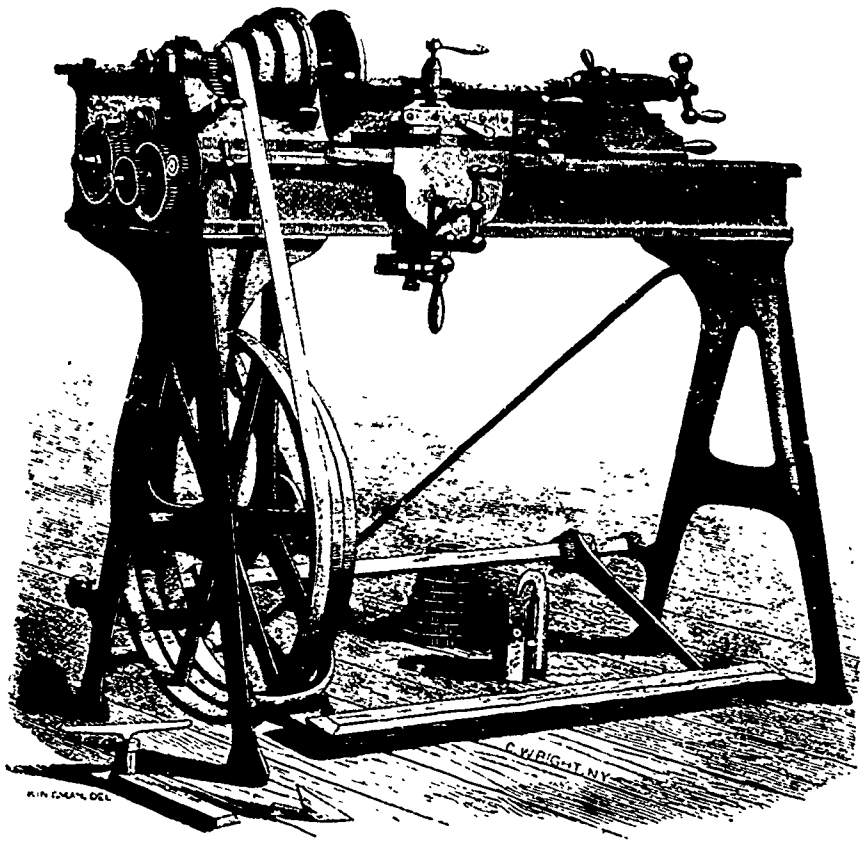
## ON SAW MILLS.—HOW TO GET THE MOST LUMBER FROM SAWLOGS.

Experience has abundantly proved to our satisfaction that this can be done only by the use of the circular saw. Human ingenuity, thanks be to the Giver of all Good, has been so prolific in the invention and construction of this kind of machinery, that the principal difficulty with the intending purchaser seems to be an inability to decide whose machine is really the best. Every builder or inventor of a rotary sawmill appears to claim for his machine such a perfect constellation of most desirable features, that a certain amount of hesitation in coming to a decision seems to be inevitable. Having tried the up and down saw and the circular saw also, we would again repeat our conviction that the last mentioned is the best for manufacturing lumber, and should any person act on this expression of opinion, let him in the first place be very careful to get if possible the best machine, bring it to the mill, and set it perfectly level and true. When you get it in operation, see that you, handle it carefully. If you have been used to running the up and down saw only, you will soon find out that your former experience avails almost nothing in the management of the rotary machine; but when you get the hang of running it, the compensation in the way of convenience, rapidity, and quantity of work, is immense. Some prefer to use the inserted tooth saws, and will use no other. They seem to possess many advantages, and are entirely safe. A late invention of *spreading* the *upper part* of the tooth *towards the point* during the process of manufacture, spreading it out so as to make the point of the tooth the *thickest* part of the circumference of the saw, enables the sawyer to dispense in a great measure with the use of the swage. Those inserted tooth saws which do not possess this improvement must be carefully swaged and filled at least twice per day, and sometimes as often as six or seven times per day, depending upon the kind of lumber being cut. In filing or swaging the saw, be careful to form the point of the teeth absolutely square, and even across, the slightest deviation from perfect truth in this respect being apt to cause the saw to *run*, as it is termed, or vary from its proper course while passing through the log. Some prefer to form the point of the tooth a little hooking, just enough so as to be barely perceptible, and in swaging to use *that part* of the die belonging to the swage, which gives the tooth of the saw a slightly curved or rainbow form, something in this shape⌣, or scarcely so much curved. One

AMATEUR FOOT-LATHE.



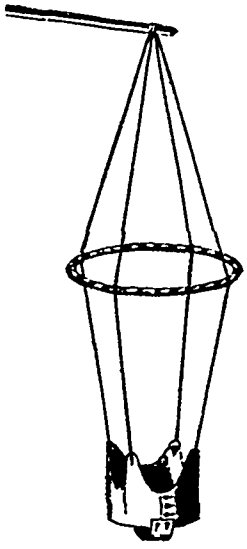
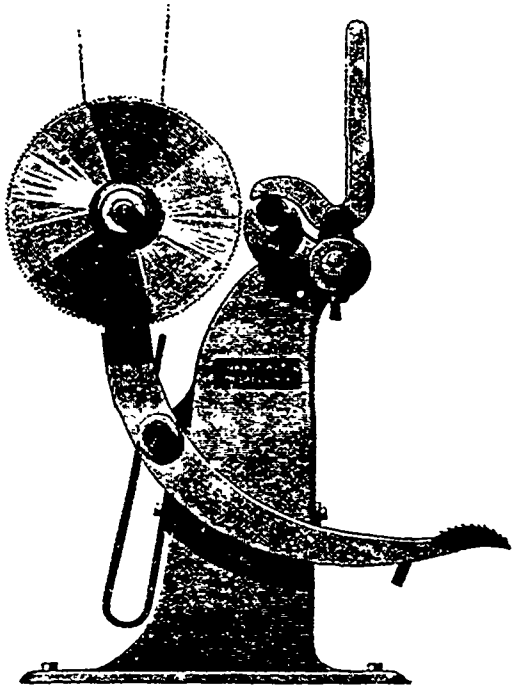


FIG. 2. BABY-JUMPER.



MACHINE FOR CUTTING HOT IRON.

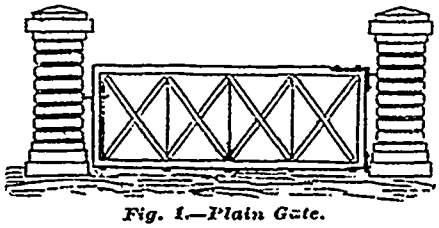


*Fig. 1.—Plain Gate.*

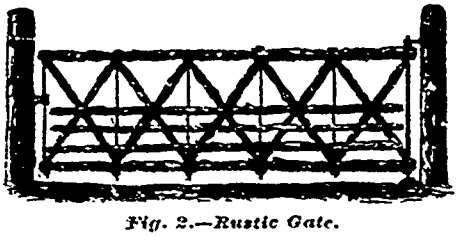


*Fig. 2.—Rustic Gate.*

## FRAME FOR GRINDING TOOLS.

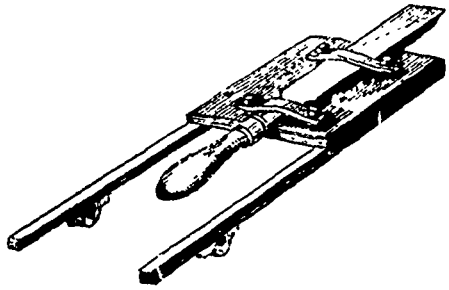


FIG. 1. FRAME FOR HOLDING TOOLS.

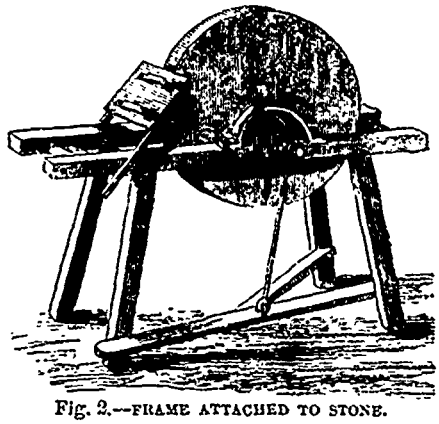


Fig. 2.—FRAME ATTACHED TO STONE.

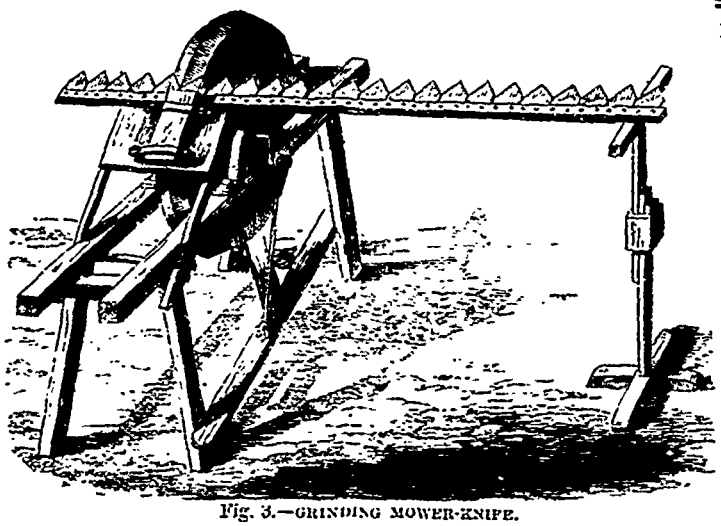


Fig. 3.—GRINDING MOWER-KNIFE.

DISH-SWAB.

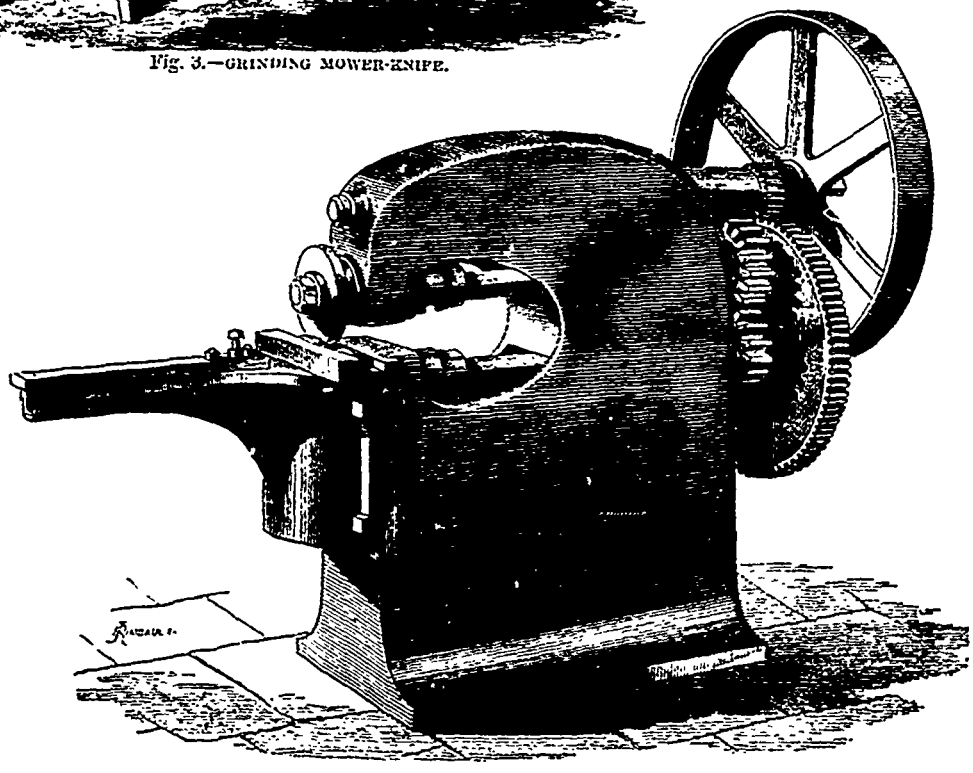


PLATE SHEARING MACHINE FOR REVOLVING CUTTERS.

sawyer of 20 year's experience in running machinery, informed us that he never did better or more rapid work with his mill than when he kept his saw exactly right on these *two points* just stated. If you can run a No. 7 gauge saw on your mill, the loss resulting from sawdust will be very slight, and as large saws are generally thickest at the centre, tapering off towards the circumference, this size or No. 6 will, as a g neral rule, be found sufficiently strong for most purposes. Make sure at all times, especially during frosty weather, that the dogs have a secured hold of the log before the saw enters it. It is only a few days ago that a case came to my knowledge of a firm near Fredericton, N.B., having sustained a severe loss by a log (insufficiently secured, of course) canting ove on the saw as it was passing through it. The effect was to break off the saw from the mandril, twist off the nut at the end near the saw, and break away the two iron pins used for securing the saw in the collar, causing a stoppage of the mill, and the consequent expense of repair and delay. When you get the mill in operation, see that you handle it carefully, and maintain unceasing watchfulness over her while in operation. Give her *plenty of power*, if you *don't*, you may as well shut up shop at once; *good attendance*, and with a good machine, the attendants will not have much time to play themselves, I can assure you. Keep all the parts well *oiled* — that has a great deal to do with the smooth and successful running of the machine; and, by the way, I would remark that sawmills are not the only things in this world that run all the better for being oiled. If that kind, loving, gentle, and affectionate spirit of which *oil* is the symbol, pervaded the hearts and minds of our race, and found universal expression in every thought, word, and deed during our daily intercourse with each other, it would be a very different world from what it is —better for ourselves, and better for our neighbors. Let us all carry on *this* branch of the *oil business* as extensively as possible, and we shall soon see a brotherhood "dwelling together in unity." In order to facilitate calculations regarding the velocity of saws, herewith is appended a reliable table to serve as a guide in ascertaining the proper speed for running:—

TABLE OF SPEED FOR CIRCULAR SAWS.

| | | | | | |
|---|---|---|---|---|---|
| 36 | inches in diameter, | 1000 | revolutions per minute. | | |
| 38 | " | " | 950 | " | " |
| 40 | " | " | 900 | " | " |
| 42 | " | " | 870 | " | " |
| 44 | " | " | 840 | " | " |
| 46 | " | " | 800 | " | " |
| 48 | " | " | 760 | " | " |
| 50 | " | " | 725 | " | " |
| 52 | " | " | 700 | " | " |
| 54 | " | " | 675 | " | " |
| 56 | " | " | 650 | " | " |
| 58 | " | " | 625 | " | " |
| 60 | " | " | 600 | " | " |
| 62 | " | " | 575 | " | " |
| 64 | " | " | 560 | " | " |
| 66 | " | " | 545 | " | " |
| 68 | " | " | 530 | " | " |
| 70 | " | " | 515 | " | " |
| 72 | " | " | 500 | " | " |
| 74 | " | " | 485 | " | " |
| 76 | " | " | 475 | " | " |

—*Moore's Artizan's Guide.*

HINTS TO YOUNG DRAUGHTSMEN. — If sections are cross-lined in indian ink they do not want colour, but if coloured for section do not let your brush quite touch the top or left-hand lines, and finish with one stroke along the bottom line. Let your tints always be faint, and when perfectly dry (if not quite dark enough) carefully wash over again. The fault of many draughtsmen is "colouring too high," and good finished mechanical scale drawings, not working, are often unsightly through this one cause. We would recommend you in tracing on cloth only, put a little ox-gall in the ink, and colour both this and tracing paper on the wrong side after all else is finished. Mechanical shades and shadows fall at an angle of 45°, and look best with light coming from left-hand top corner of board.

PUBLIC READING —Your failure lies entirely in the painful consciousness of the want of power which the audience can see in your face, your action, and intonation; for although you may have got over what is commonly called the "platform fever," you are yet nervous, and you have not the art to hide it. But take courage, go to work, and work hard. I suppose you have some daily occupation. Let it be your nightly study, your change of occupation for tw years, and altogether give up the study of elocution as far as acquiring rules, and take to the old standard English authors such as the old "Spectator." Read and re-read it aloud, especially the essays by Addison, also read Johnson's "Rambler," and see the difference in style, read the "Vision of Mirzah," by Addison; Gray's "Elegy", Collins "Ode to the Passions"; Pope's "Essay on Man", Milton's "Comus," and his "Sonnets." Read them aloud, so as to get the music out of them. Read them to yourself to get an insight into their inner beauty, and when you can get all the music, and can realise the beauty of the compositions of the old authors of the day past, you may begin to understand the authors of to-day. Look up among the old authors Blair's "Lectures on Rhetoric," Sheridan's "Elocution," Lake "On Eloquence"; Walker's "Elocution" Among the best modern works you will find useful hints in Cassell's "Educator," and on the English language in the "Educational Course." Of one thing you may be certain, you must study to understand and make yourself master of your subject before you can make other people understand it, and listen with any pleasure whilst you recite it. This is the first grand point. You may have all the rules of all the authors, you may be able to give a long Greek name to every figure of speech used from Hesiod down to Sankey—but it will avail you nothing if you have not mastered your subject; and this applies exactly the same whether it be in the grand declamation of the fallen archangels in Milton's "Paradise Lost" or in the dialogue of the gravediggers in "Hamlet"—it applies the same to the sweet pathos of Gray's "Elegy" as to the rollicking fun of Hood. It is not a matter of reading — my child can read any of th se works, but he does not understand them, and therefore he does not interest me when he recites them; and so it must be with you—don't be offended. I pride myself upon being thoroughly conversant with Milton— if there is one author alive or dead with whose works I am most familiar through constant reading it is Milton — yet I never remember being more astonished than I was one day last week when, in private conversation upon Milton, my friend recited the short "Ode on Time." I have read it often. Had I been asked to read it in public I should have made nothing of it, because I had never studied it; but since I heard it recited by my friend, who has studied it, I think it one of the gems of the book. There is one other point I wish to notice—that is, you must be natural Do not strain after effect. The artist rubs out from his canvas all the lines of perspective that give the proportion to his subject, so must you keep out of sight the drudgery that give you the power to hold an audience One of the great principles of elocutionary art is its concealment—the great object of all art is to hide art. To sum up, the , you fail because you want the power. Your failure lies in yourself, your success lies also with yourself. Study yourself, criticise yourself, but work, work and you will succeed.

TO BRAZE A BAND SAW.—*Whitney's method.*—The tools required are a small portable forge, brazing clamps, &c., and a straight edge, 3 or 4 feet long, also some brass wire and powdered borax. Take the saw and cut it to the proper length, scarf the ends from one-half to three-fourths of an inch, then put the saw in the clamps. I would say that I use a very small and simple clamp in the shape of a double vise. Keep the back of the saw out of the jaws of the vise, or clamps, and apply the straight edge to the back, as it is very necessary to braze it straight; make the fire in as small a compass as possible, place the clamps directly over the centre of the fire, and then put on three pieces of brass wire, bent in the form of the letter U, so that they will pinch the laps together; put on as much borax as will lie on the saw, cover the whole with a piece of charcoal, melt the brass so that it will flow over the saw before taking it off the fire, and cool very slow so as not to make the braze brittle. File off what remains on the saw, and it is ready for use.

## PAINTING OF MACHINERY.

We often have occasion to notice the great lack of taste displayed in painting machinery, which is too often daubed with the most glaring and ill contrasted colors, that disgust the sight and mar the general appearance of the machine. The following remarks will assist our readers to a better comprehension of what we mean, and also to select proper artistic contrasts. In our rounds through various machinery warehouses, and particularly at our industrial fairs, we have often seen bright, gaudy reds and scarlets mingled with bright blues and yellows in the most extraordinary way. A very little consideration will show that such combinations are breaches of the laws of harmony, which require that one color shall be subservient to the other, so as to perfectly blend the whole to an even and pleasing tone. Thus, the complementaries of red are green, of blue, orange, of yellow, violet. Precise rules, however, cannot be laid down, and much depends upon artistic effect, to be decided by the reasoning eye. The following suggestions as to contrasts, however, may be found of assistance; 1st, black and warm brown; 2nd, violet and pale green; 3rd, violet and light rose color, 4th, deep blue and golden brown; 5th, chocolate and bright blue, 6th, deep red and gray; 7th, maroom and warm green; 8th, deep blue and pink; 9th, chocolate and pea-green; 10th, maroon and deep blue, 11th, claret and buff; 12th, black and warm green; 13th, slate color with nearly all bright colors excepting blues; 14th, buff and black; 15th, buff and blue or mauve, and so on.

Colouring Rooms.—Some people seem to think that whitewashing ceilings and colouring rooms is a very simple matter, whilst, on the contrary, it is a matter requiring much judgment and skill; no man can give any precise particulars that shall answer in all cases, as what will suit one ceiling will not suit another. If you have a good clear wall that has not been knocked about, and patched, and repatched, you may work on the wall comfortably by first well going over with a coat of size, not too strong. Then apply your ground colour, which should be a light drab for pea-green, and darker for the other green, made also with size and water, in which a few drops of turpentine have been beaten; then, when dry, go over with your finishing colour. I do not know of any means whereby water alone may be made to carry the colour. You must use some size, some whiting—in fact, stain your whitewash with green till you get the shade you require. I would put a small piece of soap into it. If your wall is patchy, and you want to make a good job of it, hang your room with white lining paper, and distemper over it. Well strain your finishing colour, and make up over night to let it chill.

Blisters in Oak Painting.—To grain oak on deal, to stand the action of sun and weather, all knots should be well covered with red lead and glue size (which supersedes the patent driers for durability), and primed with red lead priming, the stopped with white lead putty; for the second and third coats add a little oil and white lead to the priming colour, then follow on with two coats of buff, made with white lead, patent driers, turps, and linseed oil (about 3 of turps to 1 of oil), Oxford ochre, chrome yellow, and Venetian red—the less used of the two last the better, as also of the patent driers. Each coat should be put on thin, and well glass-papered. The graining and overgraining colour should be done in oil (leaving out the whiting), and use the best carriage varnish. *To paint and grain on old varnished woodwork.* it must be first prepared either by burning or eating off old paint or rubbing it down with pumice-stone and cold water. If the latter, care must be taken to cut through the varnish to the paint underneath, or blisters will surely follow after. Cover over all the bare knots with the red lead knotting, then the coat of priming (made thin, drying, and not too oily), and afterwards two coats of buff as before, and screen the paint, when finished (where practicable), from the sun for a few days to harden. Painting on oak is very seldom done. It is generally oiled or varnished. It being more porous and pungent than deal, use boiled oil, thinned with a little turps, to make the paint more workable when required to be done.

Hydraulic Cement.—Powdered clay, 3 lbs.; oxide of iron, 1 lb.; and boiled oil to form a stiff paste.

## ARCHITECTS IN AMERICA.

Some of our friends in the States are very anxious we should know what manner of man the Architect is in some parts of their country, and they send us the advertisements issued by one Mr Appletart, let us call him. Here is part of one of the advertisements:—

"G S H Appletart, Rear-end, R. M. Miller & Son's Building 4th street Charlotte N C architect, and agent for all kinds of iron fronts of building galvanized cornices, iron fences crestings, and all kinds of galvanized work, which he will sell cheaper than any person

G S H. A, wishes to inform the public at large that he is prepared to furnish plans of all kinds of buildings, with working drawings in full, which will be found much plainer than those of any other man in the State, he being a practical builder having an experience of fifteen years in three of the largest cities of the United States. He can answer any question or give any information in regard to the construction of any part of the building as he is fully qualified to go and do the work himself. With fifteen years as a builder and fourteen as an architect he knows just what it is necessary for a mechanic to get along with, and with this experience you will at once see that he has a pretty good knowledge of the business.

He can show as many fine buildings as any other man of his age, and will take pleasure in doing so. Any person visiting Charlotte is invited to call and examine his drawings, which he has at least 500. He guarantees to have 50 to 1 of any other person in the State. All are invited to examine them whether they are going to build or not. The ladies are specially invited.

In another paper our energetic *confrère* bursts into verse, as thus:—

"G. S. H. Appletart. Architect, Charlotte, N. C.

Come on! Come all!!
Both great and small!
To my office in rear of R. M. Miller's Hall.

It makes me feel as though I should say,
Call on me about the Centennial day
And hear what I have to say
About buildings, on the Centennial day,
If you don't, when your building is done
You'll feel as if you wish'd you'd ne'er begun
As for style and beauty you have none:
Call on me, as I please every one.
In style I please the eye and purse.
And guarantee to have no fuss
And, if dissatisfied, will pay for time and trouble
Taken to investigate the truth.
Should you employ me, and I fail to please,
You can go away at your ease."

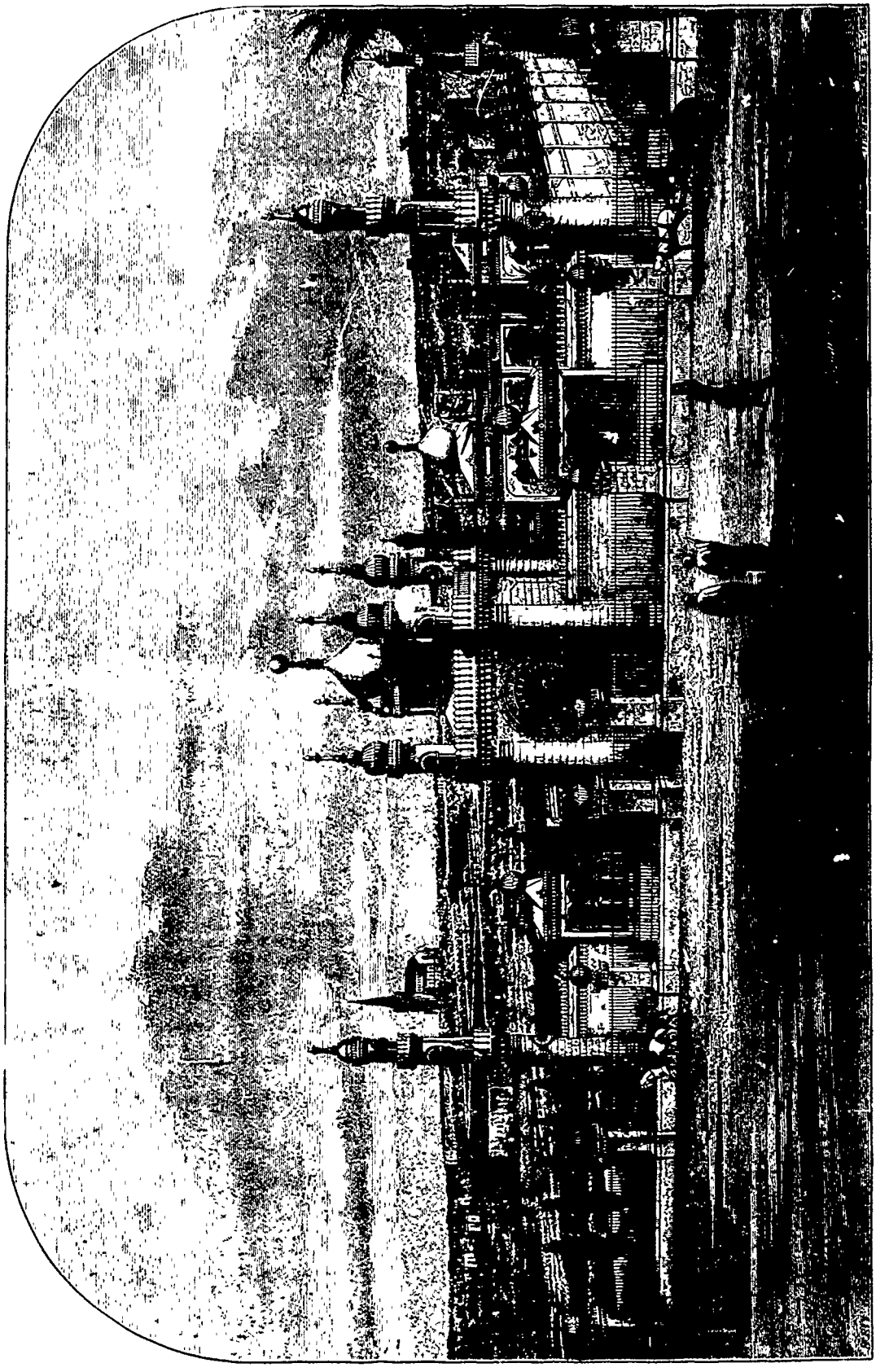
One of our correspondents from Atlanta, who encloses copies of these same advertisements, says,—"No doubt you have wondered at the manner in which architects have been appreciated in this country, but when you read the enclosed you will understand why it is that humbuggery has led the van."

Now, certainly, reading these has not conveyed to us that knowledge: those who can find any reason in these rhymes for employing the advertiser must, we think, be a very peculiar, if not very limited, class. Such vagaries in a country like America, where the profession is as yet but young, need not be looked at very seriously.—*The Builder.*

A New Cement.—A French chemist has succeeded in preparing a mineral compound, which is said to be superior to hydraulic lime for uniting stone and resisting the action of water. It becomes as hard as stone, is unchangeable by the air, and is proof against the action of acids. It is made by mixing together 19 pounds of sulphur and 42 of pulverized stoneware and glass; this mixture is exposed to a gentle heat, which melts the sulphur, and then the mass is stirred until it becomes thoroughly homogeneous, when it is run into moulds and allowed to cool. It melts at about 248° Fahr, and may be re-employed without loss of any of its qualities whenever it is desirable to change the form of an apparatus, by melting it in a gentle heat, and operating as with asphalt. At 230° Fahr., it becomes a stone and preserves its solidity in boiling water.

We regret having been obliged to leave out of this Number of the Magazine, Lessons in Mechanical Drawing, Lectures to Little Folk, and Domestic Matter, on account of so much space being occupied with notes on the Provincial Exhibition at Ottawa, but which hereafter will be valuable as a record of the articles there exhibited, and prizes awarded.

We shall resume the omitted subjects in our next Number.—Ed.



THE MAHOMEDAN CEMETERY, MALTA.—MR. F. L. GALIZIA, ARCHITECT.