SCIENCE AND MECHANICS.

A new explosive has been brought out under the name of fulminatine, which is said to consist of a mixture of nitro-glycerine and silicious matters, with 15 per cent. of a substance the composition of which is a secret, but which is dissipated

At the Dover Chamber of Commerce Mr. W. Forster introduced the subject of a newly-invented anti-mildew apparatus, to be adapted to granaries and vessels laden with grain. The invention is by Mr. loannides, and consists of an arrangement of perforated and solid tubes, on the principle of the syphon, whereby the air is passed through the mass of the corn as stored in the hold of a ship, in granaries, or in warehouses

Saving Fuel.—An alteration in a steam-engine which saves fuel and improves the vacuum could hardly fail to be acceptable. It occurred to Mr. R. Edge, of Dean Mills, near Bolton, that if he connected each end of his horizontal air-pump with the upper part of his condenser by a pipe fitted with a valve, the pump would, while working, draw air from the condenser above the surface of the water. He tri d, and succeeded. By improving the vacuum the consumption of coal is diminished, and the saving in this particular is said to be beyond expectation; and we are not surprised to hear that many engines in Lancashire have been fitted with the additional pipe, as above described. It may be applied also to vertical air-pumps, but not with so large an amount of economy in the result. We have the more pleasure in making this invention known, as the inventor, instead of taking out a patent, has presented it freely to the public.

APPARATUS FOR THE BLIND .- At a recent meeting of the Royal Scottish Society of Arts, a communication was read from Mr. Albert Meldrum, teacher of the blind, Alloa, describing an improved method of corresponding between blind persons. The invention consists of two parts-the upper having the types, with keys and levers for moving them, and the lower containing the paper-moving apparatus. The base of the upper part is a metal disk, with a circular hole in the centre. Around the central opening are arranged twenty-six little hammers, having on their striking surface copper types for embossing the paper. The types are so arranged that they all strike at the same place, viz., on the opening in the disk, and each hammer, after striking, is pulled back to its original position by an indiarubber band. Each of the keys represents a letter, and when any particular key is pressed down, the corresponding hammer strikes, and the type makes a mark on the paper, which is stretched on a revolving drum in a drawer below the disk. When a line is impressed, the drum is moved round by a handle in front of the machine, and a plain surface is presented for the next stroke. When a line is finished, the drawer in which the paper moves is pulled out one line. The machine is constructed to print Moon's type, but its principle is equally applicable to any other, especially to Braile's. After the paper had been read the machine was exhibited in operation, and worked very satisfactorily.

NEW METHOD OF COPYING MANUSCRIPTS .- A clever application of science to commercial purposes has been made by an Italian gentleman, M. Eugenio de Zuccato of Padua. By means of the invention any number of copies of manuscript or design, traced upon a varnished metal plate, may be produced in an ordinary copying press. The modus operandi is very simple: To the bed and upper plate of a press are attached wires leading from a small battery, so that, when the top of the instrument is serewed down, the two metal surfaces come into contact, and an electric current passes. An iron plate resting upon the bed of the press is coated with varnish, and upon this surface is written with a steel point any communication it is desired to copy. The letters having thus been formed in bare metal, a few sheets of copying paper are impregnated with a solution of prassiate of potash, and placed upon the scratched plate, which is then subjected to pressure in the copying-press. An electric current passes wherever the metal has been left bare (where the writing is, therefore); and the prussiate solution acting upon the iron, there are found prussiate of iron, or Prussian blue characters, cor-responding to those scratched upon the plate. The number of copies that may be produced by the electric chemical action is unlimited, and the formation of the Prussian blue line is of course instantaneous. The patent, we believe, is the property of a mercantile house, and is a remarkable instance of science serving as a handmaiden of business.—The Industrial Monthly.

THE CAUSE OF CONSUMPTION .- Dr. Henry McCormac, of London, in a new book, puts forth the theory that tubercular disease of the lungs is caused solely by breathing air which has already passed through the lungs of either brutes or human beings, or air that is deficient in oxygen. If we assume the quantity of air in the chest at two hundred and thirty cubic inches, and that from twenty or thirty cubic inches are changed and removed during each respiration, about ten breathings will suffice to renew or exchange the gaseous contents of the chest cavity. At each inspiration, from four to five per cent, of the oxygen inhaled is, or should be, replaced by about the same quantity of carbonic acid, an amount which l be represented by an of solid carbon. If any portion of the inhaled air be pre-breathed air, says Dr. McCormac, the dead metamorphic carbon will be retained pro rata unoxidised within the organism. This effete unoxidised carbon—this "detritus of degradation" being retained-speedily becomes "tubercle," He says that without adequate ventilation we cannot possibly get rid of the ten or twelve hundred cubic inches of carbonic acid which the lungs eliminate hourly. He has also been at some pains to obtain the average deathrate from consumption in various parts of the world. We learn from him that in the Austrian capital phthisis prevails to such an extent as to have been named morbus Viennensis; but he traces the cause readily enough to close stoves in stuffy chambers, to doubly glazed and padded windows, which are never opened, ventilation being never thought of. A similar state of things he finds to exist nearly everywhere, the deaths being from twenty-eight per cent, in some parts of America to ten per cent, in Paris, while in St. Petersburgh, out of 5,000 deaths, 1,000 are occasioned by phthisis! "Double doors and windows, every interstice being carefully closed with wadded cloth or voilok exclude the current, and, along with the close stove or petch, render stagnant utterly the stinted, breath-fouled atmosphere, effectively hindering its replacement from without, and in fine, entailing the direful scourge of tubercle, from which poclass or condition of the community finds escape."

PEAT FUEL MANUFACTURE IN CANADA.

(Continued from Page 154.)

Thus we have described throughout the whole of Mr. Hodges' successful and long-worked process of peat fuel manufacture. Founded on the only true and economical principle of profitably utilising peat existing under such conditions as those we have noticed, it has been carried out with the greatest care in all its details. It remains to add a few words upon the cost of the process, and to record one or two tests made with the fuel upon the Grand Trunk Railway. Mr. Hodges speaks from his experience in 1865 as to the expense of manufacture. Prices were, of course, lower then than now, but the comparison still holds good. He says that a machine working ten hours excavates and pulps sufficient peat (from 300 to 400 tons) to give of air-dried fuel 50 tons, and in doing so it makes a navigable canal 150 ft. long, 19 ft. wide, and 5 ft.

a, deep. The staff required is as follows:		
To prepare the pulp beds, &c., and prepare		
the canal track	6	men.
For working the vessel	6	**
For cutting and marking out the peat into bricks	2	44
For separating and piling the bricks, 4		
men and 14 boys, equal to	11	11
Turning and repiling the bricks, 8 boys, or	4	6.6
Loading fuel into barge and taking to depot	9	11
	_	
Total per day	38	11

This total, with wages at \$1 per day, gives an outlay of

To the above estimate 20 per cent., or, say, \$8 has to be added for contingencies, inspection, depreciation, and interest, bringing the total cost per day to \$46. The cost for labour, which is paid for by piecework per ton of air-fried peat fuel on the ground, is 92 cents—a sum not much in excess of which was paid at that date for cutting, splitting, and piling a cord of wood (a cord of wood contains 128 cubic feet, measuring 4 ft. by 4 ft. by 8 ft.) after it was delivered.

The cost of the floating manufactory complete	Dollars,
was	$\frac{8,000}{2,000}$
	519,000

Which represented the total amount of the first outlay for the whole of the machinery, power, and boats to produce 50 tons of finished peat fuel per day of ten hours; or, by continuous abour, more than double that amount duly. A ton of peat fuel measures 79 cubic feet.

With regard to the efficiency of this fuel, we can scarcely do better than refer to some careful experiments conducted upon the Grand Trunk Railway under the care of Mr. Eaton. The experiments were conducted with a special freight train running from Montreal to Brockville, a distance of 125 miles.

ng from Bronned to Brock the, a distance of	1 - 1/ 1/11/17/
Total train miles run	683
** ear **	15,267
Number of cars in train	22.4
Gross weight of train in tons (2240 lb.) ex-	
clusive of engine and tender	428
Net weight of freight in tons (2240 lb)	202
Wood used in lighting fire, and getting up	16.
steam	500
Peat Consumed :	ъ.
	- •
1. In getting up steam	1,050
2. During trials	47,425
3. Total quantity used	48,475
getting up	69.4
5. Per train mile inclusive of getting up	
steam	70.1
6. Per car per mile	3.18
7. Per ton of gross weight moved per mile,	
exclusive of engine and tender	.166
8. Per ton of freight moved per mile ex-	•• ••
clusive of engine and tender	.351
Number of miles run per ton of peat	31.6
induction and that for tou or protection.	
Data at a si a a tana tana at a a a a a	Dollars.
Price of peat per ton of 2,240 lb	3.90
n wood n n	2.35
1. Total cost of peat in cents per train	
mile, including the wood used in light-	Cents.
ing fires, &c	12.43
2. Cost in cents per car per mile	.556
3. Cost in cents per ton of gross weight of	,550
train per mile (exclusive of engine and	
tender	696
4. Cost in cents per ton of freight moved	,029
	6.01
per mile	.061
Average time occupied in getting up steam. Average speed per hour:	57 min.
Including stops	13 miles
Excluding "	15.8 "
¬ ,,	

In some further experiments with an express passenger train, the distrace run was 177 miles, and the average consumption of fuel per mile was 45 th., the total amount of peat consumed being 3½ tons, worth \$12.25, and the distance made per ton of fuel 50½ miles. Compared with the results obtained with goal and wood used in a similar train the result stands

	rnn to one ton of coal	59.91
maighing 4666	with one cord of wood	40.00
Average mileage	with one ton of peat fuel	50.50
weighing 4000 Average mileage	with one ton of peat fuel	40,60 50,50

The prices ruling at the time these trials were made were, for coal, \$10 per ton, and for wood, \$7 per cord, so that the cost coal, \$10 per ton, and for wood, we prove of fuel for the distance of 177 miles would be as follows:

1. Coal, 2.95 tons at \$10	29,50
2. Wood, 4.41 cords at \$7	30.87
3. Peat fuel, 3.5 ton1 at \$3\frac{1}{2}	12 26

The first two prices are, however, given in currency, which at the then current rates would have increased the price of the

peat if reduced to the same standard, to \$16. In concluding our notice of Mr. Hodges' admirable process for the conversion of peat into a cheap and serviceable fuel, we have to remind our readers, that though there exist vast

upon this method, it is only applicable where a sufficient supply of water exists in the peat to fill up the channel as it is formed, and float the manufacturing vessel forward. Under other conditions different means are required, and of late years a great amount of labour and ingenuity have been expended to bring them to perfection.

MISCELLANEOUS.

There has been a congress of dancing-masters at Amster-

It is calculated that there are 100,000 women named "Marie" in Paris.

The Court Journal says that it is believed in well-informed circles that the prosecution of the Galway priests will be abandoned after all.

The French Geographical Society, after being somewhat incredulous about Stanley's discovery, is now having a gold medal engraved for him.

The Paris Morgue is to be abolished. So, at least, says a recent edict of the Prefect of Police, which ordains that in future each corpse is to be photographed, and the portrait alone exposed to the public gaze. The establishment is to have a resident photographer.

The Gardener's Magazine gives us a capital idea for an "ornament for our fire-stoves," namely, ivy trained on trellis work the width of the fireplace, the roots being contained in boxes similar to those placed on window sills. To make the effect more pleasing, bright-coloured flowers or cool-looking ferns might also be planted.

A singular pet-a tame wasp, was exhibited by Sir John Lubbock in one of the recent sittings of the British Association. The wasp, described as "of a social kind," was captured in a nest in the Pyrenees, and though at first "rather ready with its sting," is now perfectly tame, cats sugar from its master's hand, allows him to stroke it, and, though occasionally enjoying an outing, always returns to its bottle-home.

SHARESPEARE AND THE Dog .- Sir Henry Holland relates that Lord Nugent one day said no passage was to be found in Shakespeare, commending directly or indirectly the moral qualities of the dog. A bet of a guinea was made, which Sir Henry after a year's inquiry paid. Lord Nugent was right. Mora qualities is a big way of putting it. But there was vertainly a fondness between Lance and his animal, and the recognition that that animal was worthy of his master.

Mr. Coxwell, the well-known aeronaut, remarks, in a letter to a contemporary, that a captive balloon would greatly assist Dr. Livingstone in his researches in Central Africa, as it would enable him at once to obtain a bird'swye view of the country tor many miles round. As Dr. Livingstone has plenty of time at his command, and can wait for a fine day, and fuel in the shape of jungle or chopped wood is plentiful, he recommends the "Montgolfier," or tire balloon, which, when not in use, might be folded up and packed as an ordinary bale of merchandise.

ANOTHER GARRALDIAN EPISTIE -The hermit of Capreta (Garibaldi) lately wrote a letter, published in the Movimento of Genoa, and which makes some noise in Italy. In it he traces out a radical programme, which he imposes on the Government of Victor Emmanuel on the pain of being overthrown; he demands the suppression of all religious corporations without exception, and insists on obligatory, gratuitous, and by instruction ; lastly, he interdicts the existence at Rome of any Catholic traching, because "the elerical sect perverts instead of educating.

There is still a good deal of mystery hauging about the affair of the Marquis de Vogue, and it is a most point whether he asked the Sultan to stand up, or permission for himself to sit down. In connection with this affair, a French planist is related to have once had the honour of performing before His Majesty, and that not only had he to play standing up, but the piano (the legs of which had been removed for fear of injuring the handsome floor) was placed on the backs of four Turks; one Turk, being smaller than the other three, had to be propped up with a pillow

An Income FROM A SNUFF-Box .- Carafa, the composer, who died recently, was far from rich. His principal income was derived from a snuff-box. The snuff-box was given to the author of "La Prison d'Edimbourgh," about thirty years ago, by Baron James de Rothschild, as a token of esteem. Carafa sold it twenty-four hours later for seventy-five napoleons to the same jeweller from whom it had been bought. This became known to Rothschild, who gave it again to the musician on the following year. The next day it returned to the jeweller's. This traffic continued till the death of the banker, and longer still, for his sons kept up the tradition to the great satisfaction of Carafa.

A subterraneau chamber has been discovered at Rideau Hall, Ottawa, in a singular manner. A heavy waggon, while passing up the road leading to the hall, broke through, but was dragged out by the horses. The driver, on examining the place found that there was a large chamber immediately be neath the road. It was about ten feet deep and 12 square. On one side, the wall was apparently formed by the natural slope of the ground; the opposite wall was built of masonry. The whole was roofed in with solid oak beams, and covered with earth to the depth of about a foot and a-half. The chamber was quite clean inside, but seemed to be without any entrance. No one in the neighbourhood knows anything about it, or when it was built. It is supposed that it was constructed years ago by the Hon. Thomas McKay, though for what purpose no one can imagine.

The Record is responsible for the following story :- Sir Stafford Northcote recently related an anecdote to the following effect: A candidate in his canvass was told that a particular publican was for the ballot. It was no use his going there. He went, and the following conversation ensued—"Are you a supporter of the ballot?" "No," said the candidate. "Then," replied the publican, "I will vote for you." The candidate expressed his surprise, as he had heard he was in favour of the ballot. "So I was," replied the voter, "but I will tell you what happened the other day, There was a club election, and out of twenty members of the Committee fifteen promised to vote for me. When the ballot took place seven did so, I did not so much mind that, but the thing was that the whole fifteen came to me, one by one, and said, "It was a great pity tracks of bog suitable for carrying out the manufacture of fuel that you were not elected - I voted for you."