

EDUCATIONAL NOTES.

In the Kingston schools it has been decided to allow afternoon schools.

The Rev. J. F. Gorman, M.A., has been appointed Inspector of Schools in the City of Winnipeg, Man.

The death is announced of J. McKenna, Esq., M.A., Ph.D. The deceased was Professor of Physics in Dalhousie College, Nova Scotia.

A theological professorship in connection with the Anglican cathedral at Fredericton, N.B., is about to be established by the Society for promoting Christian knowledge.

The Canada School Journal for March contains a portrait of Mr. Benj. Conroy, late chairman of the Board of Education of London, Ont., with accompanying biographical sketch.

The Ottawa Public School Board have authorized their managing committee to introduce the kindergarten system into their schools, but the action is at present deferred on account of the depression of the times.

In Stratford a school mistress was brought up before a J. P. for an assault on a pupil. The stick with which the teacher struck the boy, caught him in the face and drew blood. The charge is dismissed, and very properly too.

The Board of Trustees of the Napawan High School, have set an example which was true soon to be followed by other High School boards. They have appropriated a sum of money for a reference library, which is soon to be purchased.

The Stratford High School only received \$41.50 of the last appropriation on inspection. This gave rise to an animated discussion, the general management of the school and the qualification of the teachers coming in for a thorough overhauling.

The Professor of Victoria College, Dr. Nelles, Dr. Burwash, Dr. Wilson, Mr. Bain and Mr. Reynar having indicated their sympathy with the objects of the Northumberland Teachers' Association, have been elected honorary members of that body.

The Goderich High School Literary Society seems to be a flourishing institution, and we would be glad to see similar ones established in connection with other High Schools and Collegiate Institutes. The Society gave a most successful public entertainment at length to the general public to put in an appearance at their meetings. The Board, by a narrow vote, decided that it could not consistently with its reputation for modesty move any farther town.

The people of Goderich think they ought to see their Public School trustees collaborate. The place where the Board meets is felt to be too far away for the general public to put in an appearance at their meetings. The Board, by a narrow vote, decided that it could not consistently with its reputation for modesty move any farther town.

At the East Middlesex Teachers' Association, the President, Inspector Deane, gave an interesting and thoughtful address, "A Public Officer in loco parentis," referring at length to the subject of corporal punishment. The President, Inspector Deane, gave an interesting and thoughtful address, "A Public Officer in loco parentis," referring at length to the subject of corporal punishment.

The Canada School Journal says that in the Province of New Brunswick, during the school term ending October 31st, 1878, there were 1,343 public schools in operation in the Province, and 1,284 teachers and assistants. For the corresponding term of 1877 the numbers were 1,305 schools and 1,349 teachers. It is gratifying to note the steady increase in the population attending school, when we remember that there are at the present time about 22,000 pupils more than there were ten years ago, and some 9,000 more than there were five years ago.

The North Hastings Teachers' Association held its usual half-yearly meeting at Madoc on the 27th and 28th ult. Mr. Hughes, Public School Inspector, Toronto, was present and took part in the proceedings, as also did Messrs. Chas. Miller, Kirk, Thompson, Rev. Mr. Keane, Rev. Mr. Wishart and Miss Ledlow. The following officers were elected:—President, W. Macintosh, L. F. S.; Vice-President, Mr. Thompson; Secretary, Geo. Kirk; Treasurer, Miss A. Cowie; Librarian, Miss J. Riddell; Council, Messrs. J. W. Rodgers, Marton, Tulley, L. Tait, L. Conover, J. M. Henderson, and Misses Ledlow and Riddell. The next meeting will be held at Madoc on June 28th.

Mr. A. P. Knight, Rector of the Collegiate Institute, Kingston, discussed in a paper read before the Literary Association of Ontario before the subject of "Higher Education." He contended that Ontario had no right to support higher education of any kind, because (1) it is an unjust interference with the rights of individual citizens; (2) it is a class legislation; (3) the three distinct classes of the wealthy—the School of Practical Science for class-engineers. The argument that Provincial colleges send forth a stream of educated men who exert a refining and elevating influence on society is dismissed with contempt, though it is admitted, though we think the conclusions are not warranted by the premises.

FOREIGN.

In West Virginia there are 3,216 free schools. The value of school property is estimated at \$1,714,599.

Eight hundred and fifty thousand dollars of appropriated school money in Virginia has been diverted to other purposes. The air in the school rooms in New York on recent analysis yielded on an average 20 parts of carbonic acid in 10,000, while the air in the prisons averaged only 14.7.

The Duchess of Leeds is a member of the school board of Stapleford, England. She was elected on the formation of the board, over a year ago, and has been very constant in her attendance. She was re-elected.

The Kingdom of Prussia annually expends the immense sum of \$18,000 for its educational interests. Last year 56,680 teachers were employed. It is stated that at least 8,000 more teachers are needed. The average salary paid to teachers is \$250.

The Chinese are an educated people and value education. They have preserved what is perhaps unique, an unbroken list of their graduates for 500 years. Those who walk through the corridors of the Temple of Confucius may read carved into lofty stone slabs, the principal classics of their literature.

The New York State Library report for 1877 gives the number of volumes in it as 104,010, of which 3,228 were added during the year. Among the foreign works are many of those of Wm. Prynne, a voluminous writer and distinguished lawyer statesman of the 17th century. He was a great opponent of Lord Coke and was dignified by Charles II. with the title of the "Cato of the 17th century."

The following statistics taken from the articles of a correspondent of *Magisterio Español*, show the material progress made in Spain within the last thirty years.—In 1846 the schools were 15,640; the scholars, 563,531; the expenses, in money matters, 18,143,807 reales. In 1870 the schools were 28,117; the scholars, 1,410,476 kinds, 79,073,960 reales. Thus twenty-four years there has been an increase in the number of schools of 12,477; of scholars, 746,945; of expenses, 60,930,000 reales; being about 30 per cent. in the scholars, and much more than 100 per cent. in school expenses.

SOMETHING NEW IN FARM MACHINERY.

A REMARKABLE INVENTION.

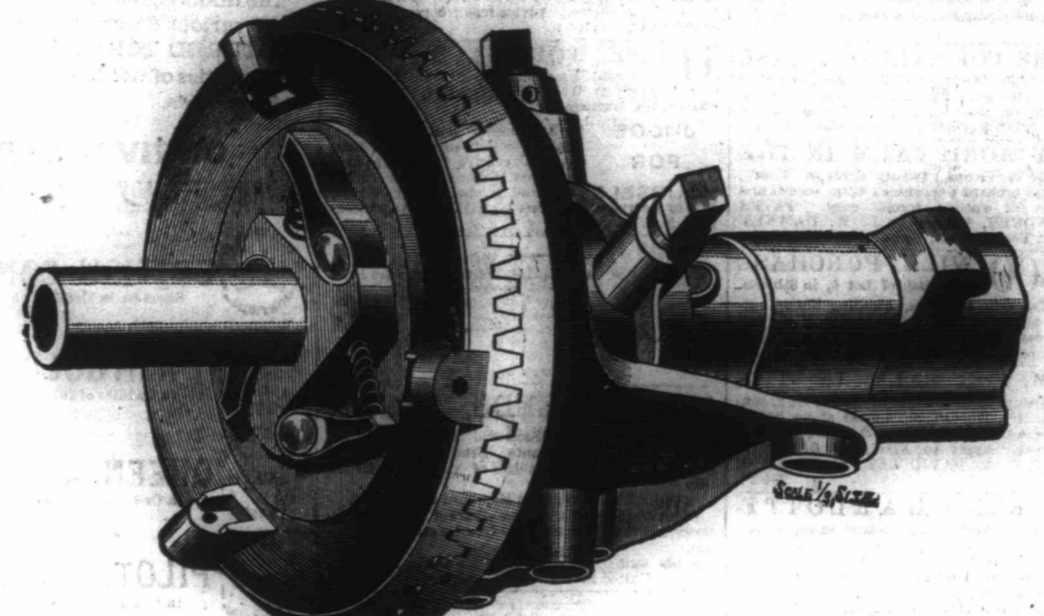
Canada is so thoroughly an agricultural country that whatever invention relates to the improvement of this branch of her industry should be accepted as a blessing for the common good of all. The rapid strides of improvement that have been made in the art of farming within the past few years, have kept well abreast with that taking place in other pursuits. The old way of sowing the seed in the ground, broadcast by hand, is now more evenly and better sown with much less expense by machinery.

The sowing and cradle are laid by, and in a few years will be exhibited only as curiosities of the past age.

The Fall and Treadmills have given way to better, quicker and cheaper, until the agricultural profession can boast of inventive genius fully up to the highest standard of mechanical science.

In this issue of *The Mail* we devote a page of our space to the illustration of a new style of Reaping and Mowing machinery that deserves particular notice.

This peculiar implement was first introduced into Canada about two years ago by the Toronto Reaper and Mower Company.



THE NEW MECHANICAL GEAR FOR DRIVING THE KNIFE.

During the season of 1877 a few hundred simple machines were made of this new style, known in the United States as "Whitely's New Champion," but christened in Canada the Toronto Mower, in honour of this city. The greater part of the year, however, was spent in perfecting arrangements for future trade.

There are always eleven cogs in contact, instead of two or three, as with other machines, thus distributing the wear over a much larger surface, and proportionately reducing the pressure, friction and wear upon each. Machines which have run five seasons show no indications of wear whatever on the cogs, and, as far as we can judge, a pair of wheels could not be worn out in a lifetime.

It runs without noise, and with extraordinary smoothness. The cutter bar is operated by two levers, one for foot, the other for hand, and may be raised bodily to a height of twelve inches horizontally, or be thrown up at any angle, or to a vertical position, all without throwing the machine out of gear, or stopping the knife.

The Toronto Reaper and Mower Company. This concern was organized under the Dominion laws incorporating joint stock companies, during the month of September, 1876, for the purpose of manufacturing these new implements in this country.

The value and importance of malleable shoes upon the finger bar is now generally acknowledged as most desirable.

The knife is constructed with the extension of the section projecting in rear of the knife back, for the purpose of supporting the knife, independent of the bar, and holding the cutting edge close to the guard plate; this gives the knife and guards a perfect shearing action.

The heel of the knife is riveted to the back in such a manner, that in case of wear or breakage it can be easily replaced by a new one, with but little trouble or expense.

The connection between the knife and driving mechanism is self-adjusting, and will take up all the slack caused by wear, and at the same time is so constructed as to form a universal joint between the knife and driving arm, thus avoiding any twist or torsion upon the moving parts.

This link connection moves at all times within the width of the shoe, and cannot possibly be injured by stones, clumps, or obstructions.

The material used in the construction of this machine is of the very best character, the important wearing parts being cast steel, malleable iron, cold-rolled iron and wrought iron; the material employed being selected with special reference to the greatest strength and least weight.

To insure a more perfect manufacture of this machine, special machinery has been invented and fitted up expressly adapted to its manufacture.

Each mower is carefully tested before being sent out, by placing the machine upon iron trucks, and running it at a speed of ten miles an hour, or about three times faster than it would run when ordinarily cutting grass. By this severe test any defective parts are discovered and repaired before the machine leaves the factory.

The plan of the new machine is to be the most perfect, and the most durable, and the most economical, and the most reliable, and the most perfect, and the most durable, and the most economical, and the most reliable.

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TORONTO MOWER CUTTING OVER ROUGH AND STONY GROUND.

existence, owing chiefly to the fact that what few bearings there are, work under very light motion and strain.

The driving wheel in the Toronto Mower is keyed to the main shaft and revolves with it. This has forty-two cogs gears into it, but instead of revolving it makes a succession of rapid serpentine vibrations around the face of the wheel, and this it does in consequence of being on what is termed a gimbal joint, like a ship's compass. An arm extending from this vibrating disc to the knife gives the requisite motion, and this is all the machinery there is, except a small fly wheel, which assists in giving regularity and steadiness of motion.

The gimbal joint movement is extremely pretty, and has the advantage over ordinary gearing, that quite four times as many teeth are simultaneously engaged, thus distributing the wear over a larger surface, reducing the friction.

The loss of power by the friction of the mechanism is indeed very small, as is attested by a pair of such mowers having been in use for five seasons and showing hardly any wear.

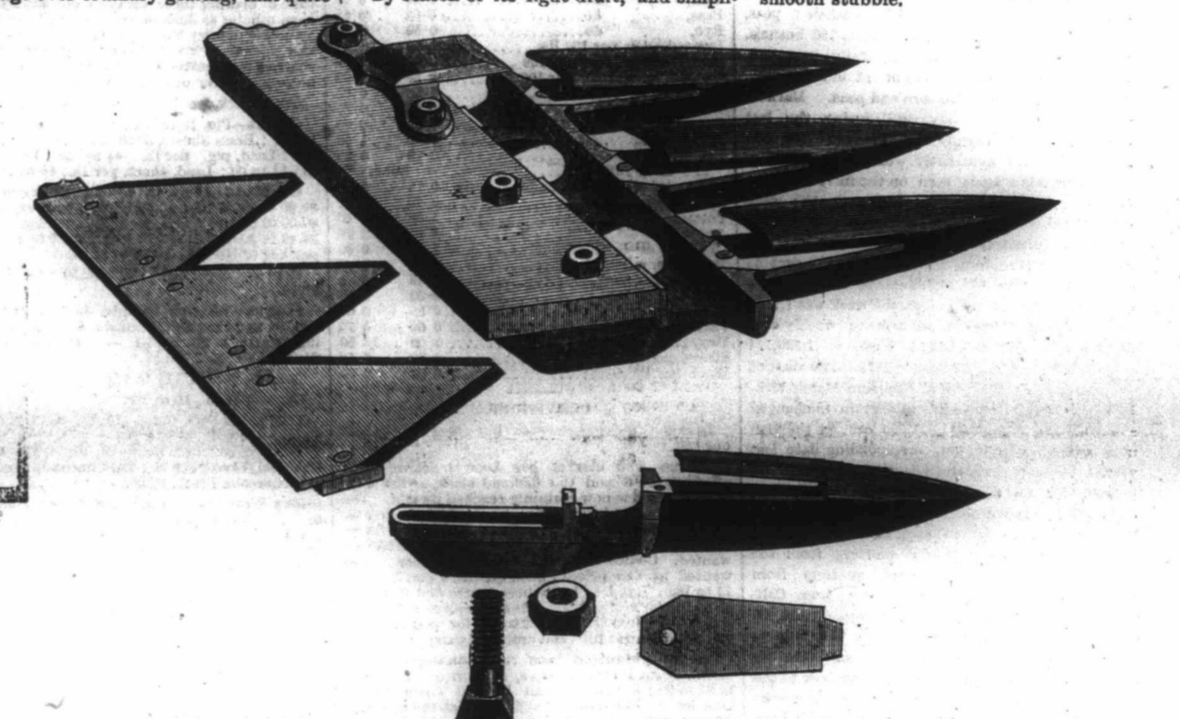
Without leaving his seat, the driver can raise the cutter-bar bodily, or set it at an angle, to adapt it to the most varying conditions, and can throw it in or out of gear at pleasure; or he can fold it and secure it for leaving the field; in short, he has a perfect control over the machine, through levers worked either by hand or by foot.

By reason of its light draft, and simplicity of construction, this mower is rapidly becoming a favourite among the farmers.

THE CUTTING APPARATUS.

The Cutting Apparatus is connected to a projecting arm from the bearing of the main axle in such a manner that it may raise and fall at either end in mowing over the ground, but entirely independent of the pole or main wheels, and without in the least affecting the driver or his seat.

The draft of the team is not upon the pole, but through a draft rod directly connected to the cutting apparatus, which dispenses with the need of any small carrying wheels for the finger bar, as the weight of the cutting apparatus can thus be regulated upon the ground sufficient only to cut a smooth stubble.



MALLEABLE IRON GUARD FINGERS AS USED ON THE TORONTO MACHINES.

Both shoes on the finger bars are malleable iron. The guard fingers are bolted on to the bar, and can be easily and quickly removed to repair or sharpen, as desired.

The guards are all alike upon the bar and upon any machine, and are perfectly interchangeable.

The knife is very plain in construction. The sections are riveted upon a plain steel bar, and project in the rear of the knife back or bar, by which means the knife is suspended upon its rear edge, and upon its front or cutting edge. By this arrangement the sections can be held down upon their cutting edges to the guards very perfectly, and producing the desired shearing action.

The sections are arranged near the operator, arranged near the operator, whereby the points of the fingers may be turned down or up instantly, while cutting.

This plan of attaching the knife to the power is admitted by all manufacturers to be the most perfect arrangement in existence.

The pivoting connection with the knife and driving mechanism is self-adjusting, and takes up all slack caused by use. The tilting or turning of the guards up or down is done by means of a lever conveniently arranged near the operator, whereby the points of the fingers may be turned down or up instantly, while cutting.

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WHITELY'S NEW TORONTO REAPING MACHINE WITH MECHANICAL GEAR.

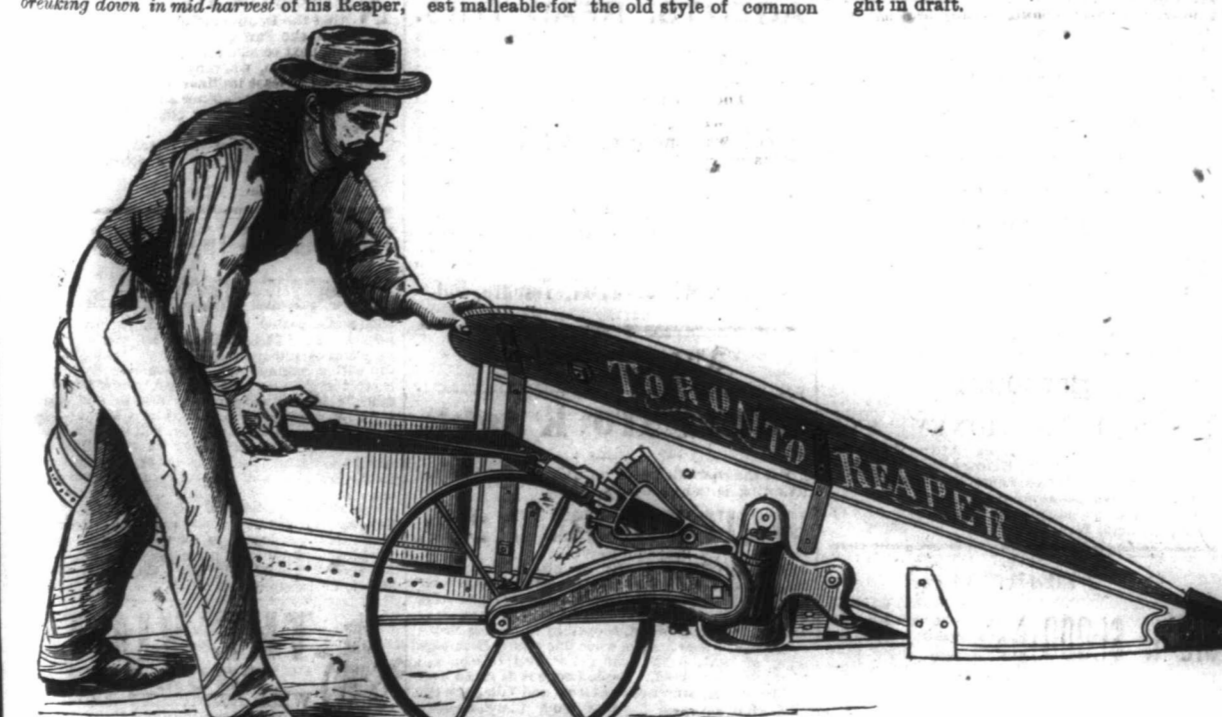
This new Reaping Machine has been produced especially to meet the great demand for a light draft Reaper, combined with strength and durability.

Within the past few years there have been a large number of "Light Reapers" brought out, each of them possessing some good points of excellence, but as a rule they have proven to be too light; composed as they were of frail material they were too delicate to withstand the severe strain imposed upon them during the past season, and the result was, that the benefit arising to the farmer in running a low draft machine was largely overbalanced by the breaking down in mid-harvest of his Reaper.

incurred thereby expensive delays and severe loss to ripened crops. In the construction of this new Reaping Machine, special attention has been directed towards combining the greatest possible strength with the least possible weight—that is, to strike an average between the large, heavy, cumbersome Reapers on the one side, and the frail, light-constructed machines of recent growth in the opposite extreme. To accomplish this it is necessary that the implement should be almost wholly built of steel, malleable wrought iron, and by the substitution of the strongest malleable for the old style of common cast-iron, increased strength is obtained, and much of the unnecessary weight dispensed with. The use of steel and cold-rolled iron is an expensive change from the old way of building machines, but the result will be gratifying. With the aid of educated workmen and good system in the manufacture, together with the severe test given each machine before it leaves the factory for the field, enables the manufacturers to offer the Toronto Reaper to the Canadian farmer with a full guarantee that they will find in this machine what has been so badly needed—a good substantial Grain Harvester, easy to handle and light in draft.

There are no bearings or bolts to wear out, or bolts—for securing them—get loose or lost; there being none of the usual bearings and cog-wheels to cause friction, almost the entire power exerted by the horses is applied directly to actuating the knife; hence, while it is the lightest draft, it is the strongest cutting machine in use, as has been repeatedly proven in the mowing of swamp lands, which had never before been mowed, because no other machine could be found that would do it.

The cutting apparatus is constructed with cast steel finger bar, malleable iron shoes and guard fingers all faced with hardened steel cutting edges. The guard



NEW ARRANGEMENT FOR RAISING AND LOWERING THE CHAIN WHEEL.

There is no pinion to become obstructed among stubs and stones. The wheels are wide apart, to stride the swath, and leave the grass unmolested. The steady, uniform and powerful movement of the knife in the crowning feature of success, and the admiration of all who have ever seen this machine in operation. There are but two small cog wheels in the machine, and but one of these revolves. There is no gearing in the drive-wheels. The gearing is enclosed by one small disc or rim, perfectly protecting it from dirt. All quick running machinery heretofore used on mowing machinery is entirely dispensed with, and but one small guiding shaft is used upon this machine;

in fact, one of the great features of this machine is discarding the old-fashioned style of quick running, complicated and cumbersome gearing, and consequently dispensing with any frame work such as heretofore employed carrying the gearing. This novel gear is guaranteed to outwear two sets of any other style of gearing heretofore employed upon harvesting machinery.

One of the distinguishing features of this mower is a new mechanical movement for producing the rapid reciprocating motion of the knife with the least possible number of parts, while at the same time it is much more durable and easy running than any other machine, and it is noiseless.

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