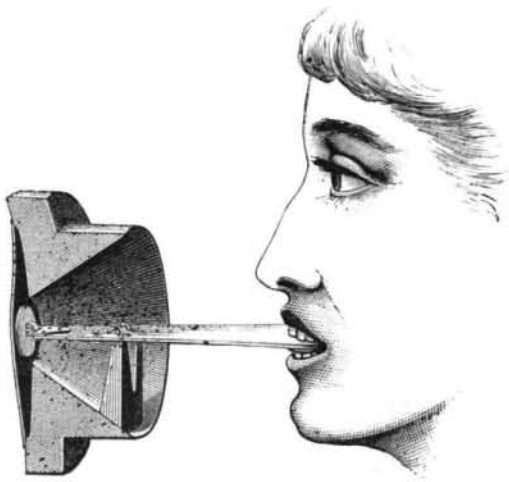


DENTAL ATTACHMENT FOR TELEPHONES.

The engraving shows a device to be attached to an ordinary receiving telephone for transmitting the vibrations of the diaphragm to the teeth, to enable deaf persons to hear conversation, music, etc.

The device may be readily detached so that the telephone may be used in the usual way. A link of rigid sound conducting substance, such as wood or hard rubber, is connected with the center of the diaphragm, or with a disk attached to the center of the diaphragm, and is supported by an elastic fulcrum attached to the mouthpiece of the telephone. The under surface of the link is provided with an elastic coating which prevents the vibrations from affecting the teeth of the lower jaw.

This device is applicable to either the electric, or the string, or acoustic telephone, and transmits the vibrations to the teeth and bones of the head, affecting the auditory

**DENTAL ATTACHMENT FOR TELEPHONES.**

nerves, and enabling persons having defective ears to hear. This device was lately patented by Mr. H. G. Fiske, of Springfield, Mass.

Canned Salmon by the Cargo.

The first cargo of canned salmon of this year's catch, from the Columbia River, was lately cleared from Portland, Oregon, for Liverpool, England. It comprised 56,756 cases, each containing four dozen one pound cans, or their equivalent. The gross weight was over 1,400 tons. Two other ships were soon to follow, both taking nearly full cargoes. Large consignments have also been received at San Francisco, for reshipment to England, Australia, and New York. The steamer Oregon, from Portland, June 25, brought 22,546 cases, the largest invoice of the season, if not the largest single shipment ever made to San Francisco from the Columbia River.

IMPROVEMENT IN SEWERS.

The engraving shows a device for preventing back flow of sewage in sewers, and for preventing noxious gases from being driven from sewers out into the air. The improvement consists in applying to the sewer a valve or gate provided with one or more floats, and a branch pipe running around the valve.

Fig. 1 in the engraving shows the arrangement of the sewer, and Fig. 2 is an enlarged view of the sewer and its branch. A short distance from the discharge end of the sewer there is a valve which swings on a horizontal axis running transversely through the sewer. The upper portion of the valve is provided with a float. Above the valve a branch pipe rises gradually to a height a little above high water mark, and then descends and discharges into the sewer beyond the valve. The branch may discharge into the river or into the main sewer, instead of returning, as shown in the engraving.

With this arrangement, when the outflow of sewage is obstructed by high water or otherwise, the back water having risen above the pivot of the valve, the float will rise, carrying the valve with it, closing it. The sewage will then rise and flow out through the branch. The engraving shows, in Fig. 3, a paddle wheel which may be applied to the sewer to increase the rapidity of the flow through the sewer, but the inventor has found that this is rarely needed.

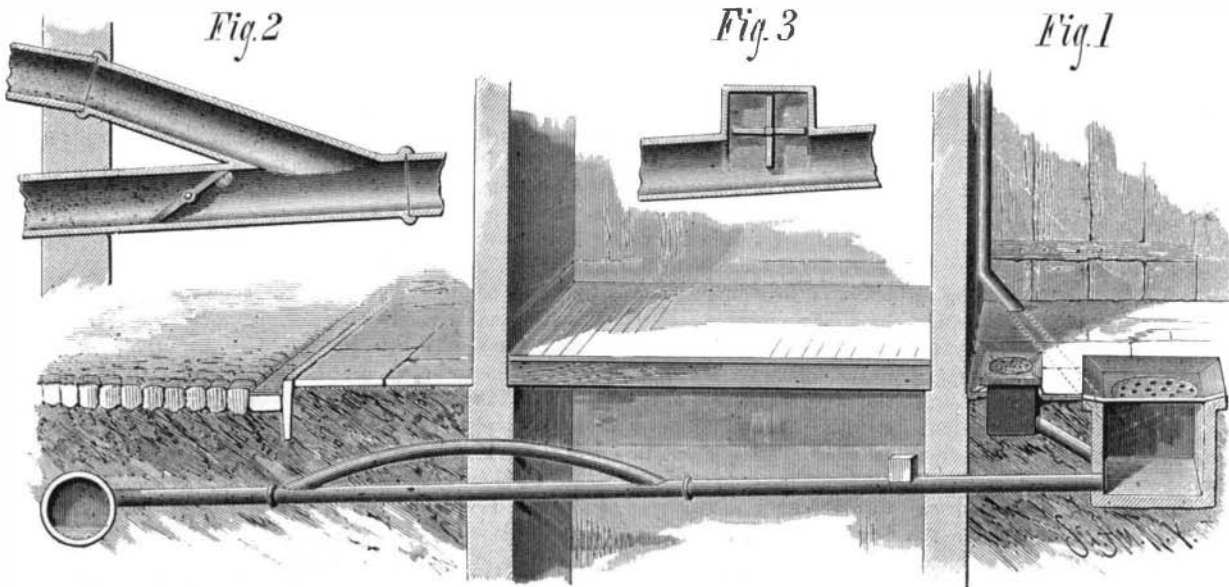
The inventor states that bath tubs and water closets, where this improvement is applied, may be placed in the cellar without the slightest danger from floods, and we are informed that the device has been applied under trying conditions, and is working well, controlling the back flow and

preventing flooding when, with the usual sewer provisions, a flood would be unavoidable.

This invention was recently patented by Mr. Charles Schirrmeister, of Brooklyn, E. D., and is being introduced by Mr. Alonzo Gaubert, 107 Broadway, Brooklyn, E. D., who should be addressed for further particulars.

Death Rate of the Rich and the Poor.

An important paper on the comparative mortality of the rich and the poor was read at the recent meeting of the American Medical Association. The author, Dr. Charles Robert Drysdale, of London, began by pointing out the achievements of sanitary science during recent years. Yet, with all these advantages, it was found that the death rate in London had rather increased than diminished, having been 22.2 per 1,000 in 1856, 22.3 in 1876, and 23 in 1877. In all England the rate had remained identically the same for three decades, namely, 22.35 per 1,000. The point Dr. Drysdale endeavored to elucidate was, that the great cause of this non-improvement resided in the mass of indigence which, now as always, was instrumental in producing a large crop of premature deaths in all densely populated States. M. Villermé, the distinguished Parisian physician, and several of his able collaborators on the *Journal d'Hygiène Publique* had contributed some valuable facts to the argument. Thus, it had been observed in France that persons between the ages of 40 and 45 die, if in easy circumstances, in the proportion of 8.3 per 1,000, while, if poor, they died at the rate of 18.7 per 1,000. That is, the mortality between these ages was twice as large among the poor as it was among the wealthy. It was found, too, that in Paris, between the years 1817 and 1836, 1 inhabitant in every 15 died in the Twelfth Arrondissement, which is peopled in great part by the poor; while in the Second Arrondissement, inhabited by the wealthier classes, the deaths for the same period were only 1 in every 65. M. Garnier, of Paris, in 1857, speaking of the mean life in a large English manufacturing city, had found that it was only 17 years in the quarters inhabited by the poor against 42 among the higher classes. Villermé calculated that the probable life of the infant of a weaver at Mulhouse was as low as 1 year and 6 months, while that of the baby of the proprietor of the factory was 26 years. Dr. Drysdale cited from a pamphlet written in 1877 upon the dwellings of the wages-receiving classes in Paris some further suggestive figures, from which it appeared that a death rate which was the mean of the whole population is always misleading. Thus, in part of a sub-district in London, comprising houses in good condition, the death rate did not exceed 11.3 in every 1,000, while there were adjacent dwellings in the same sub-district in which the death rate had risen to 38 per 1,000; and it was now reported that there were particular districts in London where the death rate was 50 per 1,000. On the other hand, the average death rate of the whole population was only 24 per 1,000 in 1843, and had scarcely deviated from that figure since. If such statistics were insufficient, he would refer to the researches of Ansell, who collected the statistics of 48,044 children of the opulent classes in England, including professional men, the nobility, and gentry. It appeared from Ansell's tables that, among these classes, the death ratio was only 80.45 per 1,000 for children under a year old, while for all classes taken together it was 150. Dr. Little found the ratio in Berlin, a city of extreme poverty among the working classes, to be occasionally as high as 500 per 1,000. In conclusion, Dr. Drysdale referred to the statistics of New Zealand as a remarkable confirmation of Ansell's tables. In New Zealand, of late years, the wages of labor-

**SCHIRRMESTER'S IMPROVEMENT IN SEWERS.**

ers had been very high, and the profits of capital large, with meat only 3d. a pound, so that a laborer was able to secure plenty of food without undue anxiety. The result was a death rate of only 12.5 per 1,000—a fact mainly due to the absence of an indigent and badly paid class. In England and Wales, with the same death rate, some 230,000 lives would be saved every year. In passing, Dr. Drysdale took occasion to dissent from the view that alcohol is the great cause of evils in modern states. It was probable that a

New Zealand laborer did not drink less beer than he did before he left England, and yet he lived nearly twice as long in New Zealand as he could expect to live at home.

NOVEL CAN OPENER.

The can opener shown in the engraving consists of a curved blade, having its cutting edge tapered or inclined backward obliquely on each side of the penetrating point. This blade is secured in an annular groove in the handle by a pin passing through the handle and through slots in the blade.

The handle has two or more annular grooves into which the blade may be sprung and fastened to adapt it to cans of different sizes.

The method of using this instrument is obvious. The penetrating point is forced through the top of the can near

**BROCK'S CAN OPENER.**

one side; the blade is then pushed down, making a shearing cut and cutting out a circular portion of the can cover.

This invention was recently patented by Mr. W. E. Brock, of New York city.

NEW INVENTIONS.

Mr. Jules Lambert, of New York city, has patented an improved flitter for milliners' trimmings that is ornamental, and serves also to attach other ornaments, such as beads, bugles, etc., to feathers and other articles of dress.

An improved heater or steam generator for open grate fireplaces has been patented by Mr. Issac B. Potts, of Columbus, Ohio. It is designed that this heater or steam generator shall be placed in an open fireplace, with its pipes forming or lining the back and sides of the fireplace, and with upward inclined pipes forming or lining the lower slope of the chimney flue.

An improved car coupling has been patented by Mr. John F. Stanley, of Chaplin, Ky. The object of this invention is to furnish car couplings so constructed that they will couple automatically when the cars are run together, can be easily uncoupled, and will not be liable to become uncoupled accidentally.

Mr. James R. Thomas, of Calpella, Cal., has patented an improvement in eyes for securing hoe blades and other tools to handles, so constructed that the blades or tools will be held firmly in place and may be detached and exchanged when desired.

A telescopic or extension pedestal, to be used as an accessory in forming photographic backgrounds, and so constructed that it may be extended and lowered as the height of the person to be photographed or the character of the pose may require, has been patented by Mr. William F. Ashe, of New York city.

Mr. John Collins, of Brooklyn, N. Y., has recently patented an improved apparatus for generating gas for soda water. The object of this invention is to render the operation of gas generating continuous or intermittent, as may be desired, without removing the charge of carbonate or acid until it is entirely exhausted. The device which controls the supply of acid to the carbonate is entirely automatic after being once set in operation, the gas pressure controlling the flow of acid. The mechanical devices by which this invention is carried out cannot be readily described without engravings.

A new tree protector, for protecting trees from grubs and insects, has been patented by Mr. Joseph W. Richards, of Lynn, Mass. It is simple and effective.

An improvement in commodes has been patented by Mr. Andrew Climie, of Ann Arbor, Mich. The object of the invention is to prevent the unpleasant odor arising from a water closet, especially such as are used in railway cars, and to inclose the deposits and convey them away.

An improved nail for the soles of shoes, so formed that after being driven and having its head removed the nail will have a four pronged appearance, has been patented by Mr. Zephaniah Talbot, of Holliston, Mass.

An improved refrigerating and ice making apparatus has recently been patented by Mr. Charles P. G. Linde, of Munich, Germany. The improvements relate to that class of refrigerating or ice making apparatuses in which the refrigerating effect is obtained by the evaporation of a volatile liquid, the vapors of which are compressed by a pump into a condenser, and then liquefied ready to be again subjected to the process of evaporation. The object of this invention is, first, to prevent overheating of the pump; second, to effect a more perfect packing of the stuffing box of the pump, and the employment of the stuffing medium for the lubrication of the points of contact of the working parts; third, to provide means for replenishing the apparatus with pure liquid ammonia while in operation; fourth, to provide means for the production of transparent ice and the means for discharging the same from the carriers.

Mr. Samuel A. Bollinger, of Patterson, O., has invented a harrow so constructed that either side or the whole harrow can be raised from the ground to clear it from rubbish and to pass roots, grass, and other obstructions.

AN IMPROVED HARVESTER.

Although the general principle of the reaper shown in the engraving is common to many machines of this class, the particular machine illustrated embodies several novel improvements of considerable merit which render it superior. The machine is constructed throughout with a view to convenience in handling, to strength and durability, and at the same time the new features render it very efficient.

The frame containing the running gear is composed of two iron end pieces and two wrought iron side pieces, secured together by bolts or rivets. The outer side piece supports an adjustable slide, to which is attached the seat spring, thus making the seat adjustable, so that the driver may move it either backward or forward to balance the machine and relieve the necks of the horses from undue weight.

The inner side piece of the main frame carries an adjustable foot piece which forms a guide for a vertical bar, the lower end of which is jointed to the side bar of the platform or table. On the upper end of the vertical bar there is a hand lever, which is connected by a rod with the side bar of the platform, a short distance back of the vertical bar, so that by moving the lever the platform may easily be tipped one way or the other as may be required. The lever is provided with a bolt or latch, which retains it in any desired position by falling into one of several notches in a sector secured to the top of the vertical bar.

Upon the foot piece which guides the vertical bar there is a ratchet and chain wheel for winding a chain connected with the inner end of the platform. A lever carrying a pawl is adapted to work the ratchet wheel so as to raise or lower the inner end of the platform by winding or unwinding the chain. A holding pawl is provided for retaining the ratchet wheel in any desired position.

The crank shaft and gearing intermediate between it and the axle are supported by journal boxes attached to the main frame. Side draught is avoided by attaching the tongue to the inner side of the frame. The automatic rake is of a well known type, which will be recognized by those of our readers familiar with agricultural machines.

The appearance of this machine is trim and workmanlike, and it seems well adapted to the work for which it is designed.

The adjustments, which are calculated to meet every requirement, are all easily made. The working parts are of wrought and cast iron and steel.

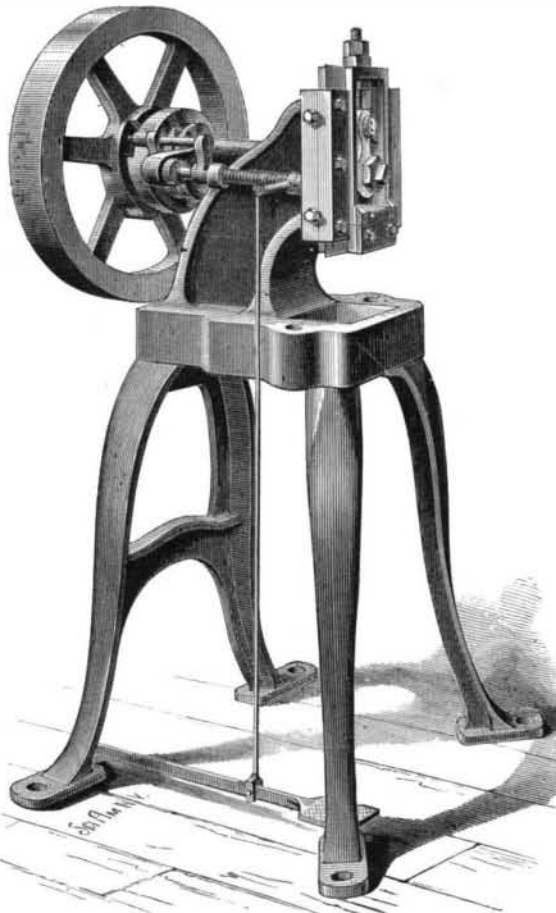
This machine is made by Messrs. Crawford & Co., at their Globe Agricul-

tural Works, London, Ontario, Canada. The name given the machine is "The Imperial Harvester."

A NEW PUNCHING PRESS.

The Peerless Punch and Shear Company, 52 Dey street, New York, have just completed a new power press for punching sheet and bar metals, similar in design to their No. 1 foot press, of which we published illustrations in September last, excepting that the treadle and pendulum are replaced by a balance wheel for belt power.

One of these presses, although weighing but 500 lb., will punch a $\frac{1}{2}$ inch hole in $\frac{1}{4}$ inch iron, or 1 inch hole in $\frac{1}{2}$ inch iron, and will cut a blank $6\frac{1}{2}$ inches square from No. 14 iron or brass. If used as a shear, it will cut bar iron 2 inches by $\frac{1}{4}$ inch in thickness, or $\frac{5}{8}$ inch round.



PEERLESS POWER PRESS No. 1.

The wheel is 22 inches diameter and weighs 130 lb. The design embodies great strength, while the press occupies floor space only 2 feet 3 inches by 2 feet 11 inches. Many of this style of presses are sold with a pendulum attachment to be worked by foot power when steam is not available. This is a great convenience, as the operator is not altogether dependent upon steam power, and can use his press at any time by merely taking off the balance wheel and putting on the pendulum in its place.

Covington, Iowa, Threatened.

In several instances thriving towns on the treacherous banks of the Mississippi and the Missouri rivers have been wiped out by the erosion of the river banks. Covington, Iowa, according to the *Sioux City Journal*, is another doomed city. It stands on a bend of the Missouri River, where the banks are being gradually eaten away. Many feet of fast flowing water now sweep over the spot where the court house stood a year ago. Recently the current set in shore and took off a strip of land thirty feet wide in a few hours. No invasions were made for another week, when another slice was cut off. Then about half a dozen buildings were moved back about some thirty feet, and the next day the land on which they had stood was all gone. The citizens have tried to moor trees and logs to the bank in the hope of forming a barrier for the flood, but the current is so swift and the water so deep that these attempts have failed. To give an idea of what the town of Covington has suffered in the past five years, the case of the ferry house and the principal hotel may be instanced. Two years ago there were six hundred and sixty feet of land between the building and the river bank; now you can toss a stone out of the hotel window into the river, and buildings are now being put on rollers for removal.

Hatching Spanish Mackerel.

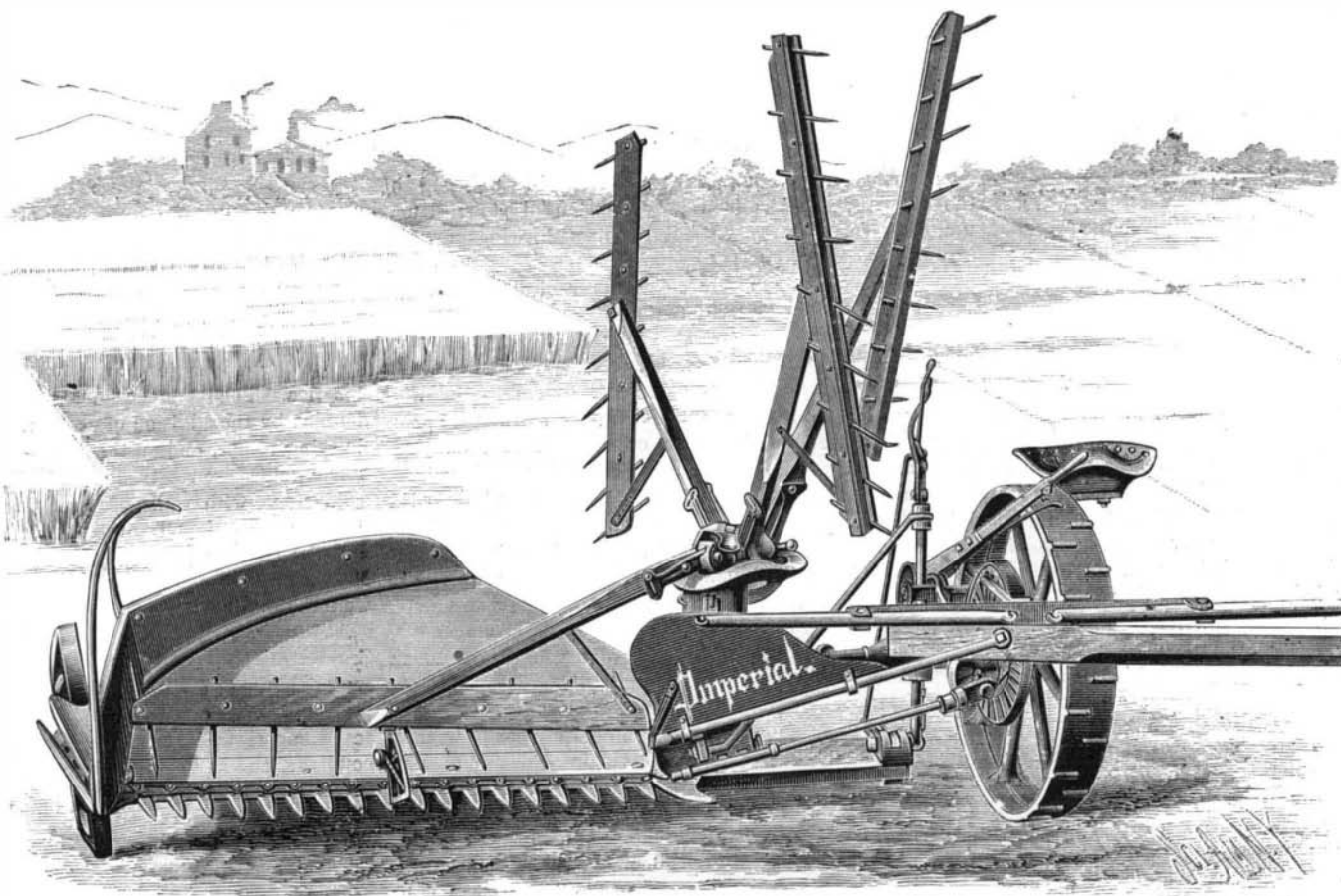
Professor Earle, of the United States Fish Commission, has discovered that Spanish mackerel can be hatched artificially, and that its capacity of reproduction is many times that of the cod or the shad. Professor Earle received his first hint in regard to Spanish mackerel from Chesapeake fishermen, who reported that large numbers of them annually frequented the inland waters near Chrisfield, Md., and Mob Jack Bay. On being directed by Professor Baird to make experiments there with hatching apparatus, Professor Earle was surprised to find that the fish were hatched within eighteen hours from the time the milk and spawn were brought together. It requires five days to hatch shad, and from eight to twelve days to hatch cod. The number of eggs operated upon at a single hatching was between 200,000 and 300,000, while of shad only about 20,000 to 30,000 can be turned out at once.

Another fact of importance is that the season for operations with the spawn of the Spanish mackerel is toward the last of June and first of July, after the shad season is over, and before that of cod begins. It is estimated that the number of young fish "turned out" this season will be more than a hundred million.

How Mr. Hannay Made his Diamonds.

Mr. G. B. Hannay, in a recent number of the "Proceedings before the Royal Society," gives an interesting account of the method employed by him in starting and prosecuting his experiments in making diamonds. And if only as a record of indomitable perseverance against ever-increasing difficulties, of scientific acumen, and of the true application of the Baconian method of research, as the *London News* justly says, it is worthy of study. Some idea of the nature of the investigation may be obtained from the fact that out of complex and expensive experiments only three succeeded. Violent explosions were frequent; furnaces were blown to pieces; steel tubes burst, scattering their fragments around. On other occasions, tubes which had

been carefully prepared, filled, welded, and nestled in areverberatory furnace for many hours, were found to have leaked and spoiled the experiment. "The continued strain on the nerves," writes Mr. Hannay, "watching the temperature of the furnace, and in a state of tension in case of an explosion, induce a nervous state which is extremely weakening, and when the explosion occurs it sometimes shakes one so severely that sickness supervenes." The diamond-making experiments were started in September, 1879, when Mr. Hannay made many attempts to find a solvent for the alkali metal, sodium, potassium, and lithium. But in no instance could such a solvent be found which did not, in the gaseous state, and under pressure,



THE "IMPERIAL HARVESTER."—MADE BY CRAWFORD & CO. LONDON, ONTARIO CANADA.