

PLAN OF HYDRAULIC ELEVATOR.

MECHANICAL INVENTIONS.

DRY COPYING PROCESS.—After a somewhat lengthy litigation before the United States Patent Office, to determine the originator of the invention for producing multiple copies of writing, by what is known as the dry process, two patents have lately issued, which seem to vest in a German subject the authorship of the invention. The process has been so often described in this and other papers, we will not repeat the formula; but parties desiring to use the invention will gain all information by addressing the Hektograph Company, of this city. Copies of the patents may be had at the office of this paper at the usual charge.

Mr. George Lettenmyer, of Little Georgetown, W. Va., has patented an improved carpenter's work bench. This is an improvement in the class of work benches which are provided with a sliding dog or clamping jaw operated by a lever.

Messrs. William A. Branch and Edmund Golucke, of Crawfordville, Ga., have patented improvements in grinding mills of that form in which the runner-stone is provided with metal grinding surfaces arranged in the eye of the stone, so as to give a preliminary grinding to the grain near the center, where the leverage is greater, before being admitted between the stones.

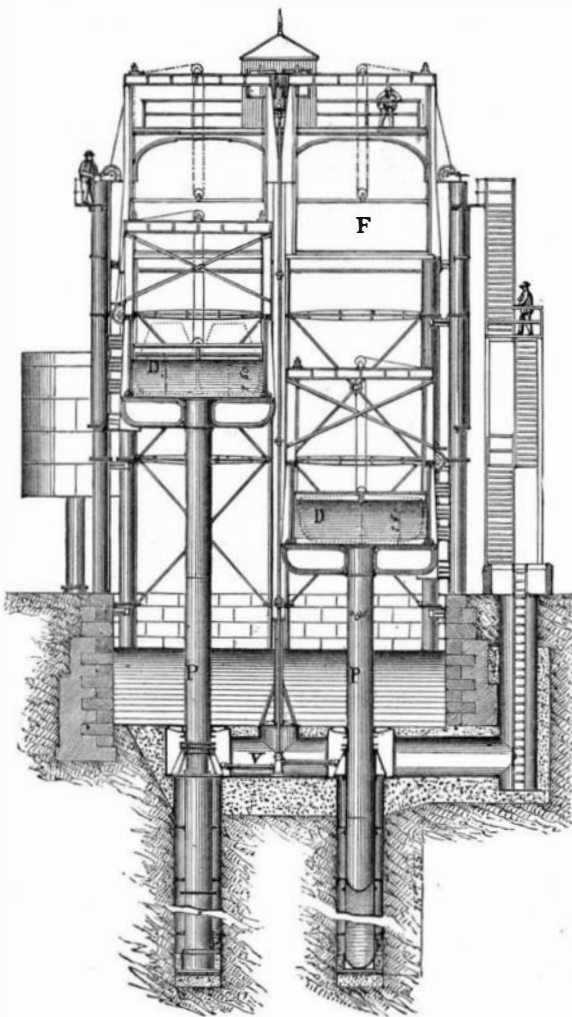
An improved roll for forming billets from steel railroad rails has been patented by Mr. Frank B. Davis, of Johnstown, Pa. The invention consists in constructing the rolls with a series of grooves, so formed as to gradually lower and thicken the web and fill out the angles between the web and the flanges and head, and then bring the rail into the form of two triangular parts connected by a thin web, and separate the two parts, forming two triangular billets.

An improved rotary pump has been patented by Mr. Erwin B. Newcomb, of Cumberland Mills, Me. The object of this invention is to construct a rotary pump in such a manner that the floats shall be balanced and operated by the pressure of the water acting through ports or channels formed in the cylinder heads, and communicating with the exit and entrance ports of the pump and with the radial float slots of the revolving cylinder.

An improved rock drill has been patented by Mr. George P. Schaurer, of Nashville, Tenn. The object of this invention is to provide a drill that will cut a perfect channel in the rock, and at the same time dress both faces of the said channel.

HYDRAULIC ELEVATOR FOR CANAL BOATS.

One of the serious defects of canal transportation is the loss in time caused by locking a boat from one level to



TRANSVERSE SECTION.

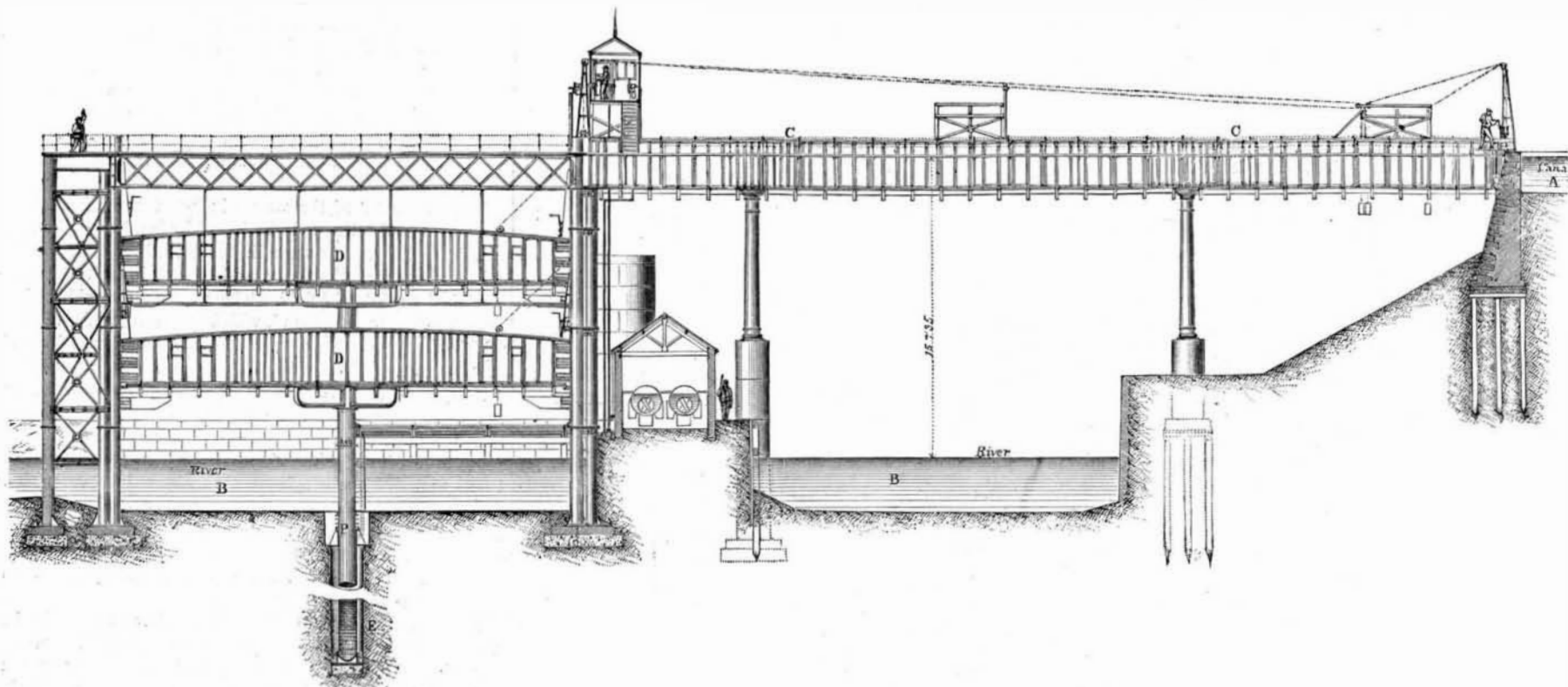
another, especially if the height between the levels is considerable. Another is the great loss of water, which in many

cases is a factor of the greatest importance. These and like difficulties have been overcome by means of a hydraulic elevator for canal boats, constructed by the engineers, Messrs. Edwin Clark & Sidengham Duer, in the Weaver, at Auderton.

The annexed engraving, which we take from the *Annales des Travaux Publics*, is an excellent representation of this elevator. The upper canal, A, is conducted directly over the lower canal, B, by means of a wrought iron aqueduct, C C, supported by iron columns, and provided with gates at the ends. The car or carriage, D, consists of an iron caisson, provided with iron sluice gates, and is centrally supported on a large iron casting, forming the upper extremity of the cast iron plunger, P, of a hydraulic elevator. This plunger passes into an iron cylinder, E, placed in the bottom of the lower canal, B, and is in communication with an Armstrong accumulator. The caisson is 80 feet long, $14\frac{1}{2}$ feet wide, and the water in it is never permitted to rise higher than $5\frac{1}{4}$ feet.

The total weight of the caisson and the water contained in it is about 250 tons. The diameter of the piston is $35\frac{3}{4}$ inches, and the height between the levels of the two canals is 50 feet 2 inches. The time and power required are greatly diminished by the use of two elevators. One large or two small boats are floated into each caisson, one of which is on a level with the upper canal, and the other on a level with the lower canal. The gates, FF, are then closed, and the level of the water in the upper caisson is raised about 6 inches. The valve, V, is now opened, placing the two cylinders in communication with each other. The upper caisson will now descend and the lower one will rise until the bottom of the lower one has arrived at the level of the lower canal, upon which the communication valve, V, is closed, and the valve admitting water under pressure, from the accumulator into the cylinder of the rising piston, is opened, and the rising caisson is raised to the level of the upper canal. The discharge valve of the cylinder of the descending piston is then opened, permitting the corresponding caisson to descend entirely into the lower canal, when the boats are floated out of the caissons.

A CORRESPONDENT, writing from near Leadville, Col., under date of June 1st, says they have just had a fall of eight inches of snow. He lives at a place 11,500 feet high above the sea.



HYDRAULIC ELEVATOR FOR CANAL BOATS.—CONSTRUCTED IN THE WEAVER AT AUDERTON, ENGLAND.

IMPROVED STYLOGRAPHIC PEN.

For over two years fountain pens or ink pencils have been sold in this and other countries, and thousands have found them to be a very useful instrument. During this time many defects have been noticed and efforts made to overcome them, resulting at last in the production of the newest and latest pen of this kind, which was patented March 9, 1880.

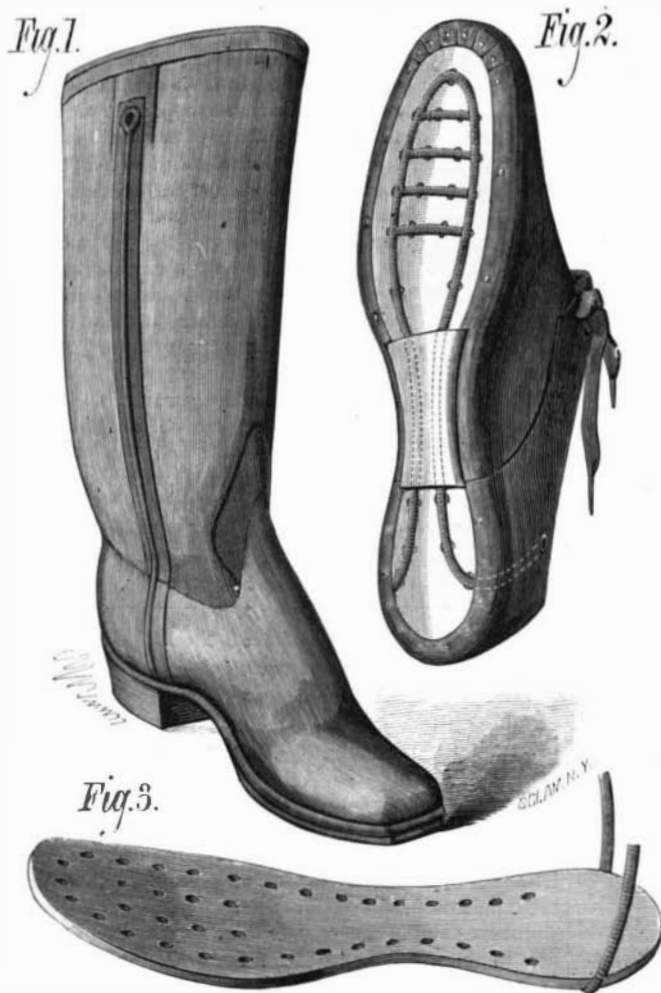
The pen consists of an ink holder of vulcanized rubber, ornamented and beautifully mounted. The ink is conveyed by capillary attraction to the tubular point, containing a solid iridium-pointed needle. It combines all the advantages of pencil and pen, and is a great saver of both time and patience.

Fig. 1 shows the pen complete in its new form. Fig. 2 represents the point section removed ready for filling. Fig. 3 shows the new and late improvements, the duplex, interchangeable point section. The advantages of these improvements are at once apparent. If by any accident the pen point should break down, a new one could be obtained at a small cost. Two points can be had with each pen for fine and coarse writing. The needle by being detached from the air tube, D, cannot become bent or broken while filling the pen, but is always protected by the section, B. The new pen has the delicate spring on the end of the needle completely covered, thus effectually preventing oxidation, a source of constant annoyance in those of earlier make.

Further information may be obtained from the Stylographic Pen Company, office No. 169 Broadway, Room 13, New York.

VENTILATION OF BOOTS AND SHOES.

It is a matter of the most common every-day experience that in the wearing of boots and shoes, and especially those made of rubber, the feet sweat and heat almost continually in cold weather, making the feet clammy and cold, and inducing chilblains, and in warm weather, with the best precaution, exceedingly noxious. It is doubtless the cause of much of the rotting and breaking of uppers, and is, above all, an exceedingly unhealthy feature of the present method of dressing the feet. Attempts have heretofore been made to obviate this in a number of ways, for instance by inner soles of different kinds intended to absorb the



BOOT AND SHOE VENTILATOR.

moisture; and unsuccessful efforts have also been made to ventilate the boot or shoe. Every person feels the need of something that will satisfactorily accomplish this object. The accompanying engraving illustrates a recent invention which does this effectually, and is an exceedingly simple device. It consists of a spiral coiled brass wire, laid in a groove extending in and around the under side of the insole of the boot or shoe, with holes punched at close intervals, immediately over the coil. The coil is extended along to the heel, and carried to the top, where it stops at an eyelet hole, forming, when walking, a complete automatic air pump, continually drawing in pure air and throwing off the foul and heated air.

The inventor states that the invention stands a practical test, successfully ventilating a boot or shoe, and it is an especial benefit to rubber goods, which, as at present worn, are peculiarly destructive to the feet. Its application is inexpensive and will not materially increase the price, and it is claimed that its use will be economical, as it prevents the breaking of the uppers where they join the sole.

There can be no question that the unhealthy condition of the feet induces many of the diseases and ailments with which we are afflicted, and the sanitary and health-preserving features of the invention are among the first that recommend it to universal use. It insures economy, personal

FIG. 1.



FIG. 2.



NEW STYLOGRAPHIC PEN.

comfort, and health above all, and will undoubtedly become an article of every-day wear as soon as it is properly presented to the public. We learn that contracts are now being made with large manufacturers to introduce it in their

FIG. 3.



goods. It was invented and patented by D. A. McDonald, a practical shoemaker, and is now owned and controlled by the McDonald Boot and Shoe Ventilating Company, of Rockland, Me.

A Glycerine Barometer.

A glycerine barometer has been suggested by James B. Jordan, of London, and is being tested at Kew. The cistern is a cylindrical vessel of copper lined with tin, five inches deep and ten inches in diameter, fitted with a screwed cover, the air having access through a small hole in the cup attached to the cover, which has a recess holding cotton wool for filtering out the dust. The main tube, twenty-seven feet long, is connected with the cistern by attachment (with a soldered joint) to a projecting piece of tube which enters the cistern through the bottom, and is fitted at its opening with a screwed plug. The tube is an ordinary piece of metal gas pipe five eighths inch in diameter, furnished at the top with a gun-metal socket, into which is cemented a glass tube four feet long, with an inside diameter of one inch, terminating in an open cup, and fitted with an India-rubber stopper.

The fluctuations of the level of the column of glycerine are observed and read off on brass scales placed on either side of the tube, and fitted with indices and verniers moved by mill heads at the bottom of the scales. One of these scales gives the length of the column of glycerine, the other the corresponding length of a column of mercury. A variation of a tenth of an inch in a mercurial column is shown by a change of more than an inch in the glycerine column, and the latter is therefore expected to show minute variations which are imperceptible in the former. Glycerine absorbs moisture freely when exposed to the air, but this is prevented in the new barometer by covering the exposed surface in the cistern with a layer of heavy petroleum oil specially prepared.

Arsenical Poisoning.

A recent number of the *Neue Freie Presse*, of Vienna, gives,

on the authority of the *Berliner Börsen Courier*, the following account of arsenical poisoning through a dress: A certain Commerzienrath L— brought home for his daughter from a well known Parisian atelier a splendid dark-green dress trimmed with light-green leaves. The dress was frequently worn, but, after a time, the lady, who had a very beautiful complexion, remarked an outbreak of pustules on her neck and arms, which was especially painful at night. For a long time she concealed her state from her parents and the family physician, but after applying in vain all kinds of domestic remedies, she could no longer keep the matter secret, as she had become much worse. The family doctor at once recognized the effect of arsenical poisoning, and on

chemical examination detected a large percentage of arsenic in the material of the dress.

Spontaneous Combustion.

Some experiments made at Riga with reference to the spontaneous combustion of various materials, wadding, raw flax, hemp, the waste of silk, wool, and cotton spinning, also sponge, as well as the wood dust found in the cabinet-makers' shops, appear to demonstrate the important fact, among others, that small quantities really take fire sooner than large ones. The substances named were saturated with various fluids—oils, turpentine, petroleum, various

varnishes, etc. All the fibrous materials took fire when saturated with any of these oils, or with mixtures of the same; sponge and wood dust, on the contrary, proved to be entirely harmless. Combustion ensued most rapidly with seventeen grains of wadding and sixty-seven grains of a strong oil varnish, namely in thirty seven minutes; while two hundred grains of washed cotton waste, of which a portion was saturated with seven hundred and fifty grains of strong oil varnish and the remainder wrapped about

it, required a period of well-nigh fourteen hours. On these materials being placed in a well-sheltered spot and subjected to a heat of from 18° to 40° C., silk did not flame up, but slowly charred: and, as already mentioned, small quantities seemed to take fire sooner than large.

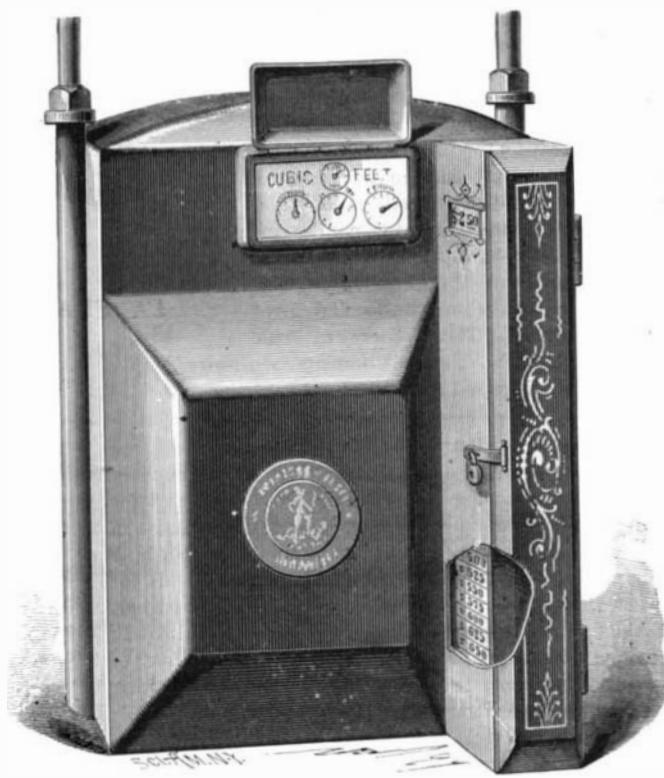
PRICE INDICATOR FOR GAS METERS.

A gas meter is by no means a very difficult instrument to understand, yet the majority of gas consumers are unable to tell how much gas has been consumed by an examination of the meter, and the consequence is that disputes frequently arise between the gas manufacturer and the consumer, which might be entirely avoided if some means were provided which would enable the gas consumer to tell at any moment just how much is due the manufacturer.

Mr. Frederic Egner, of Norfolk, Va., has recently patented a price indicator for gas meters which obviates difficulties of this nature, and always shows in dollars and cents the amount due for gas.

The invention is very simple, and may be applied to meters already in use, or it may be made a part of a new meter. It consists of an endless band having printed on it figures representing dollars and cents advancing regularly in some fixed ratio. This band is mounted on two rollers in an auxiliary case attached to the meter case, and is driven by a simple train of gearing from the "hundred" pinion of the registering mechanism.

The gas consumer may at any time know how much he is indebted to the gas manufacturer by noticing the figures



EGNER'S PRICE INDICATOR FOR GAS METERS.

visible through an opening in the case containing the endless band. The meter inspector carries a key to the case containing the band, and the latter may at any time be turned back to the zero point by loosening the lower roll, and should the scale of prices be changed a new band may be supplied at a trifling expense.

This invention is well calculated to settle many of the disputes arising between the gas consumer and the gas manufacturer, and it affords an effectual check on meter inspection, insuring correct statement.

This useful improvement is the invention of Mr. Frederic Egner, of Norfolk, Va., who may be addressed for further information.