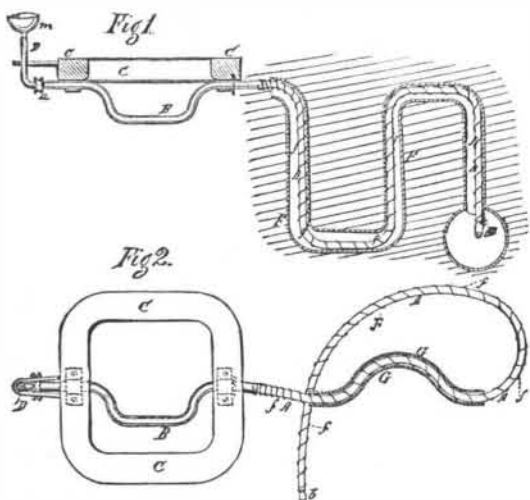


Fig. 1 is a side elevation, and Fig. 2 is a plan view.

A is a flexible pipe, of rubber or other material, furnished at its outer end with a rounded metallic nozzle, *b*, and connected at its inner end with a tubular crank, *B*, working in suitable journals in a frame, *C*, the opposite end of said crank being connected by a swivelled joint, *a'*, with an upright tube, *D*, into which hot water may be poured by means of a funnel shown at *m*. A screw-thread is formed externally upon the pipe *A* by means of a wire, *r*, having sufficient pitch or interspace between its coils, and snugly wound upon the pipe aforesaid.



APPARATUS FOR THAWING FROZEN WATER-PIPES.

In using the apparatus, the nozzle end of the pipe *A* is thrust into the water-pipe to be thawed, and a rotatory movement being given to the crank *B*, the tube is rotated around its axis, and, by means of its external thread, *f*, formed, as hereinbefore set forth, of a wire wound spirally around the said pipe, is screwed into the water-pipe shown at *F*, with its nozzle bearing against, or close to, the ice within to be removed, so that hot water, being poured into the pipe through the funnel, is caused to impinge against the ice to thaw the same, the screwing movement of the flexible spirally-threaded pipe enabling the nozzle to be kept in due relation to the ice to be thawed. As the rotation of the flexible pipe, when the latter is of considerable length, may be materially assisted by power applied close to the throat or opening of the water-pipe into which the flexible pipe is thrust, a tubular crank, *G*, is placed upon the latter in such manner as to be capable of longitudinal movement thereon, and, consequently, adjustable to any desired place along the length thereof.

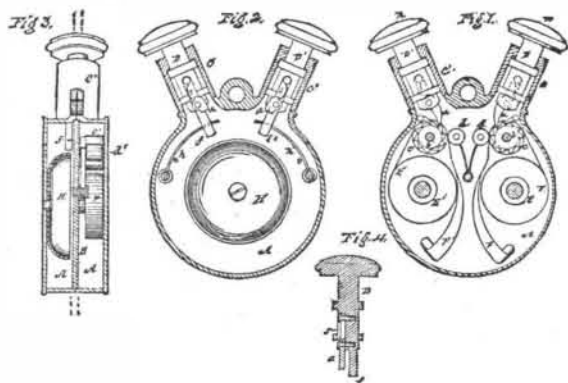
#### NOVEL FARE-REGISTER.

By A. F. JOHNSON, Parkville, N. Y.

By means of this improvement, each fare as soon as received is immediately recorded on a continuous strip of paper within the apparatus, and inaccessible to the person who receives the money, and the fact of such record having been made is at the same time made known by the sounding of a bell within the apparatus.

Fig. 1 represents a plan view, partly in section through the line 1-2, of the devices for printing or impressing on a strip of paper each fare received. Fig. 2 is a similar view, on the line 3-4, of the devices for striking the bell or gong. Fig. 3 is a transverse vertical section, and Fig. 4 a detail view.

A, shell or case; B, plate which divides the same into two compartments, the one (shown at the right of Fig. 3) for holding



NOVEL FARE-REGISTER.

the devices for impressing upon the paper the number of fares received, and the other (shown on the left of said Fig. 3) in which the bell, *H*, is located. Connected with these compartments are two cylindrical necks, *C* and *C'*, which are secured at their bases to the rim of the shell, *A*, and within which are plungers, *D* and *D'*, each of which terminates in a knob, *e* and *e'*, at its upper end, one of which is struck when a full fare is to be recorded, and the other when a half fare is taken. A pawl, *a*, pivoted within a longitudinal groove in the plunger *D*, and actuated by a spring, *s*, engages with a ratchet-wheel, *b*, fitted on a pin or shaft having bearings in the plate, *B*, to which wheel, *b*, is attached a roller, *c*, having figures or other characters embossed on its periphery, which work in contact with a pressure-roller, *d*. A strip of paper, or other suitable material, *F*, held upon a roller, *E*, which has bearings in the plate, *B*, is passed over the roller *c* and between it and the pressure-roller *d*, and at each stroke of the plunger *D* the ratchet-wheel, *b*, is moved the distance of one tooth, carrying around with it the roller *c*, and an impression is made on the paper, which latter passes downward and lies in the body of the box.

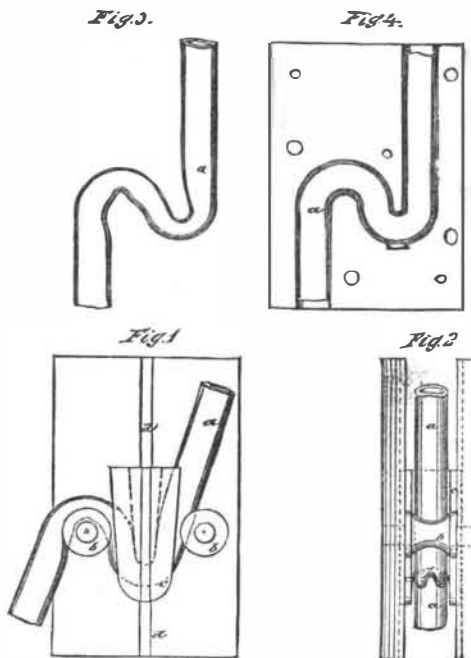
When the apparatus is designed to record both fares and half fares, or different kinds of fares, a second strip of paper, *F'*, is employed, which is operated in the same manner by the plunger *D'* through the medium of a duplicate set of devices, similar to those just described, consisting of roller, *E'*, impressing-roller, *c'*, pressure-roller, *d'*, ratchet-wheel, *b'*. A projecting pin or rod, *f*, is formed on the lower end of the plunger *D*, on the side opposite to that on which the pawl, *a*, is pivoted, which, when the knob of the plunger *D* is struck, comes in contact with a bell or gong, *H*, thereby sounding the bell at one and the same time that the impression is made on the paper. A similar pin or rod, *f'*, is formed on the plunger *D'*, for the purpose of sounding the bell at the time

a half fare is recorded. Fig. 4 is a sectional view of the plunger. *h h'* are springs for retracting the plungers. The impressing-rollers, *c c'*, may have embossed on their periphery any desirable figure or character to be impressed upon the paper which will designate the number of fares received.

#### MANUFACTURE OF WATER-TRAPS.

By GEO. W. WICKS, New-York.

FIG. 1, plan of a die in which the lead pipe, *a*, has been bent between two rollers, *b b'*, by forcing the forming-wedge, *c*, in the line of *d d'*. An edge view in Fig. 2, and the crudely-bent trap thus formed in Fig. 3. Fig. 4 represents a metallic die, made in bilateral halves, with a recess intervening between.



MANUFACTURE OF WATER-TRAPS.

In this die, Fig. 4, the roughly formed trap, seen in Fig. 3, is placed, and the two bilateral halves, constituting the die, are firmly secured together by screw-bolts or otherwise; and one end of the pipe *a* is stopped with a water-tight plug, and in the other end of the pipe the nozzle of a hydrostatic force-pump is inserted, and water or other fluid is forced into the pipe, *a*, which causes the pipe, *a*, to take the exact form of the die.

In the first step of the process it is only necessary to select a soft metallic tube of any desired diameter and length, and placing it lengthwise across rollers, *b b'*. The wedge, *c*, is forced against the pipe, carrying it between the rollers, *b b'*, a sufficient distance to make the first bend; then the wedge and pipe are withdrawn, and the pipe is reversed in its position across the rollers, *b b'*, and the second and reverse bend is made in the same way as the first.

This mode of constructing water-traps produces an article superior to cast traps, which are always porous to some extent, and is superior to those made in halves and united by soldering, which is often imperfect.

#### PRINTING ORNAMENTAL BORDERS, ETC., TO CARBON PICTURES.

By E. W. FOXLEE.

THE design wished for as a border is made on a large—say a “royal”—size sheet of card-board; then a piece of black paper the shape of the picture is mounted with india-rubber solution upon it in the proper position, and a negative taken of it the size required. The object of using india-rubber solution for the mounting is that by moistening the paper with benzole it may be removed and another shape substituted, so that the same design will do for many different shapes.

Having got a negative, the next thing is to make a transparency of it; and perhaps the best means of doing this is by printing it on a piece of autotype transparency or dense black tissue, and developing it on glass. Should the transparency not be dense enough, it may be intensified by a solution of permanganate of potash, as described by Mr. J. W. Swan some years ago. Now, having obtained our transparency (or, as we shall call it, a “tinter”) we shall require a mask for the portrait negative. This may be made by printing the outline of the negative of the design on silvered paper, and cutting out the centre with a pen-knife. By this means the exact size of the opening will be secured.

This mask should be secured to the negative by a few touches of india-rubber solution, which does not injure the varnish, and allows of its being removed and used on other negatives. To adjust the tinter, place it on the negative, film upwards, and hold it up to the light, when its position is easily seen. It should be so arranged as to slightly overlap the opening of the mask on two sides, so as to produce the light and dark line or shadow according to taste. When adjusted, draw a pencil line on the mask along two of the edges of the tinter—say the top and the left side.

All that is now necessary in printing is to place two edges of the tissue against the pencil lines, and in tinting to see that the same two edges of the tissue coincide with the edges of the tinter. The simplest way to secure this is to push the tinter into an angle of the frame, and then to push the tissue close up to the corner of the frame also. By this means most perfect registration will be secured.

Should it be desired to have a dark design on a light ground—the reverse of that adopted by M. Lambert—it is only necessary to use the original negative of the design, making it, of course, thinner, so that it prints through. In this case the blank cut from the mask should be mounted on this tinter to protect the portrait while the border is printing.

A very pretty effect may also be obtained by making the design on a rough, tinted, cut-out mount, backing the opening with white paper, and using the negative taken from this as a tinter. The mount should be illuminated with a strong side-light when the negative is taken, so as to show the roughness of the mount, and also to produce a strong shadow of the edges of the opening.

#### IOWA COUNTY METEORITE.

ON the evening of February 12th, 1875, at about half-past ten o'clock, a very large meteor was seen passing from S. W. toward N. E., over Northern Missouri and Southern Iowa, and coming to the earth, in the form of a shower of stones in Iowa County, Iowa, a few miles east of Marengo. At this hour the sky being cloudless, the meteor was seen throughout a region extending at least 400 miles in length from S. W. to N. E., and 250 miles in breadth.

At Keokuk, Iowa, it is described as “oblong in figure, with a train ten to twelve times the length of the body, giving an intensely brilliant light of crystalline whiteness at the centre, fire-red on the border, throwing out red sparks and purplish jets of flame; the train less luminous than the body. It exploded like a rocket.”

Again, it has been described as being of a horseshoe shape, much elongated.

Professor Macomber writes from Iowa Agricultural College: “In form it was like an immense rocket, with streamers flowing from the hinder part, the front being smooth and curved like a sabre.”

Mr. J. A. Donnelle, at Sigourney, speaks of it as “a globe of fire with pale lines of light radiating from it.”

Mr. F. Christen writes that the light was at first dazzling, then changed to red.

In their description of the course it pursued, the accounts of observers varied with their position with reference to the place where it fell.

At Amana, Mr. F. Christen first saw the meteor when at an altitude of 10 or 11 degrees, and at a bearing of S. 19° W.

At Mount Pleasant, some thought it passed very near the moon, others thought it passed above.

At Albia, Monroe County, Mr. Pascal T. Lambert saw it when due east at an altitude of 40 to 45 degrees, and pointed out the place of its disappearance, which I found to have a bearing N. 41° 30' E., or almost in the direction of South Amana, in whose vicinity it fell.

The product of this meteor-fall was a large number of irregularly-shaped stones, varying in weight from a few ounces up to 74 pounds, and aggregating, so far as found, 500 pounds weight. These meteoric stones are many of them covered with the ordinary black coating, and they all present the “pitted” appearance common to such bodies.

The following is a chemical analysis of a fragment of the meteorite, made by J. Lawrence Smith.

This meteorite has a hardness rather above the average of its class. It was found to be composed of

Stony matter.....	86.64
Troilite.....	5.82
Nickeliferous iron.....	12.54

Of the stony part there was,

Soluble in acid.....	5.15
Insoluble.....	45.85

Separate analyses of these gave for the

	Soluble	Insoluble.
Silica.....	35.61	55.02
Protoxide of iron.....	27.20	27.41
Magnesia.....	33.45	13.12
Soda, with traces of potassa and lithia....	1.45	2.01
Alumina.....	.71	.84

The nickeliferous iron contained, besides traces of phosphorus, sulphur, and copper,

Iron.....	89.04
Nickel.....	10.34
Cobalt.....	.58

Its specific gravity was 3.57.

The first stone from the meteor was found on the afternoon of the 15th of February; the other stones were not found until after the melting of the snow, in the latter part of March.

The velocity with which the meteor moved can not be satisfactorily stated. The maximum velocity, according to data in the author's possession, would be about ten miles per second, the minimum about three miles. The most probable value for the last 60 or 70 miles of its course is from six to seven miles per second.—*N. R. Leonard, American Journal of Science*, 1875.

[Advertisement.]

#### AMATEUR WOOD-WORKERS

Can find every thing they require in rare and fancy woods, planed ready for use, at Geo. W. Read & Co.'s, 186 to 200 Lewis street, New-York. Send 3-cent stamp for catalogue and price-list. We also call the attention of manufacturers to our general price-list of hard-wood lumber and veneers.

#### THE NEW-ZEALAND TELEGRAPH.

THE Eleventh Annual Report of the Acting Commissioner of the New-Zealand Telegraphs, for the year ended the 30th of June last, states that during the year 917,128 messages were transmitted—an increase of 164,299, or more than 17 per cent over the previous year. Taking into account the value of general government messages transmitted (£13,679 10s. 9d.), the total earnings of the department for the year amount to £69,536 12s. 3d., which, after deducting the cost of the signal department, maintenance of lines, etc., leaves a balance of £9,460 13s. 4d. as interest upon the capital expended.

During the past year 456 miles of new lines, carrying a single wire, have been erected, and 988 miles of wire have been added to the original lines, making a total addition of 1444 miles of wire.

There are now opened to the public throughout the colony 127 stations, 21 of which have been opened during the past year.

At the close of the year 2986 miles of lines, carrying 6626 miles of wire, were in circuit, showing an increased mileage upon the previous year in line 456, and wire 1444.

The numerical strength of the department, including line-men and inspectors, on June 30th, 1875, was 509, against 388 of the previous year.

The duplex system of telegraphy, mentioned in the last annual report, has been in successful operation on the No. 3 wire in the Cook Strait cable since June 18th, 1874, and the advantage of speedy communication consequent thereupon has been very obvious. Instruments are now ready, and the system will be immediately introduced on the No. 3 wire north to Napier, and on the No. 3 wire between Blenheim and Christchurch. With the additional wires erected between Napier and Wellington, it is anticipated that this will greatly facilitate the transmission of the increasing work now offering. It is proposed to introduce shortly the automatic system on some of the longer circuits, instruments for this purpose having just arrived from England.