2 Sheets--Sheet 1.

J. A. T. OVEREND.

Type Casting-Machines.

No. 136,091. Patented Feb. 18, 1873.

Fig. 1.

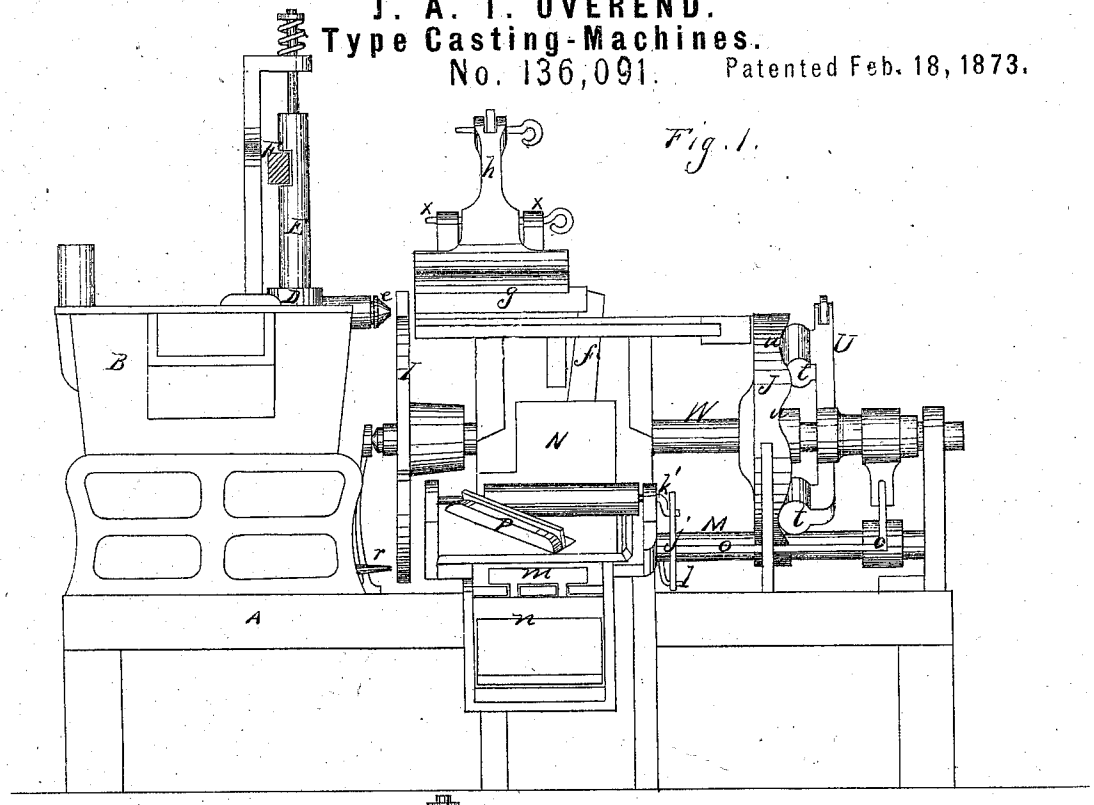
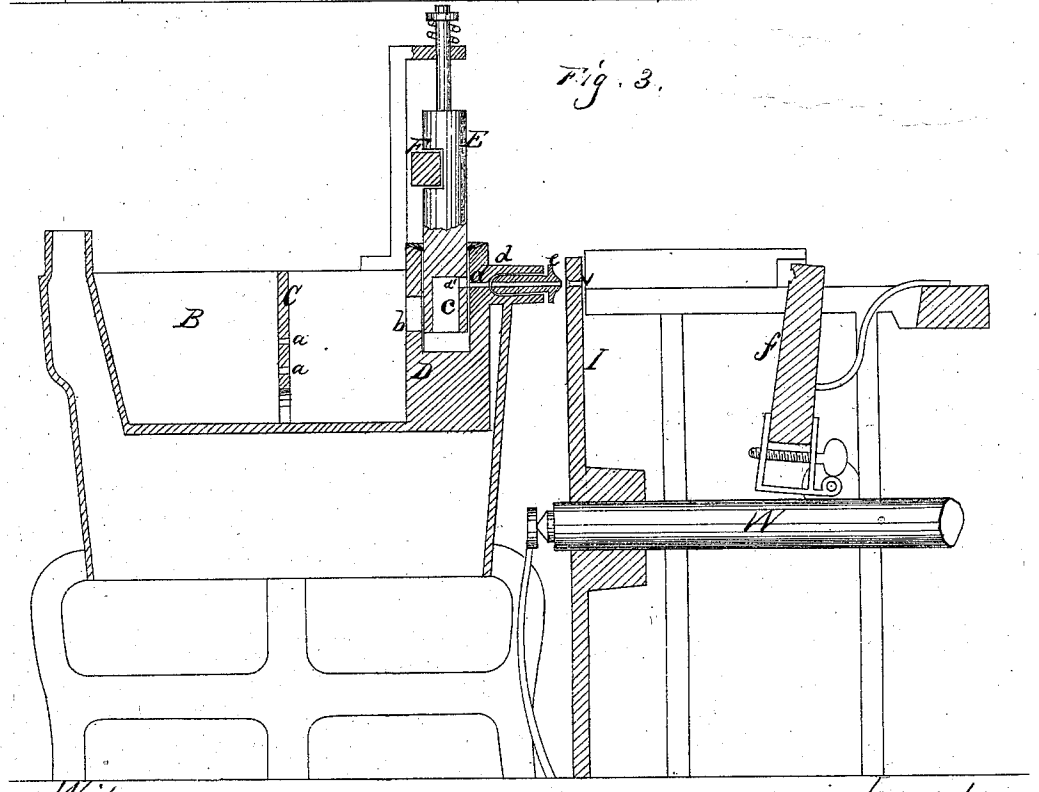


Fig. 3.



Witnesses,
Geo. H. Strong
Jno. L. Boone

Inventor.
John A. T. Overend

2 Sheets--Sheet 2.

J. A. T. OVEREND.
Type Casting-Machines.

No. 136,091. Patented Feb. 18, 1873.

Fig. 2.

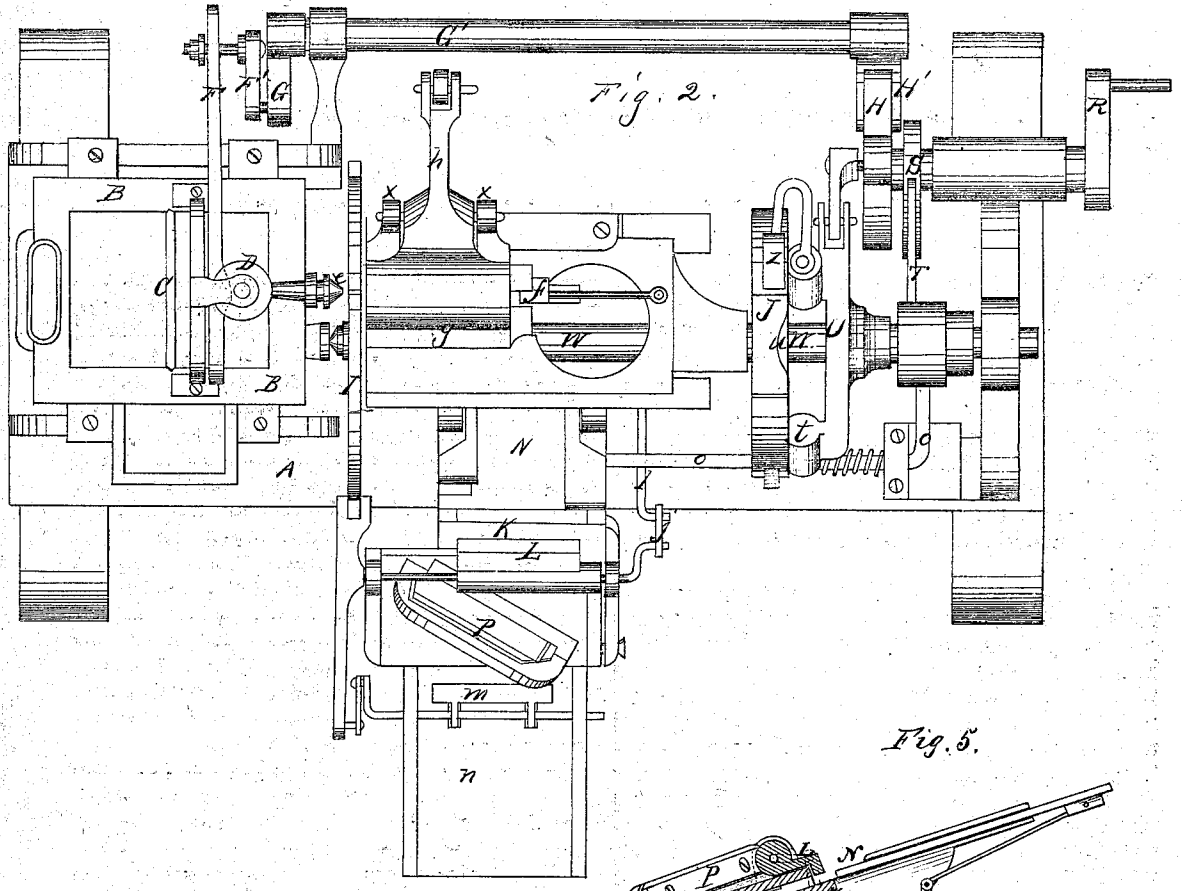


Fig. 5.

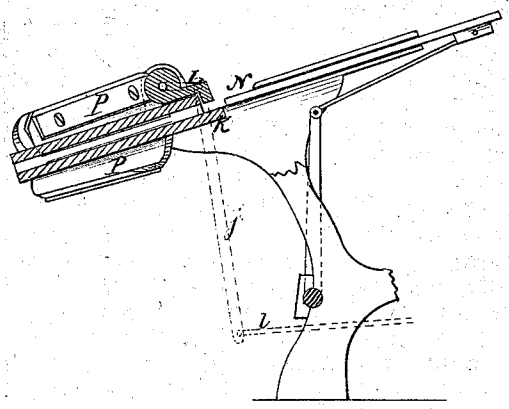
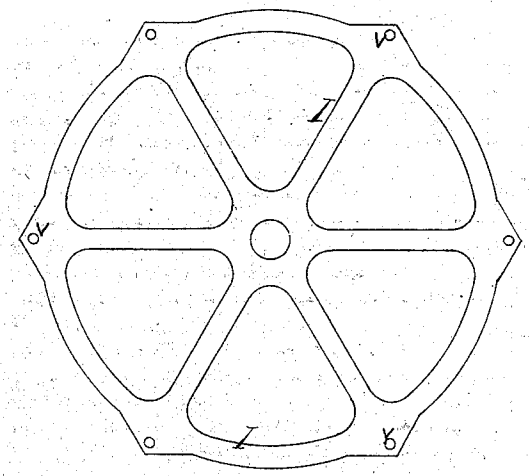


Fig. 4.



Witnesses.
Geo. H. Strong
Jno. L. Boone

Inventor.
John A. T. Overend

UNITED STATES PATENT OFFICE.

JOHN A. T. OVEREND, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN TYPE-CASTING MACHINES.

Specification forming part of Letters Patent No. **136,091**, dated February 18, 1873.

To all whom it may concern:

Be it known that I, JOHN ALFRED THOMAS OVEREND, of the city and county of San Francisco, State of California, have invented a Machine for Casting, Breaking, and Rubbing Movable Type; and I do hereby declare the following description and accompanying drawing are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention without further invention or experiment.

The object of my invention is to provide a machine for casting movable type, and then conveying them directly from the matrix and mold to another part of the mechanism, by which the type are broken from the stem and rubbed or cleaned and smoothed of any irregular projecting edges which may have formed in casting, the whole operation being continuous, and requiring no power but that required to drive the machine. It also consists in a novel arrangement of the pump by which the metal is forced into the mold, and of the conveying-nozzle through which the metal passes.

The melting-pot is provided with a partition or diaphragm, with openings near the bottom, so that metal can be introduced, when necessary, to one compartment and not materially reduce the temperature in that of the other, while by means of the openings at the bottom no dross or impurities can pass to the second compartment, which contains the pump. An opening in the side of the pump-cylinder allows the metal to be always in contact with the piston or plunger. As this rises some of the melted metal will flow into the barrel beneath the plunger. When the plunger is forced down, communication with the pot is cut off by the movement, and at the same instant a small hole connecting with the hollow space in the lower end of the plunger will be brought opposite the ejection-nozzle. The further contraction of the space forcibly ejects the metal through the nozzle into the mold, which has been closed and moved closely against the carrier and opposite the nozzle. The matrix being in position, a type will be formed, after which the matrix is retracted, the mold opened, and the carrier moved forward by suitable mechanism. The carrier consists of a wheel or series of arms having holes through their ends. This wheel is turned until one of these holes is brought into line with the nozzle and the mold, when the metal is ejected and the type is formed. When the wheel next moves forward the type is carried out of the opened mold, which is then closed, and, another arm being in position, another type is formed. The movement of the arm carries the type forward and downward till it lies with its side on an inclined plate, where a sort of clamp holds it. A sliding plate then moves forward and pushes it forward into the smoother, at the same time breaking it from the stem by which it was held to the arm. The smoother or rubber consists of two angular rasps or planes, one above and one below, between which the type must pass.

Referring to the accompanying drawing for a more complete explanation of my invention, Figure 1 is a side elevation of the machine. Fig. 2 is a top view or plan. Fig. 3 is an enlarged sectional view of the melting-pot, pump, and nozzle, showing their arrangement. Fig. 4 is an enlarged view of the carrier-wheel or arms. Fig. 5 is a vertical longitudinal section, showing the sliding plate N, clamp L, and rubbers P P.

A is a frame or bed, upon which the machinery is placed. B is a melting-pot, under which is the furnace necessary for melting the metal and keeping it liquid. The pot is provided with a movable diaphragm, C, which may be raised slightly, or it may be provided with holes *a a* near the bottom. In one of the compartments thus formed the pump-cylinder D stands close to the side of the pot, so that the metal will pass through as short distance as possible after leaving the pot. The other compartment serves to receive the metal, and in this it is first melted, after which it is free to pass to the second compartment through the holes *a*. This arrangement prevents any dross or other impurities from passing into the pump compartment, and also prevents too great a reduction of temperature in that part by the introduction of cold metal. The pump-cylinder D is provided with a narrow slot, *b*, at the side within the pot, and this slot is long enough to insure its being filled with

metal. The plunger E moves up and down in the cylinder, so that its bottom just rises above the slot *b* and passes a little below it. A chamber, *c*, is made in the bottom of the plunger, and a small opening, *d'*, connects this chamber with the opening *d* leading into the ejection-nozzle *e*. This nozzle fits loosely in a hole bored out for it, and has its inner or receiving end rounded so as to make a sort of ball-and-socket joint, as shown, in which it may have some motion. This is for the purpose of allowing the nozzle to adjust itself to any changes in position caused by the varying temperature of the parts. The supporting-legs are also secured near the top of the pot, so that most of the expansion will be downward, and not affect the nozzle. The pump is driven by a lever, F, which is moved by a crank, G, on the shaft G', by means of a connecting-rod, F'. A little metal will always pass up beside the piston into the cup at the top of the cylinder, from which it overflows and frees the pump from dross. A cam, H, on the driving-shaft of the machine strikes an arm, H', which is keyed to the shaft G', and thus operates the mechanism. The type-mold is placed in a line with the nozzle *e*, and the matrix *f* in which the letter is formed is brought up against the end of the mold. The upper part *g* of the mold is hinged to the frame at *x*, and an arm, *h*, which extends out from it, is connected by a rod with an oscillating arm on the shaft M, and by this the mold is opened and closed at the proper time.

In order to hold the type, and convey it to the rubber after it is made, the carrier I is interposed between the nozzle and the mold. This carrier consists of six or other number of arms, either separated or united by a rim, so as to form a wheel, and it revolves in a plane at right angles with the plane of the mold. A small hole, *v*, is made in the end of each of the carrier-arms, and when the machine is in motion one of these holes is stopped opposite the nozzle at each movement. The mold being closed, and the matrix in place, these, with the carrier, are given a side movement by a cam, J, which brings them closely against the nozzle, and makes a tight joint throughout. At this instant the piston moves in the pump-cylinder and ejects a small portion of the melted metal, which is forcibly thrown into the mold and matrix, thus forming a type.

After the type is formed the carrier-mold and matrix are allowed to move away from the nozzle by a side movement from the cam, as before described, the mold opens and at the same instant the carrier moves forward, taking the type with it. In the present case the second movement of the carrier lays the type with its side on an inclined table, K, when a clamp, L, is brought down and holds the type. The clamp is operated by the arms *k'* and *l*, and a connecting-rod, *j*, from the shaft M, as shown. As soon as the clamp has seized the type a sliding-plate, N, is moved forward by an arm from the shaft O, and this plate forces the type between the rubbers P, which are placed angularly in the table K, one above and one below the type. These rubbers are for the purpose of smoothing off any little rough edges which may be left in casting. The moving of the sliding plate N also breaks the type from its holding-stem, so that it is all ready for use. As the carrier continues to revolve the holes in the arms are brought opposite a short pin, *r*, near the bottom of the machine, and when the side movement of the carrier I takes place for making the joint this pin enters a hole and forces out the stem which is left after breaking the type. This leaves the arm free and all ready for another type when it arrives at the proper place. A short shaft, operated by a pulley or the crank R, drives the machine. The shaft G' is operated by the cam H on this shaft, as before described. Another cam, S, on the same shaft operates an arm, T, which is keyed to the shaft M, giving it an oscillating motion, and from this shaft M the mechanism which opens and closes the mold is driven; also, the device for operating the clamp L. Above the shaft M is the shaft W, extending parallel with it and driving the carrier I, which is keyed to the shaft W. This shaft has an end motion for closing the joints through which the metal passes, as before described, and has the cam J keyed to it. An arm, U, is placed loosely on the shaft W, and has friction-rollers *t t* at each end, which bear against the side face of the cam. In this face are depressions *u*, and when the rollers *t* fit into these depressions the end movement of the shaft allows the carrier I and the mold to move away from the nozzle; but when the rollers rest on the higher part of the face the joint will be closed. The edge of the cam is formed into a ratchet, and by means of a pawl, *z*, on the arm U, the cam and shaft are rotated with the necessary intermittent movement.

The cutters or rubbers P are made self-clearing, being formed like planes, with a throat, and they are set at an angle with the table and also with each other, so as to form a V or an X shape, as they stand.

The different mechanism for operating the parts is clearly shown in the accompanying drawing; but I do not wish to confine myself to the especial devices shown for this purpose, as it will be manifest to any skilled person that many different arrangements of mechanisms might be employed and the same results obtained; but

What I do claim, and desire to secure by Letters Patent, is—

1. In combination with the pump-cylinder D having the openings *b* and *d*, the chambered piston E having slot or opening *d'*, the

whole constructed to throw the metal into the mold without the use of valves, and operating substantially as herein described.

2. The sliding plate N, arranged as described, so as to carry the type between the rubbers P P, in combination with the carrier I, clamp L, and table K, constructed and operated substantially as and for the purpose set forth.

3. The cam J and the arm U, constructed and operated substantially as described, for the purpose of giving the carrier I, the mold *g*, and the matrix *f*, a side movement and making a tight joint.

JOHN ALFRED THOMAS OVEREND.

Witnesses:

A. H. EVANS,

WM. M. EVANS.