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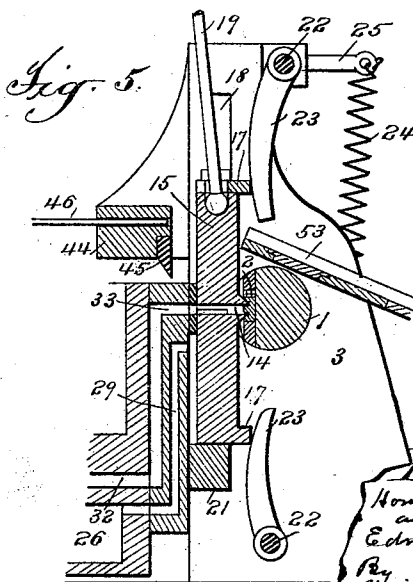
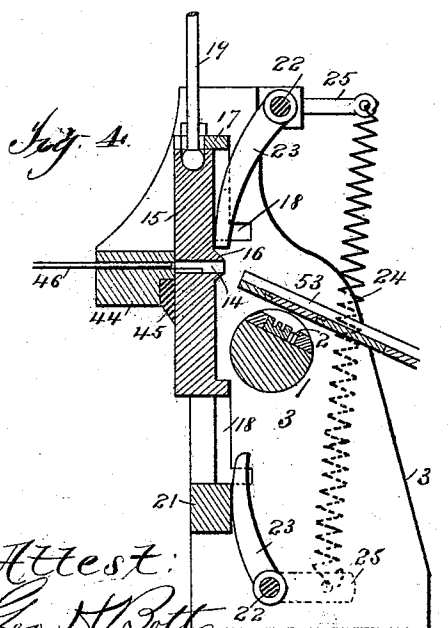
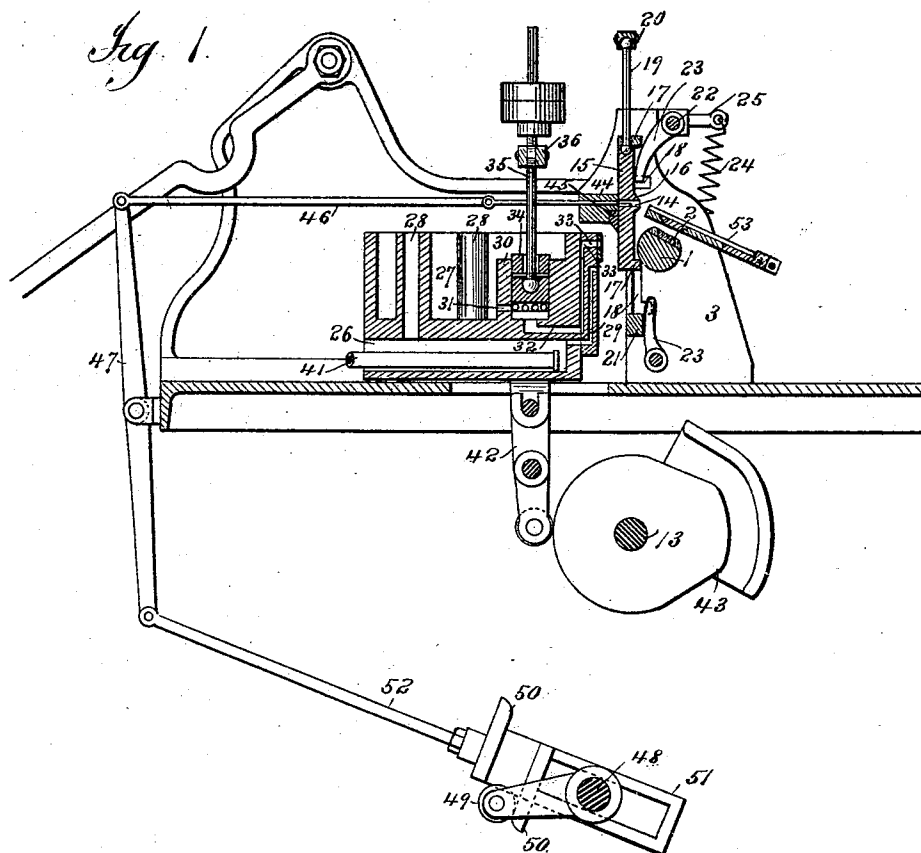
2 Sheets—Sheet 1.

H. LEE & E. LEBRUN.

MATRIX MAKING AND PRINTING BAR CASTING MACHINE.

No. 542,224.

Patented July 2, 1895.



Attest:

G. H. Bott
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

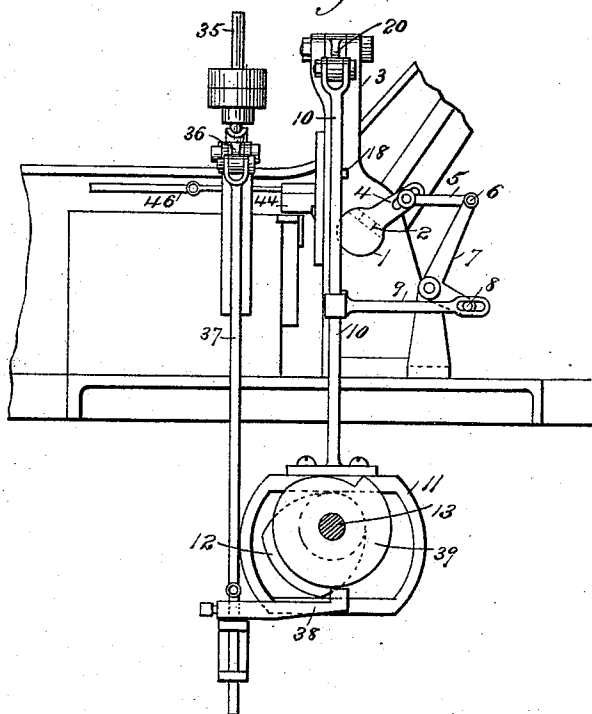
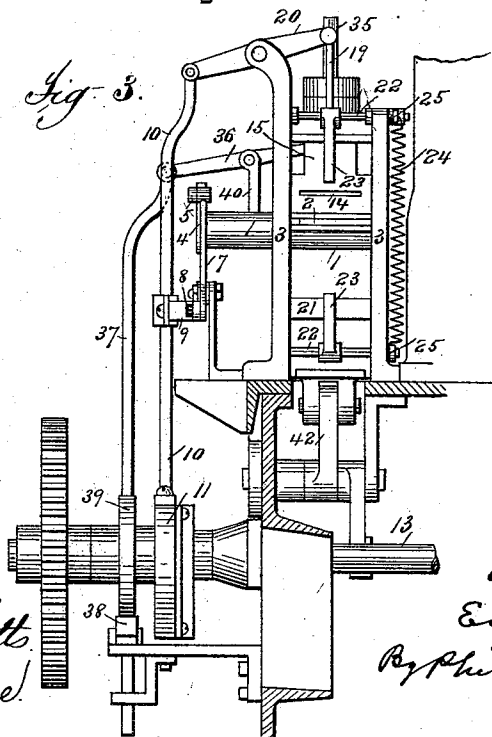


Fig. 3.



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UNITED STATES PATENT OFFICE.

HOMER LEE, OF NEW YORK, N. Y., AND EDMOND LEBRUN, OF NEWARK,
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MATRIX-MAKING AND PRINTING-BAR-CASTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 542,224, dated July 2, 1895.

Original application filed October 31, 1888, Serial No. 289,676. Divided and this application filed October 11, 1890. Renewed
February 23, 1895. Serial No. 539,496. (No model.)

To all whom it may concern:

Be it known that we, HOMER LEE, residing
in the city, county, and State of New York,
and EDMOND LEBRUN, sometimes known as
5 EDMUND LEBRUN, residing at Newark, in the
county of Essex and State of New Jersey, citi-
zens of the United States, have invented cer-
tain new and useful Improvements in Matrix-
Making and Printing-Bar-Casting Machines,
10 fully described and represented in the follow-
ing specification and the accompanying draw-
ings, forming a part of the same.

This invention relates to mechanism for
casting printing-bars from matrices produced
15 either in the machine in which the casting
operation is performed or in an independent
machine, from which the matrices are trans-
ferred to the casting mechanism.

The object of the invention is to improve
20 the construction of this class of casting me-
chanism; and to this end it consists in various
constructions and combinations of parts, all
of which will be particularly described in the
following specification and pointed out in the
25 claims.

In the accompanying drawings, Figure 1 is
a sectional side elevation of a portion of a
matrix-making and type-casting machine,
showing such parts as are necessary for un-
30 derstanding the present invention. Fig. 2 is
a partial side elevation of the same. Fig. 3
is an end elevation, looking to the left in Fig.
2. Figs. 4 and 5 are detail sections on an en-
larged scale, showing the parts in two posi-
35 tions.

Referring to said drawings, 1 is a partially-
cylindrical holder, provided on its flat face
with a groove 2, which receives the matrix,
the holder being mounted to oscillate in up-
40 rights 3. The holder projects outside one of
the uprights and is provided at its end with
a slotted projection 4, connected by a link 5
and wrist-pin 6 with a bell-crank lever 7, piv-
oted to the frame of the machine. The lower
45 end of the bell-crank lever carries a pin 8, en-
tering a slot in the end of an arm 9, which is se-
cured to a rod 10, carrying at its lower end a
hollow cam-block 11, by which the rod is ver-

tically reciprocated by a cam 12, mounted
upon the shaft 13.

The mold-cavity in which the printing-bar
is cast is an oblong opening 14, cut trans-
versely in a mold-plate 15 and provided, pref-
erably, with projecting lips 16 on each side
of the mold-cavity. The mold-plate 15 has
55 across its top and bottom bars 17, the ends
of which enter and move in L-shaped guide
slots 18, formed in the two uprights 3, and by
which the mold-plate is guided in vertical
and short horizontal movements. The mold-
60 plate is suspended and its motion directed in
the slots 18 by a bar 19, attached at one end
by a ball-and-socket joint to the top of the
mold-plate and at the other end by a similar
joint to a lever 20, pivoted in one of the up-
65 rights, the other end of the lever being con-
nected to the upper end of the rod 10, previ-
ously referred to. The vertical portions of the
slots 18 are of a length equal to the vertical
throw of the cam 12, so that the reciprocation
70 of the rod 10 will move the mold-plate be-
tween the top and bottom of the slots. A
rest-bar 21, the top of which is level with the
bottoms of the guide-slots 18, partially re-
lieves the bottoms of the slots from the blow
75 of the descending mold-plate.

Above and below the mold-plate are mount-
ed two rock-shafts 22, each of which carries
an arm 23, the shafts being rocked rearward
by means of a spring 24, secured to crank-
80 arms 25 on the shafts, the arms 23 pressing
against the mold-plate and tending to push it
backward.

Behind the mold-plate is the casting-box,
in which the type-metal for the printing-bars
85 is melted and from which it is forced into the
mold. The casting-box may be of any suit-
able construction, that shown having fire-
chamber 26 in its lower part, just above which
is the melting-pot 27, through which pass
90 chimneys 28 for the escape of the products of
combustion. Another chimney 29 passes out
and up along the front of the box for main-
taining the temperature of the metal as it
passes out of the casting-box. In the front
95 central part of the casting-box is a pump-cyl-

inder 30, connecting by means of openings 31 near its base with the interior of the melting-pot 27 and by means of a passage-way 32 with a series of small circular openings 33, arranged near the top of the forward end of the box in a transverse line about equal in length to the printing-bar to be cast.

The pump-piston 34 is operated by a weighted piston-rod 35, pivotally connected to a lever 36, which in turn is connected by a rod 37 to a reciprocating arm 38, engaged by a notched cam 39, carried by the shaft 13. The lever 36 is pivoted to a support 40, moving with the casting-box, and the rod 37 is pivotally connected to the arm 38, thus permitting the lever to move independently of the arm. The pump-piston is pressed downward by the weight upon the piston-rod, and this movement is resisted by the pressure of the arm 38 against the cam 39. As the notch in the cam comes opposite the end of the arm once in each revolution the arm is permitted to move upward, allowing the pump-piston to be moved downward by the weight sufficiently to force the molten metal from the casting-box and through the openings 33. The casting-box may be heated in any suitable manner, preferably by means of a jet 41, supplied through flexible connections.

A horizontal reciprocation is given to the casting-box by means of a lever 42, pivoted in the frame of the machine and connected at its upper end to the casting-box by a slotted pivotal connection, the lower end of the lever being acted upon by a closed cam 43, mounted upon the shaft 13, the casting-box thus being reciprocated once at each revolution of the shaft.

As the mold-plate 15 rises it moves in contact with a block 44, carrying a knife 45, the edge of which is horizontal and against which the rear face of the mold-plate is pressed. The block 44 is slotted horizontally, and a plunger 45 moves through said slot, being connected by a link 46 to a lever 47, operated from the main shaft of the machine 48 by means of a bowl 49, carried by a crank-arm on the shaft and engaging cam-toes 50. These cam-toes 50 are carried by a block 51, slotted to reciprocate upon and be guided by the shaft and connected to the lower end of the lever 47 by a rod 52. By this construction the bowl 49, engaging the cam-toes 50, reciprocates the plunger 45 once during each revolution of the main shaft, thus forcing the printing-bar from the mold and into the trough 53, by which the printing-bars are received.

The operation of the casting mechanism will be readily understood from the drawings and a brief description.

It is assumed that a matrix has been placed in the holder and that the melting-pot contains a supply of molten type-metal, the parts being in the position shown in Figs. 1 to 4. By the operation of the machine the holder

is oscillated backward, and simultaneously the mold-plate is moved by its connections to the lower limit of its vertical movement. At the same time the casting-box is moved forward, and, as the mold-plate reaches its lowest position, comes in contact with the mold-plate and moves it forward in the slots 18 against the spring-pressure of arms 23, the bars 17 entering the short horizontal portion of the slots 18 and holding the mold-plate firmly in position, and the pump is then operated to force the molten metal into the mold-cavity 14. All the parts are now in the position shown in Fig. 5 and remain in this position during the casting of the bar. When the mold-cavity is filled and the bar cast, the casting-box moves backward and simultaneously as the pressure of the casting-box is released the springs 24, operating through arms 23, move the mold-plate backward, to the limit of the guiding-slots, in which position its rear face is pressed against the block 44 and knife 45. The mold-plate now rises and the rear face of the printing-bar is trimmed by the knife, the mold-plate continuing its upward movement until it reaches the position shown in Fig. 4, when the plunger 45 is operated to push the printing-bar out of the mold and onto the incline. Meanwhile the holder carrying the matrix has been oscillated forward to the position shown in Fig. 4, and all the parts are now in position for the next matrix.

It will be understood that other forms of casting-box and matrix-holders may be used with our reciprocating mold and that our invention is not to be limited to the exact form of mold and operating mechanism shown, this being but one of many that may readily be devised, and shown and described only as constituting the preferred form of mechanism in which our invention is embodied.

This application forms a division of our application, Serial No. 289,676, filed October 31, 1888.

What we claim is—

1. The combination of a matrix holder, and a mold reciprocating in straight lines in two directions, in one direction to and from contact with the matrix in the holder and in the other to and from a position for discharging the printing bar from the mold, substantially as described.

2. The combination of a casting box, a plunger for ejecting the printing bar from the mold, a casting box moving to and from the mold and a mold reciprocating in a straight line from a position wherein the mold cavity is in communication with the casting box to a position wherein the mold cavity is in the path of the plunger, substantially as described.

3. The combination of a matrix holder, a mold reciprocating in straight lines in two directions, and a casting box moving to and from the mold, substantially as described.

4. The combination of a mold reciprocating in straight lines in two directions, and a ma-

trix holder and casting box located on opposite sides of the mold and moving to and from the same, substantially as described.

5 The combination of a reciprocating casting box, a matrix holder, and a mold reciprocating from a position for discharging the printing bar to a position in which the mold cavity is in communication with the casting box, and moved against the matrix holder by
10 the casting box in the latter position, substantially as described.

6 The combination with a reciprocating casting box and matrix holder, of plunger 45, and mold 15 reciprocating in straight lines in two directions from the plunger to the casting box and matrix holder, substantially as described.

7 The combination with a casting box and matrix holder, of the swinging mold 15 reciprocating vertically and horizontally in fixed
20 guide slots 18, substantially as described.

8. The combination with a mold having rectilinear movement to and from its position for taking a cast from a matrix, of a plunger for ejecting the printing bar from the mold, 25 a casting box moving to and from the mold and mechanism which operates said plunger when the mold has moved from said matrix, substantially as described.

In testimony whereof we have hereunto set
30 our hands in the presence of two subscribing witnesses.

HOMER LEE.
EDMOND LEBRUN.

Witnesses as to the signature of Homer Lee:

J. J. KENNEDY,
C. J. SAWYER.

Witnesses as to the signature of Edmond Lebrun:

E. S. SIEBLE,
J. J. KENNEDY.