(No Model.)

# C. E. STRONG & H. G. LANGE.

## STEREOTYPE CASTING MACHINE.

No. 443,656. Patented Dec. 30, 1890.

Fig. 1.

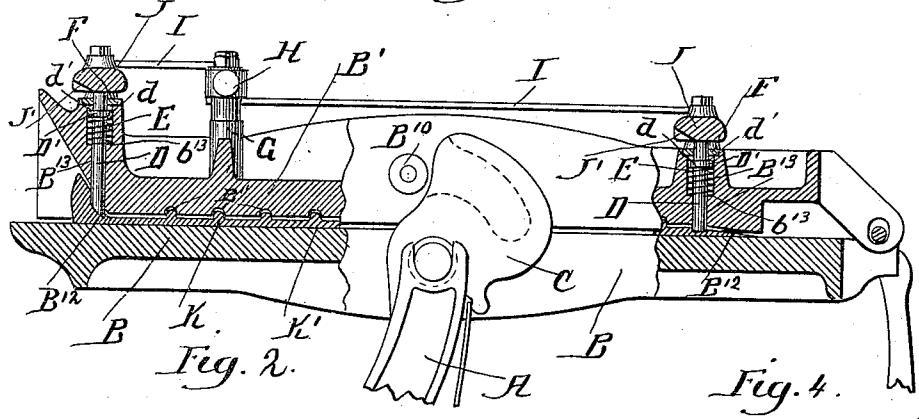
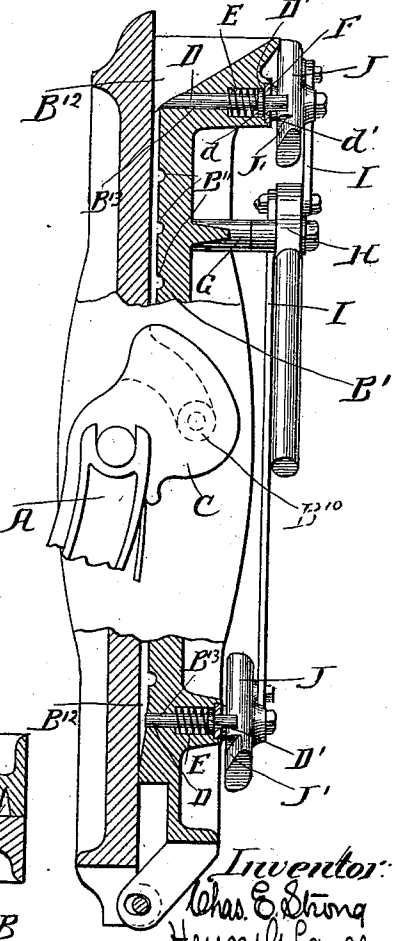



Fig. 2.

Fig. 4.



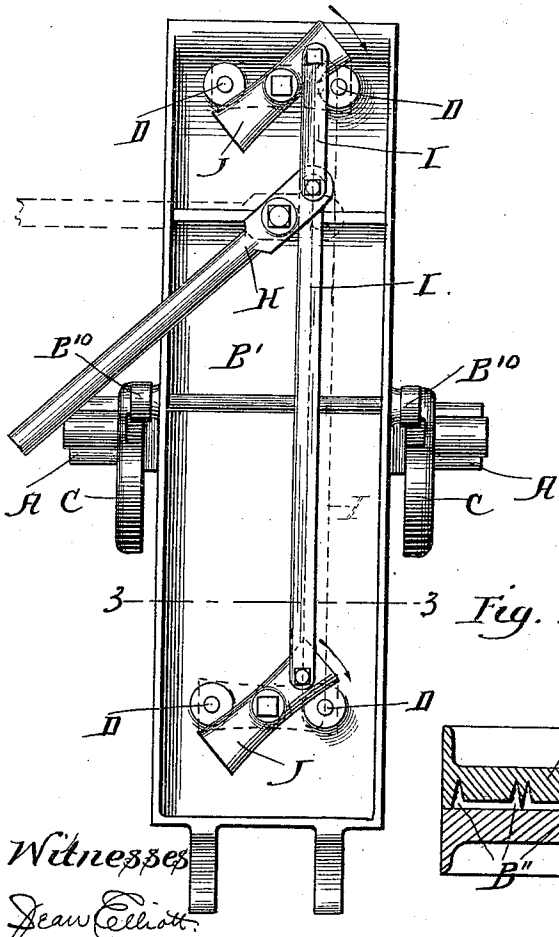
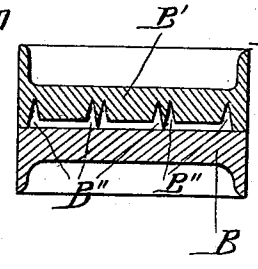




Fig. 3




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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

CHARLES E. STRONG AND HENRY G. LANGE, OF CHICAGO, ILLINOIS; SAID LANGE ASSIGNOR TO SAID STRONG.

## STEREOTYPE-CASTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 443,656, dated December 30, 1890.

Application filed September 8, 1890. Serial No. 364,247. (No model.)

*To all whom it may concern:*

Be it known that we, CHARLES E. STRONG and HENRY G. LANGE, citizens of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in a Stereotype-Casting Machine, which is fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide improved means for relieving a cast formed in a two-part mold or casting-box from one member of such mold or box when the form of the cast is such as would cause it to be retained in one member after opening the box. This is the case with casts of stereotype-plates or printers' furniture, which have the back formed with ribs or flanges which are employed to give the proper type height with the least possible weight consistent with strength. Casting-boxes or molds designed for the purpose of casting such printing plates or furniture have usually one member of the mold formed with a plain surface, this face, in case stereotype or other printing-face is desired, serving to receive the matrix, and being therefore hereinafter referred to as the "matrix-bed," the other member of the mold having channels in which the ribs of the cast are formed, said member being called the "cover."

Heretofore it has been customary to pry out the cast from the upper member or cover of the mold by any tool which can be inserted under the cast at the edge; but complicated casting-boxes have been constructed in which a greater or less portion of the bottom of the mold-cavity (usually the bottom of the grooves wherein the ribs are cast) is made movable, such movable portions constituting bars which extend longitudinally beyond the box and are actuated by mechanism by means of which they are forced and force the cast outward or downward. The first crude method is inconvenient and frequently damages the cast by the unequal and irregular application of the strain, and the second method is seriously objectionable, because it is impossible on account of the expansion caused by the molten metal to make such movable sections of the bottom of the mold fit closely enough in the cavities wherein they lie to prevent the metal running in around them and forming "feathers" on the cast, which in the first place prevent the same from relieving as it should, and in the second place necessitate labor and expense in dressing up the cast to render it serviceable. In our invention we provide, therefore, plungers which extend directly through the cover of the mold and protrude from the upper surface, while at the inner ends they are in position to bear against the waste portions at the ends of the cast, and we provide means for actuating these plungers at the proper time directly inward to force the cast off from the cover, or, to speak more correctly, in view of the movement which actually occurs, to force the cover off from the cast, the latter remaining in the position in which it is produced face downward on the matrix-bed. We thus avoid the unequal strain and awkward manipulation attendant upon the use of the hand tools or wedges mentioned, and also the faulty casts which result from the construction wherein sections of the bottom of the mold are made to serve as the means for forcing the cast off from the mold.

In the drawings, Figure 1 is a side elevation of a casting-box on a portion of the frame of the machine in which it is handled, the casting-box being shown partly in vertical section at the two ends. Fig. 2 is a plan of the same. Fig. 3 is a transverse section at the line 3 3 on Fig. 2. Fig. 4 is a sectional side elevation of the same device shown in the other figures with the casting-box in upright position ready for pouring in the metal.

A is one of the standards of the machine-frame in which the casting-box is journaled, B being the matrix-bed or lower half of the casting-box, and B′ the upper half or cover of the same. The two are clamped together in the movement which the casting-box is given by familiar mechanism (not shown) from horizontal to vertical position, the particular mechanism herein illustrated, which comprises the eccentric cam C, in whose groove the stud $B^{10}$ on the cover travels as the box

swings, is not herein claimed, being the invention of Henry G. Lange, whose application, Serial No. 364,241, was filed in the Patent Office simultaneous herewith.

For the purposes of our present invention it is immaterial what devices are employed to clamp the box and cover together.

The cover B′ has the grooves $B^{11}$ $B^{11}$, in which the ribs of the cast are formed, and has the extensions $B^{12}$ of the cast-forming cavity reaching beyond the ends of the ribs and beyond the end of the matrix which lies on the matrix-bed and forms the printing-face (represented at K′) on the cast, whose body is represented by K. Directly through the cover B′ are formed holes $B^{13}$ $B^{13}$ $B^{13}$ $B^{13}$, of which there are preferably at least two at each end beyond the ribs and leading into the extensions $B^{12}$ of the cast-cavity. Into these holes are inserted plungers D D D D, the holes being suitably enlarged at the upper part, in order that coiled springs E, encircling the plungers, may be stopped at the lower ends on the shoulder $b^{13}$, the bolts being provided with a shoulder *d*, against which the other end of the spring is stopped, whereby the springs tend to force the bolts outward, said shoulder *d* being formed by means of an annular enlargement of the bolt or collar fixed on the bolt represented at D′, the upper portion of said collar constituting a shoulder *d*′, which is stopped against the annular plate F, which is let into the upper side of the box at the margin of the holes after the bolt and spring have been inserted in place, said plate being suitably secured to the bed and constituting a marginal flange thereon around the plunger-holes. The position of these plungers being outside the portion of the cast designed to be retained, and adapted to protrude therefore into the space in which the waste margin is formed on the cast, adapts them to operate against that waste margin to expel the cast without danger of-damaging the body of the latter. These bolts at the end at which the metal is poured in protrude through the beveled portion of the cover where the same is cut away to make a flaring mouth for charging the mold with metal, and at their inner ends the bolts are correspondingly beveled.

In order to force the plungers inward, as is necessary for the purpose for which they are provided, we construct the mechanism, which will now be described, mounted on the upper side of the box.

Upon a stud-post G on the upper side of the box we pivot the lever H, and to one end of it we connect the bar I, the other end serving as a handle whereby it is operated. The bar I is connected intermediate its ends to the lever H, said bar being at its opposite ends connected to the cam-levers J J. Said levers are pivoted at their middle points on the upper side of the cover midway between the plungers D D at the ends, respectively, of the box, and the said point of connection of the bar I to said levers J J is distant from the pivot of said levers as far as the pivotal connection of the bar to the lever H is from the pivot of said lever, so that the two levers J and the portion of the lever H from the pivot to its connection with the bar operate as three parallel links connecting the bar to three pivots on the box—viz., the pivot of the lever G and the pivots of the levers J, respectively—so that the rocking movement of the lever H upon its pivot will give to the levers J J precisely equal and similar movements about their pivots respectively.

It is immaterial whether the bar I be integral, as indicated by the foregoing description, or be made in two parts, both connected to the pivot which joins them to the lever H. The drawings may be understood as representing either construction, the difference not necessarily appearing in the views presented. If this bar is made in two parts, their junction at said pivot need not be rigid, because their movement will be controlled by the lever H and the levers J J precisely as if they were rigidly united as one. Each of the levers has at each of its ends a cam-face J′, inclined with respect to the plane of movement of the levers about its pivot, said inclined faces being in position to collide with the ends of the plungers D as the levers are rocked over their pivots and to act as wedges to crowd the plungers inward against the reaction of the springs E.

When the box is prepared for casting, the metal, being run in, forms in the extension $B^{12}$ of the mold-space the portion of the cast (which as respects the ultimate use of the cast is a waste portion) at the ends covering the inner ends of the plungers. When the cast is completed and ready to be discharged, the clamping devices which hold the cover onto the matrix-bed being relaxed so that the two parts of the mold can be separated, the operator will by means of the lever H swing the levers J about their pivots in the direction of the arrow on Fig. 2, thereby causing the inclined cam-faces on the inner side of said levers to engage the protruding ends of the plungers and force the latter inward, their inner ends engaging the waste portion of metal of the cast which covers them, forcing the cast off from the cover of the mold. This will be done practically and usually before the mold has been opened—that is, before the cover has been in any degree separated from the bed—and the cover will be separated from the bed only in and by the movement which the cover itself receives from the action described by the cams and their actuating-plungers, so that in fact the plungers and cast will not move; but the plungers will simply be firmly held on the cast and hold the latter on the bed, while the cover will be forced off by the cams, the plungers serving as the points of resistance for the cams, whereby the latter, being operated by the levers which are pivoted on the cover, will wedge the cover upward. In case the cast

is one which does not require a matrix, or requires such a matrix that the mold may be opened without damaging the face produced in the matrix, the same devices will operate after the cover has been turned back free of the bed to force the cast off from such cover; but usually the method followed will be that first above described, wherein the cast is left upon the bed in the position in which it is formed and the cover relieved from it by the movement of the latter produced by the cams and their operating-levers.

We claim—

1. In a casting-box or mold, in combination with one member having grooves or cavities to form ribs or projections on the cast tending to retain the cast therein, plungers operating through such member transversely to the plane of parting between the two members and protruding from the outer surface of said member, levers pivoted to said member of the mold and engaging the protruding ends of such plungers, said levers being connected to a common operating-lever, whereby they may all be simultaneously operated to actuate the plungers inward to relieve the casts from the mold, substantially as set forth.

2. In a type-casting box or mold having in one member grooves or cavities adapted to form on the cast ribs or projections which tend to retain the cast in said member in combination with such member, plungers operating through it transversely to the plane of parting of the two members and into a cavity adapted to form waste metal on the cast, and levers fulcrumed on said member and actuating such plungers, respectively, substantially as set forth.

3. In a casting-box or mold, in combination with a member having recesses which tend to retain in said member the cast formed therein, plungers operating through said member transversely to the plane of parting of the two members, levers pivoted on the outer side of such member having inclined cams at their opposite ends in position to engage the protruding ends of such plungers as the levers oscillate, a link or bar connecting such levers, and a lever pivoted on the same member of the mold connected to such link or bar, and provided with a handle whereby it may be rocked on its pivot to oscillate the cam-bearing levers to cause them to force the plungers inward, substantially as set forth.

4. In a stereotpye-casting box, in combination with the cover having recesses which form projections on the cast tending to retain the latter in the cover and having cast-forming cavities at the ends beyond the matrix, whereby waste metal may be formed on the cast, plungers operating through such cover into such waste-forming cavities, springs reacting against such plungers tending to withdraw them from such cavities, levers pivoted upon the outer side of the cover and engaging the protruding end of the plungers, and a co-operating lever to which said plunger-operating levers are connected, whereby said levers may be caused to actuate the plungers inward to engage the cast at said waste portions and to force the same free from the cover, substantially as set forth.

In testimony whereof we have hereunto set our hands, at Chicago, Illinois, this 3d day of September, 1890.

CHAS. E. STRONG.
HENRY G. LANGE.

Witnesses:
CHAS. S. BURTON,
H. B. HALLOCK.