C. E. HOPKINS.

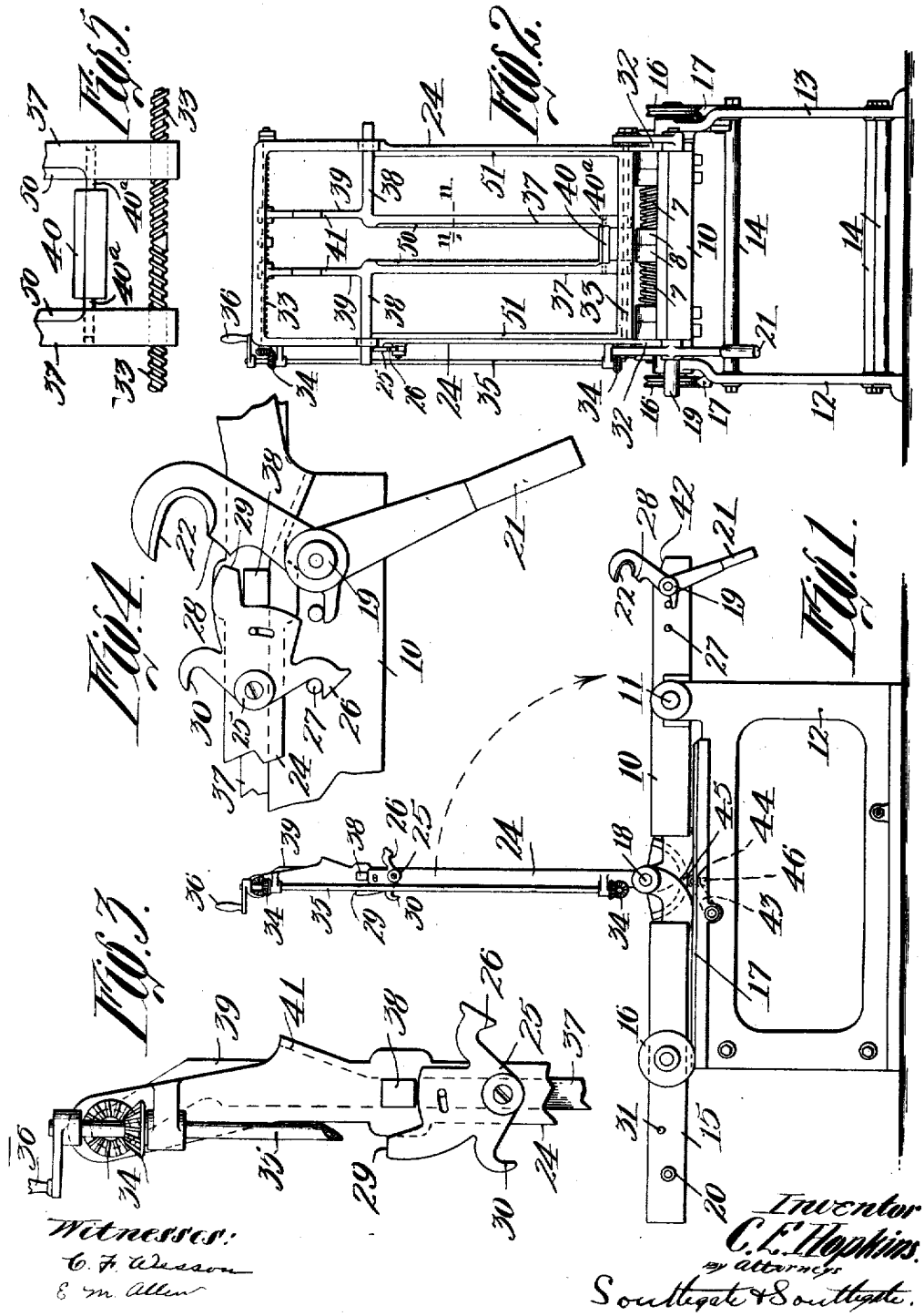
FLAT STEREOTYPE PLATE CASTING APPARATUS.

APPLICATION FILED APR. 5, 1913.

1,287,998.

Patented Dec. 17, 1918.

3 SHEETS—SHEET 1.



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

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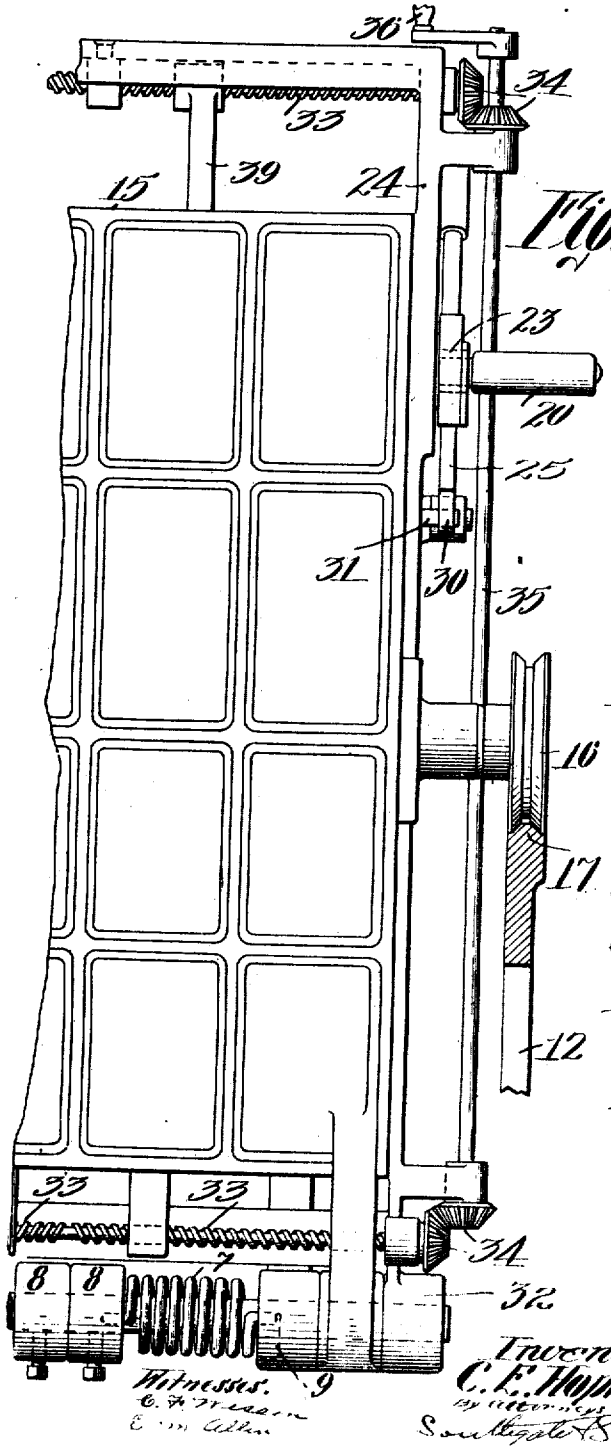


FIG. 7.

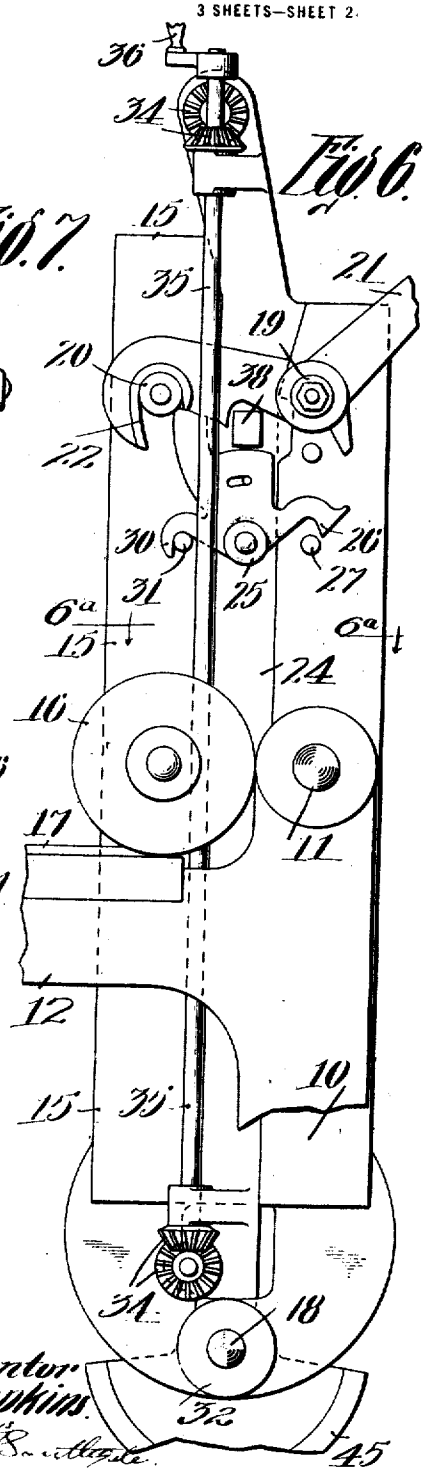


FIG. 6.

Witnesses.

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3 SHEETS—SHEET 3.

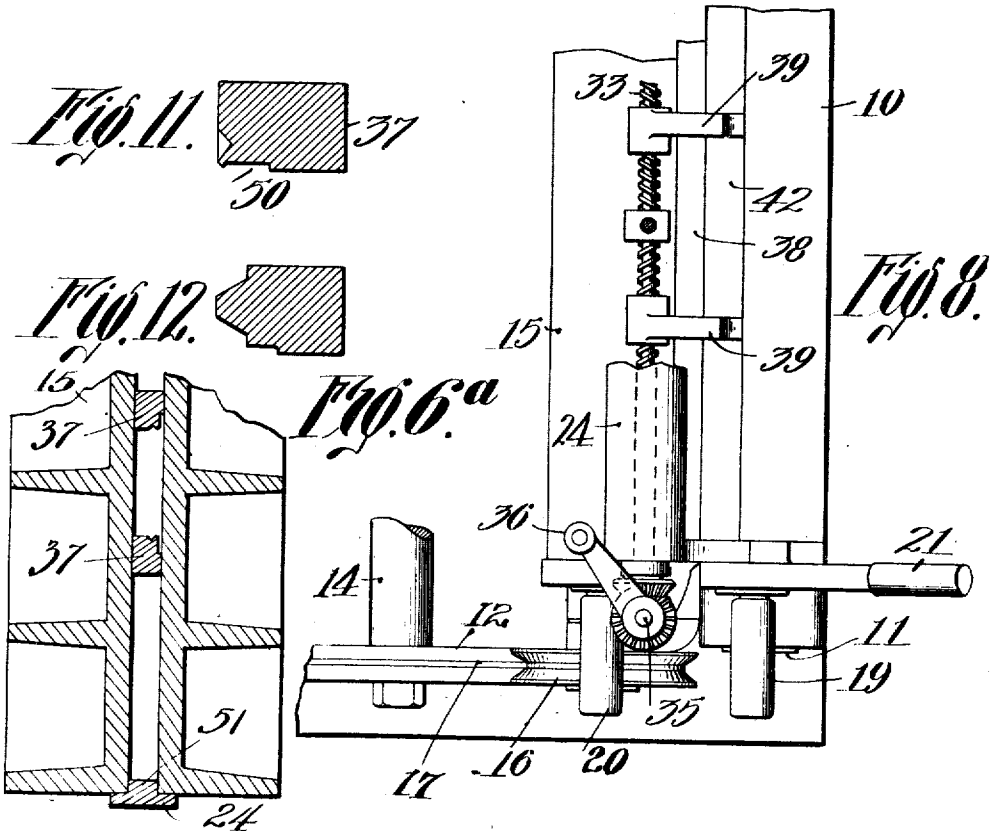


Fig. 8.

Fig. 6a

Fig. 12.

Fig. 11.

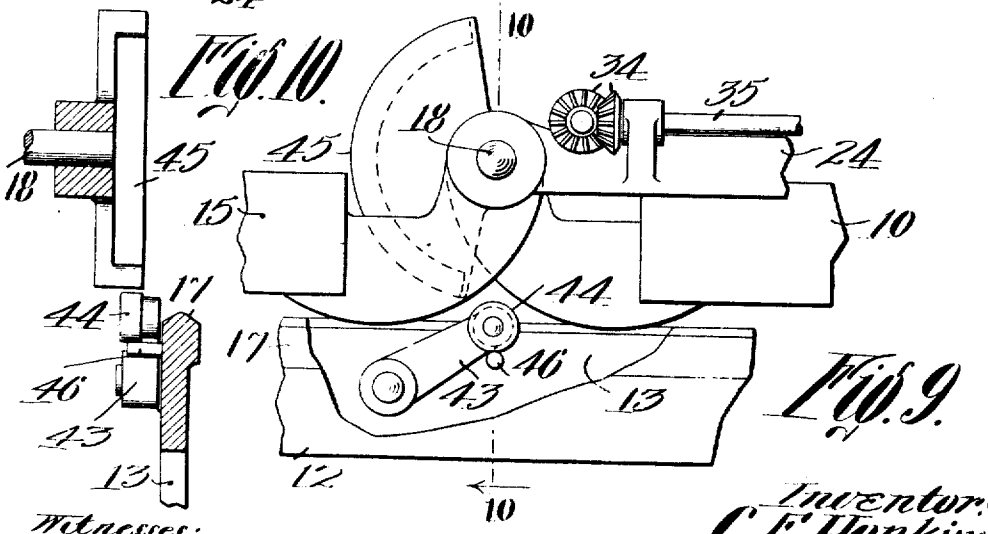


Fig. 10.

Fig. 9.

Witnesses:
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C. M. Allen

Inventor:
C. E. Hopkins.
by attorneys
Smith Hopkins & Smith

UNITED STATES PATENT OFFICE.

CHARLES E. HOPKINS, OF NEW YORK, N. Y.

FLAT-STEREOTYPE-PLATE-CASTING APPARATUS.

1,287,998. Specification of Letters Patent. Patented Dec. 17, 1918.

Application filed April 5, 1913. Serial No. 758,998.

To all whom it may concern:

Be it known that I, CHARLES E. HOPKINS, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Flat-Stereotype-Plate-Casting Apparatus, of which the following is a specification.

This invention relates to a machine for the production of flat stereotype plates and particularly for casting newspaper advertisements of various sizes.

The flat casting boxes now in use are composed of two members having flat surfaces and hinged together at one end; one of the members (called the matrix supporting back) is pivoted in a frame so the casting mold can be turned from the horizontal, open, to a vertical, casting, position with the open mouth of the casting chamber up to receive a charge of metal.

The casting bars in use, which form both the side walls of the casting chamber, and the means for holding a matrix in position for casting, are composed either of two L-shaped pieces with a clamp to fasten the cross arms together so the vertical arms can be moved toward or from each other for different sized casts, or of two L-shaped bars and a straight cross bar for the bottom. In either of these constructions the operator has to loosen up the clamps and adjust the side bars each time he changes the size of the cast.

Owing to the time lost in making this adjustment it has become the general practice to use three straight bars, that is, two long side bars and a short cross bottom bar. In this construction the operator has to handle each bar separately every time he sets a matrix in the box, and owing to the liability of the bars moving, when closing and clamping the casting members together, it is necessary to allow considerable margin all around that which will be the finished cast. This extra margin has to be removed from all sides of each cast, and thereby greatly increases the labor of producing a finished stereotype plate.

Although there are flat casting boxes with automatic locking devices they have not been perfected so as to come into general use in newspaper stereotype departments, and the old manner of locking the casting members together still prevails, in which there is a swinging yoke provided with a compress screw, or a set of screw clamps, pivoted to the sides of the matrix supporting back. In such construction the clamps and screws have to be manipulated twice for each casting operation.

The making of separate flat stereotype plates of each advertisement to be run through a series of editions has greatly increased in late years, and in many plants a large proportion of the work in the stereotype department consists of producing flat advertising plates.

The custom is to cut such advertisements as run more than a day or two from the regular page matrix which has been used to produce the curved plates for the printing press cylinders of the day's issue, and from these fragmental sections of the page matrix make separate flat casts which, when finished by trimming on all four sides and shaving down the bottom so as to make the plate type high, are inserted in the page type form, the corresponding type advertising matter being removed. The object is to preserve the type, as continuous use of loose type in molding and drying the matrix greatly depreciates its value at each operation.

Owing to the matrix thus secured not being provided with the usual flat margins the thickness of the plates varies greatly, as no provisions have been made in the casting boxes in use for gaging the thickness of the cast other than to rest the casting bars upon the flat bolster of the matrix. And in cases where the matrix margins are not flat but raised the same as the body of the matter the plate would be cast a great deal thicker than necessary, which extra thickness must be removed; and although the operator saves the necessity of making a special matrix by thus cutting it from the used page, he is required to do considerable labor in the finishing.

The principal objects of my invention are to provide a flat stereotype casting device in which variations in the thickness of the matrices does not affect the thickness in which the cast plate is delivered face up with the matrix on top; and in which plates can be cast conveniently.

In my preferred construction the flat

plates are supported between two side frames; one of the plates is pivoted between bearings formed in the frames, while the other is provided with rollers which can operate along tracks formed on top of the frames, the two plates being hinged together by their adjacent ends. By this construction the turning of the pivoted plate or "back" on its pivots causes the roller supported plate or "cover" to turn and at the same time advance along its tracks until both are in a vertical position in which there is formed a flat casting chamber thereinbetween.

I also provide a frame which I call the "casting bar frame". This frame is located between the casting back and cover and fast at one end to the pivot shaft of the hinge uniting the said back and cover. In this frame are supported two vertical casting bars readily adjustable toward and from each other to vary the width of the cast. There is also provided a series of cross or bottom bars of different lengths suitable for the various widths of cast desired.

Having set forth in a general way the advantages of this new casting apparatus over those in use, I will now describe the embodiment of my invention shown in the accompanying drawings, in which—

Figure 1 is a front side elevation with the casting members in open position, and the casting bar frame held in vertical position midway between the flat casting back and cover, both of which are horizontal.

Fig. 2 is a front end elevation of the apparatus with the members in the same position as in Fig. 1.

Fig. 3 is a partial side elevation of the casting bars on enlarged scale.

Fig. 4 is a side view of certain details in locked position on enlarged scale.

Fig. 5 is a front end elevation of certain parts on enlarged scale.

Fig. 6 is a partial side elevation with the casting members in closed position ready to receive a charge of metal.

Fig. 6^a is a horizontal cross section through the mold on the line 6^a—6^a of Fig. 6.

Fig. 7 is a rear end view with the casting members in closed position as in Fig. 6.

Fig. 8 is a plan of part of the mechanism with the casting members in the same position as in Figs. 6 and 7.

Fig. 9 is a front side elevation on enlarged scale with the members in open position, and a casting bar frame turned down with its vertical locking cam plate disengaged;

Fig. 10 is a sectional view on the line 10—10 of Fig. 9, and

Figs. 11 and 12 are sectional views of two forms of casting bars.

The matrix supporting back 10 is pivoted in bearing 11 between side frames 12 and 13. The said frames are held in position by stay rods 14. The casting cover 15 is supported by rollers 16 operating on tracks 17 formed on the top edges of the side frames 12 and 13.

The casting cover 15 is connected to the matrix supporting back 10 by a pivot shaft 18 in extending bearings located on the adjacent ends of the said back and cover. It will be seen that by this mechanism the act of lifting up on a lifting handle 19 on the back, will cause the back and cover to turn and advance along the tracks until they are in the vertical position shown in Fig. 6. A second handle 20 is provided and located on the said cover for the purpose of assisting in holding the cover in vertical position while the operator locks the members together by raising a locking lever 21, thus causing locking cams 22—22, carried on a shaft extending across and through the matrix supporting back 10, to engage over antifriction rollers 23—23 mounted concentrically with the handle 20 on studs on the cover 15.

The casting bars, which form the side walls of the casting chamber as well as a matrix holding or clamping means, are mounted in a rectangular frame 24 called a "casting bar frame" which is fixed on the pivot shaft 18. Owing to the casts varying in size it is necessary to make the said bars adjustable sidewise in the frame. The casting bar frame 24 is held normally in a vertical position by right and left counterbalance springs 7. The springs are mounted on the pivot shaft 18. One end of each spring is held in a recess in a collar 8 fast on the shaft, the opposite end operating in an elongated recess 9 formed on each adjacent bearing on the back 10. Therefore, each spring turns with the shaft 18 and frame 24. In turning from horizontal position, on either side, to vertical position, one spring is loose and turns freely until its end reaches the end of the stationary arcuate recess 9. Any further turning motion tends to uncoil that spring. By this arrangement when the casting bar frame is vertical both the right and left springs are engaged or slightly under pressure, but when the frame is pulled down against the pressure of either spring the opposite spring is free to move along the elongated recess. Thus one spring or the other is always under tension but only one spring is under tension at the same time, except when the back and cover are moved into closed position when both springs become engaged or under tension, and it becomes necessary to draw the cover up to the back, but on opening, the springs give the necessary impulse or start in separating the cover from the back so that only a slight pull on the

turning handle is necessary to return the back and cover to the horizontal position.

Owing to the casting bar frame being counter-balanced so as to lift free from the back means is provided for holding it down on the back so as to hold in position a matrix positioned between the back and casting bars of the frame. The means shown to accomplish this object is a latch 25 pivoted to one side of the casting bar frame 24. The latch is so weighted that as the frame is forced down over a matrix positioned upon the back and against the back's flat surface the latch's weight will cause the latch to turn on its pivot and engage a hook 26 formed on the latch, beneath a stud 27 on the back 10. In this manner the casting bar frame is held against the back with a matrix positioned thereinbetween while the casting members are being moved into vertical or casting position, whereupon the operator moves the locking cam 22 into locked position over the antifriction rollers 23.

The act of moving the locking cam 22 into locked position moves a cam face 28 on the arm of the locking cam 22 into engagement with the top of a projection 29, on the latch 25, which causes said latch to turn on its pivot, thereby disengaging the hook 26 from the stud 27 on the back 10, and moves a similar hook 30, on the said latch into engagement with a stud 31 on the cover 15. By this means the casting bar frame is caused to travel with the cover, upon opening the casting chamber, and to deliver a stereotype plate with its type face up and the matrix on top of the plate, instead of the type face down with the matrix beneath as in other casting boxes. The hook 30 remains engaged with its locking stud 31 until the operator removes the matrix, and examines the type face of the cast, after which he releases the cast from the casting bars as hereafter explained.

As stated, one of the chief features of this invention is the casting bar frame, which is mounted on the pivot shaft uniting the back and cover. This casting bar frame comprises the rectangular frame 24, provided with two bearings 32—32, in which bearings is supported the pivot shaft 18 of the back 10 and cover 15. Near each end of the casting bar frame is a right and left threaded shaft 33 operating in bearings at the ends of the rectangular frame 24. These shafts are connected by bevel gears 34 to an operating shaft 35, one end of which shaft having a crank arm on which is fixed an operating handle 36.

Positioned in this rectangular frame 24 are casting bars 37—37 supported by one of the helical shafts 33. Each bar has a right angular extension 38—38, which projects through an opening in the sides of the rectangular frame. This extension is to prevent any metal passing down between the bars and frame when casting. Between the bars 37, and held in position by pins 40ª extending through holes in the said bars, is a cross or bottom bar or head gage 40. Bars of different lengths are provided with each apparatus for the various widths of casts. Extending above, but out of alinement with the casting bars 37 are supporting arms 39—39 each of which is provided with a helical bearing through which passes one of the shafts 33. The opposite ends of the casting bars 37 are provided with extensions likewise provided with helical bearings through which another helical shaft 33 passes. It will be seen by turning the handle 36 both the shafts 33 are caused to turn and thereby worm the casting bars 37 toward or from each other for the purpose of adjusting for different widths of casts, or to release a cast. The purpose of supporting the cross bar 40 by pins is as aforesaid; to hold it in position when releasing a cast.

The casting bar supporting arms 39—39 are formed with a bevel 41, on one edge which engages a like bevel 42 on the back 10. These bevels form the side walls of the open mouth of the casting chamber when formed between the casting bars, back and cover. The casting bar supporting arms 39 are set back out of alinement with the casting faces of the casting bars.

As stated, the custom is to cut advertisements out of the regular full page matrix. These portions not being provided with the usual flat margins formed on a matrix, I have formed recesses 50 in the casting bars 37 to admit the high margins and arranged so the casting bars proper always rest on the face plates of the back 10 and cover 15 when casting. These bars are made a thickness equal to the height of standard type plus the thickness of an average matrix bolster. Owing to this recessing it is possible to cast a plate sufficiently true in thickness to dispense with the usual shaving operations. However, it is to be understood that what are known as thin plates can be cast in this apparatus by simply substituting thin bars for the type high.

To prevent springing of the back or cover each inner vertical face of the frame 24 is provided with a flange 51 made the same thickness as the casting bars 37.

For the purpose of locking the back and cover in horizontal position, and thereby preventing accident by a careless operator when the casting bar frame is vertical, I have mounted a rock lever 43 by one end on a pivot to the inside face of side frame 13, the opposite end of this lever 43 is provided with an antifriction roller 44, which engages, when in locked position, the outside

face of a cam plate extension 45 formed on one of the casting bar frame bearings 32. The action of this locking device is such that when the casting bar frame is pulled down and against the back 10 the cam plate extension 45 moves from engagement with the roller 44 and when the back is turned on its pivot to close the casting chamber the extension moves down beneath the roller. On the reverse movement of separating the back and cover, in which the casting bar frame moves along with the cover 15, the cam extension 45 passes up on the opposite side of the roller 44 engaging and pushing the same up until the extension has passed up and beyond the roller, whereupon the said roller drops back and against a stop pin 46 and alines with and engages the outside face of the cam extension 45. Upon releasing the hook 30 of the latch 25 on the casting bar frame from engagement with the pin 31 on the cover 15, the counterbalance spring of the casting bar frame will instantly elevate the said frame and move the cam extension over the roller, thereby locking the back and cover horizontally.

In operation the matrix is laid face up on the pivoted back, the counterbalanced casting bar frame is then pulled down toward the back and until the casting bars lightly engage the edges of the matrix, when the operator adjusts the matrix into proper position, after which the frame is forced solidly down against the back in which position it is held by the locking hook.

The casting bars being provided with suitable recesses for the matrix margins the variation in thickness of the matrix does not affect the thickness of the plate.

So long as the casting bar frame is free from engagement with either the back or cover the said back and cover can not be moved from their horizontal position, but when the frame is drawn down and locked either to the back or to the cover the locking mechanism is disengaged and the parts are free to be turned vertically to casting position.

During the locking of the back and cover in casting position, the latch is moved so as to disengage the casting bar frame from the back and engage it with the cover, and upon unlocking the back and cover and separating them they turn to horizontal position and the casting bar frame travels along with the cover and delivers the cast face up on top of the cover with the matrix on top of the said cast. This is a very valuable feature of the invention as it makes it unnecessary to lift the plate and matrix and turn them over for the purpose of removing the matrix and inspecting the plate.

This delivery of the plate face up has another great advantage in that should another cast from the same matrix be desired the operator can proceed, by laying the matrix in position on the back, releasing the casting bar frame from the cast by giving the screws a slight turn, and releasing the latch holding the frame down and turning the bars over to the back. During the time required to release the bars and position them over a matrix laid on the back for a following cast the cast plate has chilled sufficiently to be handled.

Certain features disclosed herein are not claimed as they constitute a part of the subject matter of my co-pending application filed on even date with this one, Serial No. 758,999.

Although I have illustrated and described only one form of the invention, I am aware that many modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited to all the details of construction herein shown and described, but what I do claim is:—

1. In a stereotype plate casting apparatus, the combination of a back, a cover, and casting bars pivoted between said back and cover and simultaneously adjustable in opposite directions.

2. In a stereotype plate casting apparatus, the combination of a back, a cover, casting bars, and means independent of said back and cover for supporting the said casting bars.

3. In a flat stereotype casting apparatus, the combination of a back, a cover, casting bars, and means for simultaneously moving the said bars toward or from each other.

4. In a flat stereotype plate casting apparatus, the combination of a back, a cover, casting bars positioned between said back and cover, and means independent of said back and cover for supporting the said casting bars.

5. In a flat stereotype plate casting apparatus, the combination of a back, a cover, casting bars arranged to engage with the back and support a matrix, and means for disengaging the said bars from the said back and engaging them with said cover.

6. In a stereotype casting apparatus, the combination of a back, a cover, relatively movable casting bars between them, and pivotal means independent of the back for supporting said casting bars.

7. A device for casting stereotype printing plates, comprising a casting box, embracing a pair of mold members, one being moved toward and from the other in the opening and closing of said casting box, there being a mold chamber formed between said mold members when the cast-

ing box is closed, and a pivotally mounted clamping frame adapted to hold a matrix or mat in said chamber, said frame including a clamping bar adapted to be adjusted to permit the casting of printing plates of various widths.

8. In a flat stereotype casting apparatus, the combination of a back, a cover, casting bars, and means independent of either the back or cover for supporting said casting bars.

9. In a flat stereotype plate casting apparatus, the combination of a back, a cover, casting bars, and means separate from either back or cover for carrying said bars.

10. In a flat stereotype plate casting apparatus, the combination of a movable back, a movable cover, means for holding a matrix, and means for delivering a cast made between the back and cover on the said cover with its type face up.

11. In a flat stereotype plate casting apparatus, the combination of a back and cover, a rectangular frame, movable casting bars supported in said frame, and means for simultaneously moving the said bars toward or from each other.

12. In a stereotype plate casting apparatus, the combination with a frame, of a flat back pivoted thereon, a flat cover hinged to said back, supports for said cover horizontally movable along said frame, and means for bringing the back and cover together to form a flat casting chamber.

13. In a stereotype plate casting apparatus, the combination of side frames having tracks thereon, a casting back pivoted between said side frames, a casting cover for said back hinged to one end of said back, rollers operating on said tracks formed on said side frames and supporting said cover, and means for moving both back and cover so as to form a casting chamber thereinbetween.

14. In a stereotype plate casting apparatus, the combination of a frame having tracks thereon, a casting back pivoted in the frame, a casting cover for the said back operative on the tracks on the frame, connections between the back and cover, and means for turning the back on its pivot and simultaneously moving the cover along the said tracks into engagement with the said back to from a casting chamber thereinbetween.

15. In a flat stereotype plate casting apparatus, the combination of a flat face back, a flat face cover, casting bars positioned between said flat faces, a hinge mechanism supporting said back, cover and bars independently, and means whereby the said parts can be moved on said hinge mechanism to form a flat casting chamber between the said flat faces and said casting bars.

16. In a stereotype plate casting apparatus, the combination with a frame, of a back pivoted thereon, a cover hinged to said back, supports for said cover movable along said frame, and means for bringing the back and cover together to form a casting chamber.

17. In a stereotype plate casting apparatus, the combination of a casting back, a casting cover, casting bars pivoted between said back and cover, means for moving the bars into engagement with the back, means for moving both back and casting bars so as to engage with the cover, means for locking the cover and back in said engagement and thereafter unlocking, and means for causing the bars to move with the cover on the separation of said back and cover.

18. In a stereotype plate casting apparatus, the combination of a horizontal back, a horizontal cover, a set of casting bars, and means operative with the bars for locking the said back and cover in horizontal position.

19. In a stereotype plate casting apparatus, the combination of a back and cover, pivoted casting bars co-acting with said back and cover, and a counterbalance for said casting bars.

20. In a stereotype plate casting apparatus, the combination of a back and cover, and casting bars disposed thereinbetween, said bars being provided with extending arms, and a means carried by said arms for adjusting said bars simultaneously.

21. In a stereotype plate casting apparatus, the combination of a back and cover, adjustable side casting bars, a cross casting bar positioned between said side bars, and means for locking the said cross bar in position between the said adjustable side bars.

22. The combination with a casting back, of a pair of casting bars pivoted to said back and adjustable toward and from each other, and a head gage movable with said casting bars about the pivot.

23. In a stereotype plate casting apparatus, the combination of a pivoted back for supporting a matrix, a cover movable toward and from the back, a casting bar frame between them, and yielding means for moving said frame away from the cover.

24. In a flat stereotype plate casting apparatus, the combination of a pivoted back for supporting the matrix, a cover movable toward and from the back, a casting bar frame pivoted between the back and cover, and yielding means tending to hold said frame away from both the cover and back in an intermediate position part way between them.

25. In a flat stereotype plate casting apparatus, the combination with a back and cover separable from each other, of a casting bar frame pivotally mounted between them, and two springs connected with said frame, one of said springs tending to move

the frame away from the cover and the other away from the back.

26. In a flat stereotype plate casting apparatus, the combination with a back and cover separable from each other, of a casting bar frame pivotally mounted between them, two springs connected with said frame, one of said springs tending to move the frame away from the cover and the other away from the back, and means whereby when said cover and back are separated and the frame is moved into contact with either one, one of said springs will be free from tension.

27. In a casting box, the combination with a back, of a cover therefor pivoted to the back on a transverse axis at one side of the back, gages pivoted to the back on a transverse axis, means for moving said gages toward and from each other, and means carried by the box for fixing the cover to the back.

28. In a casting box for stereotype plates, the combination of a back, a cover, a pair of slidable side bars, a right and left hand adjusting screw for moving said bars toward and from each other.

29. In a casting box for stereotype plates, the combination of a back and cover, with a pair of side gages supported between them, and a right and left hand adjusting screw connected with said side gages for moving them simultaneously toward and from each other.

30. The combination with a casting back, of a member pivoted to the back, and casting bars mounted on said member to move therewith about the pivot, said casting bars also being simultaneously adjustable toward and from each other along said member.

31. In a casting box, the combination with a back, of a cover therefor pivoted to the back on a transverse axis at one side of the back, gages pivoted to the back on a transverse axis, means for moving said gages toward and from each other, and means carried by one of the parts of the box for fixing the two parts together.

32. In a stereotype plate casting apparatus, the combination of a pivoted back for supporting a matrix, a cover movable toward and from the back, a casting bar frame movable between them, and means for preventing the moving of said cover or back while the casting bar frame is out of contact with them.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

CHARLES E. HOPKINS.

Witnesses:
C. W. BREWSTER,
BLODWEN W. JONES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."