Feb. 9, 1937. T. C. KORSMO 2,070,438

STEREOTYPE MOLD

Filed Jan. 12, 1935 2 Sheets-Sheet 1

Fig. 1

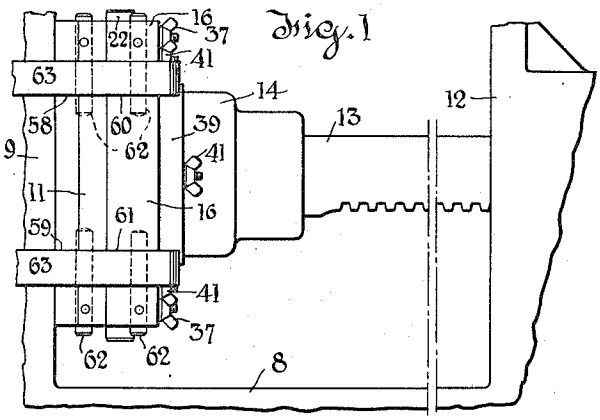


Fig. 5

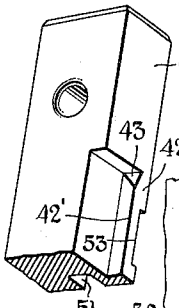


Fig. 3

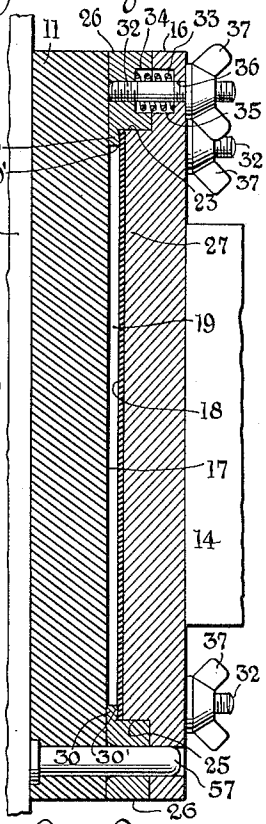


Fig. 2

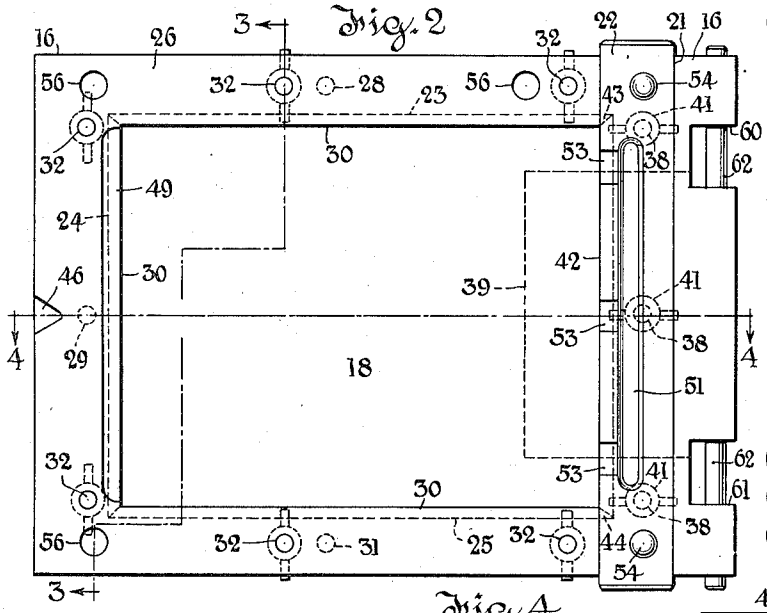


Fig. 4

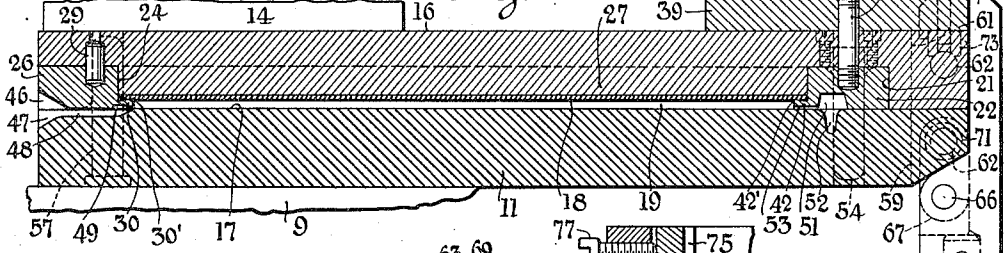


Fig. 6

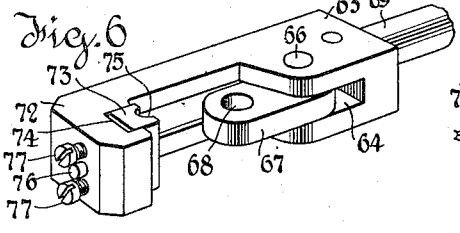
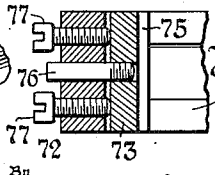


Fig. 7



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Feb. 9, 1937. T. C. KORSMO 2,070,438

STEREOTYPE MOLD

Filed Jan. 12, 1935 2 Sheets-Sheet 2

Fig. 10

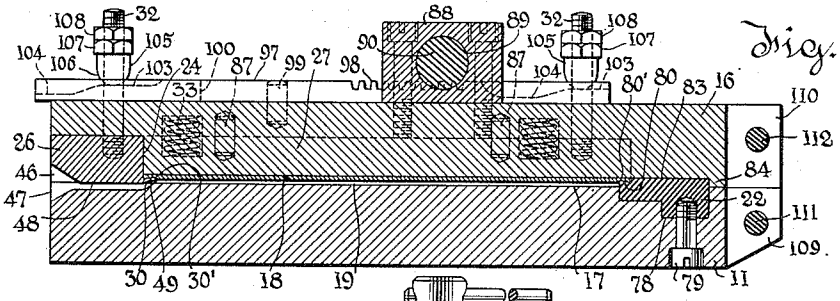


Fig. 9

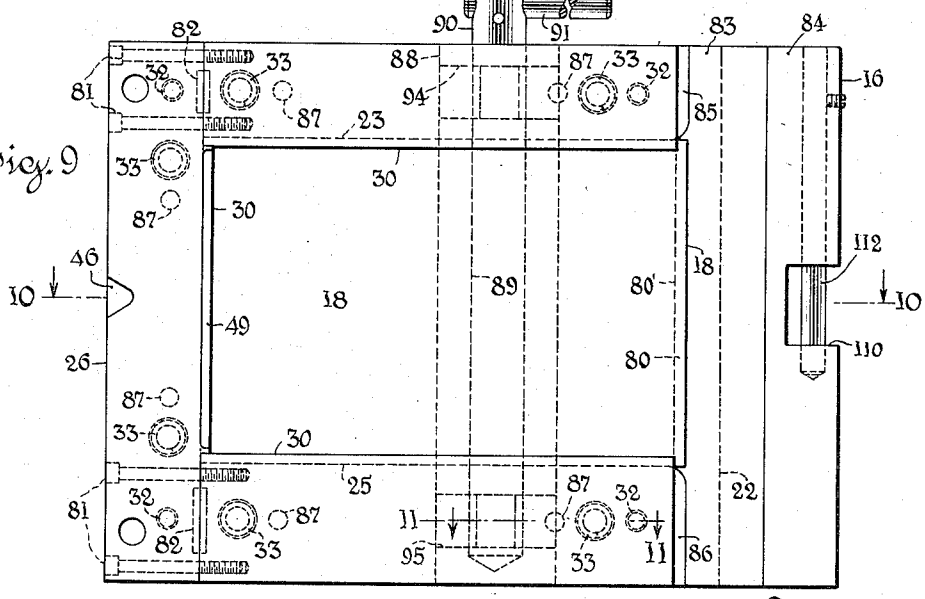


Fig. 8

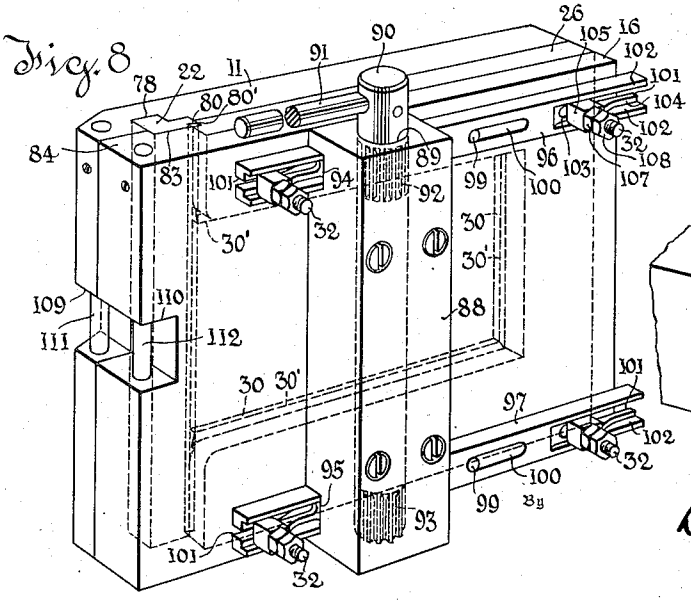


Fig. 11

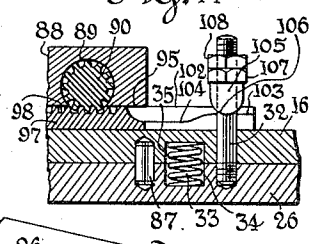
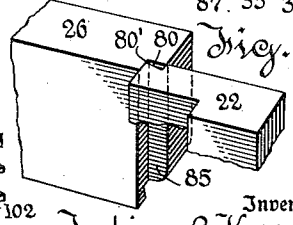


Fig. 12



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UNITED STATES PATENT OFFICE

2,070,438

STEREOTYPE MOLD

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Application January 12, 1935, Serial No. 1,575

14 Claims. (Cl. 22—5)

The present invention pertains to molds or dies for casting stereotype plates, especially flat stereotype plates.

The most important purpose of the invention is the provision of an efficient and yet simple separable die in which stereotype plate castings may be made without the numerous objectionable features characteristic of former constructions.

Improved means for clamping in place on the die the matrix from which the stereotype plate is made so that it is impossible for molten metal to flow behind the matrix and thus cause the production of defective stereotype plates, constitute an important feature of the invention. The clamping means are especially designed to permit ready insertion and removal of the matrix when desired, thereby materially reducing the time required to make large quantities of plates which requires frequent renewal of the matrix. The parts which comprise the clamping means are both few in number and simple in construction, thereby minimizing the time required in making replacements and the cost thereof.

A feature of one form of my improved die involves mounting the securing means for the matrix entirely on the part of the separable die to which the matrix is attached. This avoids any necessity for careful matching of the cooperating die parts and permits removal of the casting without disturbing the matrix or its securing means.

Another feature is the improved means for securely clamping the separable die parts together preparatory to making a sterotype plate casting. This is important because, while not limited thereto, the present die is primarily designed for pressure casting of stereotype plates. Additional features and objects will appear from the following detailed description and the accompanying drawings, in which are shown two practical embodiments of the invention now in use.

Fig. 1 is a side elevation of one form of the improved die mounted in a die casting machine, the die being closed and locked.

Fig. 2 is an enlarged front elevation of the movable half of the die of Fig. 1, showing a matrix clamped in place thereon.

Fig. 3 is an enlarged section on line 3—3 of Fig. 2 with the fixed half of the die shown associated with the movable half in the closed position of Fig. 1.

Fig. 4 is a similar section on line 4—4 of Fig. 2, showing the fixed die half as in Fig. 3, and also the clamping means for the die halves.

Fig. 5 is a fragmentary perspective of one of the matrix clamping members.

Fig. 6 is a fragmentary perspective of one of the die clamping devices removed from the die.

Fig. 7 is a vertical section through the hooked end of the die clamping device of Fig. 6.

Fig. 8 is a perspective of another form of the die, the same being shown closed with a matrix clamped in place therein.

Fig. 9 is an enlarged front elevation of the movable die half of Fig. 8 with the matrix in place.

Fig. 10 is a section on line 10—10 of Fig. 9 with the fixed half of the die shown associated with the movable half in the closed position of Fig. 8.

Fig. 11 is a section on line 11—11 of Fig. 9.

Fig. 12 is a fragmentary perspective of a portion of the matrix clamping means.

Referring to the embodiment of the invention shown in Figs. 1 to 7, the frame 8 of the casting machine on which my improved die is used includes a standard 9 to which a stationary die half 11 is removably secured, as appears in Fig. 1. Suitably mounted for horizontal reciprocation in an opposing standard 12 is a ram 13. A die carriage 14 on the outer end of ram 13 has detachably secured thereto a movable die half 16. Suitable operating means, preferably manual (not shown), are provided to reciprocate ram 13 and thus either close and lock movable die half 16 against stationary half 11, as shown in Fig. 1, or separate the die parts as when removing a casting.

Stationary die half 11, as shown in Figs. 3 and 4, consists merely of a flat part having a substantially plain inner face 17 with which movable die half 16, a rectangular matrix sheet 18 secured thereon, and the matrix securing means coact to form the die cavity 19.

Movable die half 16 also comprises a plate-like part which, however, on its inner face is grooved at 21 along one edge to receive an elongated matrix clamping member 22. The die half is also rabbeted at 23, 24, and 25 on its three remaining edges to receive a U-shaped matrix clamping member 26. There is thus provided a central projecting portion 27 on die half 16. Upon this die portion 27 is supported the matrix sheet 18 which is substantially coextensive therewith. Matrix 18 is formed of papier-mâché, cardboard, or other deformable material suitable for the purpose.

The U-shaped clamping member 26 is somewhat thicker than projection 27 so that it serves in part to form the edges of the die cavity 19. Member 26 has a continuous lip or flange 30 extending entirely around its inner edge between which and central portion 27 of the die half extend the three corresponding edges of matrix

18. Clamping member 26 is adapted to slide back and forth on central portion 27 incidental to the operation of inserting and removing matrices as explained later. For this purpose it is provided with guide pins 28, 29, and 31 slidably engaging corresponding sockets in movable die half 16 (Figs. 2 and 4). Clamping member 26 also has projecting therefrom a plurality of stud bolts 32 (six being shown), whereby it may be adjustably secured to the die part. Surrounding each bolt 32 is a partially compressed coil spring 33 which is arranged in coacting sockets 34, 35 surrounding the bolt and located in the opposed faces of clamping member 26 and movable die half 16, respectively. The bolt extends freely through an opening 36 in the die half and its projecting end carries a wing nut 37 bearing against the die half.

The parts are so proportioned that with the several wing nuts 37 screwed up, as shown in Figs. 3 and 4, lip 30 on clamping member 26 tightly clamps the three edges of the matrix against central portion 27 of the die half. In order to insure a tight seal between lip 30 and the matrix, the inner or matrix-engaging face of lip 30 is slightly undercut or transversely inclined from its outer edge inwardly and away from the matrix-receiving face of die portion 27. Thus, there is provided on the lip 30 a relatively sharp edge 30' which compresses or pinches the matrix against the die portion 27 a short distance inwardly from the edges of the matrix.

Since all of the coil springs 33 on bolts 32 are under compression, it will be clear that, when the die is open and wing nuts 37 are loosened, these springs will serve to slide clamping member 26 outwardly on central die portion 27. As a result, matrix 18 is automatically released from the clamping action of lip 30.

Clamping member 22, which secures the remaining edge of the matrix, abuts against the legs of U-shaped member 26 and has a plurality of stud bolts 38 (three being shown) for adjustably securing it in place on movable die part 16. Each bolt 38 extends freely through an opening in the die half, while the middle bolt also extends freely through an opening in a block 39 secured to the back of the die half. The projecting end of each bolt 38 carries a wing nut 41 bearing against the die half.

Similarly to U-shaped clamping member 26, clamping member 22 has a lip or flange 42 on its inner edge (Figs. 2 and 4) between which and central portion 27 of the die half extends the edge of matrix 18. Lip 42 also has its matrix-engaging face similarly slightly undercut or transversely inclined to provide a relatively sharp edge 42' which, when wing nuts 41 are screwed up, compresses the matrix against die portion 27 a short distance from the edge of the matrix.

Clamping members 22 and 26 form a rectangular frame the lip edges 30' and 42' of which not only clamp matrix sheet 18 securely in place but also form therewith a continuous, unifom seal on a line extending along the four edges of the matrix and spaced a short distance inwardly thereof. This precludes all possibility of molten metal entering die cavity 19 under pressure from leaking behind matrix 18 which obviously would result in the production of defective stereotype plates. As a further means of insuring an uninterrupted tight seal extending entirely around the matrix, the matrix-engaging side of lip 42 on clamping member 22 has inclined triangular surfaces 43, 44 at its upper and lower ends which form continuations of the inclined matrix-clamping surface of lip 30 on clamping member 26. Thus the form of the clamping lip at the four corners of the rectangular clamping frame is the same and uniformity at all points in clamping the matrix to the die is assured.

Although the edges 30' and 42' of the clamping frame securely hold the matrix in place and prevent leakage of metal therearound, the slight inclination of the matrix engaging surfaces of the clamping lips 30 and 42 away from the matrix supporting surface of the die permits shrinkage of the matrix and resulting slippage of the same past binding edges 30', 42' without shearing the matrix at these points, as would be the case were sharp beads used to clamp the matrix in place.

While the die construction of Figs. 1 to 7, and that of Figs. 8 to 12 described later, are of the side-gated type, it will be obvious that the improvements described herein are applicable to other types of dies. In the die of Figs. 1 to 7, U-shaped clamping member 26 is grooved at 46 and stationary die half 11 at 47 to provide, when the die is closed, an inlet opening into which molten metal, generally zinc alloy, is fed under pressure by any suitable means. Thence, the metal passes into an inwardly flaring, runner passage 48 and a cooperating groove 49 extending across the base of clamping member 26 and is discharged into and fills die cavity 19.

Clamping member 22 has a longitudinal groove 51 and die half 11 a coacting groove 52 which form an overflow chamber to receive excess metal from the die cavity through shallow transverse grooves 53 in the face of member 22. This permits escape of gases and gas-contained metal from the die cavity proper and results in the production of better castings.

Guide pins 54 mounted on movable die half 16 and corresponding openings in clamping member 22 and stationary die half 11 provide for proper registry of the die halves. Openings 56 in U-shaped clamping member 26 and movable die half 16 also receive similar guide pins 57 (only one of which is shown) mounted on stationary die half 11.

Additional manually operable means are provided for locking the forwardly projecting edges of the die halves tightly together when the die is closed. An upper notch 58 and a lower notch 59 on the edge of stationary die half 11 aline with an upper notch 60 and a lower notch 61 on movable die part 16. Extending across each of these notches is a pin 62.

The upper pair of pins 62 and the lower pair are adapted to be connected by separate clamping devices to lock the die closed. Since these devices are duplicates, only the upper one will be described. The body 63 of the clamping device (Fig. 6) has a slot 64 across which extends a pin 66. On this pin is pivotally mounted a link 67 the outer end of which is perforated at 68 to receive pin 62 on the stationary die half. Thus, the entire clamping device is pivotally supported for horizontal swinging movement on the stationary die half. An operating handle 69 is provided on member 63 for this purpose. Spacer sleeves 71 (Fig. 4) on pin 62 above and below link 67 properly locate the link on the pin.

The outer end of the clamp 63 is in the form of a hook 72 which in the closed and locked condition of the die engages the pin 62 in notch 60 on the movable die half. In order to provide for necessary adjustment between the parts, a bearing block 73 is slidably mounted in a groove 74

in hook 72. A groove 75 in the block receives the pin 62 on the movable die half. A guide pin 76 on the block cooperating with an opening in hook 72 and set screws 77 mounted in the hook (see Fig. 7) provide for adjustment of the block and its proper retention in adjusted position.

It will be seen that body 63 and link 67, in conjunction with pin 66 and the two pins 62, form a toggle arrangement which securely locks the die halves together when the parts are moved into the position of Fig. 4, by means of handle 69, i. e., into a position with the three pins in alinement. In order to release the device, handle 69 is simply swung to the right (Fig. 4) to break the toggle. Clamp member 63 may then be moved by the handle to release hook 72 from pin 62 on the movable die half.

In use, assuming the die halves are clamped securely together by means of ram 13 and the pair of toggle devices and the matrix 18 is in place as shown, molten metal fed into the die cavity forms the desired stereotype plate casting. When sufficient time has elapsed to permit the casting to freeze, the two handles 69, 69 are operated to disconnect hooks 72, 72 from the movable die half 16. Ram 13 is then operated to open the die, whereupon the casting may be readily removed from the movable die half without disturbing the matrix or its clamping means. After trimming, and cutting to size if necessary, the resulting stereotype plate is ready for use.

Following removal of the casting, ram 13 is operated to close the die and the two toggle devices on the fixed die part manipulated to lock the die parts together in the manner already described. The casting operation may then be repeated.

The number of castings which may be made from a single matrix varies. When, however, it becomes necessary to replace the matrix, with the construction above-described this involves a simple operation which may be accomplished with considerable facility. After the die is opened and the casting removed, wing nuts 41 on the three stud bolts 38 which hold matrix-clamping member 22 in place, are removed. Member 22 is then entirely removed from die half 16 by grasping its extremities, which project somewhat above and below the die, and pulling the member off of guide pins 54 and out of its groove, the stud bolt openings in the die part permitting passage of the bolts. This releases one edge of matrix 18 and exposes it ready for grasping by the operator.

The six wing nuts 37 holding U-shaped matrix-clamping member 26 against the matrix are now loosened and retracted on their bolts. As a result, clamping member 26 is automatically moved to the left on matrix-supporting projection 27 by the expansive force of the several compressed coil springs 33, stud bolts 32 sliding through openings 36 to permit such movement. This causes the matrix to be released on its other edges whereupon the operator may remove it from the die by grasping the right hand edge of the matrix and withdrawing it from beneath the clamping edge 30 of U-shaped member 26.

A new matrix is now slipped into place and wing nuts 37 tightened to move member 26 into matrix-clamping position. Upon positioning of clamping member 22 in its groove and replacement and tightening of wing nuts 41 on their bolts 38, the clamping means are restored to their original position and the matrix is securely held in place ready for the casting operation.

An important advantage of the construction described is the mounting of the matrix-securing means entirely on the movable die half so that it clamps the matrix in place independently of the stationary die half. Thus the movable die half is a unit in itself insofar as mounting and securing of the matrix in place is concerned. As a result, there is avoided the necessity, quite common with other dies of this type, of accurate matching of the coacting die halves. In the present arrangement, the matrix and projection 27 form one side of the die cavity, while the outer faces of matrix-clamping members 22 and 26, which latter form the edges of the cavity, comprise a plane surface flush with the inner face of the movable die half 16, as appears in Fig. 4. Hence, the inner face of fixed die half 11 need be nothing more than a plane surface which forms the other side of the die cavity. In constructions where secure clamping of the matrix in place is dependent, even in part, upon functioning of both parts of the die, it is necessary to properly reposition the matrix each time a casting is removed. Obviously, there is no need for this in the above-described construction.

The die construction of Figs. 8 to 12 is substantially the same as that of Figs. 1 to 7, with the exceptions that in the former member 22 of the matrix clamping means is mounted on the fixed die half and a single means common to all of the stud bolts 32 attached to U-shaped clamping member 26, are provided for simultaneously operating these bolts to move member 26 into clamping engagement with the matrix or for simultaneously releasing the bolts to permit automatic unclamping of the matrix by the action of coil springs 33 on member 26.

In the die of Figs. 8 to 12, fixed die half 11 is grooved at 78 on its inner face 17 to receive matrix clamping member 22 which is firmly secured in place by machine screws 79 extending through suitable openings in the die part. Member 22 projects somewhat from the face of die half 11 and at its inner edge is formed with an undercut lip 80, having a relatively sharp edge 80', extending the entire length of member 22 for clamping engagement with the front edge of the matrix 18 on the movable die half when the die is closed, as shown in Fig. 10.

Movable die part 16 is rabbeted at 23, 24, and 25 along three of its edges, similarly to the die of Figs. 1 to 7, to receive the U-shaped member 26, thus providing the central projecting portion 27 upon which the matrix 18 is adapted to be clamped. At the front edge of die half 16, projecting portion 27 is formed with an extension 83 running from the top to the bottom of the die and closing the front ends of rabbets 23 and 25 (Fig. 9). As shown in Fig. 10, extension 83 forms a bearing surface for clamping member 22 when the die is closed. Die half 16 has a projecting front edge portion 84 which engages the stationary die half at this time.

Member 26, as before, has a continuous undercut matrix clamping lip 30 extending entirely around its inner edge and provided with a sharp edge 30' for engaging the matrix. Member 26 may be made in one piece, if desired, or in three pieces, as shown in Fig. 9, the parts being rigidly secured together by machine screws 81 and keys 82. The outer ends of the legs of member 26 are cut away at 85 and 86 (see Figs. 9 and 12)

to accommodate lip 80 of member 22 when the die is closed and thus permit the sharp edge 80' of member 22 to engage the matrix on central portion 27. This position of member 22 is indicated in dotted lines in Fig. 9.

U-shaped member 26 is adapted to slide back and forth on central portion 27 when a matrix sheet is inserted or removed. Pins 87, mounted on U-shaped member 26 and slidably engaging corresponding sockets in movable die half 16, serve to guide member 26 during such movements. A number of stud bolts 32 (four being shown) project from member 26 and extend freely through suitable openings in the movable die half for adjustment as described later to secure member 26 in clamping engagement with the matrix, as shown, or to release the matrix. Registering sockets 34 and 35 in the opposed faces of clamping member 26 and movable die part 16, respectively, provide chambers to receive coil springs 33 which constantly urge member 26 outwardly away from die part 16 to release the matrix.

The common adjusting means for the four bolts 32 attached to member 26 will now be described. Fixed on the outer face of movable die half 16 between the right hand and left hand pairs of bolts 32 is a housing 88 having a passage 89 therein closed at its lower end. Mounted for rotation in said passage is a shaft 90 having its upper end projecting from the housing and provided with an operating handle 91. Shaft 90 is formed with an upper toothed or pinion portion 92 and a lower toothed portion 93 which extend across slots 94, 95, respectively, provided on the inner face of housing 88. Mounted for reciprocation in slots 94, 95, respectively, is a pair of bolt operating bars 96, 97 each having a rack portion 98 meshing with the corresponding pinion portion of shaft 90. Since the construction and operation of these bars are identical, only the upper one will be described in further detail.

Bar 96 is limited in its reciprocatory movements by a pin 99 secured to die half 16 and projecting into a slot 100 in the bar. At each end bar 96 is slotted at 101 to receive the outer end of the corresponding stud bolt 32. At each side of slot 101 the bar is rabbeted to provide a flange 102 and also a cam surface having an elevated portion 103 and a depressed portion 104. On each bolt 32 is mounted a flat-sided sleeve 105 having a rounded end 106 bearing upon the cam surface of bar 96 and guided by flanges 102, 102. A pair of nuts 107, 108 holds the sleeve in place.

It will thus be clear that when handle 91 is swung to rotate shaft 90, toothed portions 92, 93 will coact with the rack portions on bars 96 and 97 to operate the two bars simultaneously. When handle 91 is in the position of Fig. 8, the elevated portion 103 of each of the cam surfaces on the bars 96, 97 engages the sleeve 105 on each of the four stud bolts 32. The parts are so dimensioned and adjusted that in this position elevated portions 103 coact with sleeves 105 and these in turn coact with nuts 107 and bolts 32 to hold U-shaped member 26 with its lip 30 in tight clamping engagement with the edges of the matrix. With the die closed, as shown, the front edge of the matrix is also securely clamped in place, the sharp edges 30' and 80' of the clamping members thus serving to provide the highly desirable continuous line of sealing extending entirely around the matrix and spaced inwardly somewhat from its edges.

The front edge of stationary die half 11 is notched at 109 and the movable half 16 at 110. Across notches 109, 110 extend pins 111, 112 adapted to be connected together by a device similar to device 63 in the construction of Figs. 1 to 7 to clamp the forward portions of the die halves firmly together. For sake of clearness, this device is not illustrated in the construction of Figs. 8 to 12.

Following injection of a charge of metal into die cavity 19 and freezing of the metal, the die is opened and the plate casting removed. Although the front edge of the matrix is released from the clamping action of member 22 at this time, the matrix is not disturbed, since it is still securely clamped onto the movable die half by U-shaped member 26. The die may then be closed and the casting operation repeated.

When a new matrix is to be inserted, after the die is opened and the casting removed, handle 91 is swung to operate shaft 90 and move bars 96, 97 towards the front of the die. Slots 101 permit this movement of the bars on stud bolts 32. During the forward movement of the bars, and in fact at all times, sleeves 105 are maintained in contact with the cam surfaces on the bars by the constant tendency of U-shaped member 26 to move away from the die half because of the action of springs 33 thereon. Thus, as the forward movement of bars 96, 97 continues, depressed cam portions 104 are brought opposite sleeves 105, thereby permitting springs 33 to force member 26 outwardly on central portion 27 of the die half. The matrix, having now been fully released, may be removed by sliding it forwardly from beneath clamping lip 30 of member 26.

After a new matrix has been slipped into place, handle 91 is swung back to the position illustrated, thereby operating shaft 90 and moving bars 96, 97 rearwardly to restore the parts to their original positions. As a result of re-engagement of elevated cam portions 103 with sleeves 105, U-shaped member 26 is drawn towards the die half against the resistance of springs 33 and its lip 30 clamped in sealing engagement with the matrix. The die may now be closed and casting operations continued.

While the improved matrix clamping means of Figs. 1 to 7 are shown as supported upon the movable half of a pressure casting apparatus, they are equally as well adapted to be carried by the fixed die half. They may likewise be utilized on a separate die unit or casting box of either the pressure or gravity types, as may also the matrix clamping arrangement of Figs. 8 to 12.

What is claimed is:—

1. The combination in a multi-part, stereotype die of a die part; a second die part cooperating with the first-mentioned die part to form a die cavity; and a closed frame carried by the die for clamping a matrix sheet in place in the die cavity, said frame being provided with a continuous surface between which and the die the matrix is to be clamped, the matrix engaging surface of said frame having a slight, transverse inclination extending from the inner edge of said frame and away from the matrix supporting surface of the die, whereby said matrix engaging surface of the frame is adapted to bind the matrix in sealing contact with the die completely around the edges of the matrix and a relatively short distance inwardly therefrom, but permits movement of the matrix due to shrinkage thereof.

2. The combination in a pressure casting, stereotype die of a die part; a second die part; and a rectangular frame carried entirely by said

first-mentioned die part for clamping a matrix sheet thereon, said die part forming one side wall of the die cavity, said frame forming the edge walls of the cavity and having a plane outer surface, and the second-mentioned die part having a plane surface, adjacent the plane surface of the frame, forming the opposite side wall of the cavity and cooperating with the frame and the first-mentioned die part to provide a die cavity completely closed except for a metal inlet opening leading thereto.

3. The combination in a multi-part stereotype die of a die part having a matrix receiving surface; and a matrix clamping member adjustably mounted on the die part and between which and the die part the edge of a matrix is to be clamped, the matrix engaging surface of said clamping member having a slight, transverse inclination extending inwardly from an edge thereof and away from said matrix receiving surface, whereby said matrix engaging surface of the clamping member is adapted to bind the matrix in sealing contact with said matrix receiving surface a short distance inwardly from the edge of the matrix, but permits movement of the matrix due to shrinkage thereof.

4. The combination in a multi-part stereotype die of a die part having a matrix receiving surface; and a matrix securing member adjustably mounted on the die part, said member being provided with a projecting lip between which and said matrix receiving surface the edge of a matrix is to be clamped, the matrix engaging face of the lip having a slight, transverse inclination extending inwardly from its extreme outer edge and away from said matrix receiving surface whereby said lip is adapted to engage and bind the matrix in sealing contact with the die part a short distance inwardly from the edge of the matrix, but permits movement of the matrix due to shrinkage thereof.

5. A multi-part stereotype die having a matrix receiving surface; and a closed matrix securing frame adjustably mounted on the die, said frame being provided with a continuous inner lip between which and said matrix receiving surface the edge of a matrix is to be clamped, the matrix engaging face of the lip being continuous and having a slight, transverse inclination extending inwardly from its extreme outer edge and away from said matrix receiving surface at all points throughout its length whereby said lip is adapted to engage and bind the matrix in sealing contact with the die completely around the matrix and a short distance inwardly from the edge thereof, but permits movement of the matrix due to shrinkage thereof.

6. The combination in a multi-part stereotype die of a die part provided with a projecting portion having a matrix receiving surface; a matrix clamping frame slidably mounted on said projection for movement substantially perpendicular to the matrix receiving surface and having a lip between which and said matrix receiving surface the edges of a matrix are adapted to be clamped; and means for adjustably securing the clamping frame to the die part.

7. The combination with a separable stereotype die having a projecting portion with a matrix receiving surface of a multi-sided closed frame carried by the die for clamping a matrix in place on said matrix receiving surface, said frame consisting of a multi-sided clamping member mounted on said projecting portion of the die for bodily movement toward and from the matrix and a second member to complete the closed frame.

8. The combination in a stereotype die of a die part; a second die part coacting with the first-mentioned die part to form a die cavity, said first-mentioned die part having a rectangular projecting portion provided with a matrix receiving surface within the die cavity; a U-shaped clamping member slidably mounted on said projecting portion and having a lip between which and said matrix receiving surface all edges except one of a rectangular matrix are adapted to be clamped; a second clamping member slidably engaging said projecting portion to close the open end of the U-shaped member and also having a lip between which and said matrix receiving surface the remaining edge of the matrix is adapted to be clamped; stud bolts projecting from said clamping members through openings in the first-mentioned die part; and nuts on said bolts to secure the clamping members in place.

9. The combination of claim 8 further characterized in that said lips on the clamping members are undercut to form inclined matrix engaging surfaces adapted for binding contact with the matrix a short distance inwardly of its edges, and coil springs on said bolts between the first-mentioned die part and the U-shaped clamping member serve automatically to move said member out of clamping position upon release of the nuts.

10. The combination in a stereotype, pressure casting die of a die part; a second die part coacting with the first-mentioned die part to form a die cavity; means on the die for holding a matrix in place in the die cavity; and manually operable means clamping the die parts together, said means comprising a clamping member having a hook engaging said first-mentioned die part and a link pivotally connected to said clamping member and to the second-mentioned die part, the pivotal connection between the link and the second-mentioned die part being located between and in alinement with its pivotal connection with the clamping member and the point of engagement of the hook with the first-mentioned die part, whereby the toggle device is locked to secure the die parts together.

11. The combination in a multi-part stereotype die of a die part; means carried by said die part for clamping a matrix in place thereon; a plurality of connections between said clamping means and said die part adapted for adjustment to secure the clamping means in clamping relation to the matrix or to release the matrix, each of said connections including a stud bolt projecting from the clamping means through an opening in the die part and a head member mounted on the outer end of the stud bolt; and a single means for effecting simultaneous adjustment of said connections, said adjusting means including at least one reciprocable member having cam surfaces engaging a plurality of said head members and adapted upon movement of the reciprocable member in one direction to effect clamping of the matrix and upon movement in the opposite direction to release it.

12. The combination in a multi-part stereotype die of a die part; means carried by said die part for clamping a matrix in place thereon, said clamping means being mounted for movement perpendicularly to the matrix; at least one slidable connection between said clamping means and said die part adapted for adjustment to

cause the clamping means to clamp the matrix against the die part or to release it; and manually operable wedging means, in addition to said connection, adapted to act upon said connection to effect the desired adjustment of the clamping means.

13. The combination in a stereotype die of a pair of coacting die parts; means adjustably mounted on one of said die parts for clamping a matrix thereon along all except one edge thereof; and means on the other die part clamping the remaining edge of the matrix to the first-mentioned die part when the die is closed.

14. The combination in a multi-part stereotype die of a die part having an inwardly projecting matrix-receiving portion; a U-shaped member slidably mounted on said matrix-receiving portion for movement between a matrix clamping position and a matrix releasing position; spring means urging the U-shaped member toward releasing position; a plurality of studs, including an upper pair and a lower pair, projecting through openings in said die part; head members on the outer ends of said studs; upper and lower toothed bars mounted for simultaneous reciprocation on the exterior of said die part, the ends of the said upper bar being slotted to receive the upper pair of studs and the ends of said lower bar slotted to receive the lower pair of studs; a shaft mounted for rotation on said die part and provided with toothed portions meshing with the teeth on said bars; and a handle for operating said shaft to reciprocate the bars, said bars having cam surfaces coacting with said head members on the studs to move the U-shaped member into clamping position when the handle is swung in one direction and to permit said spring means to move the U-shaped member to releasing position when the handle is swung in the opposite direction.

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