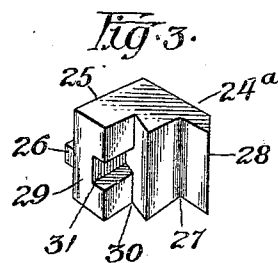
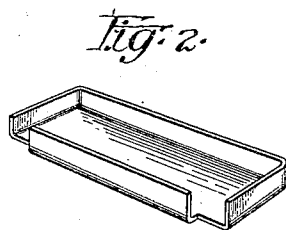
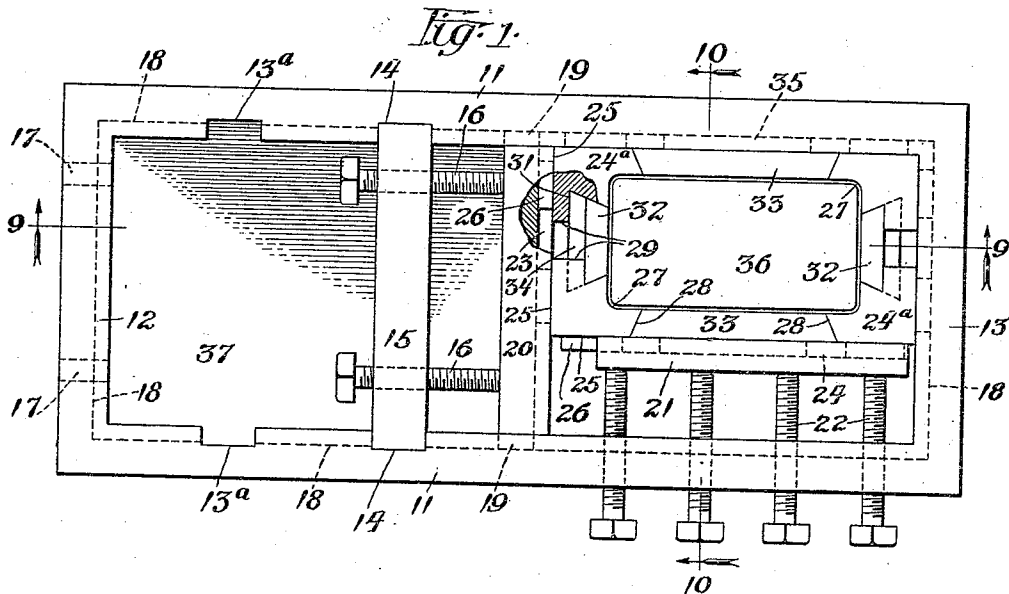


J. H. AMES.
BUILT-UP DIE.
APPLICATION FILED APR. 30, 1909.

958,459.

Patented May 17, 1910.
4 SHEETS—SHEET 1.



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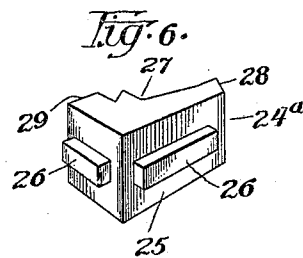
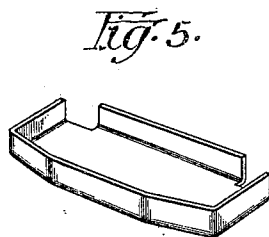
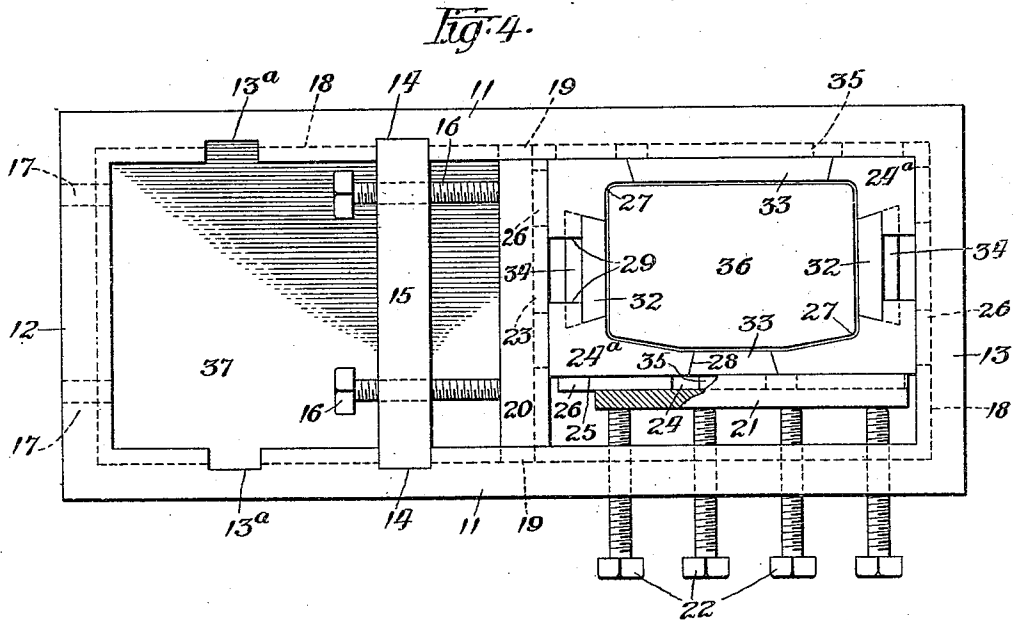
by *[Signature]*
Attys. & C.

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4 SHEETS—SHEET 2.



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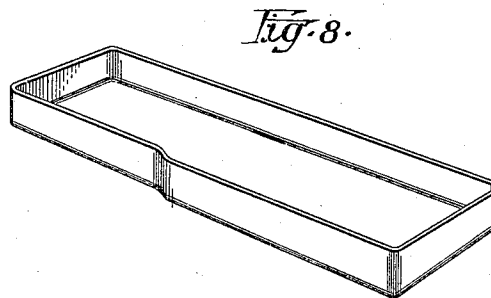
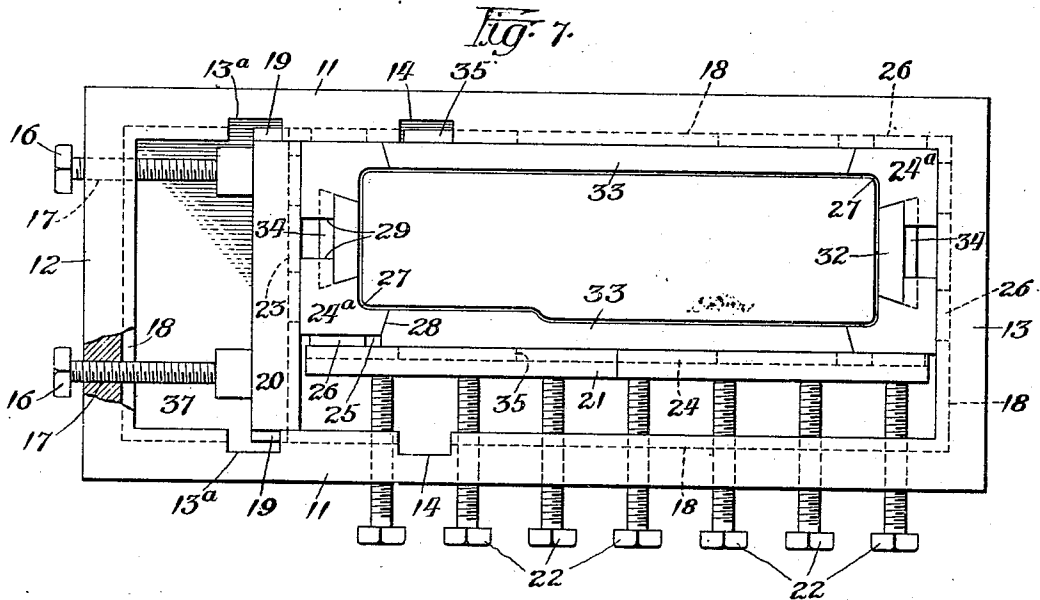
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Patented May 17, 1910.

4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

Fig. 10.

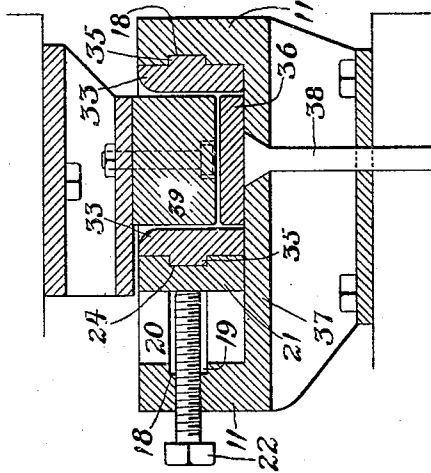
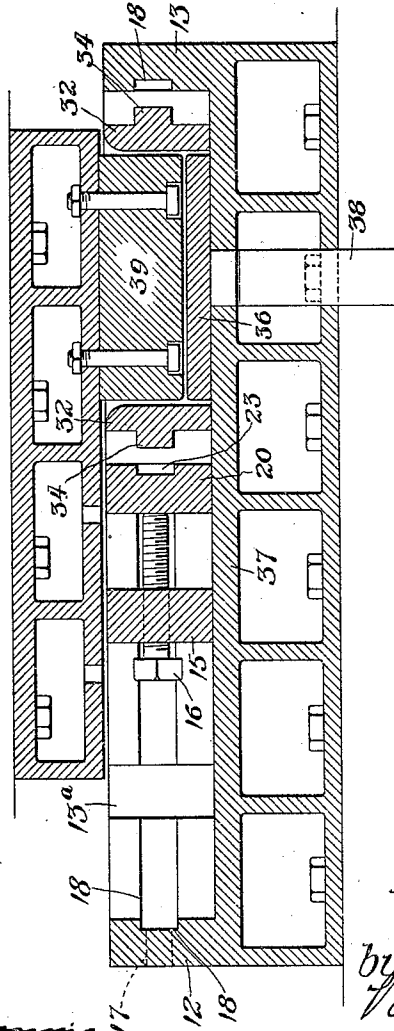


Fig. 9.



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UNITED STATES PATENT OFFICE.

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BUILT-UP DIE.

958,459.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed April 30, 1909. Serial No. 493,180.

To all whom it may concern:

Be it known that I, JOSEPH H. AMES, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Built-Up Dies, of which the following is a specification.

This invention relates to a female die member, which is adapted to be built up from a number of stock pieces or blocks, so that by the use of a given number of such pieces, a large number of variations in the size and shape of the female die can be secured, thereby enabling the same die frame to serve for the purpose of building up a female die member to the desired shape and size.

Further objects of the invention are to so arrange the blocks that when built up, they will mortise together or interlock with one another with sufficient firmness to prevent collapse or distortion of the die when subjected to the great pressure of actual usage.

A further object of the invention is to so construct and arrange the corner blocks that the same blocks can be used in the building up of dies of different sizes by varying the dimensions of the intermediate blocks or pieces.

Further objects will appear from a detailed description of the invention, which consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a plan view of one of the built-up dies; Fig. 2, a perspective view of the work produced thereby; Fig. 3, a perspective view of the corner block of Fig. 1; Fig. 4, a plan view of a built-up die of slightly different dimensions; Fig. 5, a perspective view of the work produced by said die; Fig. 6, a perspective view of the corner block of Fig. 4; Fig. 7, a plan view of another built-up die; Fig. 8, a perspective view of the work turned out thereby; Fig. 9, a longitudinal sectional view taken on line 9—9 of Fig. 1 and showing the male die in section; and Fig. 10, a cross sectional view taken on line 10—10 of Fig. 1 and showing the male die in section.

Referring to Fig. 1, the die as a whole is built up within a rectangular frame, comprising side rails 11 and end rails 12 and 13 respectively. The side rails are pro-

vided near one end with two pairs of in-cut rectangular notches 13^a and 14 respectively, either of which notches is adapted to receive a cross beam 15, through which are threaded a pair of clamping screws 16, which screws are likewise adapted to be threaded through a pair of tapped holes 17 in the end rail 12 of the frame. The construction is one which permits the screws to find a bearing at different points, depending upon the length of the die which it is intended to build up.

The side rails and end rails are provided on their interior faces with a continuous groove or channel 18, the side sections of which groove or channel are adapted to receive tongues 19, which outwardly project from the ends of slidable end clamping bar 20, against which the ends of the adjusting screws abut.

The clamping bar 20 coöperates with a side clamping bar 21, which is adapted to be driven to place by the action of a plurality of side clamping screws 22, which are threaded through one of the side rails of the frame. The end clamping bar 20 is provided on its inner face with a groove or channel 23, the ends of which are in register with the grooves or channels in the rails of the frame, and the groove or channel 23 coöperates with a similar groove or channel 24 in side clamping bar 21. The grooves and channels are best illustrated in Figs. 9 and 10.

The members previously described constitute a clamping frame, all the parts of which, with the possible exception of the cross beam 15, will be employed whenever a die is built up. The members to be now described will be of different sizes and shapes, depending upon the formation of the intended die, so that these portions will be interchangeable to suit the peculiar conditions of each case. Each of the dies will be built up to comprise four corner blocks 24^a, each of which will have straight, plain, outer faces 25, provided with tongues 26, adapted to enter into the adjacent grooves in the surrounding frame and clamping bar. The inner or acting face of the corner block in each case will be in-cut to afford a slightly rounded die corner 27, and the end 28 of the side portion of the block adjacent to said in-cut corner with the beveled back toward the outer side of the block, as shown in any

of the plan views. The acting face of the in-cut or angle in the block may be a true right angle, as shown in Fig. 1, or an obtuse angle in some of the blocks, as shown in Fig. 4, depending, of course, upon the shape of the work intended to be swaged out by the die.

That portion of the block intended to constitute its inner end 29 is cut square, and between the end 29 and the in-cut angle 27, the block is provided with a notch 30 of acute angular formation, the outer face of which notch is provided with a longitudinally extending groove or cut 31, as indicated in Fig. 3. Four of such corner pieces of uniform formation, except, perhaps, as to the length and angle of the side portion of each, are employed in making up each die.

The four corner pieces are mortised together by means of wedge-shaped side blocks 33 and end blocks 32, the ends of which are beveled to engage the beveled ends 28 and the notches 30 respectively. The end blocks are provided with tongues 34, the ends of which mortise into the grooves or cuts 31 in the corner blocks, and the side blocks are provided with similar tongues 35, which enter the grooves or channels in the main frame 11 and in the side clamping bar 21 respectively. The side blocks may both be of plain formation as regards their die faces, as shown in Fig. 1, or of offset formation, as shown on the lower side of Fig. 7, or may be in the form of an offset die block on one side and a straight die block on the other. Furthermore, the length of the side and end blocks may be varied as shown in the various figures, so that a very large number of different combinations can be built up from a relatively small number of blocks. The same corner blocks can be used in building up dies of varying length and width; and where irregular shapes are desired, corner blocks, as those shown in Fig. 4, can be employed.

The female die co-acts with the male die 39, as shown in Figs. 9 and 10, which male die is of a size to fit easily into the female die, allowing sufficient clearance all around for the stock.

The bottom of the built-up die is afforded by a die plate or false bottom 36, which rests upon a floor 37, which forms a part of the main frame of the die, as best shown in Fig. 9. The false bottom bears against a plunger bar 38, which is adapted to be projected by the bulldozer or other machine in which the dies are used.

In use, in building up a die, a corner block will first be fitted into the corner of the main frame, entering the tongues into the grooves in the end and side of the frame respectively. Thereafter the adjacent side and end blocks will be fitted into place, after which the corner block which bears against

the side of the frame will be fitted, and thereafter the remaining end, corner and side blocks fitted together. When the parts are fitted to position, the end and side clamping bars will be forced down to position to engage the outer tongues and force the parts rigidly together. The entrance of the tongues into the grooves in the surrounding members prevents any raising of the blocks when subjected to pressure, and the method whereby the parts are interlocked or dovetailed together serves to hold the parts true and insures a perfect outline for the die.

By providing a false bottom, the die can be built to the desired depth, and at the same time, the false bottom serves in the capacity of a stripper for forcing out the work after the impression has been registered.

What I claim as new and desire to secure by Letters Patent is:

1. In built-up dies, the combination of a main frame, a clamping end bar, a clamping side bar, means for exerting pressure on the bars, and corner blocks, side blocks, and end blocks, fitted together and adapted to be held in clamped condition by the clamping side and end bars.

2. In built-up dies, the combination of a main frame, a clamping end bar, a clamping side bar, means for exerting pressure on the bars, corner blocks having beveled cuts at their ends, and side and end blocks of wedge-formation adapted to register with the cuts of the corner blocks, the parts being arranged to be clamped and held by the side and end clamping bars.

3. In built-up dies, the combination of a main frame having side and end rails, affording a grooved corner, an end clamping bar provided with a groove, a side clamping bar provided with a groove, means for exerting pressure on the bars, and corner, side and end blocks provided with tongues adapted to register with the grooves and fitted together and adapted to be clamped in place by the end and side clamping bars.

4. In built-up dies, the combination of a main frame having side and end rails, affording a grooved corner, an end clamping bar provided with a groove, a side clamping bar provided with a groove, means for exerting pressure on the bars, and corner, side and end blocks provided with tongues adapted to register with the grooves and having beveled, abutting ends, adapted to interlock the parts together, the blocks being adapted to be clamped in place by the clamping bars.

5. In built-up dies, the combination of a main frame provided with side and end rails having grooves or channels on their inner faces, a clamping end bar provided with a groove, a clamping side bar provided with a groove, corner blocks provided with tongues adapted to register with the grooves, said

corner blocks being beveled at one of their outer ends and notched at the other outer end, wedge-shaped side blocks provided with tongues and fitted between the beveled ends

5 of the corner blocks, wedge-shaped end blocks provided with tongues and having their ends fitted into the notches in adjacent corner blocks, and clamping screws bearing against the clamping bars.

10 6. In built-up dies, the combination of a main frame provided with end rails and side rails, an end clamping bar and side clamping bar, corner blocks, end blocks and side blocks fitted together and adapted to be clamped

15 into position by the clamping bars, a floor below the blocks, and a false bottom lying between the blocks and adapted to be outwardly projected to strip the work from the die.

20 7. In built-up dies, the combination of a main frame provided with side and end rails

having grooves or channels on their inner faces, a clamping end bar provided with a groove, a clamping side bar provided with a groove, corner blocks provided with tongues 25 adapted to register with the grooves, said corner blocks being beveled at one of their outer ends and notched at the other outer end, wedge-shaped side blocks provided with tongues and fitted between the beveled ends 30 of the corner blocks, wedge-shaped end blocks provided with tongues and having their ends fitted into the notches in adjacent corner blocks, and clamping screws bearing against the clamping bars, and a false bot- 35 tom laid in the space between the die blocks and adapted to be projected to act as a stripper in forcing the work out of the die.

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Witnesses:

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