No. 867,540. PATENTED OCT. 1, 1907.

A. J. THOMSON.

DIE PRESS.

APPLICATION FILED DEC. 31, 1904.

3 SHEETS—SHEET 1.

Fig. 1

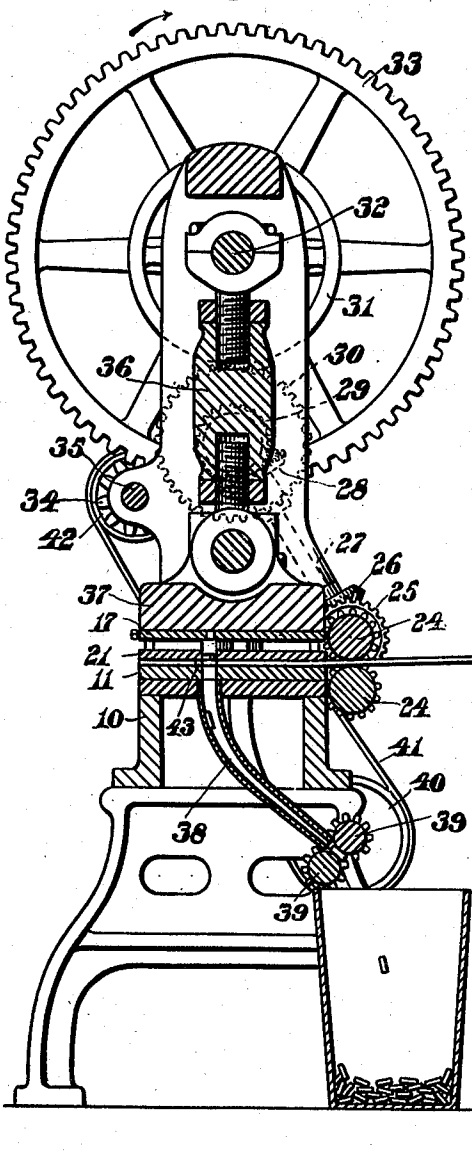


Fig. 2.

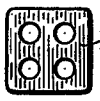
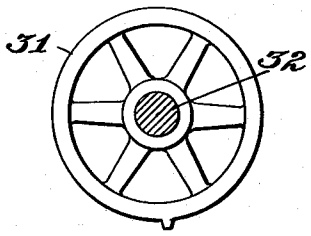
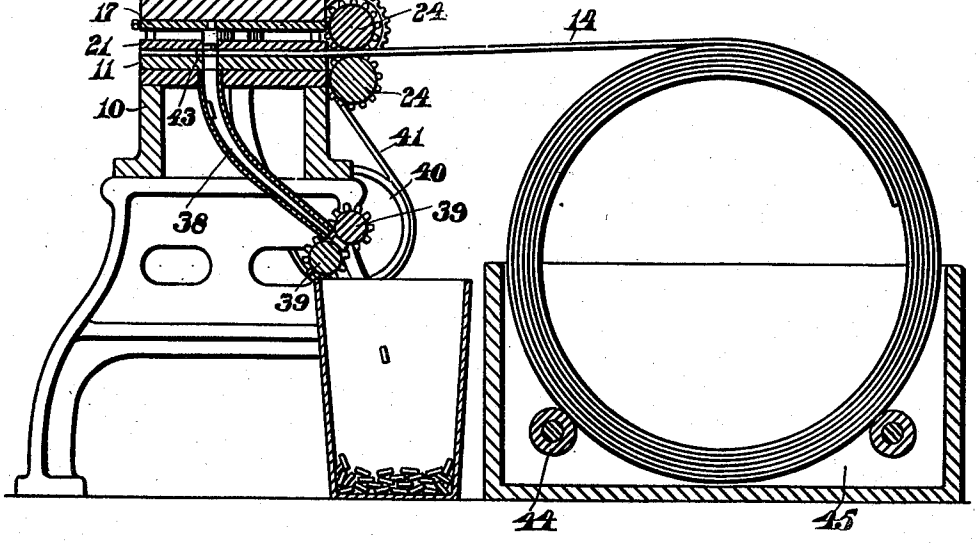


Fig. 9.





Witnesses:

Nathan C. Lombard 2nd

Winthrop G. Whitehead

Inventor:

Alfred J. Thomson,

by Watts & Lombard,

Atty.

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3 SHEETS—SHEET 2.

Fig. 3.

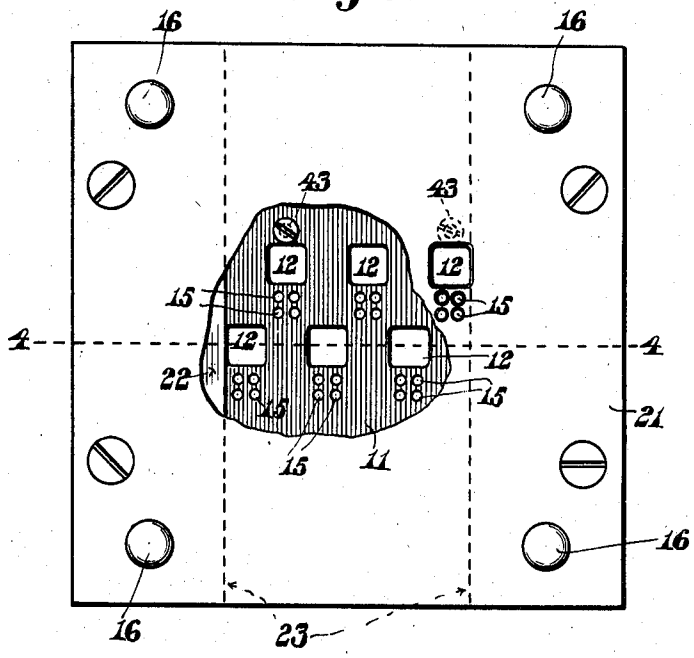


Fig. 4.

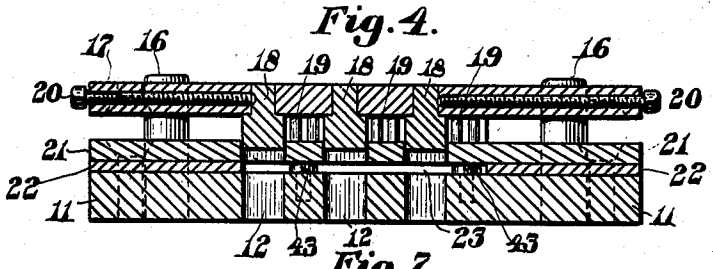
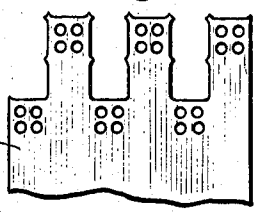


Fig. 7.



Witnesses:

Nathan C. Lombard 2nd

Smithrop G. Whitehead

Inventor:

Alfred J. Thomson,

by Walter E. Lombard.

Atty.

No. 867,540. PATENTED OCT. 1, 1907.

A. J. THOMSON.

DIE PRESS.

APPLICATION FILED DEC. 31, 1904.

3 SHEETS—SHEET 3.

Fig. 5.

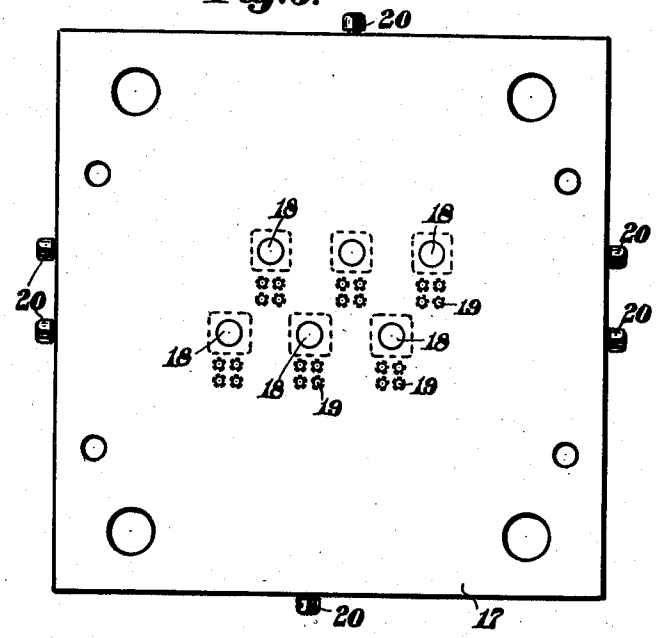
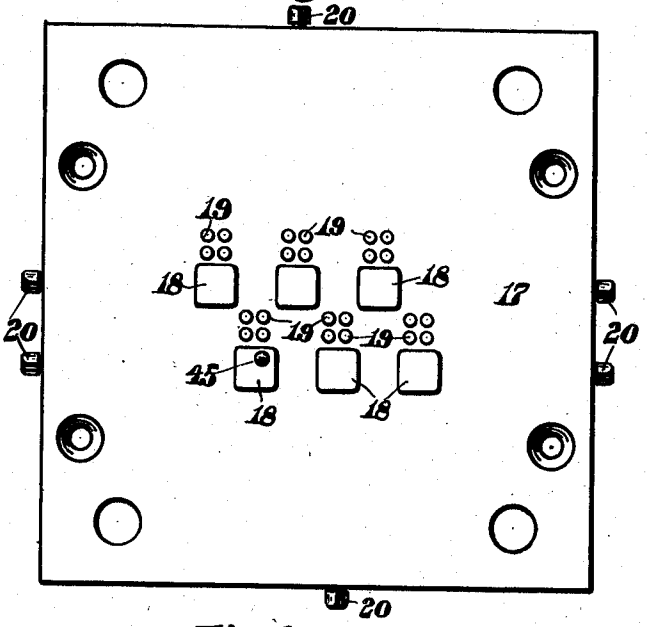


Fig. 6.

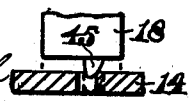


Witnesses:

Nathan C. Lombard 2nd

Smithrop G Whitehead

Fig. 8.



Inventor:

Alfred J. Thomson,

by Walter E. Lombard,

Atty.

UNITED STATES PATENT OFFICE.

ALFRED J. THOMSON, OF BOSTON, MASSACHUSETTS.

DIE-PRESS.

No. 867,540. Specification of Letters Patent. Patented Oct. 1, 1907.

Application filed December 31, 1904. Serial No. 239,070.

To all whom it may concern:

Be it known that I, ALFRED J. THOMSON, a citizen of the United States of America, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Die-Presses, of which the following is a specification.

This invention relates to die presses and dies therefor and has for its object the production of a machine in which a plurality of small blanks may be cut at the same time from a strip of material without excessive waste thereof. Heretofore in cutting blanks of this nature the entire blank is cut at one operation, leaving a section of waste material between it and the next blank. This waste of material costs the manufacturer during a year a very large sum and it is very desirable that such waste should be prevented. In order to overcome this objection, in this invention the male die is provided with a plurality of members in two rows, the sum of the width of said members equaling the width of the material from which the blanks are to be cut.

The invention consists in several novel features of construction and arrangement of parts which will be readily understood by reference to the description of the drawings and to the claims to be hereinafter given.

Of the drawings: Figure 1 represents a sectional elevation of a press embodying the features of this invention. Fig. 2 represents a blank such as the particular dies herein shown are designed to cut. Fig. 3 represents a plan view of the female die with its stripper plate, a portion of the latter being broken away to show the die plate. Fig. 4 represents a sectional elevation of the male and female dies, the cutting plane being on line 4—4 on Fig. 3. Figs. 5 and 6 represent, respectively, a plan and an inverted plan of the male die. Fig. 7 represents a plan of the end of the material from which the blanks are being cut. Fig. 8 represents an elevation of one of the male cutting-off dies showing the operation of the registering finger, and Fig. 9 represents a section through the crank shaft and showing in elevation thereon the intermittent single toothed gear for operating the feed mechanism.

Similar characters designate like parts throughout the several figures of the drawings.

In the drawings, 10 represents a suitable bed upon which is mounted the female die plate 11 provided with a plurality of openings 12 of a shape to conform to the shape of the blank 13 which it is desired to cut from the strip of material 14. Immediately in front of the openings 12 are a series of holes 15.

The female die 11 is provided with a plurality of guides 16 fitting openings in the male die 17 and upon which said male die 17 is adapted to reciprocate when in operation.

The die plate 17 is provided with a plurality of cutting-off members 18 and hole-punching members 19 projecting therefrom adapted to coöperate with the openings 12 and the holes 15 in the female die plate. The cutting-off members 18 are held in position by means of bolts 20.

The female die plate has secured thereto the stripper plate 21 between which and said female die plate 11 are interposed side guides 22, these guide plates being separated a distance equal to the width of the material being operated upon. In the openings 23, formed by the stripper plate 21, the guide plates 22, and the female die 11, the material 14, to be operated upon, is fed by means of the rollers 24 geared together as shown in Fig. 1.

The upper roll 24 is provided with a bevel gear 25 driven by a gear 26 on an inclined shaft 27, the upper end of which is provided with a gear 28 driven by means of a bevel gear 29, the hub of which has secured to it a spur gear 30.

An intermittent gear 31, provided with a single tooth, is mounted upon the crank shaft 32 which is driven by means of the gear 33 meshing with a pinion 34 on the shaft 35. The crank shaft 32 is connected by a link 36 with a reciprocating bed plate 37 to which the male die plate 17 is secured in any well-known manner. Beneath the female die plate 11 are secured a plurality of chutes 38 corresponding in number and position to the openings 12 in said plate 11. At the outlet of said chutes 38 are a pair of rollers 39 geared together and driven by the pulley 40 connected by a belt 41 with a pulley 42 on the driving shaft 35. As the shaft 35 is driven it will cause the continuous operation of the crank shaft 32 and as a result the vertical reciprocation of the male die. Each revolution of said shaft 32 will cause a single reciprocation of the male die plate 17 and by means of the intermittent gear 31 and the gearing connecting it with the rolls 24 in each reciprocation of the male die the material 14 will be moved forward until its front edge meets the rigid stop 43 when the intermittent gear 31 will disengage itself from the gear 30 and the feeding rolls 24 will discontinue their operation until the teeth of the gear 31 again mesh with the gear 30. The coil of material from which the blanks are cut is mounted upon antifriction members 44 between side plates 45 on which said coil is free to turn as the material 14 is fed to the press.

The cutting-off members 18 of the die plate 17 are located in two rows, those in one row being opposite the spaces between those in the other row and the distance between the several cutting-off members is exactly equal to the width of one of said members. In other words the side of each member 18 is in line with the opposite side of the next member in the other row. The two rows of members 18 are likewise situated a distance from each other exactly equal to the width of

a member 18. The hole-punching members 19 are located immediately in front of the cutting-off members and are arranged to punch holes in the material 14 in those portions which are to be cut into blanks at the next operation of the dies. By locating the members 18—19 as shown in the drawings the blanks 13 may be cut without waste along the sides the only waste material being the small section at the corners. This permits a stop 43 being used in the operation, against which the forward edge of the material may register during the cutting of the blanks 13. Should the strip of material 14 be fed so that the forward edge fails to register with the stop 43, the tapered finger 45 projecting from one of the cutting-off members 18 will cooperate with a hole 15 to cause the strip 14 to be fed against said stops. The object of the rollers 39 is to flatten the blanks 13 as they pass between them and thereby remove any rough edge that may be caused by the dies when they become dull. By this construction considerable strain is removed from the cutting-off dies 18 as only one to three sides of a blank are cut at an operation. In this device the four sides are never cut at once as has been the practice heretofore.

The advantages of the invention are obvious and it is believed that its operation will be thoroughly understood without further description.

Having thus described my invention, I claim:

1. The combination of a male die having two rows of cutting-off members and hole-punching members every pair of which is in an alternate row, and a female die provided with a plurality of openings to coöperate with said members.

2. The combination of a male die having two rows of cutting-off members and hole-punching members every pair of which is in alternate rows and the cutting-off members of each row being a distance from each other equal to the width of one of such members, and a female die provided with a plurality of openings to coöperate with said members.

3. The combination of a male die provided with a plurality of cutting-off members in two transverse rows and hole-punching members also in two transverse rows, a female die provided with a plurality of openings to cooperate therewith, said openings and said members being so located that in each operation of the male die a set of blanks will be cut from material through which holes have been previously punched and at the same time holes will be punched through that portion of the material from which blanks will be cut at the next operation.

4. The combination of a female die provided with a plurality of openings therein in two transverse rows, a male die provided with a plurality of cutting-off members to coöperate with said openings said members being so situated relative to each other that a plurality of blanks will be cut from the material at each operation and at the same time cut one or more edges of the blanks to be separated from the material at the next operation.

5. The combination of a male die, and mechanism for operating the same, a female die consisting of two plates each provided with alined openings corresponding to the male die members, parallel side guide plates between said female die plates at a distance apart equal to the sum of the width of all of said male dies, and a fixed immovable stop between said plates to prevent further forward movement of the strip of material fed between said plates.

Signed by me at Boston, Massachusetts, this 29th day of December, 1904.

ALFRED J. THOMSON.

Witnesses:
WALTER E. LOMBARD,
EDNA C. CLEVELAND.