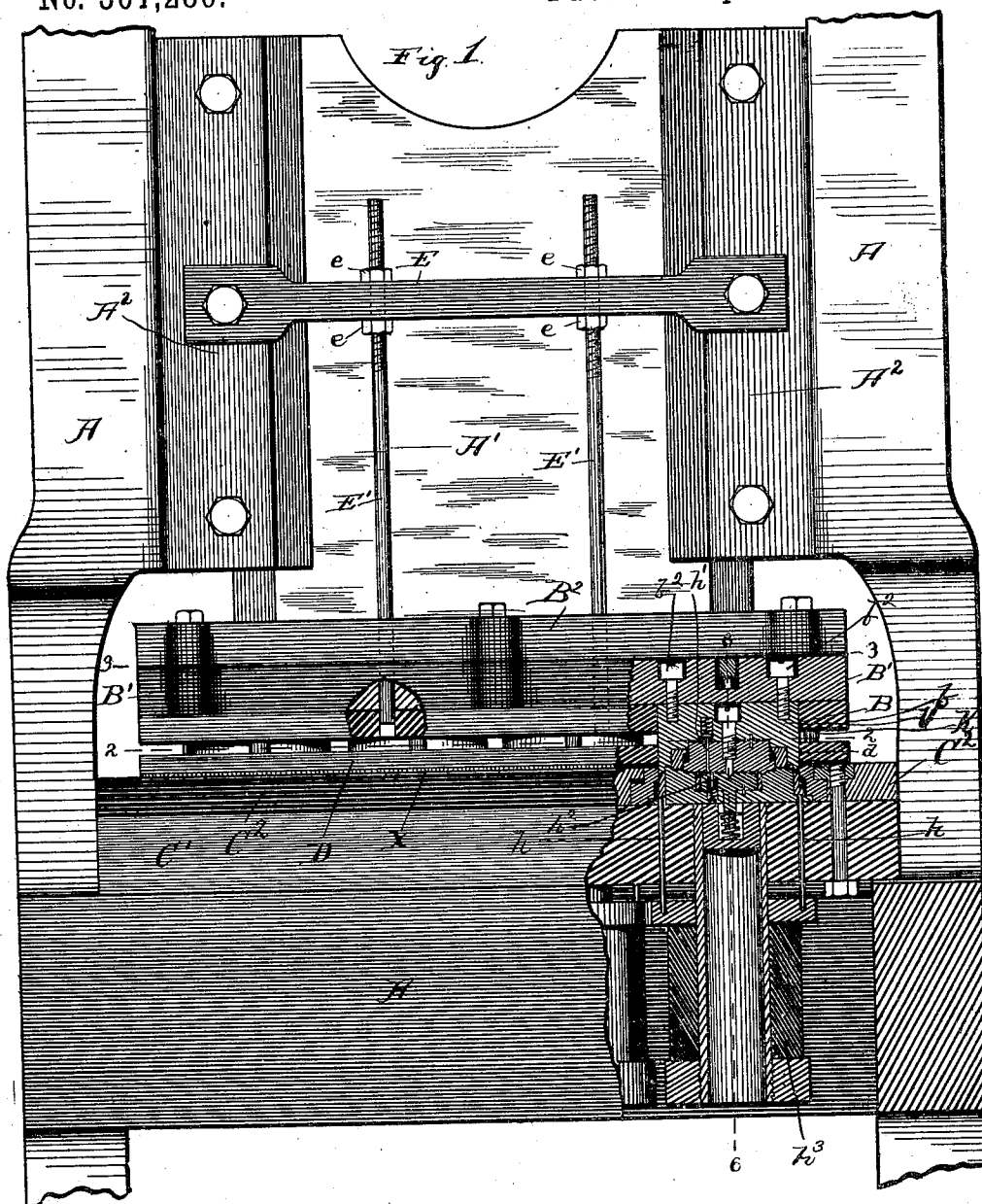


3 Sheets—Sheet 1.

No. 361,286.

Patented Apr. 19, 1887.



Witnesses:
 Lew. B. Curtis
 J. M. Munday

Inventor:
John C. Hodgson.
By Munday, Evans & Adersch
his Attorneys:

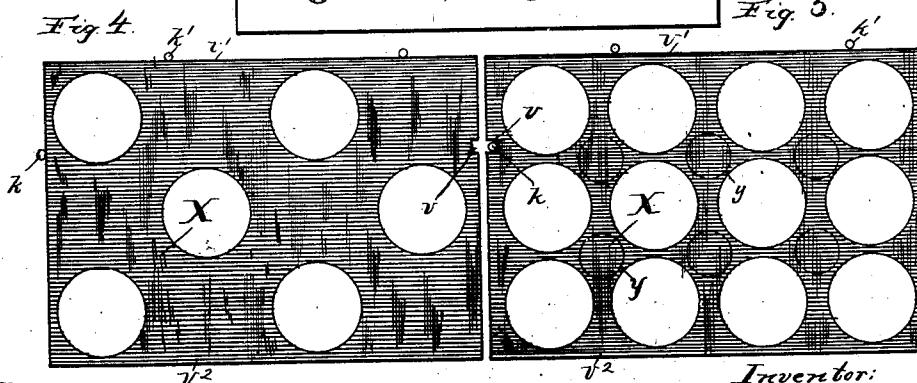
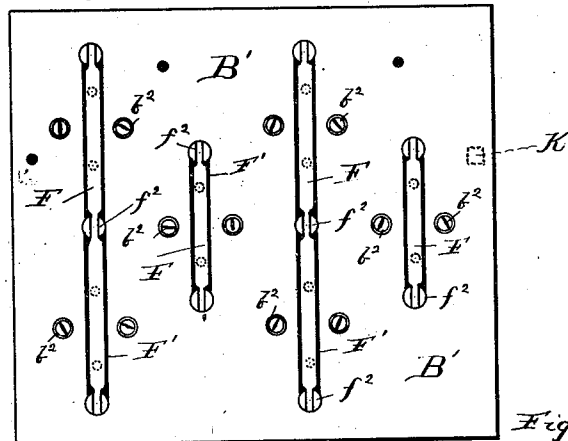
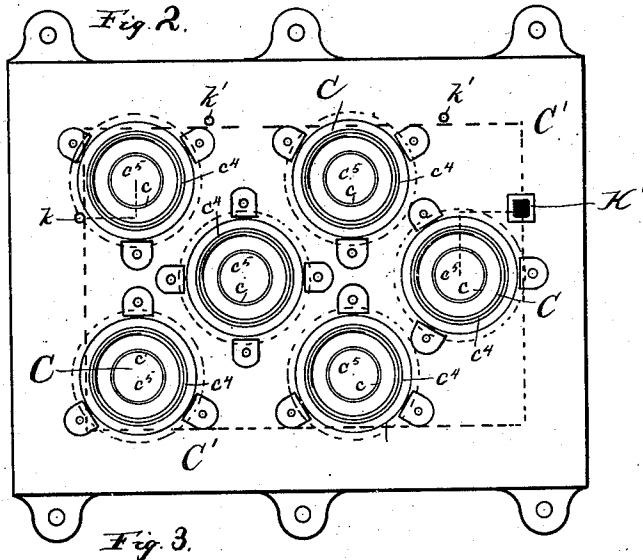
(No Model.)

3 Sheets—Sheet 2.

J. G. HODGSON.
GANG DIE PRESS.

No. 361,286.

Patented Apr. 19, 1887.



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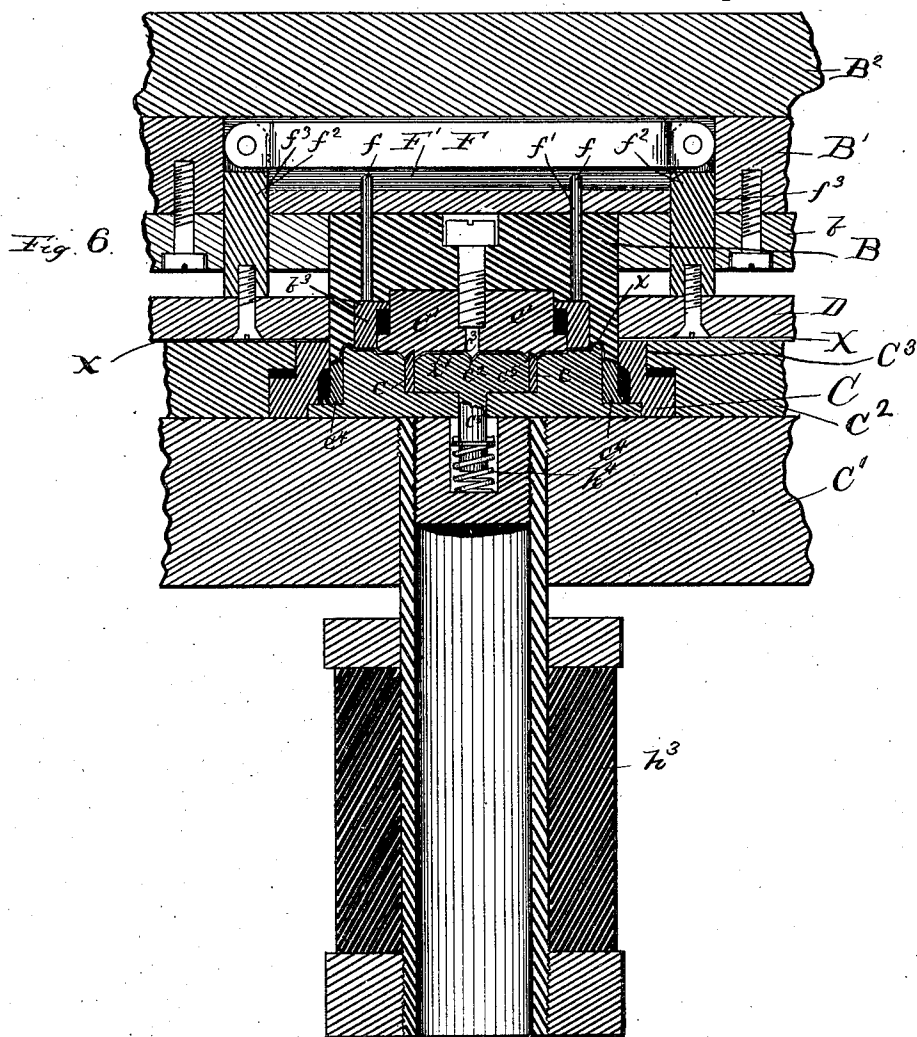
(No Model.)

3 Sheets—Sheet 3.

J. G. HODGSON.
GANG DIE PRESS.

No. 361,286.

Patented Apr. 19, 1887.



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UNITED STATES PATENT OFFICE.

JOHN G. HODGSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO EDWIN NORTON
AND OLIVER W. NORTON, OF SAME PLACE.

GANG DIE-PRESS.

SPECIFICATION forming part of Letters Patent No. 361,286, dated April 19, 1887.

Application filed December 13, 1886. Serial No. 231,356. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. HODGSON, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Gang Die-Presses, of which the following is a specification.

My invention relates to improvements in gang die-presses for cutting out sheet-metal can-heads or other blanks, and more particularly to improvements upon the gang die-press shown and described in Letters Patent No. 304,352, granted September 2, 1884.

In this invention the dies are arranged alternately, so as to cut out at each stroke of the press only the alternate heads or blanks from the sheet, as is shown and described in the patent above referred to. In operating such alternately-arranged gang dies, if the sheet does not happen to be of the exact proper size when it is reversed to cut out the second half or series of blanks therefrom and its opposite end or edge pressed against the gages or stops, the blank spaces will not always properly register with the dies, and where the sheet is just of sufficient size to cut a certain number of heads or blanks, as is frequently the case, a very slight misadjustment will occasion imperfect heads. To remedy this, in the present invention I provide the press with a registering-punch, which cuts out a registering-notch in the edge of the sheet, so that when the sheet is reversed or turned end for end or upside down, and this registering-notch placed against the guide pin or stop, the sheet will always properly register with the gang of dies. In operating such a gang of dies it is also important that the whole sheet should always be spread out perfectly flat and smooth before the dies strike the same; and to effect this result I provide the movable head of the press with a plate having holes or perforations in which the male dies fit and through which they can project. This plate comes down and strikes the sheet in advance of the dies, and thus smooths and flattens out the sheet before the male dies strike it. This smoothing-plate reciprocates upon the male dies. It also serves as a stripper to remove or strip the sheet from the male dies when the head of the press is raised. To cause this sheet-smoothing plate to operate also

as a stripper, stationary pins are secured to a fixed bar attached to the frame of the machine. These ejector-pins project through suitable holes in the movable head of the press and strike against the stripper-plate as the cross-head is raised. In order to eject the head or blank cut from the sheet from or out of the male die, ejecting-pins are provided, which project through and are mounted upon the die itself. These ejecting-pins strike against a cross-bar mounted in a slot in the die-head and connected by suitable guide-pins with the bottom stripper-plate.

The invention also consists in the novel devices and novel combinations of devices herein shown and described, and more particularly pointed out in the claims.

In the accompanying drawings, which form a part of this specification, and in which similar letters of reference indicate like parts, Figure 1 is a front view of a device embodying my invention and showing that part of the press to which my invention relates. Fig. 2 is a plan view showing the bed-plate or lower die-head, looking down from line 2 2 of Fig. 1. Fig. 3 is a plan view looking down from line 3 3 of Fig. 1. Figs. 4 and 5 are views showing the gages or stops for registering the sheet in the gang of dies. Fig. 4 shows the sheet after one-half of the heads or blanks have been cut out, and Fig. 5 the same after the remainder are cut out. Fig. 6 is an enlarged cross-section on line 6 6 of Fig. 1.

In the drawings, A represents the frame of the machine or a part thereof.

A' is the cross-head, and A² the guides for the cross-head on the frame.

B C are male and female dies alternately arranged, as illustrated in Fig. 2, and as also indicated in Fig. 4.

B' is the movable die head or plate attached to the cross-head, and in or upon which the dies B are secured, and C' is the bed-plate, in or upon which the female dies are secured. The die-head B' is furnished with a rigidly-attached socket-plate, b, having holes or sockets b', to receive the end of the dies B. The dies B are secured to the die-head B' by means of screws b², the heads of which fit in counter-sunk holes in the upper surface of the die-plate. The socket-plate b and screws b² afford

a secure and easy means of fixing the dies in the die head or plate B'. The die head or plate B' is secured to a plate, B², which is attached rigidly to the cross-head A'.

5 D is a smoother or stripper plate fitted upon the male dies B, and adapted to reciprocate thereon below the socket-plate *b* of the die-head. This plate D has holes *d*, in which the male dies B fit, and through which they may

10 project.

E is a stop-bar attached to the frame of the machine, and provided with adjustable ejecting-pins E' E', which project through suitable holes in the die-head B' and the plate B². The pins E' E' are adjustably fixed to the stationary bar E by means of screw-threads and nuts *ee*. When the cross-head of the press is raised or makes its backward stroke, the fixed pins E' E' will strike against the movable stripper-plate D, and thus arrest its upward movement with the movable gang of dies B, and thereby strip the sheet X from the same, and at the same time withdraw the dies B within the holes in the plate D, so that said plate will project in advance of the dies or their cutting-edges at their next downward stroke. The plate D will thus strike the sheet X in advance of the gang of male dies B and exert a light pressure against the same, so as to perfectly smooth and flatten it out before the male dies strike it.

The head or blank, *x*, cut from the sheet is automatically ejected from the male die, as the cross-head makes its upward or reverse movement, by means of one or more ejecting-pins, *f*, mounted in suitable holes, *f'*, in the die B itself, which ejecting-pins strike against a movable cross bar or stop, F, mounted in a suitable slot or recess, F', in the die-head plate B'. This stop-bar F is rigidly connected by suitable pins, *f*², with the stripper-plate D, so that when the upward movement of the plate D is arrested by the stop-pins E' E' the upward movement of the stop-bar F will be likewise arrested, and the pins *f* thus caused to eject or strip the head or blank *x* from the die. The connecting pins or links *f*², which connect the bar F with the plate D, may preferably project through suitable holes, *f*³, in the head-plate B' and its die-socket plate *b*. The stop or bar F may, however, be connected with the stripper-plate D in any other suitable manner, if desired. Each die B is preferably provided with two ejecting-pins, *f* *f*, and a single movable stop, F, will of course answer for both ejecting-pins, the stop in such case being preferably in the form of a bar extending over both ejecting-pins, as shown.

In the gang die shown in the drawings, Figs. 2, 3, 4, it will be observed that two pairs of the six dies shown come directly opposite each other in the die-head, and I therefore, for sake of convenience, employ a single stop-bar, F, for the four ejecting-pins *f* of each such pair of dies B B. This is clearly shown in Fig. 3. The gang dies illustrated in the drawings are of such size as to cut out of the ordinary tin-

plate sheet twelve can-heads—six at each operation—the heads being for three-pound cans. The sheet, as shown, is a little larger, both in width and length, than is required for making twelve three-pound can heads. The dies are, however, arranged preferably about as shown in the drawings, so that equal intermediate spaces may be left, and thus all utilized for cutting out can-caps, as indicated by the lines *y* in Fig. 5.

In a gang die-press for cutting the sheet into smaller or larger sized heads, of course it will be understood that a greater or less number of dies will be employed in the gang, according to the size of the heads. Where, for example, the sheet is cut into twenty-four heads, there will be twelve instead of six of the alternately-arranged dies, and three instead of two of the dies will come in the same straight line or opposite each other, and in such case a single stop-bar, F, may preferably be employed to operate the ejecting-pins *ff* of such three dies. The ejecting-pins *ff* are secured to or fit against the usual movable ring portion, *b'*, of the die B.

As shown in the drawings, the dies B C are furnished with the usual supplemental dies, *c* *c'*, for cutting out a stud-hole in the head *x*, and for simultaneously stamping or shaping said head, as desired, and also for cutting out a cap, *x'*. The dies B C are further furnished with dies *c*² *c'*², for pricking a vent-hole in the cap *x'*, and with spring-actuated ejecting-pins *h* *h'* *h'*². The ejecting-pins *h* fit against a ring portion, *c'*, of the die C, and are actuated by a rubber spring or cushion, *h*³. The central portion, *c'*, of the die *c* is mounted upon a spring, *h'*, and serves to eject the cap *x'* from the die *c*.

K and K' are the male and female dies secured to the head-plate B' and bed-plate C', respectively, for cutting the registering notch or recess *v* in one edge of the sheet, and *k* *k'* are the registering or guide pins for the edges of the sheet. These guide pins are fixed to the bed-plate C'.

As illustrated in Figs. 2, 4, and 5, the dies K K' cut a registering-notch, *v*, in the opposite edge of the sheet X just the same distance as the stop *k* from the marginal die or dies B C, so that when the sheet is reversed and the registering-notch *v* pressed against the guide-pin *k* the sheet will properly register with the gang of dies, and the second half of the heads thus be cut out in straight lines with the first half, as is shown in Fig. 5. As illustrated in the drawings, the sheet is turned end for end and upside down for cutting out the second half of the heads, so that the same side edge, *v'*, of the sheet comes against the guides *k* *k'*. If the sheet should be reversed by turning end for end, keeping the same face up, the opposite side edge, *v''*, would come against the stops or guides *k* *k'*, and in such case similar dies, K K', should be provided for cutting like registering-notches in the edge *v''* of the sheet. I, however, consider it preferable to reverse the sheet in the manner first described, and thus

keep the same edge of the sheet against the pins k k' . The inner edge of the dies K K' , it will be observed, are just the same distance from a transverse line through the center of the die C at the one end as the guide-pin k is from a like line through the center of the die C at the other end. This is indicated by the dotted lines in Fig. 2.

The means shown and described for automatically ejecting the head or blank x from the die B may of course be also used in a single die-press as well as in a gang press.

It will be understood that the dies K K' , instead of merely cutting a narrow registering notch or recess, might be made to cut a wide notch or recess, or to square the entire edge of the sheet. A registering-notch wide enough to admit the gage or pin k is, however, all that is required.

While in the device illustrated in the drawings the plate D serves two or more functions—viz., to smooth and flatten out the sheet, and also as a stripper for removing the sheet from the dies and as the means of communicating motion to the stop-bars F —and while the more improved form of my invention consists in this plate arranged and combined so as to perform these several functions, I desire it to be distinctly understood that my invention in its broader features is not confined to a plate, D , having such duplicate functions.

In its function as a smoother-plate to smooth and flatten out the sheet in advance of the male dies the plate D co-operates with the opposing surface of the series or 'gang' of female dies, the upper or cutting faces of all of which are of course arranged in the same plane, and together constitute a single plane surface, between which and the smoother-plate the sheet is pressed and flattened out into a true plane, and all curves or crinkles removed before the gang of male dies strikes it. By means of the smoother-plate I am thus enabled to do as perfect work with a gang of dies operating simultaneously as can be done with a single die. I am of course aware that heretofore a single die has been made to operate inside of another hollow die while the latter holds or presses the blank.

The bed-plate C' is furnished with a socket-plate, C'' , having holes or sockets C''' for the female dies C . The die holes or sockets in the plate b and C'' exactly match each other, and these matching plates, in which the dies fit, thus afford a ready means for at once causing each and all the male and female dies of the gang to exactly and accurately register with each other. The die holes or sockets in the match-plates b and C'' extend entirely through one of the plates, and preferably entirely through both plates, to enable the plates to be clamped together and the die-holes bored or drilled in both plates at the same time, to insure the several die-holes in the opposing plates being exactly concentric with and opposite to each other. The two match-plates being each thus provided with die-sockets ex-

actly opposite each other, the male and female dies fixed in such match-plates may all be readily adjusted to register with each other. The movable ring portion b' of the male die is kept in place by means of a ledge or shoulder thereon, which strikes against a similar ledge or shoulder on the central part, c' , of the die.

The holes d in the smoother-plate D should loosely fit the punches or male dies B B' , so that the full weight of said plate will press against the sheet X as the cross-head of the press descends and before the dies B strike the sheet.

I claim—

1. In a gang die-press having alternately-arranged male and female dies, the combination, with a guide pin or gage for one edge of the sheet, of a pair of dies, as K K' , for forming a corresponding registering notch or recess in the opposite edge of the sheet for adjusting the sheet into position under the gang of dies for the second stroke, substantially as specified.

2. In a gang die-press having alternately-arranged male and female dies, the combination, with a guide pin or gage for one edge of the sheet, of a pair of dies, as K K' , for forming a corresponding registering notch or recess in the opposite edge of the sheet for adjusting the sheet into position under the gang of dies for the second stroke, and gage or guide pins k k' for the side edge of the sheet, substantially as specified.

3. In a gang die-press, the combination, with a gang of male dies and a gang of female dies, of a sheet-flattener or smoother-plate reciprocating upon said male dies and adapted to strike the sheet in advance of the dies, and thus smooth and flatten it out, said female dies having their cutting-edges all in the same plane and operating in conjunction with the said flattener-plate, substantially as specified.

4. In a gang die-press, the combination, with male dies B , secured to a movable head, B' , of female dies C , secured to bed-plate C' , and a sheet-smoother or flattener-plate, D , having holes d , through which said dies B may project, said plate being mounted to reciprocate upon said dies and adapted to strike the sheet in advance of the dies, said female dies having their cutting-edges all in the same plane and operating in conjunction with the said flattener-plate, substantially as specified.

5. In a gang die-press, the combination, with male dies B and female dies C , of stripper-plate D , reciprocating on said dies B , a stop-bar, E , secured to the frame of the machine, and a stop-pin, E' , adapted to strike said stripper-plate as the cross-head is raised, substantially as specified.

6. In a gang die-press, the combination, with male dies B and female dies C , of stripper-plate D , reciprocating on said dies B , a stop-bar, E , secured to the frame of the machine, and a stop-pin, E' , adapted to strike said stripper-plate as the cross-head is raised,

stop-bars F, connected to said stripper-plate D, ejecting-pins *f*, and the movable stripper rings or portions of the dies, against which said ejecting-pins *f* strike, substantially as specified.

7. The combination, with dies B and C, of head B', having slot or recess F', stop-bar F, and ejecting-pins *f f*, plate D, and connecting pins or links *f'*, substantially as specified.

10 8. The combination, with dies B and C, of head B', having stop or recess F', stop-bar F, and ejecting-pins *f f*, plate D, connecting pins or links *f'*, and stop-bar E and pins E' E', substantially as specified.

15 9. The combination, with a gang of dies, B, and a gang of dies, C, bed-plate C', head-plate B', having slots or recesses F', extending over or across two of said dies B, ejecting-

pins *f f* for each of said dies B, movable stop-bars F, mounted in said slots or recesses *b*, and 20 the movable stripper rings or portions of the dies, against which said ejecting-pins *f* strike, substantially as specified.

10. The combination, in a gang die-press, of a head-plate furnished with a match-plate 25 having sockets for the male dies with a bed-plate furnished with a match-plate having sockets for the female dies, the sockets in said match-plates being concentric with each other and extending entirely through the same, the 30 ends of the dies fitting against said head-plate and bed-plate, substantially as specified.

JOHN G. HODGSON.

Witnesses:

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