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MATERIAL HANDLING DEVICE FOR PUNCH PRESSES

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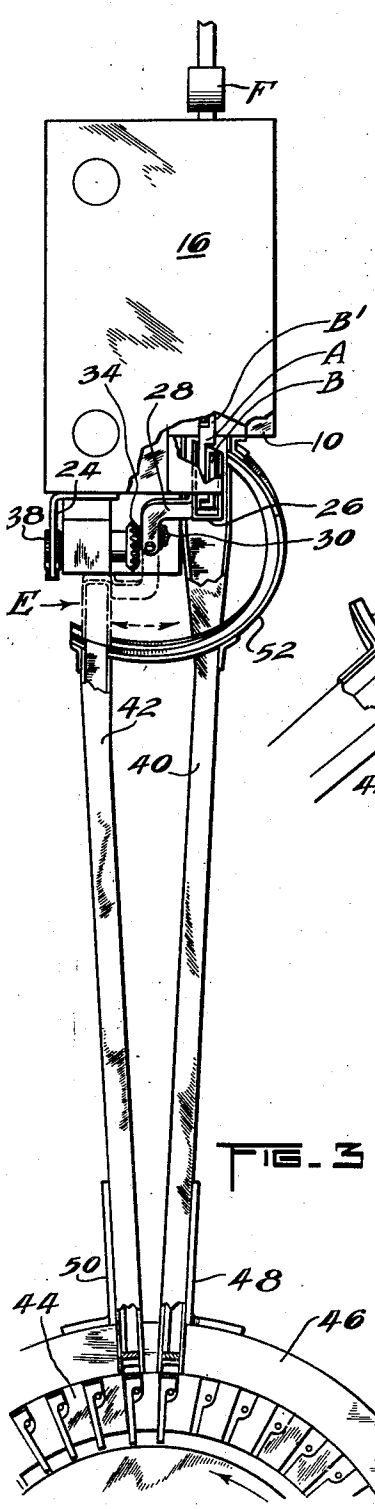


FIG. 3

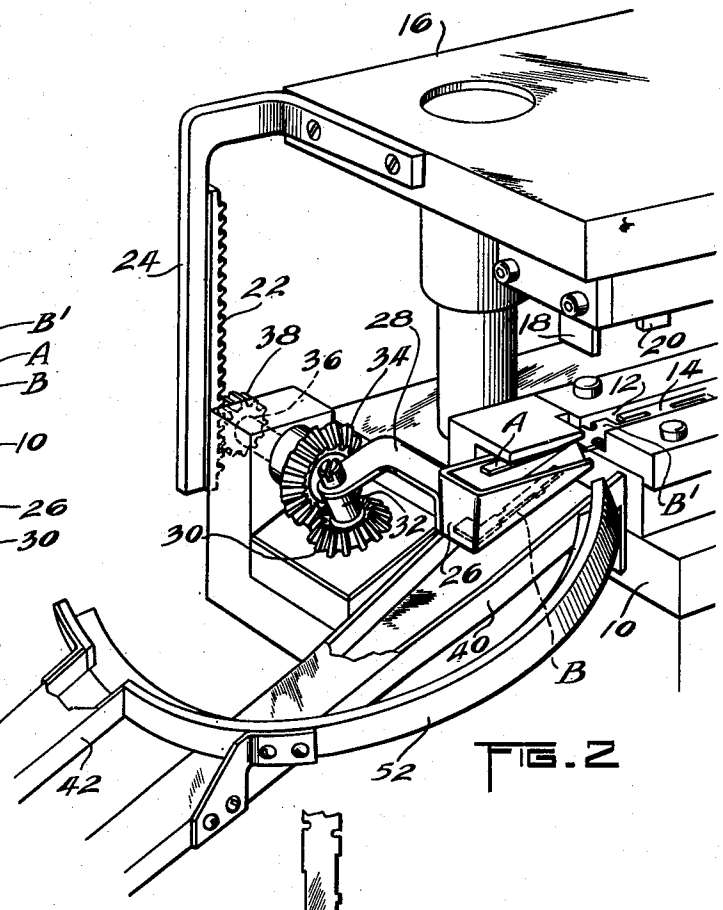


FIG. 2

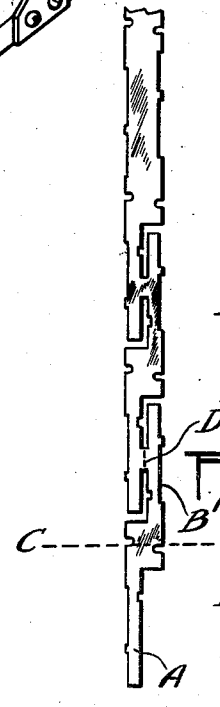


FIG. 1

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MATERIAL HANDLING DEVICE FOR PUNCH PRESSES

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3 Claims. (Cl. 164—48)

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This invention relates to material handling devices for punch presses.

In the operation of stamping or blanking pieces from large sheets or strips of material, huge quantities of the material are often reduced to scrap. This is especially true of stampings having large waste sections. It is not unusual to blank-out such pieces in a back-to-back symmetry, which materially reduces the waste.

Pieces stamped out by a press are generally collected in a hopper. Where additional work such as tapping of holes, inserting screws or staking is to be performed, the pieces are manually taken from the hopper and arranged in one direction for feeding into a second machine.

It is an object of this invention to provide a means for selectively collecting and reversing alternate blanked-out back-to-back pieces, and to supply all pieces to a second machine in the desired position.

For a more complete understanding of the invention, attention is directed to the description of the illustrative embodiment in the accompanying drawing, in which:

Fig. 1 is an elevation of a strip of material having two generally L-shaped pieces arranged in a back-to-back symmetry.

Fig. 2 is a view in perspective of a press and transfer mechanism.

Fig. 3 is a plan view of a press and a machine feed mechanism, including the transfer mechanism.

Referring to Fig. 2, a press having a bed member 10 is provided with a guide channel 12, through which is fed a strip of material 14, having sections A and B' (Fig. 1) in back-to-back symmetry as formed by prior operation of the press. Press head 16 is provided with tools 18 and 20 for shearing the strip material 14 at desired points. Head 16 is further provided with an actuator 22 on an arm 24 extending out and away from the head. Actuator 22 forms a portion of a power transfer mechanism for imparting oscillatory motion to a pan 26 as head 16 is lowered and raised. The pan 26, having an arm 28, is fastened to a bevel gear 30 by shaft 32 having a bearing in bed 10 for oscillation about an inclined axis. Gear 30 is meshed with the second bevel gear 34 mounted on a horizontal shaft 36 having a bearing in the bed 10 and driven at its other extremity by spur gear 38 in mesh with rack 22. Blanked out pieces such as A and B are ejected from the press at the exit or extremity of channel 12 and are delivered to a first chute or receiver 40 which is downwardly inclined, and

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disposed adjacent to bed 10, and under the exit of channel 12, and receives certain ones of the stampings (Figs. 2 and 3), and to a second downwardly inclined chute or receiver 42 which is provided to receive reversed alternate stampings. Chutes 40 and 42 are inclined to permit pieces A and B (shown without detail in Fig. 3) to gravitate to a movable turret 44 which feeds work to, or is a part of a second machine such as is used for tapping holes, inserting screws or staking. The chutes are secured at their lower extremity to a stationary member 46 near the movable turret by brackets such as 48 and 50. Piece B sheared by a previous operation of the press is shown in pan 26. Piece A, attached to strip 14 and extending above tray 26, is sheared during the next operation of the press.

The mechanism cyclically operates in the following manner. The head 16 is forced down by suitable pressure means (not shown) toward bed 10 causing tools 18 and 20 to shear pieces A and B' from strip 14 at points C and D, respectively (shown in Fig. 1). During the descent of head 16, rack 22 drives gear 38 to rotate gears 34 and 30 swiveling pan 26 about shaft 32. In this position (illustrated as E, Fig. 3), piece B, punched out during the preceding operation and contained in pan 26, falls into chute 42 because of the declination of the supporting shaft. To aid in retaining the parts in pan 26 during movement, a guard rail 52 is provided along the arc traced by the open end of the pan. As the press reaches bottom, piece A, which had originally been extending above pan 26 at the start of the cycle, is sheared by blade 18 and falls into chute 40 to gravitate to turret 44. As head 16 is raised, rack 22 rotates gear 38 in a direction which returns pan 26 to its position adjacent channel 12. Feed F simultaneously advances the strip material, advancing blanked-out piece B', sheared by tool 20 at the descent of head 16, until it falls into tray 26, and attached piece A to a position above tray 26.

Pieces A and B gravitate through chutes 40 and 42, respectively, building a supply within the chutes, and are fed to turret 44 which advances to receive them at desired intervals. Although we have referred to a generally L-shaped piece of work, the invention is applicable to other shaped pieces of work requiring reversal of alternate pieces.

The chutes of receivers 40 and 42 may be inclined upward from the press in which event a transport system would be required to elevate the punched out pieces to the turret 44.

Modifications of the patent arrangement which we have disclosed embodying our invention will occur to those skilled in the art, so that we do not desire our invention to be limited to the patent arrangement set forth, and we intend in the appended claims to cover all modifications which do not depart from the spirit and scope of our invention.

What is claimed is:

1. In combination, a press having a bed, a guide within said bed, a reciprocating head for simultaneously punching out a number of pieces from a strip of material, certain of said pieces having an orientation reversed with respect to the others, said head having an actuator coacting with said bed, a first downwardly inclined chute having its upper end adjacent to said bed and below said guide for receiving certain of said punched out pieces, a moveable pan having an exit inclined upwards for receiving the others of said pieces, above said first chute and below said guide, a second downwardly inclined chute spaced from said first chute, and gearing meshed with said actuator for cyclically moving said pan to said second chute and inclining said pan exit downward said chute having means for maintaining the orientation of pieces carried thereby.

2. In combination with a punch press characterized in that each operation of said press severs two pieces from a strip of material, one of said pieces lying in a reversed orientation with respect to the other, a chute positioned to receive a predetermined one of said pieces directly from said press for delivering received pieces to a receiver, a second chute for receiving the other piece for delivering received pieces to said receiver, and means interposed between said press and said second chute for reversing the orientation of said other piece whereby all pieces are delivered at said receiver with the same orientation, said means including a pan for receiving said other piece, means for swinging said pan in an oscillating motion between a position to receive said other piece and a position to deliver it to said second chute and means on said chutes for maintaining the orientation of said pieces.

3. In combination with a punch press characterized in that each operation of said press severs two pieces from a strip of material, one of said pieces lying in a reversed orientation with respect to the other, a chute positioned to receive a predetermined one of said pieces for delivering received pieces to a receiver, a second chute for receiving the other piece for delivering received pieces to a receiver, means in each of said chutes for maintaining the orientation of said pieces, and means interposed between said press and said second chute for reversing the orientation of said other piece whereby all pieces are delivered at said receiver with the same orientation, said means including a pan for receiving said other piece, means for swinging said pan in an oscillating motion between a position to receive said other piece and a position to deliver it to said second chute, the receipt and delivery of said piece taking place from the same end of said pan.

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