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1,779,641

FEEDER FOR PUNCHING MACHINES

Filed Aug. 26, 1927

2 Sheets-Sheet 1

FIG. 1

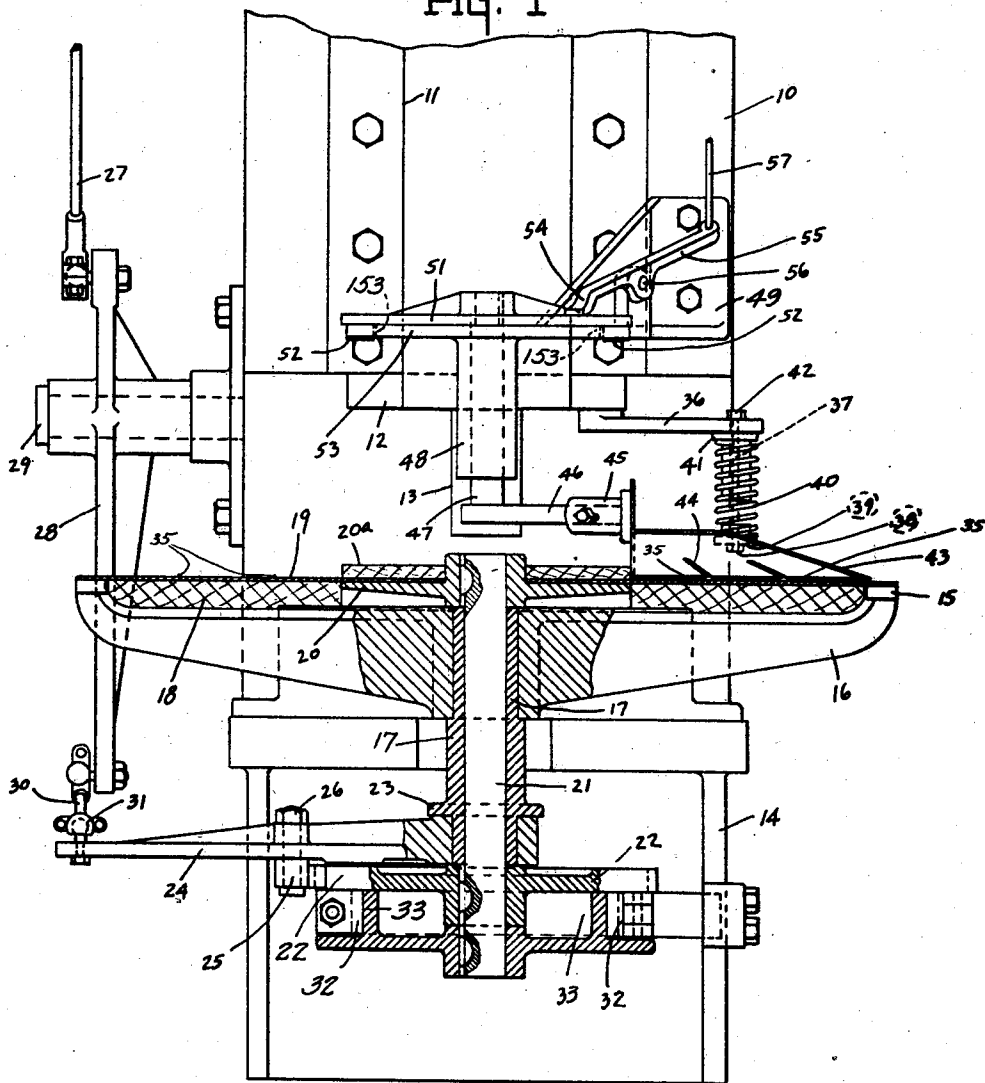
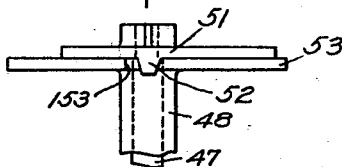


FIG. 3



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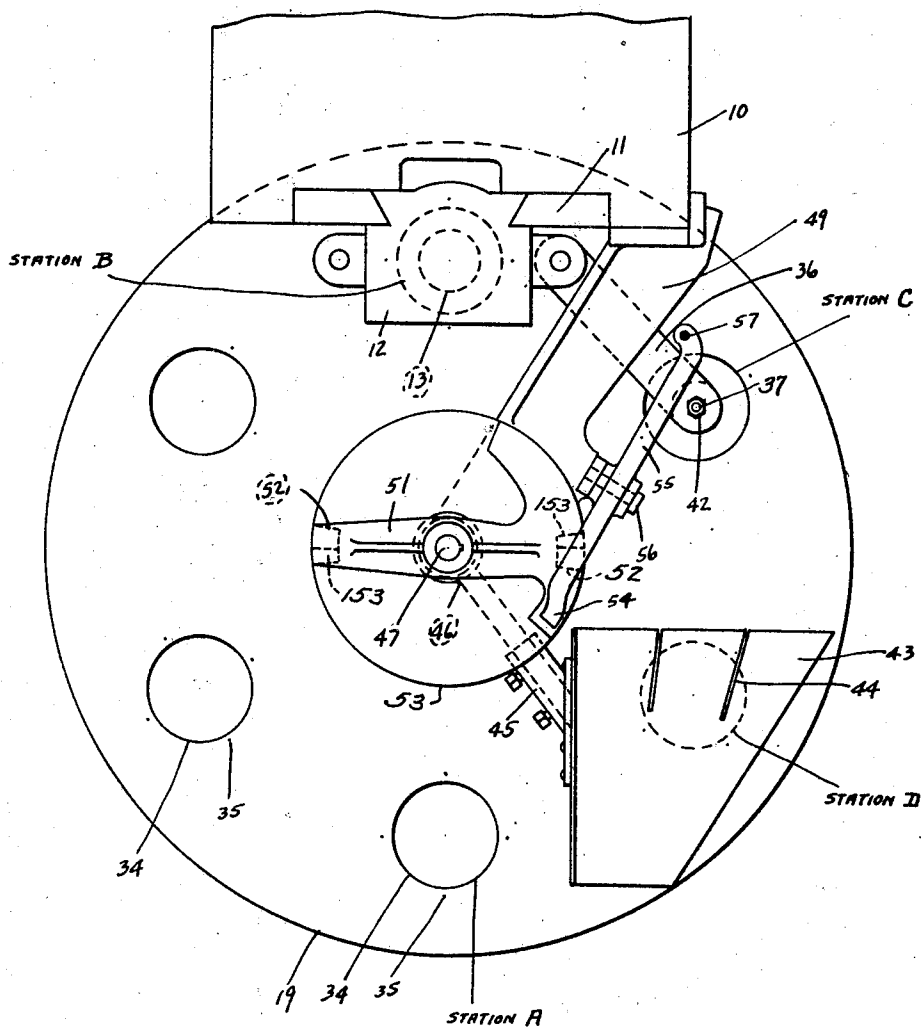
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FIG. 2



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FEEDER FOR PUNCHING MACHINES

Application filed August 26, 1927. Serial No. 215,621.

The invention relates to a punch press.

The chief object of the invention is to provide a punch press with suitable means whereby material can be readily positioned for punching and will be maintained in the adjusted position until punched and thereafter the punching and scrap will be removed from the press in separated relation.

The chief feature of the invention consists in providing means for accomplishing the foregoing object.

Another feature of the invention consists in providing means for automatically stopping the press operation if the material should jam and not be discharged therefrom.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims:

In the drawings Fig. 1 is an elevational view of the major portion of the mechanism associated with a punch press, parts being shown in section to show the same and other parts in detail. In Fig. 2 is a top plan view of the discharge and punch control mechanism as well as other parts of the device. Fig. 3 is an end elevation of the cam power control connection.

In the drawings 10 indicates a frame of a machine commonly known as a punch press. Said machine is provided with vertical ways 11 in which is slidably mounted a punch plunger 12 carrying a punching die 13. On the base 14 is supported a spider and table having the annular ring 15 and the radial arms 16 connecting the same to the hub 17. A suitable wooden platform 18 is supported thereby and lies slightly beneath the level of the annular ring 15. A disc or plate 19 is clampingly mounted between plates 20 and 20^a which are carried by a shaft 21 that extends downwardly thru the table construction and supports on its lower end a ratchet wheel 22 and brake. Pivottally supported on the extension 23 of the hub 17 is a lever arm 24 which pivottally supports a pawl 25 at 26, said pawl engaging ratchet wheel 22 for indexing the disc 19.

A connecting rod 27 may be actuated by an eccentric, said rod carrying a usual ec-

centric strap or the like and the complementary eccentric being mounted on the main power shaft or otherwise actuated, the same not being shown herein. The lever 28, thru a connecting rod or other similar connection 30, by means of the universal joint arrangement 31, is adapted to oscillate lever 24 to and fro and thus intermittently and progressively rotate ratchet wheel 22 and disc 19. To prevent overrunning or return of the disc, an adjustable brake arrangement is employed, including the brake band 32 for engaging a brake drum 33, integral with or otherwise secured to ratchet wheel 22, see Fig. 1.

The mechanism for reciprocating the plunger 12 and die 13 operates in timed relation with the movement of the disc 19,—that is, the plunger operates while the disc is stationary.

The disc 19 is provided with a suitable number of cutouts in the form of circular openings 34 adjacent which are provided a plurality of pins 35 which have sharpened points. The pins extend upwardly from the disc. As the disc 19 is progressively and intermittently rotated, pieces of stock are placed by the attendant or operator over the openings 34 at station A or directly in front of the machine. Said pieces of stock are retained in said position by the upwardly projecting pins. The stock is then progressively advanced until it is positioned beneath the die 13, whereupon it is punched to produce the desired shape and the scrap and said shape are carried from beneath the die in the next movement of the disc.

A knockout device is employed and for use thereof, the supporting platform 18 is cut out so as to permit the shape or blank to pass therethru and be discharged into a receptacle placed beneath. The knockout device consists of an arm 36 secured to and movable with the plunger 12. Said arm supports a bolt 37 which carries at its lower end a head 38 supporting a plate 39 against which one end of the coil spring 40 bears, the other end being retained by the bearing plate washer 41. The bolt or rod 37 is slidably mounted in the arm 36 and is retained thereon by the

nut 42. Thus the knockout device has sliding movement relative to the arm for separating the shape from the scrap and has general movement toward both with said arm for engaging the shape while associated with the scrap to remove the shape from the piece. The actual punching of the shape occurs at station B while the separation of the shape from the scrap occurs at station C. The scrap continues on the disc 19 until it encounters a takeoff plate 43 whose forward edge lies immediately above disc 19 to insure positive removal of the scrap and as herein shown plate 43 is provided with slots 44 to permit unobstructive passage of pins 35 there-through and therebeneath. In the rotation of the disc 19 it passes beneath the takeoff plate while the scrap rides above and upon the same and is discharged outwardly into any suitable receptacle placed adjacent thereto at the side of the machine since the plate 43 is suitably tilted for such discharge.

If the scrap should jam and not be readily removed from the prick or retaining pins 35, the edge of said scrap will engage the edge of the takeoff plate 43 and bear against the same. This will cause the takeoff plate to rotate with the disc 19 and such rotation is permitted, the arm 45 supporting said takeoff being pivotally supported at 46, by reason of a spindle 47 being pivotally mounted in a bearing 48, formed in a bracket 49, secured to and carried by frame 10. The upper end of the spindle 47 carries a radial arm 51 which at its opposite ends terminates in a cam tooth 52, normally seatable in the recessed plate portions 153 of the bracket 49. When the takeoff plate 43 is rotated, the scrap, which has jammed against the same when rotation of arm 46 causes arm 51 to elevate since the cam projection 52 raises the same in its rotation about and upon plate 53. In this elevational movement, arm 51 engages free end 54 of the lever 55 fulcrumed at 56 on the bracket arm 49 and the opposite end of said lever is connected to a control member 57 connected to the power control of the machine or press for stopping further movement of the machine, thus indicating to the operator that the scrap has jammed the machine. Removal of the scrap permits manual return of the takeoff plate 43 to its initial position and thereafter the machine can be started and proceed until it again jams. The removal of the scrap normally takes place at station D.

The invention claimed is:

1. In combination with a punching machine having a punch, a rotary stock support, said support and said punch having relative movement toward and away from each other for punching, means for intermittently rotating said support in timed relation to the punching movement, a control for said punching movement, a scrap remover

associated with said support, and a connection between said control and said remover for actuating the former by the latter when the scrap is not removed from the support by the remover.

2. In combination with a punching machine having a punch, a rotary stock support, said support and said punch having relative movement toward and away from each other for punching, means for intermittently rotating said support in timed relation to the punching movement, a shape and scrap separator operable in timed relation with the punch for removing the punched shape from the support, a control for the punching movement, a scrap remover, and a connection between said control and said remover for actuating the former by the latter when the scrap is not removed from the support by said remover.

3. In combination with a punching machine having a punch, a rotary stock support, said support and said punch having relative movement toward and away from each other for punching, means for intermittently rotating said support in timed relation to the punching movement, a shape and scrap separator operable in timed relation with the punch for removing the punched shape from the support, a control for the punching movement, a scrap remover, and a connection between said control and said remover for actuating the former by the latter when the scrap is not removed from the support by said remover, said shape and scrap separation occurring between the punching and the scrap removing stations.

4. In a device of the character described the combination of an intermittently rotatable disk, said disk having a plurality of openings therein, said openings being arranged concentrically with respect to the axis of rotation and in spaced relation to each other, stock engaging pins secured to and projecting upwardly from said disk and positioned adjacent the openings for retaining stock in registration with the openings, and a stock separator in juxtaposition to said disk and arranged to clear the pins and for removing stock therefrom.

5. In a device of the character described the combination of an intermittently rotatable disk, said disk having a plurality of openings therein, said openings being arranged concentrically with respect to the axis of rotation and in spaced relation to each other, stock engaging pins secured to and projecting upwardly from said disk and positioned adjacent the openings for retaining stock in registration with the openings, a punch for initially cutting a shape in the stock and a knock-out mechanism for removing the shape cut from the stock by passing the shape through the opening preliminary

to removal of the scrap stock by said separator.

5 6. In a device of the character described the combination of an intermittently rotatable disk, said disk having a plurality of openings therein, said openings being arranged concentrically with respect to the axis of rotation and in spaced relation to each other, stock engaging pins secured to and
10 projecting upwardly from said disk and positioned adjacent the openings for retaining stock in registration with the openings, a punch for cutting a shape from the stock, a knock-out mechanism for removing the shape
15 cut from the stock by passing the shape through the opening, and a scrap separator in juxta position to said disk and arranged to clear the pins for removing the scrap therefrom.

20 7. In combination a rotatable table, having a plurality of stock piece receiving portions concentrically arranged coaxial with the axis of table rotation and including openings for the passage of punched material
25 therethrough, a punch, a knock-out and a scrap remover, said punch and knock-out having relative movement toward and away from the plate for punching and shape and scrap separation, said knock-out and said
30 separator being arranged to cause movement of the shape and scrap in opposite directions, one being elevated from the table and the other being passed through and below the table.

35 In witness whereof, I have hereunto affixed my signature.

GEORGE O. ROCKWOOD.

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