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1,487,219

E. J. DREIS

MULTIPLE PUNCH

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Fig. 1.

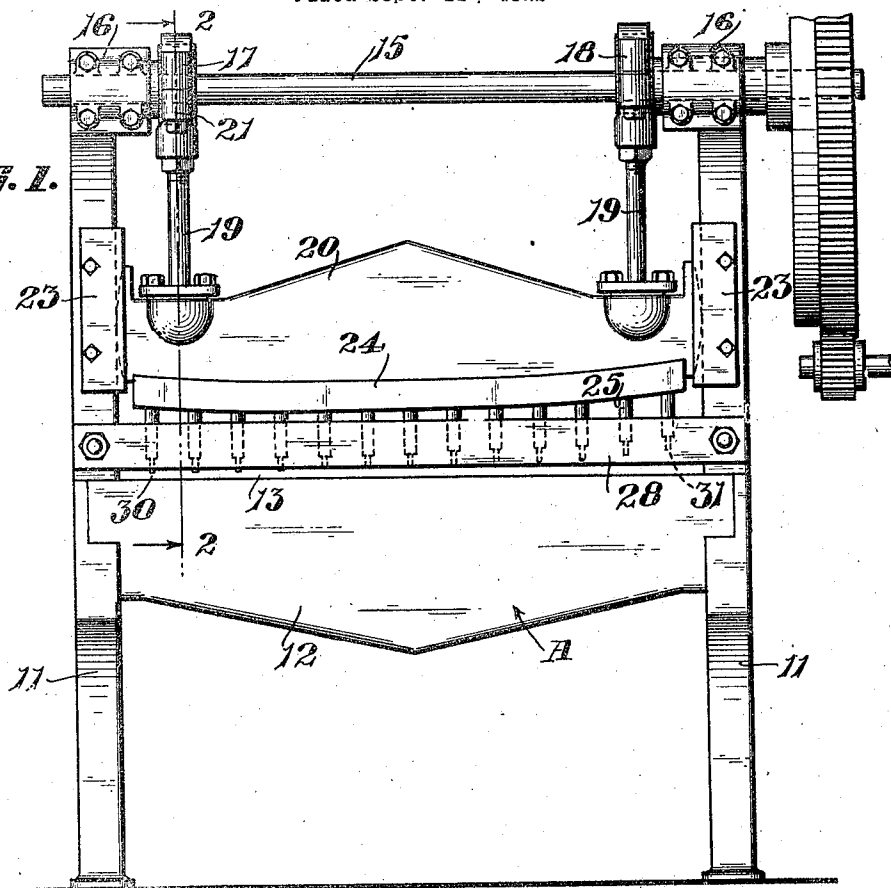


Fig. 2.

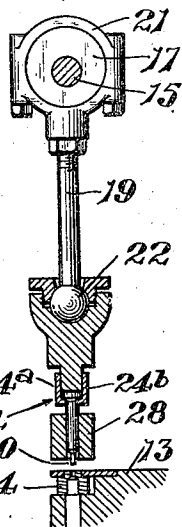


Fig. 3.

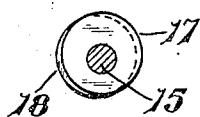


Fig. 4.

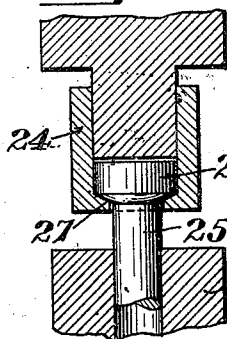
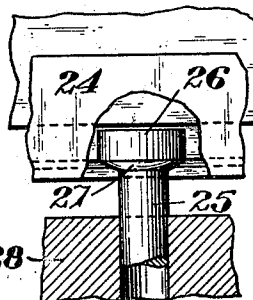


Fig. 5.



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EDWARD J. DREIS, OF SAN FRANCISCO, CALIFORNIA.

MULTIPLE PUNCH.

Application filed September 11, 1922. Serial No. 587,518.

To all whom it may concern:

Be it known that I, EDWARD J. DREIS, a citizen of the United States, residing at the city and county of San Francisco and State of California, have invented new and useful Improvements in Multiple Punches, of which the following is a specification.

This invention relates to metal working machines and particularly pertains to a multiple punch press.

It is the object of the present invention to provide an improved form of multiple punch press wherein the punches act singly and in succession, the device being simple in construction and exceedingly efficient in operation.

The invention contemplates the use of a frame structure embodying a die table and a punch bar carrying a plurality of punches, the punch bar being of peculiar formation and actuated by eccentrics in a manner whereby the punches will act singly and in succession.

One form which the invention may assume is exemplified in the following description and illustrated by way of example in the accompanying drawings in which:—

Fig. 1 is a front elevation of a device embodying the invention.

Fig. 2 is a section taken on line 2—2, of Fig. 1.

Figs. 3 and 4 are fragmentary views disclosing the mounting of the punches in the punch bar.

Fig. 5 is a diagrammatic view disclosing the relative positions of the eccentrics which operate the punch slide.

Referring more particularly to the drawings, A generally indicates the main frame of a power press. The frame consists of a pair of side frames 11 which are rigidly connected by a transverse frame 12, the latter also serving as a table or bolster plate 13. In the present instance the press is arranged as a gang punch and for this reason the table 13 is provided with a die bar 14 as shown in Fig. 2.

Positioned adjacent the upper end of the side frames 11 is an operating shaft 15. This shaft, as shown, extends parallel to the table and is journaled adjacent its ends in bearings 16, the latter being secured to or formed integral with the side frames at the upper end thereof.

Keyed or otherwise secured on the shaft

15 is a pair of eccentrics 17 and 18. These eccentrics are mounted one adjacent each bearing 16 and are connected by pitmans 19 to a slide 20. The pitmans are connected to the eccentric sheave by a strap 21 and to the slide 20 by a ball joint 22 as shown in Fig. 2. The slide 20 is mounted for vertical reciprocal movement in guides 23, these guides, as shown in Fig. 1, being secured to the side frames just above the table 13. It should be stated that the swell of the eccentric 18 is positioned on a different angle than that of the eccentric 17, therefore a rocking movement will be imparted to the bar as it is being reciprocated. The relative positions of the eccentrics is clearly shown in Fig. 5.

The slide 20 is equipped with a punch bar 24 which is formed in two sections, to-wit, 24^a and 24^b. These sections are substantially L-shaped in section and are secured one on each side of the slide as shown in Figs. 3 and 4. Mounted between the sections of the punch bar 24 is a plurality of punch members 25 each of which are formed with a head 26. The under side of this head is slightly rounded off as at 27. As shown in Fig. 2, the bodies of the punch dies are guided for vertical movement in a stripper bar 28, therefore the slight relative movement which would naturally occur between the slide and the punches, due to the rocking of the slide, is provided for by the rounding of the heads as described.

As before stated the device is constructed so that the punch members act singly and in succession. This is accomplished by imparting rocking movement to the slide 20. However it has been found necessary to slightly curve the punch bar 24 as shown in Fig. 1. The mounting of the eccentrics as described positions the punch members arranged adjacent the end of the slide connected to the eccentric 17 closest to the table so that they will be first in operation. In other words the ends of the punches are each a different distance from the table, the end of the punch 30 being closest, and the punch 31 being the farthest away from the face of the table.

In operation of the device turning movement may be imparted to the shaft 15 by any suitable means. The shaft 15 will transmit turning movement to the eccentrics 17 and 18, which movement will be trans-

mitted through the pitmans to the slide 20. The punch 30 will be first to engage the work arranged on the table. As the swell of the eccentric 18 is positioned different
 5 from that of the eccentric 17, a rocking movement will be imparted to the slide, and beginning with the punch 30 the punches will all be brought into action in rapid succession. This action is advantageous for
 10 various reasons, one of which is that the power required to operate the press is minimized.

Although the press here disclosed has been described and shown as a gang punch, it is
 15 obvious that forming or other dies may be substituted for the punches shown without departing from the spirit of the invention; the punches being shown for the purpose of clearly illustrating the invention.

20 While I have shown the preferred form of my invention, it is understood that various changes may be made in its construction without departing from the spirit of the invention as defined in the appended
 25 claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. In a device of the character described, a
 30 slide, a plurality of dies disposed in line formation and carried by said slide, and means for simultaneously imparting vertical reciprocating and endwise rocking movement to said slide whereby to cause said dies to
 35 operate in successive order.

2. In a press of the character described a slide, a plurality of dies of equal length carried thereby and arranged substantially
 40 in line formation, and means for imparting a vertical movement to the slide, and simultaneously an endwise rocking movement to cause the dies to operate in successive order.

3. In a punch press of the character described a table, a plurality of dies arranged in substantial line formation on said table, a
 45 slide disposed above the table, a plurality of dies carried thereby, said dies being adapted to cooperate with the dies on the table, and means for imparting a vertical
 50 movement to the slide, and simultaneously an endwise rocking movement to cause the dies on the slide to co-operate with the dies on the table in successive order.

4. A press comprising a frame, a table, a
 55 slide mounted for movement on the frame above the table, a shaft journaled in the frame, a pair of differently positioned eccentrics mounted on the shaft, pitmans connecting said eccentrics to said slide to im-
 60 part movement thereto when the shaft is rotated, and a curved die carrying member mounted on the lower end of said slide.

5. A press comprising a frame, a table,

an upwardly curved slide bar mounted for
 65 movement on said frame above the table, and means for imparting endwise rocking movement to said slide bar.

6. A press comprising a frame, a table, an upwardly curved slide bar mounted for
 70 movement on said frame toward and away from said table, and means for imparting a reciprocating and longitudinal rocking movement to said slide.

7. A press comprising a frame, a table
 75 supported thereby, a slide having an upwardly curved lower end mounted for movement on said frame, a shaft journaled in the frame, a pair of relatively different positioned eccentrics mounted on said shaft, and
 80 pitmans connecting said eccentrics to said slide to impart movement thereto when the shaft is rotated.

8. A device of the character described comprising a frame, a die carrying table on the
 85 frame, a slide mounted for movement on the frame toward and away from the table, said slide having an upwardly curved lower end, a plurality of dies of equal length carried by said slide and projecting from the lower
 90 end thereof, and means for simultaneously imparting vertical reciprocating and endwise rocking movement to said slide whereby to cause the dies to operate in successive
 95 order.

9. In a device of the character described, a frame, a die carrying table carried on the frame, a slide mounted for movement on the frame toward and away from said table, a
 100 plurality of dies carried by said slide and projecting from the lower end thereof for cooperation with the dies on said table, a shaft journaled in the frame, a pair of differently positioned eccentrics fixed on said shaft, pitmans operatively connecting said
 105 eccentrics to said slide to simultaneously impart vertical reciprocating and endwise rocking movement to said slide when said shaft is rotated whereby to cause said dies on the slide to operate in successive order.

10. A punch press comprising a frame, a die carrying table mounted on said frame, a
 110 reciprocable slide mounted for movement on the frame toward and away from said table, the lower end of said slide being upwardly curved, a plurality of punches mounted in
 115 the lower end of said slide and projecting therefrom for cooperation with the dies on the table, a drive shaft journaled in the frame above the slide, a pair of differently
 120 positioned eccentrics fixed on said shaft, pitmans operatively connecting said eccentrics to said slide to simultaneously impart vertical reciprocating and endwise rocking
 125 movement to said slide when the shaft is rotated whereby to cause the punches to act in successive order.

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