

April 2, 1946.

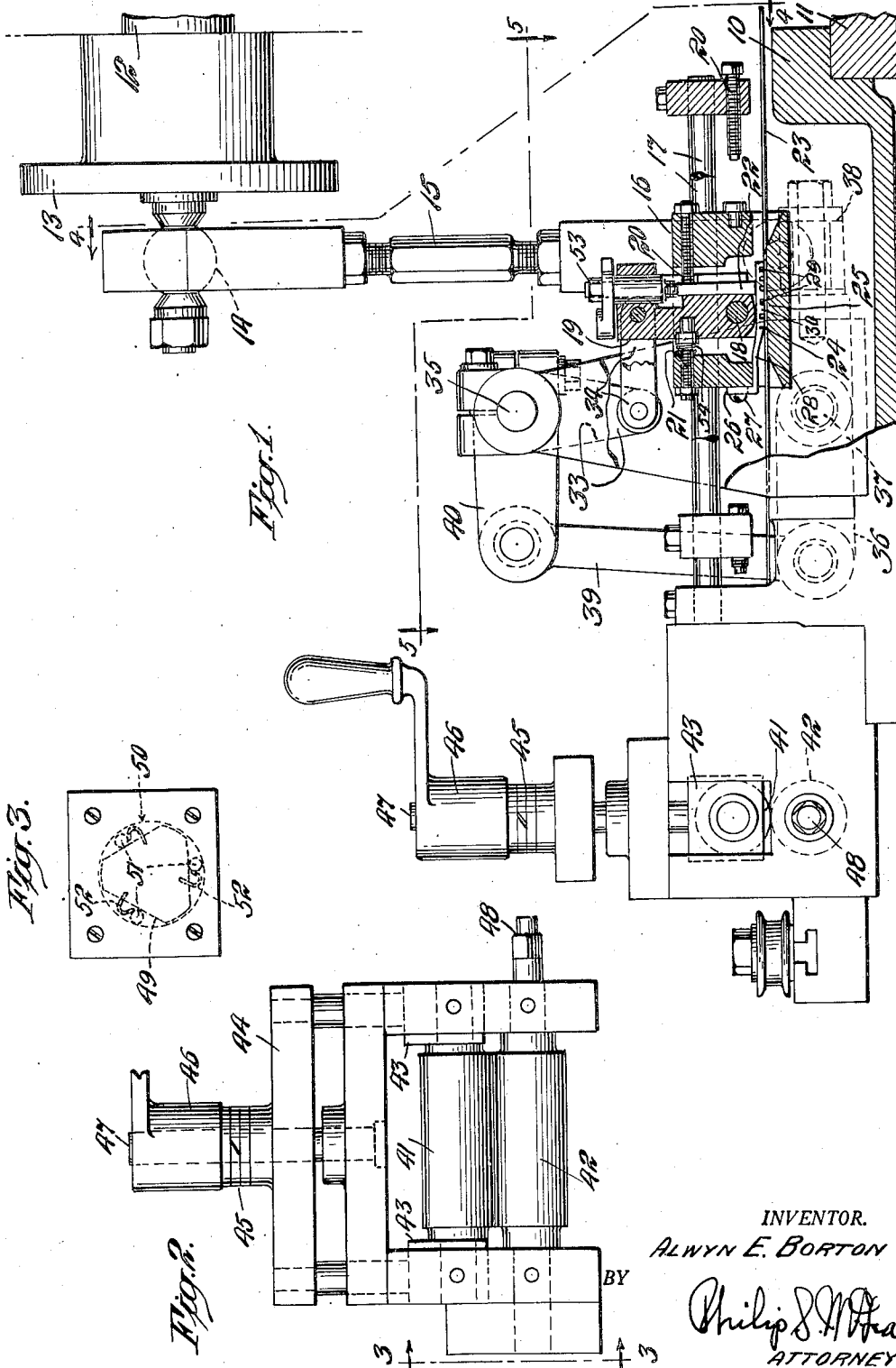
A. E. BORTON

2,397,833

SLIDE FEED

Filed Sept. 29, 1944

2 Sheets-Sheet 1



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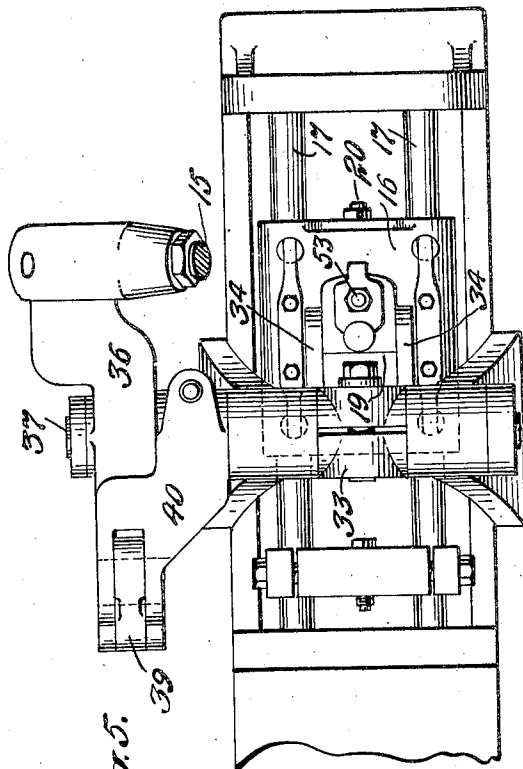


Fig. 5.

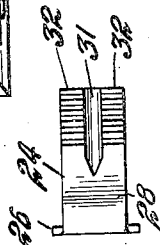


Fig. 6.

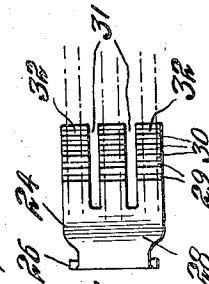


Fig. 7.

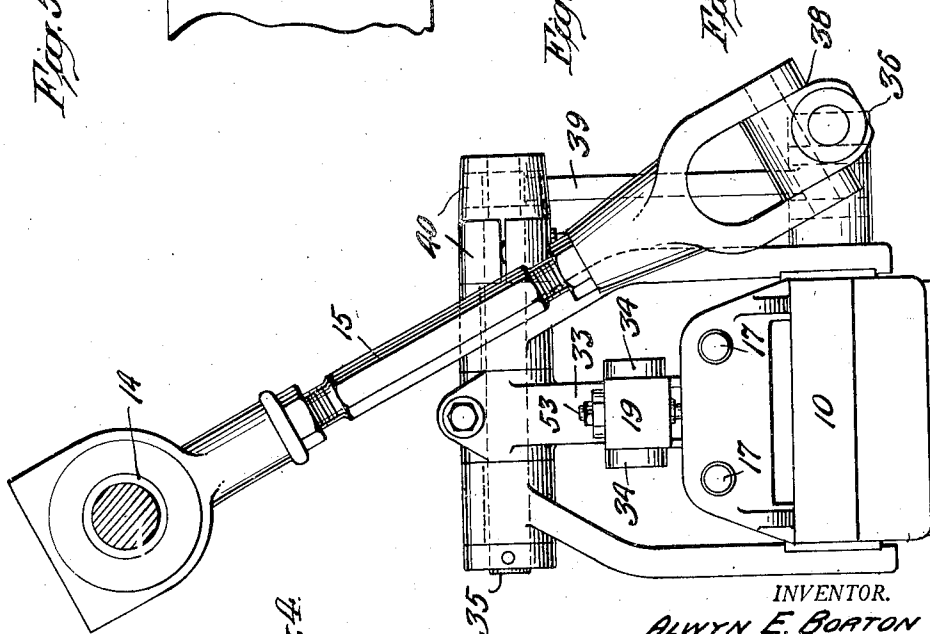


Fig. 4.

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2,397,833

SLIDE FEED

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7 Claims. (Cl. 271—2.5)

The invention here disclosed relates to slide feeds of the type covered in United States Patents 1,883,513 of October 18, 1932, and 1,959,853 of May 22, 1934.

Objects of the invention are to adapt feed mechanism of this type to punch presses and other forms of metal working machines, and particularly to enable timed operation of the same from the overhead cam shaft or other such main operating part of the machine in cases where the cam shaft or other operating part will be disposed off to one side or the other or otherwise offset or out of line with the line of feed of the stock.

Other objects are to improve the grip of the feed mechanism on the stock, and particularly to enable the gripping and accurate feeding of two or more strips of stock at the same time.

Further objects are to facilitate the initial feeding in and setting of the stock and to accurately "check" the stock against retrograde movement at the end of the feed stroke.

Other desirable objects and the novel features by which the purposes of the invention are attained will appear or are set forth in the course of the following specification.

The drawings accompanying and forming part of the specification illustrate a present practical embodiment of the invention but structure may be modified and changed as regards this disclosure, all within the true intent and broad scope of the invention as hereinafter defined and claimed.

Fig. 1 in the drawings is a broken and part sectional side elevation of one of the slide feeds as applied to and operating in conjunction with a machine on the order of a punch press;

Fig. 2 is a broken end view of the feeding in and check rollers as viewed from the left in Fig. 1;

Fig. 3 is a part sectional view of the check clutch, as on substantially the plane of line 3—3 of Fig. 2;

Figs. 4 and 5 are vertical and horizontal sectional views, respectively, as on substantially the planes of lines 4—4 and 5—5 of Fig. 1;

Figs. 6 and 7 are plan views, respectively, of a two-strip and a three-strip feed pad for gripping the stock.

In the present disclosure the invention is illustrated as applied to a punch press, and for that purpose is shown as having a base 10 adapted to be bolted or otherwise secured over the bolster or bed plate 11 of the press. The cam shaft 12 of the machine is shown as carrying a crank disc 13 provided with an adjustable ball crank 14 for the upper end of the adjustable operating link 15.

The "slide" proper is indicated at 16 in the form of a block mounted to slide on guide rods 17 and having pivoted on it at 18 the upright stock gripping lever 19. The latter is rocked between adjustable front and back stops 20, 21, and carries on its forward face the adjustable pinch block 22.

To assure firm gripping engagement with the strip or other stock 23, a yielding gripping pad 24 is shown interposed between the lower end of the rocking lever and the back or bottom 25 forming the stationary jaw part of the slide.

This pad is tensioned upwardly toward the lower end of the lever 19 and is pressed downwardly into gripping engagement with the stock on the forward rocking movement of the lever by the pinch block 22 forming the movable jaw element of the combination. For such spring tensioning purposes the pad may be made of a single piece of spring metal having an angled mounting portion 26 at one end removably secured to the slide block at 27, this mounting portion being connected with the main body of the pad by a reduced or thinned yielding neck portion 28.

Gripping engagement with the stock is improved by cross grooving the face of the pad, as indicated at 29, to break up the surface into a series of flat ridges 30, and by longitudinally grooving or slotting the pad as at 31, Figs. 6 and 7, to divide the pad into two or more longitudinal fingers 32.

The separation of the pad into a series of longitudinally extending fingers is of advantage where two or more strips of stock are to be fed, for then each of such fingers may be utilized to independently grip one such strip of material. In Fig. 6 a pad is shown divided longitudinally to provide feeding fingers for two strips of stock, and Fig. 7 shows such a pad divided to independently engage and feed three strips of stock.

The jaw lever 19 is shown as oscillated by a rock lever 33 and link 34, from an overhead rock shaft 35, as in Patent 1,959,853 above referred to, but in the present disclosure this rock shaft, instead of being directly actuated from the crank or connecting rod 15, is operated from a double ended rock lever 36 pivoted at 37 on the base 10 below and in line with rock shaft 35. One end of the rock lever 36 has a universal pivotal connection 38 with the lower end of crank rod 15 and the opposite end of said lever is connected by pivot link 39 with the rock lever 40 on the end of shaft 35.

This linkage arrangement provides for a crank or connecting rod length sufficient for operation

in cases, such as shown, where such mechanism necessarily is considerably offset from but is relatively close to the primary operating shaft. The same or substantially the same feed unit with the walking beam form of rocker 36 mounted on the base can thus be adapted to various forms of punches and other machines which require the feed mechanism to be located at the side or at the front, or some other special position.

Cooperating upper and lower rolls are shown at 41, 42, at the entering end of the unit, the upper roll in vertically adjustable bearings 43 and engaged by yoke 44 adjustably tensioned by spring 45 and hand crank 46 engaged on the screw stud 47. The lower roll is shown provided with a projecting squared shaft end 48 for engagement by a hand crank for turning in the direction to initially advance the stock into position in the feed slide mechanism.

To enable these rolls to serve as a check for the advanced stock, the shaft of the lower hand crank roll is shown as carrying a triangular fixed cam 49 turning in a circular chamber 50 and engaged by clutch rolls 51 tensioned by springs 52 to lock against reverse motion but to permit free movement in the feeding in direction.

The guide rods 17 are preferably carried by the base 10. Also, the rock shaft 35 is journaled in the head portion of the base structure and the rocker for actuating the same is mounted on the bottom portion of the base. This unit structure gives the feed mechanism the characteristics of an attachment which may be applied as such to different machines, and the location of the actuating rocker and its provision with a universal joint operating connection enables the attachment to be connected up with the different machines in various different necessary relations.

The crank pin 14 is usually adjustable for determining the desired feed stroke and the position of the clamp block 22 can be adjusted at 53 to suit the thickness of material gripped by the pressure pad. The latter, by reason of the separate transversely grooved fingers, firmly grips the stock whether it be in one, two or more separate strips. A spring such as indicated at 54, Fig. 1, may be disposed back of the oscillating jaw lever 19 to rock it in the jaw closing direction, to assist in proper timing by taking up slack that may be present in the operating connections. The irreversible feed in rolls hold the stock in advanced position and may eliminate the need for the "drag" ordinarily used on the slide block.

What is claimed is:

1. A slide feed attachment for punch presses and the like comprising a base attachable as a unit to a punch press or other machine, guide rods carried by said base, a slide block operating on said guide rods, a rock shaft journaled on said base above said slide block, a double ended rocker pivoted on said base at one side and below said rock shaft and pivotally connected at one end with said rock shaft, and a universal pivotal connection at the opposite end of said rocker for engagement by one end of an operating crank rod.

2. A slide feed comprising a slide block having a fixed jaw member and a companion movable jaw member and a pressure pad interposed between said fixed and movable jaw members, tensioned toward said movable jaw member and separated into stock gripping fingers extending longitudinally of the stock feed movement, and the gripping surface of said fingers being broken up in transversely separated sections.

3. A slide feed comprising a slide block having a fixed jaw portion, a pressure pad overlying said fixed jaw portion and having longitudinally and transversely separated gripping segments and a rock lever for pressing said pressure pad into cooperative relation with said fixed jaw portion and including a pinch block and means for effecting adjustment of said pinch block in respect to said pressure pad.

4. A slide feed comprising a slide block having a stock supporting jaw portion, a pressure pad overlying said jaw portion and having an attaching portion at one end by which the same is mounted on the slide block, said pressure pad having a flexible connection with said attaching portion and whereby said pressure pad may be pressed into engagement with the stock to be fed and a lever pivoted on the slide block over said pressure pad and having a pinching engagement with the same.

5. A slide feed comprising a slide block having a fixed jaw portion, a movable jaw lever pivoted on said slide block, a clamping jaw element adjustably mounted on said lever for stock gripping coaction with said fixed jaw portion, means for rocking said lever in opposite direction, and a spring acting on said lever in the jaw closing direction.

6. A slide feed comprising a slide block provided with stock gripping means, companion pressure rolls for advancing the stock into the bite of said stock gripping means, and an over-running clutch associated with one of said feed rolls and faced to permit feeding in rotation of said roll in one direction and to prevent rotation of the same in the opposite direction, and including a cam having flat faces, a surrounding, substantially cylindrical, stationary chamber, wedge rolls interposed between the flat faces of said cam and the surrounding wall of the chamber and spring means thrusting said rolls in the wedging direction on rotation of the feed roll in the direction opposite that for the feeding in of the stock.

7. A slide feed comprising a slide block having a fixed jaw portion, a rocking jaw member mounted on said slide block over said fixed jaw portion and a stock gripping pressure pad interposed between said rocking jaw and fixed jaw portion, said pressure pad being of spring material and having a rigid mounting portion at one end, rigidly attached to the slide block, said spring pressure pad having a yielding, resilient connection with said rigid mounting portion.

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