

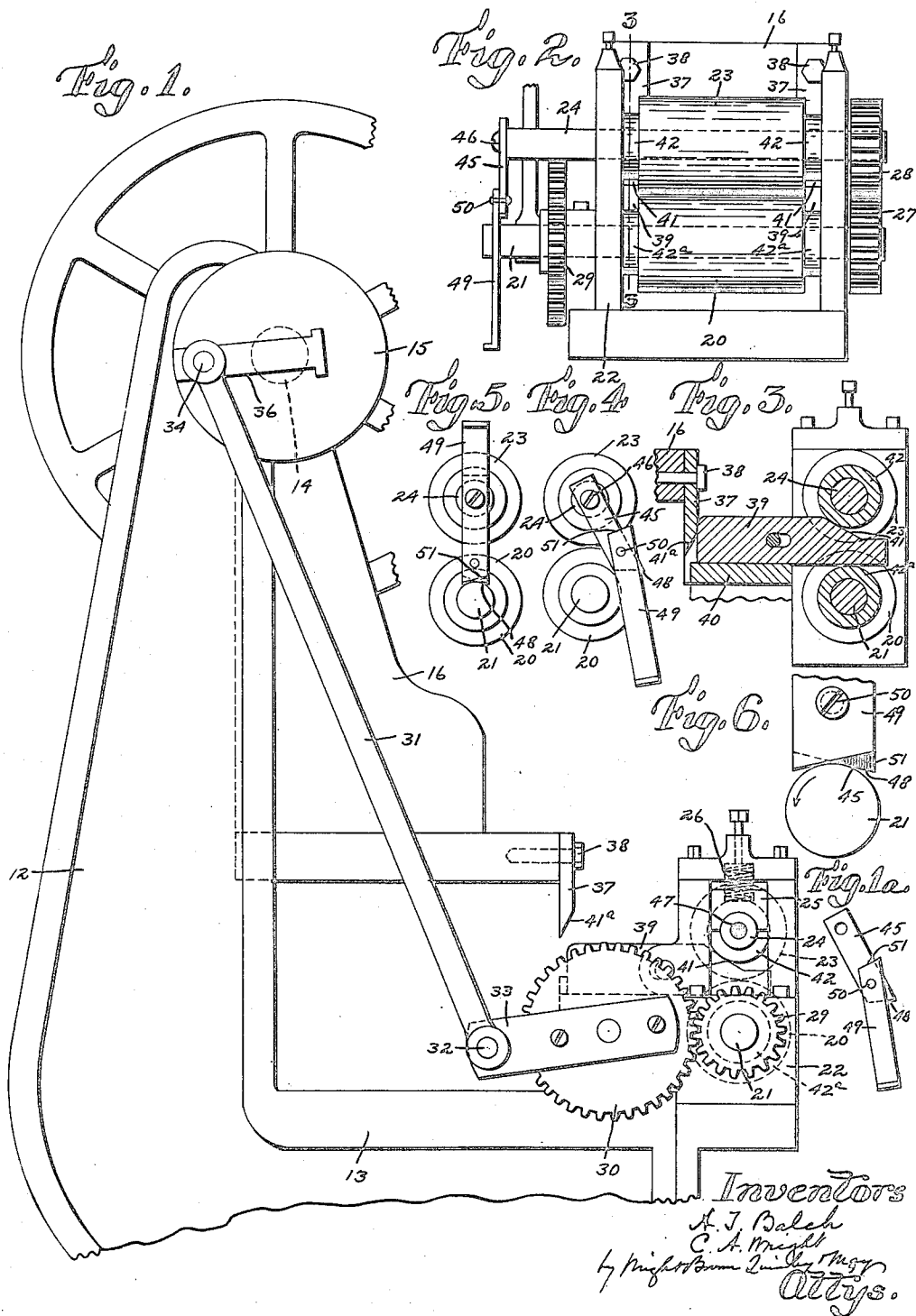
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A. T. BALCH ET AL

POWER PRESS

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ALFRED T. BALCH, OF BROCKTON, AND CLARENCE A. WRIGHT, OF WHITMAN, MASSACHUSETTS, ASSIGNORS TO LINDA M. JACKSON, OF BROCKTON, MASSACHUSETTS.

POWER PRESS.

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To all whom it may concern:

Be it known that we, ALFRED T. BALCH and CLARENCE A. WRIGHT, citizens of the United States, residing at Brockton and Whitman, respectively, in the county of Plymouth and State of Massachusetts, have invented new and useful Improvements in Power Presses, of which the following is a specification.

This instrument relates to a power press which includes a fixed bed plate, a reciprocating ram moved toward and from the bed plate by the rotation of a power-driven shaft journaled in the press frame, and forming instrumentalities cooperating with the bed plate and the ram to convert sheet metal stock into articles of manufacture, such as stiffeners for the shanks of shoes.

The invention has especial reference to a press organized to convert a strip or ribbon of sheet metal of indeterminate length into shank stiffeners, by cutting the strip crosswise into sections, or blanks of uniform length and pressing each blank to impart thereto any desired form and curvature. The strip is fed progressively to the press by reversely rotated feed-rolls engaging the transversely flat strip and feeding it to cutting-off and forming instrumentalities pertaining to the machine, one of the feed-rolls being pressed toward the other by springs.

The chief object of the invention is to synchronize the feeding movements of the feed-rolls with the movements of the ram, in such manner that the feeding movements will be of uniform amplitude, and the blanks will be cut at exactly equal lengths.

Another object of the invention is to provide improved means whereby the spring-pressed feed-roll may be manually lifted when the rolls are at rest, held separated from the companion roll to permit the insertion of stock between the rolls, and automatically released to feed the stock when the rotation of the rolls is resumed.

The above-mentioned and other objects are attained by the improvements herein-after described and claimed.

Of the accompanying drawings forming a part of this specification,—

Figure 1 is a side elevation, showing a portion of a power press embodying the invention, the manually operable lifting jack hereinafter described being omitted, and the feed-rolls shown in contact with each other.

Figure 1^a is a side view, showing the lifting jack removed from the press.

Figure 2 is a front elevation, showing the feed-rolls and a portion of the ram.

Figure 3 is a section on line 3—3 of Figure 2, showing the upper feed-roll raised by the automatic means hereinafter described.

Figures 4 and 5 show the feed-rolls in end elevation, and the lifting jack associated therewith as in Figure 2, Figure 4 showing the rolls contacting with each other, while Figure 5 shows the upper roll raised and supported by the lifting jack.

Figure 6 is an enlargement of a portion of Figure 5.

The same reference characters indicate the same parts in all the figures.

In the drawings, 12 represents a portion of the frame of a power press, said portion including the fixed bed plate 13. 14 represents the usual power driven press shaft, journaled in fixed bearings at the upper portion of the frame. Fixed to one end of the shaft is a circular face plate 15. The usual ram 16 is mounted to be reciprocated vertically toward and from the bed plate, by the rotation of the shaft, suitable means, such as a crank fixed to the shaft, and a slotted head at the upper portion of the ram, receiving the wrist-pin of said crank, being provided for reciprocating the ram.

Any suitable instrumentalities may be provided for cutting a blank from a strip fed forward under the ram, and for forming the blank into an article of manufacture, such as a shank stiffener. Since the present invention relates wholly to the combination with a well known press of the feeding mechanism hereinafter described, it is not deemed necessary to show and describe said instrumentalities. The feeding mechanism in which the invention is embodied, comprises a lower feed-roll 20, having a shaft 21, journaled in fixed bearings in a housing 22, fixed to the press frame 12, and an upper feed-roll 23, having a shaft 24, journaled in bearings 25, which are vertically movable in said housing, and are pressed downward by springs 26, so that the upper roll normally bears yieldingly on the lower roll. The shafts 21 and 24 are connected by gears 27 and 28, as shown by Figure 2.

The feed-rolls are arranged to feed stock,

such as a strip of sheet metal suitable for shank stiffeners, into the space between the bed plate and the ram.

The lower roll 20 is driven by connections between its shaft 21 and the press shaft 14, said connections being preferably embodied in a gear 29, fixed to the shaft 21, a larger gear 30, supported by the housing 22, and meshing with the gear 29, and a rod 31, connected at one end by a pivot 32, with an arm 33, fixed to the gear 30, and at the opposite end by a pivot 34, with the face plate 15.

The pivots 32 and 34 are at different radial distances, respectively, from the axes of the gear 30 and face plate 15, the arrangement being such that the unidirectional rotation of the face plate by the shaft 14, causes alternating forward and backward rotary movements of the gear 30, and of the feed-rolls. The amplitude of these movements may be varied by adjusting the pivot 34 toward and from the press shaft 14, in a slot 36 in the face plate 15. The arrangement is such that when the feed-rolls have advanced the strip a distance equal to the desired length of the blank cut therefrom, the rotation of the rolls is reversed to stop the feeding action thereof.

The feeding mechanism also comprises automatic means for lifting the upper roll at the same time that the rotation of the rolls is reversed, so that the strip will not be retracted by the backward rotation of the rolls, said means including cam-shaped strikers 37, fixed as by bolts 38 to the ram, and cam-shaped slides 39 interposed between the feed-roll shafts, and movable on fixed guides 40, one of which is shown by Figure 3. The slides 39 have inclined faces 41, which bear on enlargements or collars 42, on the upper roll shaft 24, and are so formed that the depression of the upper roll by the springs 26 holds the rear ends of the slides 39 normally in the path of the strikers 37, as shown by Figure 1, said strikers having inclined faces 41^a. The lower edges of the slides bear on enlargements or collars 42^a, on the lower roll shaft. When the ram is raised the strikers are above the slides, so that the upper feed roll is depressed to bear on the lower roll, or on an interposed strip. When the ram descends, the strikers force the slides 39 forward and cause the inclines 41 to raise the upper roll as shown by Figure 3, at the same time that the rotation of the rolls is reversed. When the ram rises and the strikers leave the slides, the latter are returned by the pressure of the springs 26, to the position shown by Figure 1.

It will now be seen that provision is made for ensuring uniformity of length of blanks cut from a strip engaged by the feed-rolls, the feed being arrested at a predetermined stage of the operation of the press.

To enable the operator to manually lift the upper roll when the rolls are at rest, and cause said roll to remain lifted, until the forward rotation of the rolls is resumed, there is provided a lifting jack, pivotally connected with the shaft of the upper roll, and including a section formed as a lever, whereby the operator may conveniently operate the jack to lift the upper roll against the downward pressure of the depressing springs, said jack remaining operative while the rolls are at rest, and being automatically rendered inoperative when the forward rotation of the rolls is resumed. The said jack includes an inner section 45, connected with the upper feed-roll shaft 24, by a pivot screw 46, the shaft being provided in one end with a screw-receiving orifice 47, as shown by Figure 1. The section 45 has a bevelled end face 48. 49 represents a lever section pivoted at 50 to the section 45, and having a bevelled end face 51. The arrangement is such that the jack may be arranged in an inoperative position, as shown by Figures 2 and 4, the lever section 49 being in position to be conveniently grasped and raised by the operator. In manually raising the upper feed-roll the operator swings the lower section 49 from the position shown by Figure 4, to that shown by Figure 5, thus inverting the section. The ends connected by the pivot 50 are at the same time swung inward. This operation causes the shorter arm of the lever section 49 to bear on the shaft 21, and exert upward force on the section 45, until both sections bear on the shaft 21, and hold the upper roll in a raised position. The bevelled end faces 48 and 51 are oppositely inclined, so that they collectively form a recess engaging the shaft 21, as best shown by Figure 6, in such manner as to prevent the strut formed by the sections from slipping off from the shaft. When the forward rotation of the feed-rolls commences, the periphery of the shaft 21 acts on the end face 51 to displace the section 49 from its operative position, and cause the jack to drop to the inoperative position shown by Figure 4.

We claim:

1. The combination with a power press which includes a power-driven shaft and a ram reciprocated by the rotation of said shaft; of feeding mechanism including a lower feed-roll having a shaft journaled in fixed bearings, an upper roll having a shaft journaled in movable bearings, said shafts being geared together, springs acting on said movable bearings to yieldingly depress the upper roll, and driving connections between the press shaft and the shaft of the lower roll, and organized to rotate the rolls alternately forward and backward.

2. The combination with a power press which includes a power-driven shaft and a

ram reciprocated by the rotation of said shaft; of feeding mechanism including a lower feed-roll having a shaft journaled in fixed bearings, an upper roll having a shaft
5 journaled in movable bearings, said shafts being geared together, springs acting on said movable bearings to yieldingly depress the upper roll, driving connections between the press shaft and the shaft of the lower roll,
10 and organized to rotate the rolls alternately forward and backward, and automatic means operable by the ram, organized to alternately lift the upper roll against the pressure of the said springs, and to permit the depression
15 of said roll by the springs.

3. The combination with a power press which includes a power-driven shaft and a ram reciprocated by the rotation of said shaft; of feeding mechanism including a
20 lower feed-roll having a shaft journaled in fixed bearings, an upper roll having a shaft journaled in movable bearings, said shafts being geared together, springs acting on said movable bearings to yieldingly depress
25 the upper roll, driving connections between the press shaft and the shaft of the lower roll, and organized to rotate the rolls alternately forward and backward, cam-shaped strikers
30 slides interposed between the feed-roll shaft

and movable in one direction by said strikers to lift the upper roll, and in the opposite direction by the action of said springs through the upper roll and its shaft, the slides being normally held in the path of the
35 strikers.

4. A power press comprising the combination specified by claim 1, the said driving connections including means for varying the
40 amplitude of the turning movements of the feed-rolls to vary the length of the feed.

5. A power press comprising the combination specified by claim 1, the said feeding mechanism including also a manually operable
45 lifting jack comprising an inner section mounted to swing on the upper roll shaft, and having a bevelled end face adapted to bear on the lower roll shaft, and an outer lever section pivoted to the inner section and having an oppositely bevelled end
50 face, also adapted to bear on said lower shaft, the jack being manually movable to an operative position supporting the upper roll separated from the lower roll, and adapted to be
55 automatically rendered inoperative by the forward rotation of the lower roll shaft.

In testimony whereof we have affixed our signatures.

CLARENCE A. WRIGHT,
ALFRED T. BALCH.