This invention relates, as indicated, to a roll feed auxiliary adjustment, but has reference more particularly to an adjustment of this character which is especially useful for presses in which a strip of metal is automatically and intermittently fed for operations thereon, such as blanking, piercing, drawing, etc.

In presses of this kind, the metal strip is usually fed past the dies by means of a roll which is rotated intermittently through a small arc to expose fresh sections of the metal strip to the action of the dies. Such rotation of the roll is usually effected by means of suitable ratchet mechanism which, in turn, is actuated by the crankshaft of the press, through the intermediary of a rod eccentrically connected to the crank-block so as to be subjected to a combined oscillatory and reciprocatory movement, a shaft oscillated about its axis by said rod, and suitable connections from said oscillating shaft to said ratchet mechanism.

It has heretofore been customary to adjust the feed stroke of the roll by varying the eccentricity of the aforesaid rod to the crankshaft, but such adjustment requires stopping of the press, and in any event, it is difficult to readily secure fine adjustments in this manner. It has also been proposed to provide auxiliary adjustments at various points such as in the connection of the aforesaid rod to the oscillating shaft or in the connections from the oscillating shaft to the ratchet mechanism, but these expedients have not proved satisfactory, since they involve stopping of the press, with consequent loss in production time.

The primary object of the present invention, accordingly, is to provide an auxiliary adjustment for roll feeds of the character described, which will obviate the disadvantages of the aforesaid expedients which have been heretofore used.

Another object of the invention is to provide an auxiliary adjustment of the character described which can be used without stopping the press, which is readily accessible to the operator, consists of a minimum number of easily assembled parts, and the use of which will increase the facility and rapidity of the set-up of the automatic roll feed press jobs, particularly plain blanking, compound blanking and piercing and combination blanking and drawing jobs.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims, the annexed drawings and the following description setting forth in detail certain structure embodying the invention, such disclosed structure constituting, however, but one of various forms in which the principle of the invention may be used.

In the annexed drawings—

Fig. 1 is a perspective view of a portion of a press, as viewed from the side and rear thereof and showing the adjustment embodying the present invention;

Fig. 2 is a plan view of the adjustment;

Fig. 3 is a side elevation of the adjustment;

Fig. 4 is a horizontal cross-sectional view of the adjustment; and

Fig. 5 is a fragmentary cross-sectional view, taken on the line 5—5 of Fig. 4.

Referring to the drawings, and especially to Fig. 1 thereof, the press is provided adjacent the top thereof with a crank-block, indicated by reference numeral 1, and having connected thereto a rod 2. The rod 2 is connected near its lower end to a ball 3 (Fig. 2), having a stem or shank 4 which extends through the flattened portion 5 of a circular stud 6 and is secured thereto by means of a nut 6.

The stud 6 extends through a casting 7, which is hereinafter termed the roll feed adjusting lever and which is rigidly clamped to the end of the roll feed oscillating shaft 8, the stud extending at an angle to the axis of said shaft, as shown in Fig. 4. The stud 6 has a portion 8 of reduced diameter, which is threaded, and has threadedly secured thereto an adjusting nut 10, the periphery of which is knurled to facilitate turning thereof. The end of the portion 9 of the stud has secured thereto a bushing 11 which is slidable in the bore in the lever 7 through which the stud extends and thereby prevents binding of the stud.

The shaft 8 is journaled in bearings 12 and 13 which extend from the side of the press. A lever 14 which actuates linkage 15 and 16, which in turn actuates the ratchet mechanism for intermittently turning the roll 17, which feeds the metal strip, as hereinafter described, is keyed to shaft 8. Reciprocatory movement of the rod 2 causes oscillation of the lever 7 and the shaft 8.

In setting up the press for the job in hand, the rod 2 will be adjusted relatively to the crank block 1 so as to secure an approximation of the desired stroke for the roll feed. The press will then be started and further adjustments to bring the feed stroke to the exact requirements can then be made while the press is running by turning the nut 10 in the desired direction, thereby decreasing or increasing the effective length of the lever arm formed by the stud 8 and casting 7. This latter adjustment while the press is running is rendered possible by the fact that the
axis of the nut 10 intersects the axis of the shaft 8, so that the only movement imparted to the nut during the press operation is a slight oscillatory movement, which is so small that the operator can turn the nut without any appreciable effort or any likelihood of danger to him. While the aforesaid position of the nut 10 represents an optimum arrangement, in which minimum movement is imparted to the nut during the press operation, it will be obvious that the nut may be placed a slight distance to the right or left of the oscillating shaft axis, without appreciably increasing the difficulty of adjustment. In practice, adjustments have been made while the press is running at speeds as high as 500 strokes per minute.

The auxiliary adjustment makes it possible to vary the feed stroke by amounts as high as about 10% of the feed stroke for which the crank block has been set.

Means are also provided for locking the stud 6 after it has been adjusted to the desired position, such means comprising a pair of clamping plugs 18 and 19 disposed within the casting 7 and movable into and out of locking engagement with the stud 6 by means of a screw 20. If desired, the screw 20 may be provided with a knurled head 21, to facilitate operation of the screw. It will be noted that the clamping plugs and operating screw therefor are also located reasonably close to the axis of the shaft 8, so that these elements may also be operated while the press is in motion.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the structure herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In a press having mechanism operable by the press operating mechanism for feeding metal strip through the press, said feeding mechanism including an oscillatable shaft, and means for adjusting the stroke of said feeding mechanism, said means comprising a stud extending angularly to said shaft and means for moving said stud relatively to said shaft, said means comprising a nut, the axis of which substantially intersects the axis of said shaft.

2. In a press having mechanism operable by the press operating mechanism for feeding metal strip through said press, said feeding mechanism including a reciprocable rod, a shaft oscillated by said rod, and means interconnecting said rod and shaft, said means comprising a stud, and a nut for actuating said stud to vary the effective distance between the rod and shaft, said nut being disposed adjacent one end of said shaft.

3. In a press having mechanism operable by the press operating mechanism for feeding metal strip through the press, said feeding mechanism including an oscillatable shaft, and means for adjusting the stroke of said feeding mechanism, said means comprising a stud extending angularly to said shaft, means for moving said stud relatively to said shaft, said means comprising a nut, the axis of which substantially intersects the axis of said shaft, and means for locking said stud in adjusted position.

4. In a press having mechanism for feeding strip through the press, said mechanism including an oscillatable shaft which is an active motive element in said mechanism, means including a lever arm for oscillating said shaft and means for varying the effective length of said lever arm to thereby vary the angle of oscillation of said shaft, said last mentioned means including a manually-operative element disposed substantially in alignment with the end of said shaft and oscillatable therewith.

5. In a press having mechanism for feeding strip through the press, said mechanism including an oscillatable shaft which is an active motive element in said mechanism, means including a lever arm for oscillating said shaft, and means for varying the effective length of said lever arm to thereby vary the angle of oscillation of said shaft, said means including a manually-operative nut disposed adjacent the end of said shaft and the axis of which substantially intersects the axis of said shaft.

6. In a press having mechanism for feeding strip through the press, said mechanism including an oscillatable shaft, a casting secured to one end of said shaft, a stud reciprocable in said casting and extending at an angle to the axis of said shaft, a rod secured to said stud and operable to oscillate said stud, and a nut for moving said stud relatively to said casting, said nut being accessible for turning at a point adjacent the end of said shaft.

7. In a press having mechanism operable by the press operating mechanism for feeding metal strip through the press, said feeding mechanism including as an active driving element an oscillatable shaft and means for adjusting the stroke of such feeding mechanism, the said means comprising an adjustable lever arm extending outwardly from said shaft, and an adjusting member located at one end of the shaft and carried thereby for varying the length of the arm.

EDWARD V. CRANE.