

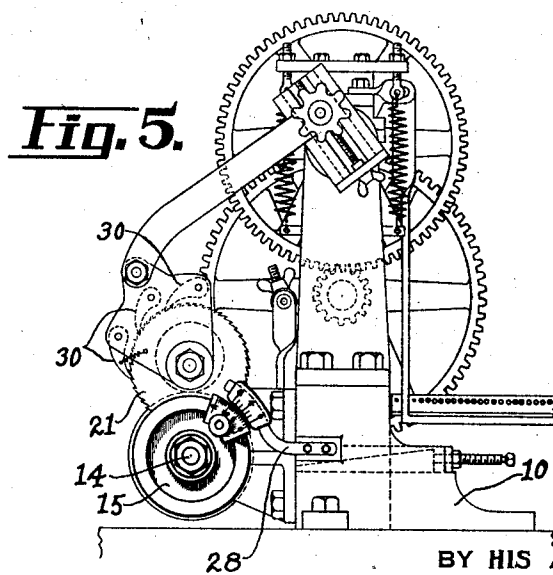
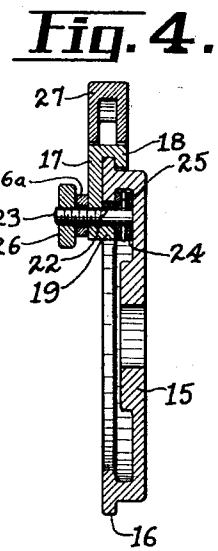
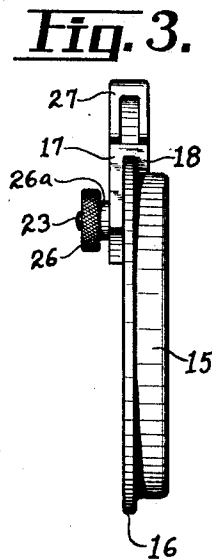
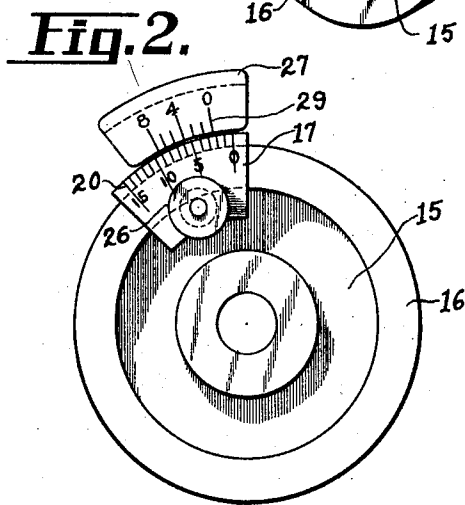
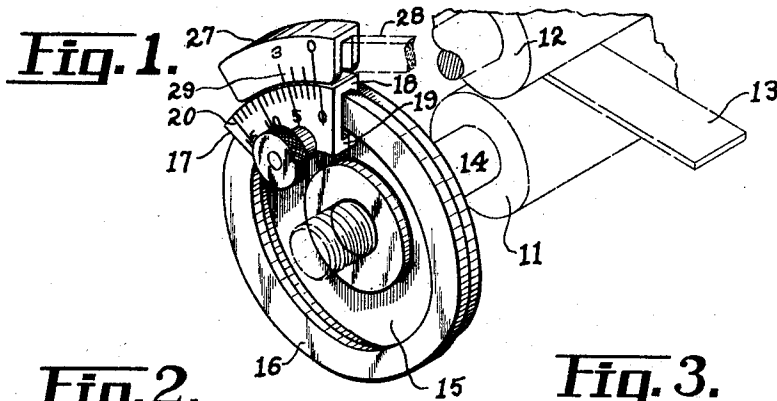
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VERNIER FEED SETTING MECHANISM

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VERNIER FEED SETTING MECHANISM

Application filed February 11, 1931. Serial No. 515,024.

This invention relates to strip feeding mechanism, and more particularly to a device for permitting the roll feed mechanism of a stamping press to be adjusted with absolute accuracy before any metal is passed through the rolls.

One object of this invention is to provide an adjustable feed setting mechanism which will cause the successive tools of a stamping press or dieing machine which operate upon the metal strip, to come into exact alinement with the holes stamped therein by the preceding tools, whereby breakage of the tools and spoilage of metal will be avoided.

A further object is to provide a machine of the above nature which will be simple in construction, inexpensive to manufacture, easy to install and manipulate, compact, and very efficient and durable in use.

With these and other objects in view there has been illustrated on the accompanying drawing, one form in which the invention may be conveniently embodied in practice.

In the drawing:

Fig. 1 represents a perspective view of the vernier feed setting mechanism as it appears when attached to the lower or driven feed roll shaft of the press.

Fig. 2 is a front view of said vernier feed setting mechanism.

Fig. 3 is an end view of the same.

Fig. 4 is a sectional end view of the same.

Fig. 5 is a front view of an automatic stamping press having the invention installed thereon.

In previous roll strip feed mechanisms for automatic stamping presses, it has been customary to adjust the roll feed by passing a preliminary strip of metal through the press, which was then operated as many strokes as was necessary to secure the desired feed adjustment. This former method was expensive of metal as it frequently had to be repeated several times before the strip could

be adjusted accurately enough to prevent breakage of the tools.

By means of the present invention the above and other disadvantages have been avoided. This has been accomplished by providing a vernier feed setting mechanism by means of which the roll feed may be accurately set to produce the desired amount of feed at each stroke of the press and without requiring the initial passing of any metal through the rolls.

Referring now to the drawing in which like reference numerals denote corresponding parts throughout the several views, the numeral 10 indicates an automatic stamping press having a pair of feed rolls 11 and 12 for frictionally feeding a strip of metal 13 into the machine to be repeatedly stamped by the vertically reciprocating successively-operating tools thereof. Attached to the front of the lower driven feed roll shaft 14 is a wheel 15 having an enlarged rim 16 on which is detachably mounted an adjustable arcuate slide 17. The slide 17 is provided with a pair of rearwardly extending flanges 18 and 19 for loosely embracing the rim 16. The flange 18 is also adapted to underlie the outer periphery of the rim 16 as clearly shown in Figs. 3 and 4.

The slide 17 is graduated on its outer edge by a scale 20 corresponding to the number of teeth on a feed roll ratchet 21, as shown in Fig. 5, where such a ratchet is used. If, however, a friction feed mechanism having no ratchet is employed, an arbitrary scale 20 will be used, preferably having either 100 or 200 divisions. The inner part of the slide 17 is provided with a tapped hole 22 for receiving a threaded rod 23 non-rotatively connected to a flat disc 24 located on its inner extremity, as by a pin 25. A locking nut 26 and a spacing collar 26a are mounted upon the exterior threaded section of the rod 23 for detachably fastening the sliding member 17 upon the rim 16 of the wheel 15 in any desired ad-

justed position around the circumference thereof.

In order to increase the accuracy of the setting of the roll feed mechanism, provision is made of an arcuate vernier plate 27 rigidly carried upon a bracket 28 mounted on a fixed part of the machine 10. The vernier plate 27 is provided with a scale 29, the subdivisions of which are graduated to indicate the number of pawls 30 employed for operating the ratchet mechanism, three in this instance. Where pawls are not used and a friction drive is employed, the graduations of the vernier plate will correspond to an arbitrary scale, such as 10 or 50.

Operation

In operation, the press will first be operated several times to take up back lash. The slide 17 will then be locked upon the rim 16 of the wheel 15 with the zero on the scale 20 in alinement with the zero on the scale 29. The stamping press will then be started without introducing the metal strip between the rolls and allowed to reciprocate the desired number of times as determined by the formulas given below and indicated by a reset counter attached to the press.

If the feed is too rapid or too slow, the zero mark of the slide 17 will then lie either to the left or right respectively of the zero on the vernier plate 27. The readings on the scales 17 and 29 will then enable the operator to readjust the feed mechanism in the proper manner to correct the error, so that when the metal strip is passed through the machine, the roll feed will be absolutely accurate, and breakage of the tools and spoilage of metal will be positively avoided.

In order to facilitate the readjustment of the feed setting mechanism, the following mathematical formulas have been derived by the inventor:

$$\frac{X}{F} = P \text{ (whole number)} + Q \text{ (a decimal)}$$

$$\frac{N(Q)F}{X} = D \text{ (whole number)} + E \text{ (a decimal)}$$

$$\frac{N(E)F}{XZ} = G$$

In the above formulas, X is the circumference of the driven feed roll 11, N is the number of teeth in the ratchet gear 21, Z is the number of pawls (30) used, F is the desired feed in inches, and P, Q, D, E and G are the computed values used to determine the desired settings.

Thus in one machine, the following computations were made:

(X)—Circumference of feed roll 11=17.67 inches,

(F)—Desired feed in inches (roughly estimated)=.781,

(N)—Number of ratchet teeth=144,

(Z)—Number of pawls 30=3.

Then applying the three formulas in succession:

$$\frac{X}{F} = \frac{17.67}{.781} = 22.65 = (22) \text{ whole number (P)} + (.65) \text{ decimal (Q)},$$

and

$$\frac{N(Q)F}{X} = \frac{144(.65)(.781)}{17.67} = 3.9 = 3 \text{ (whole number D)} + .9 \text{ (decimal E)}$$

also

$$\frac{NEF}{XZ} = \frac{144(.9)(.781)}{17.67(3)} = G = 2.1.$$

Hence the correct feed settings are:

$$P=22$$

$$D=3.9$$

$$G=2.1$$

To set the machine correctly, it will then only be necessary to reciprocate the ram of the press P times (in this case 22). The setting D (in this case 3.9) on the main scale 20 should then be opposite the zero on the scale 29. Also the setting G (in this case 2.1) on the vernier scale should lie opposite the same number of divisions on the main scale to the left of the zero on the vernier scale (in this case 5.1 on the main scale). If the settings do not lie as indicated, the operator will readjust the feed setting, and again operate the machine as above described. This operation will be repeated as many times as are necessary to obtain the desired accuracy of setting.

The invention may be applied to either right-hand or left-hand rotation by reversing the scales so that the zeros 20 and 29 will lie at the opposite ends of the slide 17 and vernier plate 27.

While there has been disclosed in this specification one form in which the invention may be embodied, it is to be understood that this form is shown for the purpose of illustration only, and that the invention is not to be limited to the specific disclosure, but may be modified and embodied in various other forms without departing from its spirit. In short, the invention includes all the modifications and embodiments coming within the scope of the following claims.

Having thus fully described the invention what is claimed as new and for which it is desired to secure Letters Patent is:

1. In a roll feed setting mechanism for a stamping press, a wheel for attachment to the roll feed shaft, a main plate adjustably carried by said wheel, and a vernier plate mounted on a stationary part of the press adjacent said main plate.

2. In a roll feed setting mechanism for a stamping press, a wheel for attachment to the roll feed shaft, a main plate adjustably carried by said wheel and adapted to rotate with said roll shaft, and a vernier plate

mounted on a stationary part of the press adjacent said main plate.

3. In a roll feed setting mechanism for a stamping press, a wheel for attachment to the roll feed shaft, a main plate adjustably carried by said wheel, a vernier plate mounted on a stationary part of the press adjacent said main plate, and means for locking said main plate to said wheel.

4. In a roll feed setting mechanism for a stamping press, a wheel for attachment to the roll feed shaft, a main plate adjustably carried by said wheel, and a vernier plate mounted on a stationary part of the press adjacent said main plate, said main plate and vernier plate having cooperating scales on their adjacent edges.

5. In a roll feed setting mechanism for a stamping press, a wheel for attachment to the roll feed shaft, a main plate adjustably carried by said wheel, a vernier plate mounted on a stationary part of the press adjacent said main plate, said wheel having a circular rim upstanding from one side of its periphery, and said main plate having a pair of flanges for embracing said rim.

6. In a roll feed setting mechanism for a stamping press, a wheel for attachment to the roll feed shaft, a main plate adjustably carried by said wheel, a vernier plate mounted on a stationary part of the press adjacent said main plate, said wheel having a circular rim upstanding from one side of its periphery, said main plate having a pair of flanges for embracing said rim, and means for clamping said plate to the inner side of said rim.

7. In a roll feed setting mechanism for a stamping press, a wheel for attachment to the roll feed shaft, a main plate adjustably carried by said wheel, a vernier plate mounted on a stationary part of the press adjacent said main plate, said wheel having a circular rim upstanding from one side of its periphery, said main plate having a pair of flanges for embracing said rim, and screw and nut means for clamping said plate to the inner side of said rim.

In testimony whereof, I have affixed my signature to this specification.

ARTHUR A. RICHARDSON.