

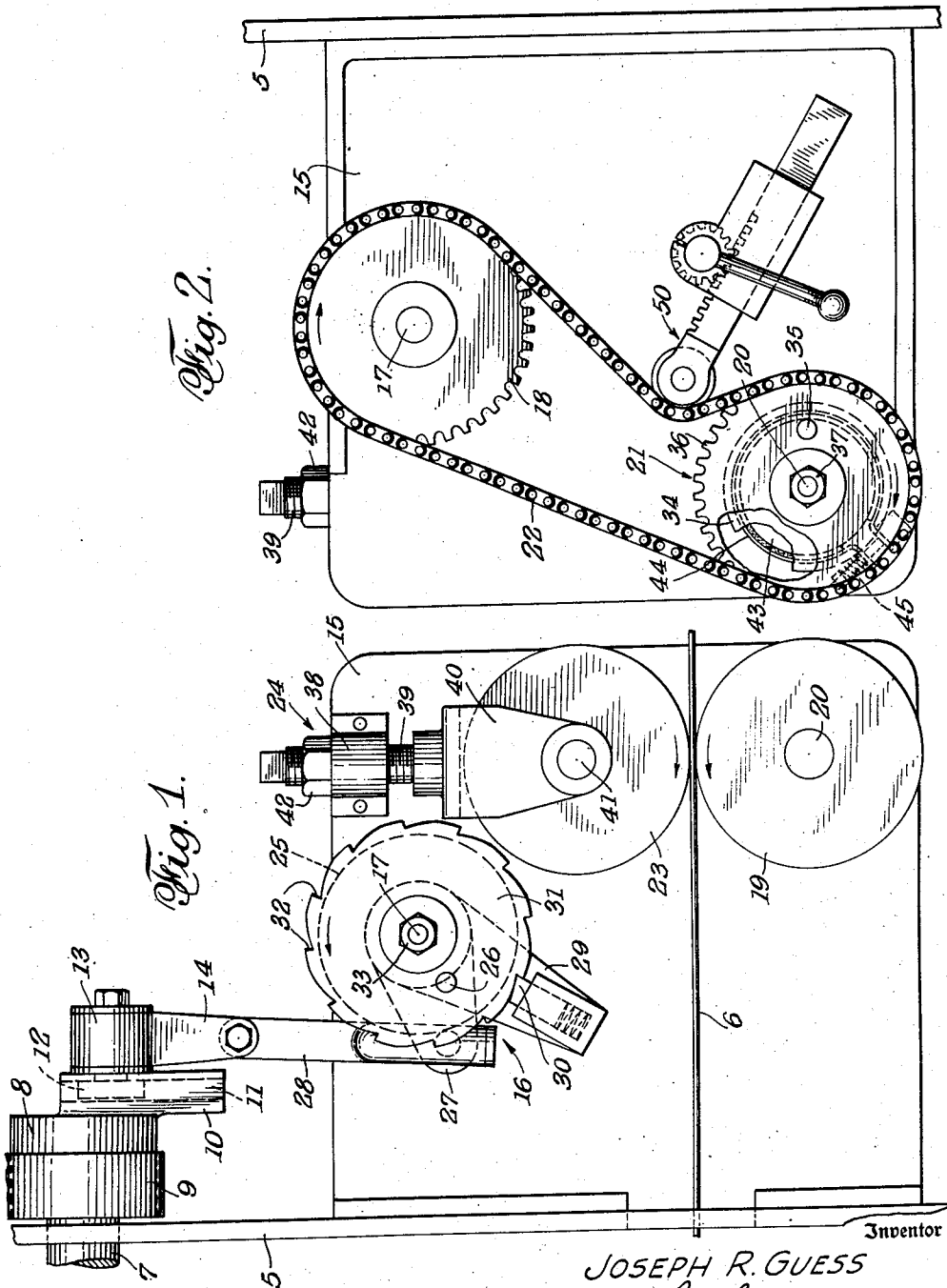
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INTERMITTENT FEED MECHANISM

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1

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INTERMITTENT FEED MECHANISM

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This invention relates to mechanism for intermittently feeding wire, rod, etc. to a punch press or like machine so that said machine may perform similar operations on uniformly spaced portions of the wire or rod being so fed.

In the manufacture of large-mesh metal screens, the cross wires or rods are usually initially provided with a series of crimps or offsets that interfit with similar crimps on longitudinal wires or rods to form a screen. These crimps may be produced or formed in a reciprocating punch press with the spacing of the crimps according to the desired mesh gauge of the finished screen. It is an object of this invention to provide novel and improved means driven by a punch press to intermittently feed a wire or rod in exact linear increments so that the punch and die of said machine may crimp uniformly spaced portions of said wire or rod in the exact spacing desired.

Since the mesh gauge of screens varies, it is another object of the invention to provide wire or rod feeding mechanism that is adjustable with easy facility to provide exact desired spacing of the crimps produced in said wire or rod by a punch press.

The invention also has for its objects to provide such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description. However, the drawing merely shows and the following description merely describes, one embodiment of the present invention, which is given by way of illustration or example only.

In the drawing, like reference characters designate similar parts in the several views.

Fig. 1 is a front elevational view of intermittent feed mechanism according to the present invention and shown in operative connection with a punch press.

Fig. 2 is a rear elevational view thereof.

In the drawing, the member 5 represents one side frame of a punch press or like machine, it being understood that said machine is provided with a die and punch to form crimps in a wire or rod 6 as the same is intermittently fed through the press. In the usual manner, the die is stationary and the punch reciprocates. The drawing shows a shaft 7 which is used for reciprocating the die, it being understood that each revolution of said shaft moves the punch from a retracted position into crimp-forming engagement with the die and back to retracted position. It is shaft 7 that is here used to drive the present feeding mechanism so that feed of wire or rod 6 is synchronized with the operation of the press and occurs during the retracted position of the punch.

The shaft 7 is provided with a cylindrical portion 8 that comprises the drum member of a brake and is engaged by a brake band 9 which arrests rotation of shaft

2

7 when the same is de-clutched in the usual manner of reciprocating presses. A radially extending guide 10 is provided on portion 8 and has a slot 11 to adjustably receive and hold the head 12 of a swivel fitting 13 that terminates in an arm 14. It will be clear that the eccentricity of swivel 13 relative to the axis of shaft 7 can be adjusted to obtain reciprocation of said swivel as desired. Said swivel constitutes the driver of the present feeding mechanism.

The feeding mechanism that is illustrated comprises, generally, a support bracket 15 affixed to the side of press frame 5 and extending laterally therefrom, ratchet means 16 on the front side of bracket 15 driven by swivel 14, a shaft 17 extending through said bracket and intermittently rotated by said ratchet means, a sprocket wheel 18 affixed to said shaft and on the opposite side of said bracket, a feed roller 19 on the front side of the bracket below and laterally outward of the ratchet means, a shaft 20 affixed to said roller and extending through said bracket, a changeable sprocket wheel 21 carried by shaft 20 in planar alignment with sprocket wheel 18, a slack chain 22 trained over wheels 18 and 21, an adjustable chain tightener 50 to remove slack from said chain, an idler feed roller 23 in planar alignment with roller 19, and means 24 to adjust roller 23 to desired feed pressure engagement with wire or rod 6 extending between rollers 19 and 23.

The ratchet means 16 comprises a plate 25 carried by shaft 17 and provided with a forwardly extending driving and locating pin 26, a lever arm 27 rotationally mounted around shaft 17, a link 28 interconnecting said arm and arm 14 of swivel 13, a second lever arm 29 affixed to arm 27 and movable therewith, a spring-pressed ratchet dog 30 carried by arm 29, a ratchet disc 31 provided with a set of uniformly spaced ratchet teeth 32 mounted on shaft 17 against plate 25 and having a hole through which pin 26 extends, and means 33 to removably lock the ratchet wheel in place on shaft 17 and against plate 25.

Reciprocation of swivel 14, through link 28, causes oscillation of arms 27 and 29, and the dog 30 of the latter arm produces step-by-step rotation of ratchet wheel 31. The degree of angular advance of shaft 17 can be varied by the number of ratchet teeth provided on wheel 31, the stroke of swivel 13 being adjusted accordingly. In practice, a set of twelve ratchet discs is provided, the teeth thereof varying in number between five and sixteen so as to provide for a wide range of angular advance of shaft 17, the advance depending on the number of ratchet teeth on the wheel 31 that is used. Accordingly, sprocket wheel 18 is intermittently and uniformly advanced in angular increments as desired.

The changeable sprocket wheel 21 comprises a backing plate 34 affixed to shaft 20, a driving and locating pin 35 on said plate, a sprocket disc 36 mounted on said shaft and having a hole receptive of pin 35, and means 37 to lock said disc in place.

If, in practice, sprocket wheel 21 has one hundred teeth, sprocket disc 36 may be one of a set of six discs having teeth varying in number between eighty-five and ninety. Thus, by suitable selection of ratchet wheel 31, a close but approximate angular advance of feed roller 19 may be obtained, and, by suitable selection of sprocket disc 36, the exact advance of said feed roller may be obtained.

The chain 22 is made with sufficient slack so that it may remain endless at all times and readily trained over wheels 18 and 21 while slack. Chain tightener 50 may then be adjusted to remove all undue slack and back lash between the sprocket teeth and the chain links. Any chain tightener comparable to the one shown may be used.

It will be clear from the foregoing that feed roller 19 can be advanced, in the direction shown, at intermittent angular increments of such exactness that wire or rod 6 is given an exact and uniform intermittent feed, as desired. By regulating the means 24 to create a desired pressure of rollers 19 and 23 on said wire or rod, slippage is obviated. In any case, the peripheral faces of said rollers may be roughened or knurled to insure against slippage.

The means 24 that is shown comprises a bracket 38, a screw stem 39 extending through said bracket, and a yoke 40 rotationally connected to the end of said stem and mounting idler feed roller 23 on shaft 41. A lock nut 42 on stem 39 is used for locking the adjustment of said roller.

Since the chain 22 cannot be so tightly tautened as to bind, there is some possibility of overrun of the intermittent feed above described. To prevent this, a brake or friction drag, comprising a drum 43 on shaft 20 and a band 44 held tensioned around said drum by a spring 45, is provided as seen in Fig. 2. Back lash of the mechanism is also prevented by said friction drag.

While I have illustrated and described what I now contemplate to be the best mode of carrying out my invention, the construction is, of course, subject to modification without departing from the spirit and scope of the invention. It is, therefore, not desired to restrict the invention to the particular form of construction illustrated and described, but to cover all modifications that may fall within the scope of the appended claims.

Having thus described the invention, what I claim and desire to be secured by Letters Patent is:

1. Mechanism for intermittently feeding a wire through crimping mechanism comprising a frame, a supporting bracket carried by said frame, a shaft journaled in the sides of said bracket, a plate secured to and adjacent one end of said shaft, a ratchet disc positioned at the side of and removably secured to the plate, a pair of arms

secured together and rotatably mounted on said shaft, one of said arms carrying a dog adapted to engage with the teeth on the ratchet disc, a link connected to the end of the other arm, a rotatably mounted driving shaft, a crank pin on said driving shaft having means for adjusting it radially of the shaft, an arm connecting said pin to said link, a sprocket wheel secured on the other end of said first-named shaft, another shaft journaled in the sides of the bracket, a wire feeding roll secured on said last-named shaft and a driven sprocket secured on the end of this shaft, a sprocket chain trained loosely around the two sprocket wheels for driving the last named sprocket and the feeding roll from the first named sprocket, a slack take-up means for the said sprocket chain, and a stem adjustably supported on the bracket and carrying a roller adapted to engage the said wire passing between the two rollers.

2. The invention as claimed in claim 1 wherein one of the said sprocket wheels is removably secured on its shaft whereby sprocket wheels having a different number of teeth thereon may be selectively mounted on the shaft.

3. The invention as claimed in claim 1 wherein the driven sprocket has a drum thereon and a brake is engageable with said drum.

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