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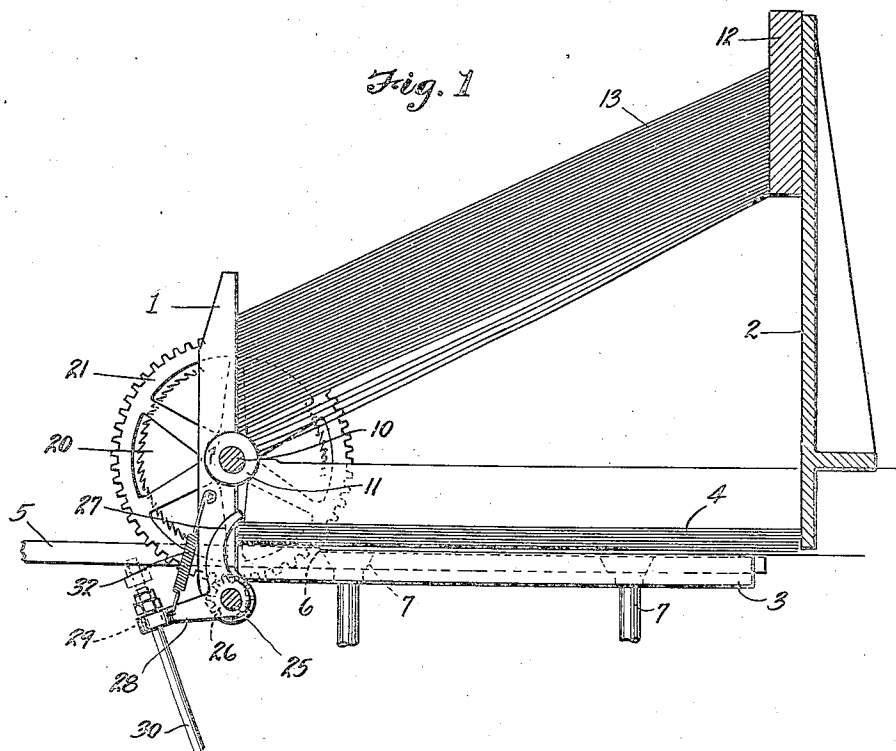
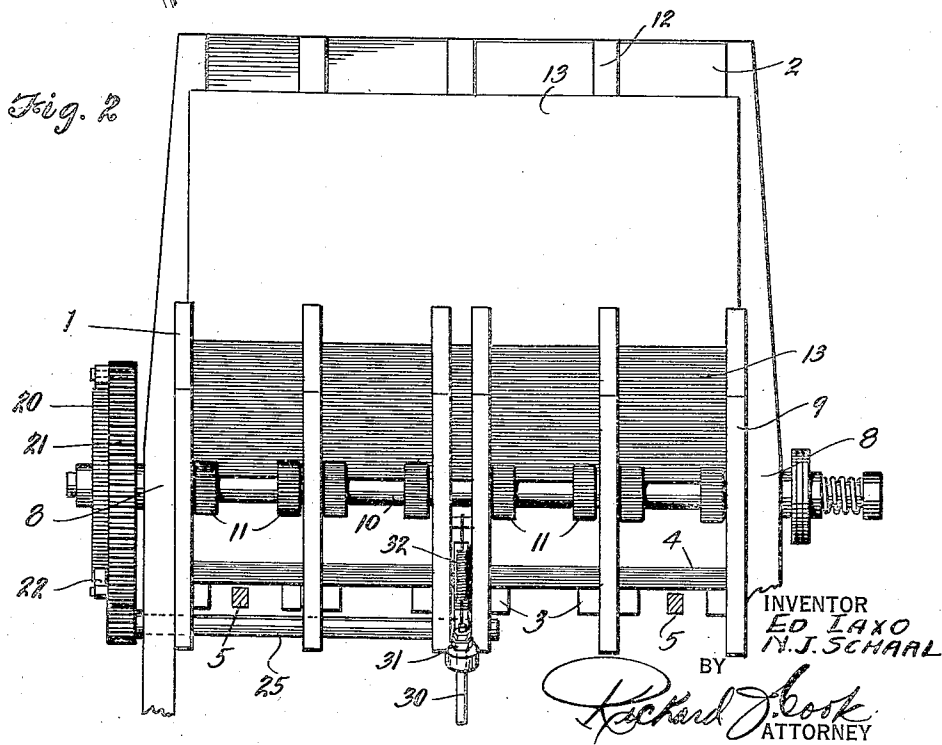
E. LAXO ET AL

1,739,153

AUXILIARY FEED MECHANISM

Filed Jan. 2, 1925

2 Sheets-Sheet 1



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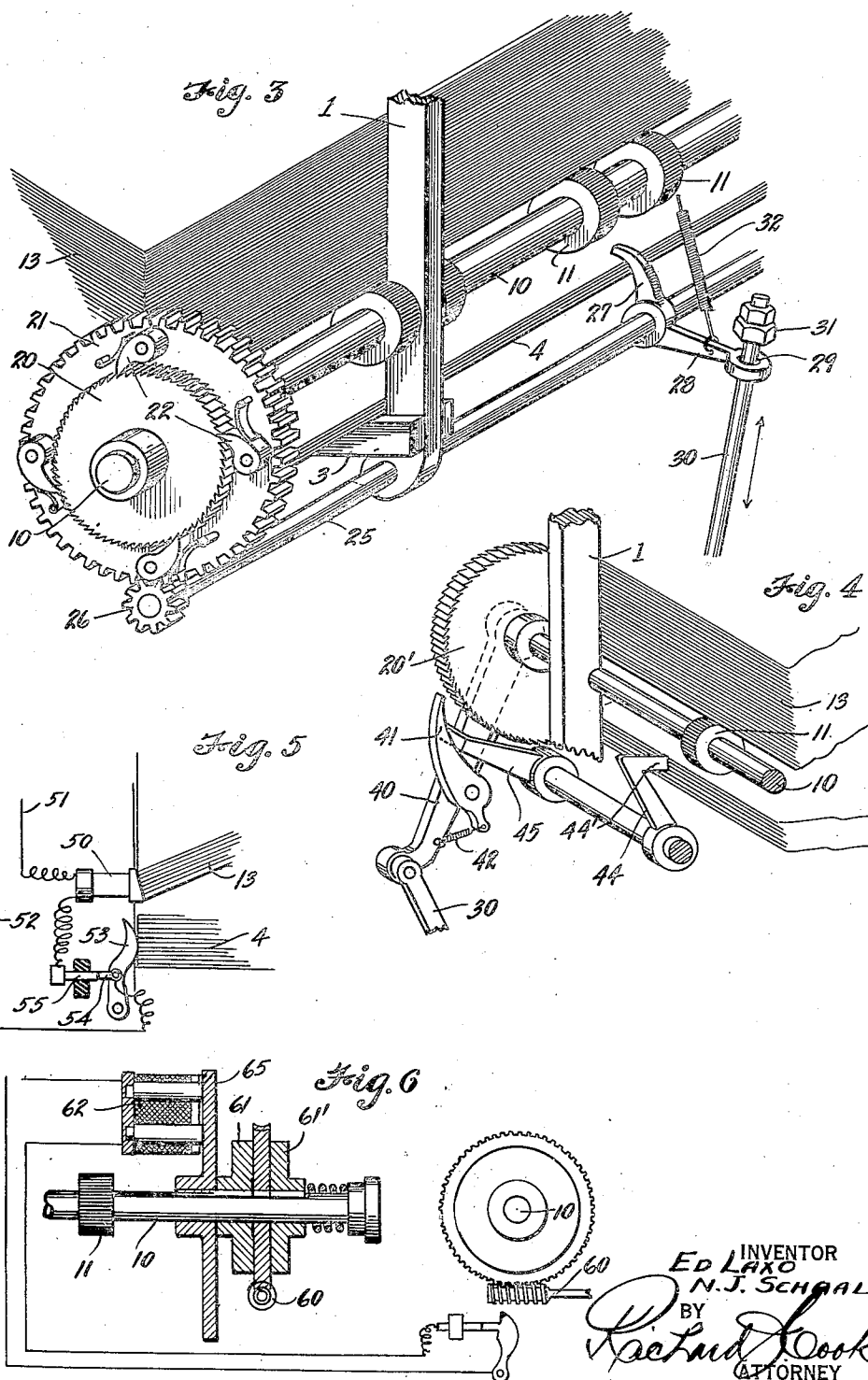
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AUXILIARY FEED MECHANISM

Application filed January 2, 1925. Serial No. 185.

This invention relates to an auxiliary feed mechanism for stacked material and more particularly to a feed mechanism for stacked metal sheets, the principal object of the invention being to provide means for overcoming the difficulties generally experienced in feeding sheet metal from the bottom of a stack due to the excessive weight thereon by the provision of mechanism which operates to deliver a few sheets at a time from a supply stack onto a working stack in accordance with the rate at which the sheets are used from the latter stack and in such manner that only a relatively small number of sheets will be maintained in the working stack and its weight will be kept below that at which there would be difficulty in feeding the sheets from the bottom thereof.

Heretofore, in the operation of machines with which the present device is intended to be used and wherein sheet metal is maintained in stacked form, an attendant has been stationed for the purpose of placing a few sheets of material at a time on the working stack so that the feed will not be interrupted due to excessive weight on the bottom sheet and it has been the purpose of the present device to eliminate the services of such an attendant.

In accomplishing this and other objects of the invention, we have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Figure 1 shows, in side elevation, a part of a machine equipped with an auxiliary feed mechanism in accordance with the present invention.

Figure 2 is a front elevation of the same.

Figure 3 is a perspective view, particularly illustrating the ratchet feed mechanism.

Figure 4 is a perspective view illustrating an alternative construction.

Figure 5 is a diagrammatic illustration of an electrically controlled feed mechanism.

Figure 6 is a diagrammatic illustration of another electrically controlled feed device.

Referring more in detail to the drawings—

1 and 2, respectively, designate upright members forming the front and rear walls of

a hopper and 3 designates horizontal bars across the base of the hopper on which a stack 4 of sheet metal plates, or the like, which will hereinafter be termed the working stack, is supported for delivery, a sheet at a time, into the machine. While the feed mechanism, which delivers the sheets from the bottom of the stack 4, forms no part of the present invention, we have illustrated it as consisting of a pair of reciprocally movable bars 5—5 that are disposed closely below the stack and are provided with shoulders 6 adapted to engage with the forward edge of the lowest sheet of the stack as the bars move rearwardly to push this sheet from the rear of the hopper. To facilitate the engagement of the shoulders of the feed bars with the sheet, it may be drawn downwardly by any suitable means operating in conjunction with the feed bars such as the suction device, as indicated at 7.

Rotatably mounted in suitable bearings 8 in end members 9 of the machine frame and slightly above the forward edge of the stack 4 is a feed shaft 10 having knurled rollers 11 fixed at spaced intervals thereon. Fixed to the upper inner surface of the back member 2 of the hopper are blocks 12 which serve, with the knurled rollers, as the supporting means for a stack 13 of sheet metal, which we have termed the supply stack and from which sheets of material may be fed onto the working stack 4 as is required to maintain a certain number of sheets of material in the latter stack.

The uprights 1 and the blocks 12 are spaced apart at such distances that when the lower, forward edge of the stack 13 is supported on the row of knurled rollers, the opposite ends or edges of the sheets or material will be supported in engagement with the blocks 12 and will be disposed in an upwardly, inclined direction, as shown in Figure 1. Then, upon rotation of the shaft 10 and the knurled rollers 11 the sheets of material will be delivered from the lower end of the stack 13 onto the stack 4; the feeding operation being accomplished by reason of the lower edges of the sheets catching in the knurls and being carried therewith to the underside

of the rollers where they are released thus permitting the sheets to fall to horizontal position onto the lower stack.

As a means for automatically controlling the feeding of the sheets from the supply to the working stack, we have provided a feed mechanism comprising a ratchet wheel 20 that is fixed at one end of the shaft 10 and a gear wheel 21 that is rotatable on the shaft closely adjacent the ratchet. Spring pressed pawls 22 are pivotally fixed on the gear wheel in positions to engage with the ratchet so that the latter may be advanced by rotative movement of the gear. Below the forward edge of the stack 4 is a shaft 25 that is provided at one end with a gear wheel 26 that operates in mesh with the gear 21 and also fixed on the shaft 25 is a trip lever comprising an upwardly and forwardly curved arm 27 that is adapted to engage with the forward edge of the stack 4 and an outwardly extending arm 28 provided with an opening 29 through which a reciprocally driven rod 30 operates. A spring 32 that is attached to the lever arm 28 and to one of the uprights 1 of the frame normally retains the trip lever arm 27 in contact with the stack.

The rod 30 may be driven by any suitable mechanism operating in synchronism with the reciprocatory movement of the feed bars 5 and has a limited upward and downward movement and is provided at its end with a nut 32 that is adapted, on downward movement of the rod to engage with the arm 29 and to move the lever and shaft 25, to which it is attached, rotatably provided that the height of the stack 4 has been reduced to such an extent that the trip may be actuated.

With the device so constructed, as many sheets of material as desired regardless of weight may be placed in the hopper to form the supply stack, then, upon operation of the machine the rod 30 is moved reciprocally and, with each downward movement, nut 31 engages arm 29 of the trip lever and causes the shaft 25 to be moved rotatably and this, through gear 26, causes rotative movements of gear 21 which in turn, through pawls 22, effects rotative movement of shaft 10 and knurls 11 which operate to feed the sheets from the bottom of stack 13 onto bars 3 to form the working stack. As this latter stack is built up, the arm 27 of the trip device contacting with the forward edge thereof causes a downward shifting of the arm 28 which finally, as stack 4 reaches a certain predetermined height or number of sheets is shifted clear of the movement of the nut 31 on rod 30 and the feeding action is discontinued.

As the machine continues to operate and the feed arms 5 deliver the sheets from the working stack into the machine, the arm 27 of the trip lever, under tension of spring 32, moves inwardly in accordance with the decrease in height of the stack and this again

brings arm 28 back to position where it can be actuated by the nut 31 to advance the ratchet wheel to again feed from the supply onto the working stack.

It is to be noted that the arm 27 is curved inwardly in such manner that it will cause the rate of feeding of sheets to the working stack to be fast or slow dependent upon the height of the stack, that is, if the stack is nearly depleted there will be a delivery of more sheets at a time and as it approaches its maximum height the movement of the arm becomes less and the number of sheets delivered from the supply stack with each reciprocal movement of the rod 30 becomes fewer.

In Figure 4 we have shown an alternative construction wherein the shaft 10 has a ratchet feed wheel 20 fixed thereon and a feed lever 40 pivoted on the shaft adjacent the ratchet and pivotally connected at its outer end to the reciprocating rod 30. On this lever is a pawl 41 that is urged by a spring 42 toward driving engagement with the ratchet. On the shaft 25 is a trip 44 adapted to engage the edge of stack 13 and on the other end is a dog 45 adapted to engage the pawl 41 to normally retain it disengaged from the ratchet. When the stack 4 becomes depleted to such an extent that a laterally extended end 44' on the trip slips over the stack it allowing the dog to release the pawl into driving contact with the ratchet.

In Figure 5 is another alternative construction wherein the lower sheets of the supply stack are supported by an electro-magnet 50 having circuit wire connections 51 and 52 through which a circuit is normally closed. In this circuit is a control switch comprising a pivoted dog 53 with a contact 54 adapted to engage a contact 55. These contacts are normally held engaged by engagement of the dog with the stack 4, but should the latter be depleted, the dog will move to open the circuit and thus release sheets from the supply.

In Figure 6 is still another construction wherein the feed shaft 10 is driven by a worm wheel 60 held frictionally between disks 61-61' that are keyed to the shaft. An electro-magnet 62 is disposed adjacent to a disk 65 on the shaft 10 and when it is energized it magnetically holds the disk against rotation. The magnet in this case is controlled by switch mechanism the same as before described in connection with Figure 5.

With devices of this character it is possible to keep a large supply of blanks, or sheets in the hopper without interfering with the feed for the reason that only a few sheets are released at a time to the working stack.

Having thus described our invention, what we claim as new therein and desire to secure by Letters-Patent, is:

1. The combination with a supply of stacked sheet material and a working stack

of said material of a feed mechanism comprising a rotatably mounted shaft, a plurality of knurled rollers on said shaft in supporting engagement with the supply stack and adapted when rotated to effect the delivery
5 of material from the supply onto the working stack, a second oscillatory movable shaft having a driving connection with the first shaft, a trip lever fixed on the second shaft having an
10 arm adapted to engage with the working stack of material and to move in accordance with the increase or decrease in height of the said stack and having a laterally directed arm, a reciprocally driven shaft and a nut
15 on said reciprocally driven shaft adapted at times to engage with said laterally directed arm to effect rotative movement of the second shaft and a consequent feeding movement of the first shaft.

20 2. The combination with a supply of stacked sheet material and a working stack of said material, of a feed mechanism comprising a rotatably mounted shaft, a plurality of knurled rollers on said shaft in
25 supporting engagement with said supply stack and adapted when moved rotatably to effect the delivery of material from the supply to the working stack, a ratchet wheel fixed on said shaft, a gear wheel rotatable on
30 the shaft adjacent the ratchet, pawls on said gear wheel adapted to engage and advance the ratchet wheel, a second oscillatory mounted shaft, a gear on the second shaft in mesh with the first gear, a yieldable trip lever on the
35 second shaft comprising an arm adapted to engage with the working stack and to move in accordance with the decrease or increase in the height thereof and having a laterally directed arm provided with an opening, a
40 reciprocally driven shaft operable through said opening and a nut on said shaft adapted to engage at times with the said arm to effect rotative movement of the second shaft.

3. A device as in claim 2 wherein the first
45 mentioned arm of the trip lever is curved so as to effect a faster rate of feeding of material from the supply to the working stack when the supply in the working stack is low and a slower feed when it is near its maximum.
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Signed at Seattle, King County, Washington, this 22 day of December, 1924.

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