April 29, 1952 C. G. PREIS ET AL 2,594,346

MECHANISM FOR LOADING SHEET MATERIAL INTO MAGAZINES

Filed Aug. 5, 1947 3 Sheets-Sheet 1

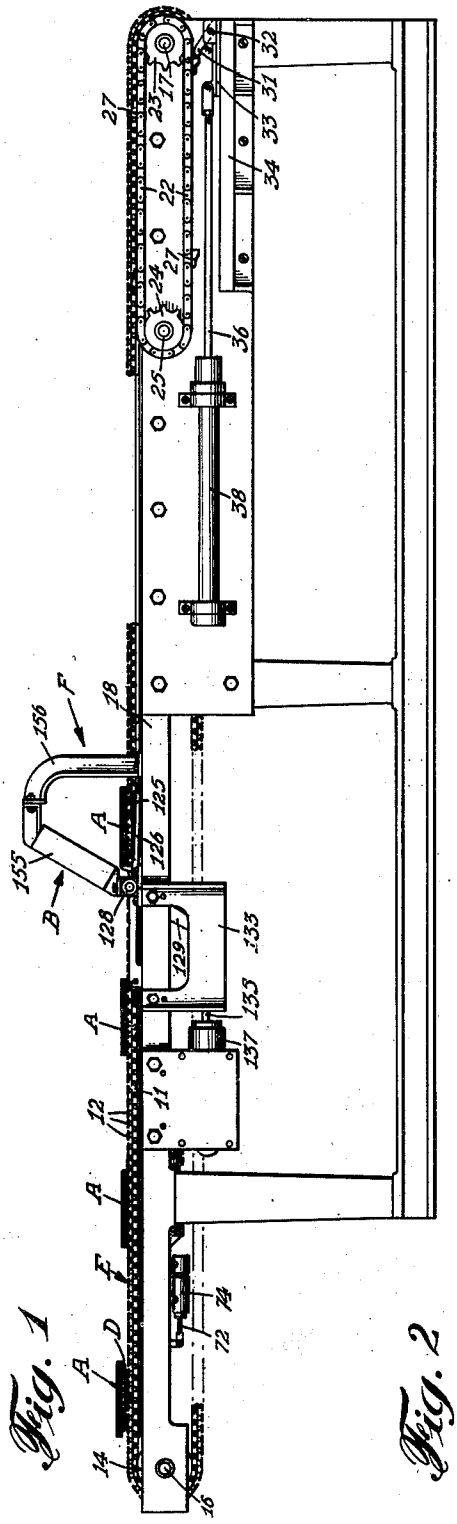


Fig. 1

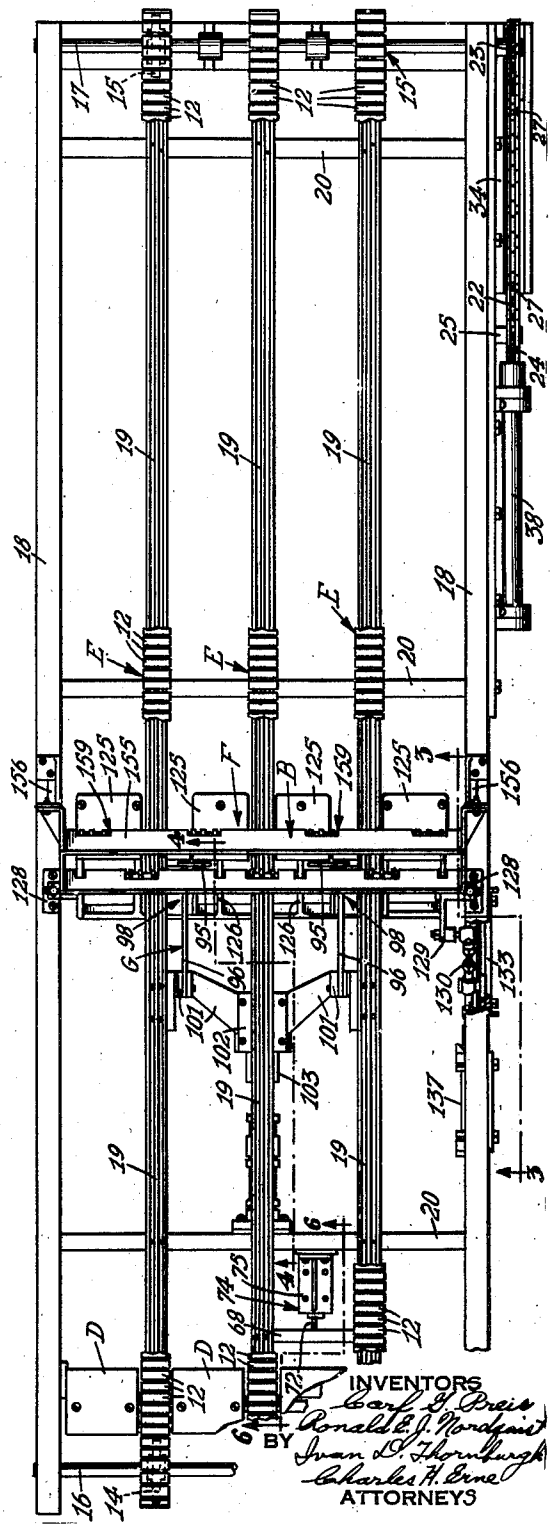


Fig. 2

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Fig. 3

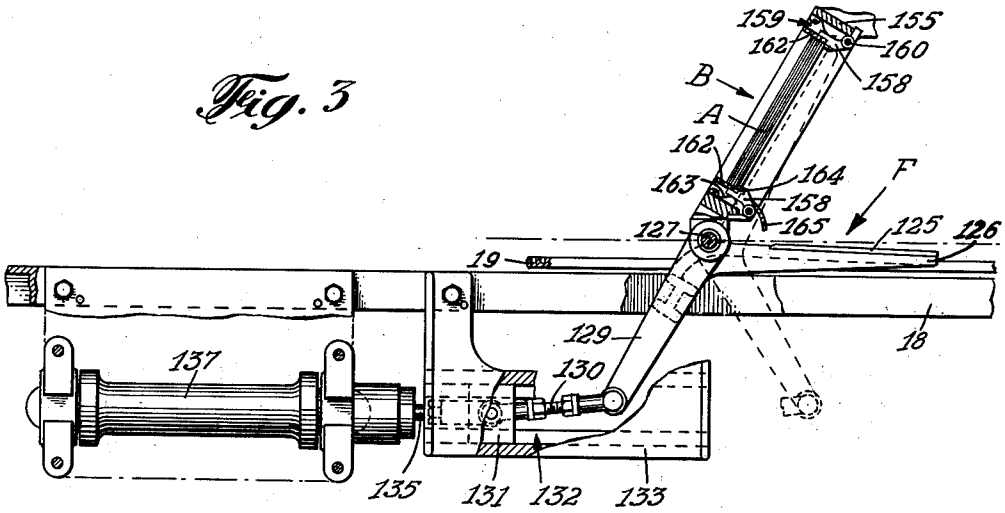


Fig. 4

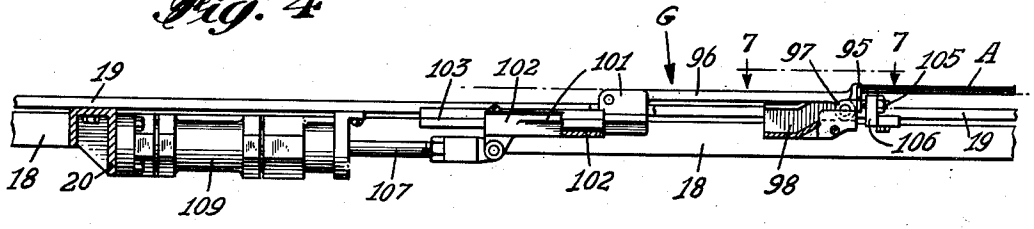


Fig. 5

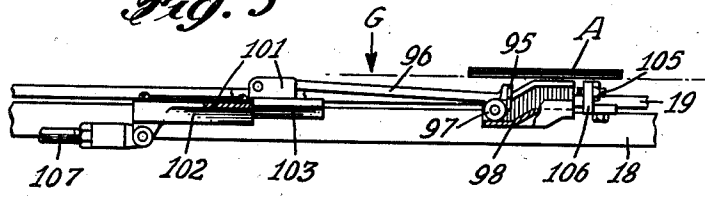


Fig. 7

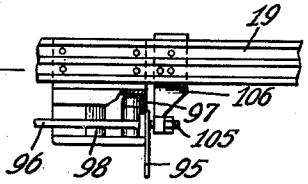


Fig. 6

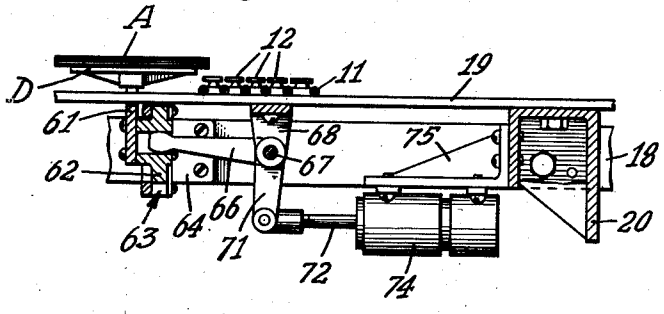
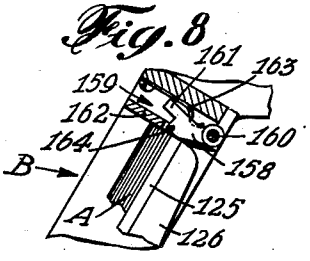


Fig. 8



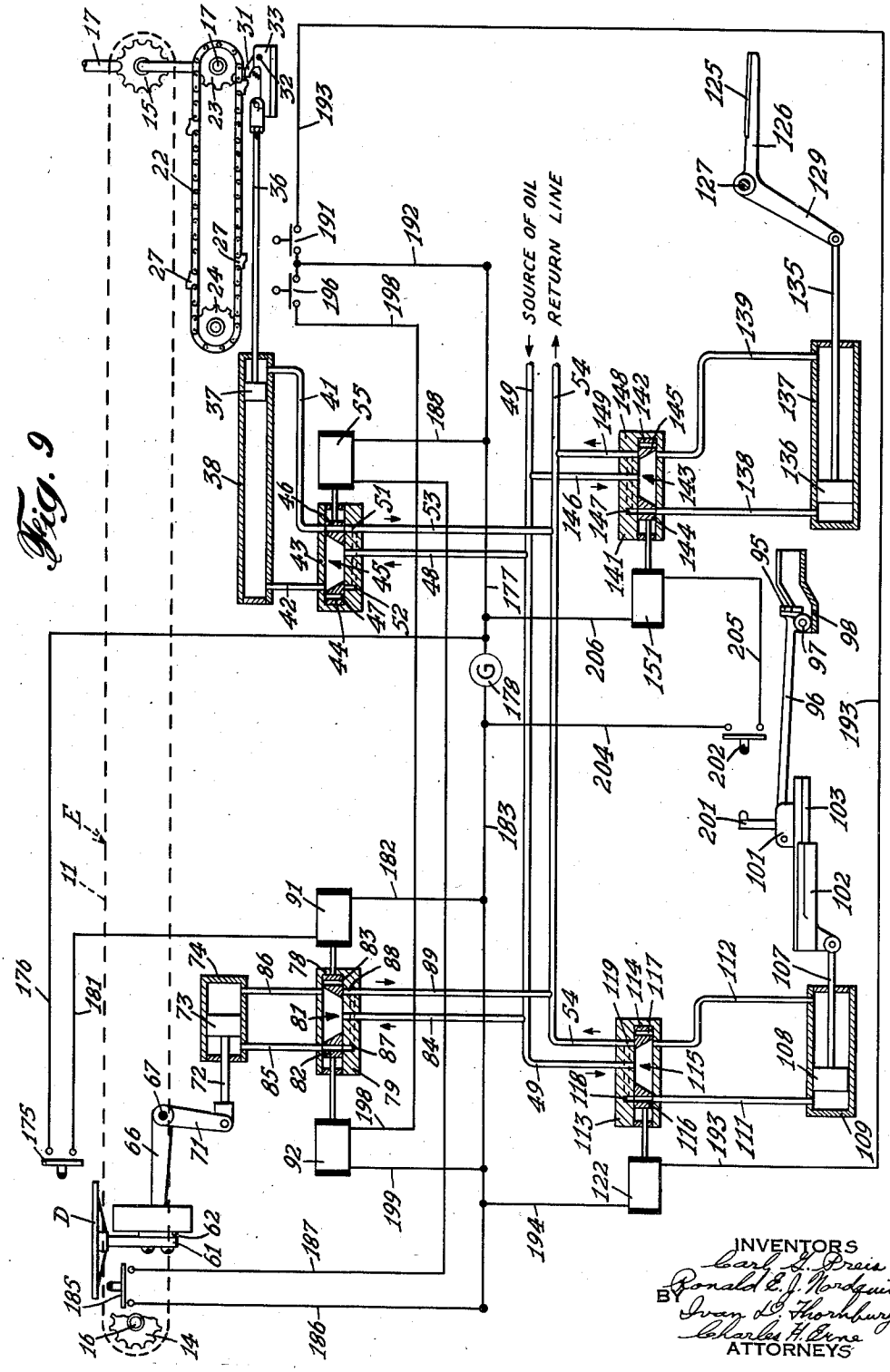
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MECHANISM FOR LOADING SHEET MATERIAL INTO MAGAZINES

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Fig. 9



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MECHANISM FOR LOADING SHEET MATERIAL INTO MAGAZINES

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Application August 5, 1947, Serial No. 766,341

8 Claims. (Cl. 214—6)

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The present invention relates to a mechanism for loading sheet material into magazines for subsequent feeding therefrom and has particular reference to devices for conveying the material in stacked formation to a magazine and for depositing it into the magazine. This is a companion application to our copending United States applications Serial Number 766,340 filed August 5, 1947, on Mechanism for Stacking Sheet Material, and Serial Number 766,342 filed August 5, 1947, now Patent No. 2,542,055 granted February 20, 1951, and Serial Number 766,343 filed August 5, 1947, on Mechanism for Loading Sheet Material into Magazines.

An object of the invention is the provision of a mechanism for loading sheet material into a magazine wherein the magazine may be continuously supplied with sheets in such a manner as to prevent interference with the simultaneous feeding of the sheets from the magazine.

Another object is the provision of such a mechanism wherein sheets in stacked formation may be delivered to the magazine so that handling of the sheets may be effected rapidly and efficiently without excessive speed of operation of the mechanism and hence with less wear and tear on the mechanism.

Another object is the provision in such a mechanism of stack locating devices wherein stacks of sheets to be delivered to the magazine are accurately located relative thereto prior to deposit therein for facilitating and expediting delivery of the stacked sheet into the magazine.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a side elevation of a sheet loading mechanism embodying the instant invention;

Fig. 2 is a top plan view of the mechanism shown in Fig. 1, with parts broken away;

Figs. 3, 4, and 6 are enlarged fragmentary detail views taken substantially along the broken lines 3—3, 4—4, 6—6, respectively in Fig. 2;

Fig. 5 is a view similar to Fig. 4 with moving parts in normal position;

Fig. 7 is a top plan view taken substantially along a plane indicated by the line 7—7 in Fig. 4, with parts broken away;

Fig. 8 is an enlarged fragmentary detail of a portion of the mechanism shown in Fig. 3; and

Fig. 9 is a combined schematic view of the mechanical control parts of the mechanism and a wiring diagram of the electric apparatus used in the mechanism.

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As a preferred embodiment of the invention the drawings illustrate a mechanism for loading stacks of strips, blanks or sheets A (Fig. 1) of sheet material, such as tin plate or the like, into a supply magazine B from which the strips, blanks or sheets may be subsequently fed individually in any suitable manner for the forming of container parts or other articles therefrom as desired. The stacks of strips A may be received from any suitable source of supply such as a slitter, a scroll shear or other machine. As they are received each stack is deposited on a platform D (Figs. 1, 2 and 6) disposed above and adjacent a normally stationary and intermittently operated conveyor E.

Upon the reception of a stack of strips A on the platform D, the platform moves down toward the conveyor E and gently deposits the stack on the conveyor. This action of the platform actuates the conveyor through a single step movement and thus advances the stack of strips into an idle station. Repeated movement of the platform, as each stack is deposited thereon, advances the stack already on the conveyor in a step-by-step manner through a plurality of idle stations and then brings the stack into a loading station F (Figs. 1 and 2). At this station the stack is located accurately in a predetermined position and then is lifted from the conveyor into the magazine B. This completes the cycle of operations of the mechanism.

In the mechanism, the conveyor E comprises a plurality of endless chains 11 (Figs. 1 and 2) disposed in spaced and parallel side by side relation and extending the full length of the mechanism. There are three of these chains 11 and each chain carries a plurality of short flats or treads 12 (see also Fig. 6) which provide a continuous table or support for carrying the stacks of strips A.

The chains operate over pairs of idler sprockets 14 (see also Fig. 9) located at the entrance or receiving end of the mechanism (at the left as viewed in Figs. 1 and 2) and driving sprockets 15 located at the opposite end of the mechanism. The idler sprockets 14 are mounted on idler shafts 16 while the driving sprockets are mounted on driving shafts 17. These shafts are carried in bearings formed in side frames 18 which constitute the main frame of the mechanism. Between the sprockets the chains operate along and are supported against sagging by longitudinal chain tracks 19 (Figs. 2 and 7) secured to crossrails 20 of the main frame.

The conveyor chains 11 are operated in unison in an intermittent or step-by-step manner by an actuating device which includes an actuating

chain 22 (Figs. 1 and 2). This chain operates over a sprocket 23 carried on the outer end of the driving shaft 17 and a sprocket 24 which is mounted on a stub shaft 25 carried in a bearing in the main frame 18. The chain carries a plurality of actuating dogs 27 secured thereto at spaced intervals. These dogs are individually engaged by a spring held finger 31 which is mounted on a pivot pin 32 carried in a slide 33 retained in a slideway 34 secured to the main frame 18 immediately below and in parallelism with the lower run of the actuating chain 22.

The slide 33 is connected to a long piston rod 36 having a piston 37 (see Fig. 9) which operates within a cylinder 38 of an oil gear actuating system. Near its ends, the cylinder 38 is connected to a pair of oil lines or pipes 41, 42 which lead from a slide valve casing 43 containing a reciprocable slide valve 44. The slide valve is formed with a central feed port 45 and a pair of vent ports 46, 47 located adjacent its ends. The central feed port 45 is continually in communication with a feed line or pipe 48 which leads from a main feed line or pipe 49 leading from a source of supply of oil or other fluid under pressure. Opposite the valve ends of the pipe lines 41, 42, the valve casing 43 is formed with return channels 51, 52 which lead into a return pipe 53 connecting with a main return line 54 which leads to any suitable place of discharge for the oil or for recirculation. The system is filled with oil at all times.

The slide valve 44 is reciprocated periodically in its casing 43 preferably by an electric solenoid 55 which is energized and deenergized by suitable electric circuits to be hereinafter explained in connection with the wiring diagram illustrated in Fig. 9. When the solenoid is energized, it shifts the slide valve 44 from the position shown in Fig. 9 to a position toward the right in which the central port 45 is in communication with the feed pipe 48 and the pipe line 41. In this position of the valve the vent port 46 is out of register with the return channel 51 and the vent port 47 is in register with the pipe line 42 and the vent channel 52.

Hence oil under pressure from the main feed line 49 flows through pipe 48, valve port 45, and pipe line 41 into the cylinder 38 in back of the piston 37 and thereby drives the piston back, toward the left in Fig. 9. Oil in front of the piston is pushed out of the cylinder through the pipe line 42, vent port 47, vent channel 52 and return pipe 53 and is thus returned to the main return line 54 for discharge or reuse.

This movement of the piston 37 draws the piston rod 36 into the cylinder and thus shifts the slide 33 connected therewith in the same direction. At the beginning of this movement, the finger 31 engages with an actuating dog 27 on the lower run of the actuating chain 22 and thus during its back travel propels the dog and the chain a distance equal to the stroke of the piston in its cylinder 38. This rotates the drive shaft 17 and hence advances the conveyor chains 11 through one step of its step-by-step movement.

By making the chain sprocket 23 smaller than the conveyor sprocket 15 the required movement of the chain 22 to bring about a given travel of the conveyor E is greatly reduced. Hence the stroke of the piston may be correspondingly reduced to within practical limits of operation.

As soon as the piston 37 has completed its back stroke, the solenoid 55 is deenergized, and the usual return spring located within the solenoid

thus shifts the valve 44 forward into the position shown in Fig. 9. With the valve in this position, the pipe line 41 is out of register with the central port 45 of the valve and the pipe line 42 is in register with this port as shown in Fig. 9. Hence oil under pressure from the pipe 48 flows through the port 45 and pipe line 42 into the cylinder 38 in front of the piston 37. This oil pushes the piston forward. The used oil in back of the piston is pushed out through the pipe line 41, vent port 46 of the valve, vent channel 51, and return pipe 53 to the main return line 54 for discharge or reuse.

During the forward stroke of the piston 37, the slide 33 and its actuating finger 31 is pushed back into its original position in front of the next actuating dog 27 for a subsequent advancement of the conveyor chains 11. During this return stroke of the actuating finger 31, the actuating chain 22 and the conveyor chains 11 remain stationary. The actuating finger, due to its spring mounting snaps under the actuating dog 27 without moving the chain to which it is connected.

The platform D which initially receives a stack of strips A for deposit onto the treads 12 of the conveyor chains 11 for advancement therewith is located at the entrance end of the conveyor (at the left as viewed in Figs. 1 and 2). This platform D is a sectional platform comprising sections which extend transversely of the mechanism and which are located between the conveyor chains 11 and immediately beyond the two outer conveyor chains. There are thus four platform sections for the three conveyor chains. These platform sections D are secured to a vertical platform plate 61 (Figs. 6 and 9) which is disposed between the upper and the lower runs of the conveyor chains 11 and which extends transversely of the mechanism.

The platform plate 61 is secured to a vertically movable slide 62 (Fig. 6) which operates in a vertical slideway 63 formed in a transverse bracket 64, the ends of which are connected to the side frames 18. The slide is periodically lowered in its slideway 63 by a lever arm 66 mounted on a pivot shaft 67 carried in a bracket 68 bolted to the middle chain track 19 and one of the adjacent tracks as shown in Fig. 2. The pivot shaft 67 also carries a depending arm 71, the lower end of which is connected to a piston rod 72 having a piston 73 (see also Fig. 9) which operates in a cylinder 74 carried on a bracket 75 bolted to one of the frame crossrails 20.

The cylinder 73 preferably is part of the oil gear system hereinbefore referred to and receives oil under pressure from the main oil line 49 and discharges used oil into the return line 54 through operation of a slide valve 78 (Fig. 9) which is similar in construction to the slide valve 44. The slide valve 78 is retained within a valve housing 79 and is formed with a central feed port 81 and two end or vent ports 82, 83. The central port 81 is always in communication with the discharge end of a feed pipe 84 which connects the valve housing 79 with the main oil supply line 49. Opposite this feed pipe 84 the outer ends of the cylinder 74 are connected to the valve housing by a pair of pipe lines 85, 86 which are in line with vent channels 87, 88 in the valve housing. The vent channels communicate with a return pipe 89 which connects with the main return line 54.

Operation of the slide valve 78 is effected preferably by a pair of electric solenoids 91, 92

which are connected to opposite ends of the valve and which are energized and deenergized by suitable electric circuits which will be more fully explained hereinafter in connection with the wiring diagram in Fig. 9.

When a stack of strips A is received on the platform D, the electric solenoid 91 is energized and this shifts the slide valve 78 from the position shown in Fig. 9 to a position toward the left in that figure, in which the vent port 83 is in register with the cylinder pipe 86 and the vent channel 88, and its central feed port 81 is in communication with the cylinder pipe 85. Hence oil under pressure from the main feed line 49 flows through the feed pipe 84, valve port 81, and pipe 85 into the cylinder 74 in back of the piston 73. This incoming oil drives the piston toward the right as viewed in Fig. 9. The oil in the cylinder ahead of the piston is thereby pushed out through the pipe 86, valve vent port 83, and return pipe 89 to the main return pipe 54 for discharge or reuse.

This movement of the piston 73 rocks the lever arms 66, 71 in a counterclockwise direction (Fig. 9) which lowers the platform D from its normal position above the upper run of the conveyor chains 11 and treads 12 as shown in Figs. 1 and 6 to a position below the treads on these chains. Thus the stack of strips A carried on the platform is gently deposited onto the treads 12 of the conveyor chains 11 as the platform moves down below the treads. This transfer of the stack of strips is effected while the conveyor chains 11 are at rest between their intermittent operation.

As soon as a stack of strips A has been received on the conveyor chains 11, these chains are moved through one step of their step-by-step movement as hereinbefore explained and thus the stack of strips is advanced from the position above the depressed platform to an idle station removed from the platform. While the stack is at this idle station the platform D is raised to its original position for the reception of another stack of strips A. This raising of the platform is effected by the energization of the electric solenoid 92. The energized solenoid shifts the slide valve 78 back into its original position as shown in Fig. 9.

In this returned position of the slide valve 78, oil under pressure from the pipe 84 flows through the valve feed port 81 and pipe 86 into the cylinder 74 ahead of the piston 73. This incoming oil pushes the piston back toward the left to its original position. The used oil in back of the piston is thus pushed out of the cylinder 74 through the pipe 85, valve vent port 82, vent channel 87, and return pipe 89 to the main return line 54 for discharge or reuse. The return of the piston 73 to its original position rocks the lever arms 66, 71 in a clockwise direction and this raises the platform D as mentioned above.

When the stacks of strips A are received on the platform D they may not be in a properly squared relation with the platform and different stacks may not be all located in the same position on the platform. Therefore when these stacks are deposited on the conveyor chains 11 and are carried into the loading station F they may arrive at the station in an out of square relation to the supply magazine B or they may be otherwise out of register with the magazine. It is for this reason that the stacks as they are received at the loading station F are properly located

relative to the magazine before they are transferred into the magazine.

Proper locating of a stack of strips A at the loading station F is brought about by a locating device G (Figs. 2, 4, 5 and 7) which includes a pair of transversely spaced and squared locating pads 95 which are normally disposed just below the path of travel of the stacks as they enter the loading station. These locating pads are secured to the forward ends of a pair of links 96. The forward ends of the links carry cam rollers 97 which operate in a pair of spaced stationary cams 98 secured to the bottom surfaces of the two outer chain tracks 19. The opposite ends of the links are pivotally secured to the outer ends of a pair of angularly disposed arms 101 which extend out from a slide member 102 slidably mounted on a pair of longitudinal slideways 103 secured to the bottom face of the middle chain track 19.

The slide member 102 is reciprocated through a forward or feeding stroke and thence through a return stroke in time with the entrance of a stack of strips A into the loading station F. The feeding stroke takes place immediately upon the entrance of a stack into the loading station. During this feeding stroke the slide member 102 pushes forward the links 96 and the cam rollers 97 and locating pads 95 carried thereon. In traversing the cams 98 during this stroke, the cam rollers 97 lift the locating pads 95 into a position in line with the path of travel of the stack on the conveyor chains 11 as shown in Fig. 4.

Hence during the latter portion of the stroke the locating pads come up behind the stack and engage the rear edges of the strips A in the stack (as shown in Fig. 4) and push the stack into a predetermined position relative to the supply magazine B while simultaneously twisting the stack into a transversely squared relation with the magazine. When the stack is in its proper position, the locating pads 95 engage against adjustable stop screws 105 carried in brackets 106 secured to the two outer chain tracks 19 and these stop screws arrest further movement of the pads and the movable parts connected therewith.

As soon as a stack has been located at the loading station F, the locating pads 95 and the movable parts connected therewith move back through a return stroke, leaving the located stack in proper position for transfer into the magazine B. During this return stroke, the cam rollers 97 in traversing the cams 98, pull the locating pads 95 down below the path of travel of the stacks on the conveyor chains 11 so that the pads will be clear of the next following or subsequent stack as it is moved at the proper time over the top of the locating device while bringing it into the loading station as shown in Fig. 5.

Movement of the slide member 102 (see Fig. 9) and the locating pads 95 connected therewith preferably is effected by an attached connecting rod 107 having a piston 108 which operates within a cylinder 109 forming a part of the oil gear system hereinbefore mentioned. This cylinder like the cylinders 37, 74 is connected by pipes 111, 112 to a valve casing 113 containing a slide valve 114 having a central feed port 115 and end vent ports 116, 117. Opposite the pipes 111, 112, the valve casing is connected with the main feed line 49 and is also formed with a pair of vent channels 118, 119 which communicate with the main return line 54.

The slide valve 114 is periodically reciprocated by a normally deenergized electric solenoid 122

which is energized through suitable electric circuits which will be hereinafter explained in connection with the wiring diagram. When the solenoid is energized it shifts the slide valve 114 toward the left as viewed in Fig. 9 from the position shown in that figure into a position where the cylinder pipe 111 is in communication with the central feed port 115 of the valve. When the valve is in this position, oil under pressure from the main feed line 49 flows through the valve feed port 115 and pipe 111 into the cylinder 109 in front of the piston 108 and thereby drives the piston forward, toward the right as viewed in Fig. 9. It is this movement of the piston that pushes the locating pads 95 into engagement with the stack of strips A for locating them at the loading station as explained above. As the piston moves forward it pushes the used oil in back of the piston, out of the cylinder through the pipe 112, vent port 117 of the valve, and vent channel 119 into the main return line 54 for discharge or reuse.

Transfer of the properly located stack of strips A from the conveyor chains 11 into the magazine B at the loading station preferably is effected by a plurality of lifter plates 125 (Figs. 1, 2 and 3) which are disposed at the loading station and which are located between and on either side of the conveyor chains 11 and just below the path of travel of the stacks. There are four of these plates arranged in a straight line extending traversely of the mechanism.

The lifter plates 125 are secured to support arms 126 mounted on a pivot shaft 127 (Fig. 3) carried in bearings 128 (Figs. 1 and 2) bolted to the main frame 18. One of the support arms is formed with a depending actuating arm 129 which is connected by a link 130 (Fig. 3) to a slide block 131 which operates in a slideway 132 formed in a bracket 133 secured to the main frame. The slide block 131 is reciprocated periodically in time with the other moving parts of the mechanism, through a forward or lifting stroke and thence through a return stroke.

Reciprocation of the slide block 131 is effected preferably by a piston rod 135 (Figs. 1, 3 and 9) carrying a piston 136 which operates in a cylinder 137 which forms a part of the oil gear system hereinbefore mentioned. Like the cylinders 38, 74 and 109, the cylinder 137 adjacent its ends is connected by oil pipes 138, 139 to a valve casing 141 containing a reciprocable slide valve 142 having a central feed port 143 and a pair of end vent ports 144, 145. Opposite the oil pipes 138, 139 the casing is provided with a feed pipe 146 which connects with the main feed line 49 and which is always in communication with the slide valve feed port 143. The casing is also formed with a pair of vent channels 147, 148 which communicate with a return pipe 149 connected to the main return line 54.

The slide valve 142 is periodically reciprocated by a normally deenergized electric solenoid 151 which is energized through suitable electric circuits which will be hereinafter explained in connection with the wiring diagram. When the solenoid is energized it shifts the slide valve 142 toward the left as viewed in Fig. 9 from the position shown in that figure into a position where the cylinder pipe 138 is in communication with the central feed port 143 of the valve. When the valve is in this position, oil under pressure from the main feed line 49 flows through the feed pipe 146, valve feed port 143 and oil pipe 138 into the cylinder in front of the piston 136 and thereby drives the piston forward, toward the right as viewed in Fig. 9.

As the piston moves forward it pushes the used oil in back of the piston, out of the cylinder through the pipe 139, valve vent port 145, vent channel 148, and return pipe 149 into the main return line 54 for discharge or reuse. This forward stroke of the piston shifts the slide block 131 forward and thus rocks the support arms 126 and the lifter plates 125 connected thereto, in a counterclockwise direction as viewed in Fig. 3. During this rocking movement of the support arms the lifter plates 125 move up into engagement with a properly located stack of strips A on the conveyor treads 12 at the loading station and thus lift the stack clear of the conveyor and swing it in an arc toward the magazine B for deposit thereinto.

After depositing the stack of strips A into the magazine B the lifter plates 125 move down through a return stroke to their original position for a subsequent transfer operation. This return stroke of the plates is effected by a deenergizing of the electric solenoid 151. When the solenoid is deenergized the usual return spring contained within the solenoid, shifts the slide valve 142 back into the position shown in Fig. 9 and this brings the valve feed port 143 into communication with the feed pipe 146.

With the feed pipe 146 and the valve port 143 in communication, oil under pressure from the main feed line 49 flows through the oil pipe 139 into the cylinder 137 in back of the piston 136 and thus pushes the piston back into its original position. It is this return movement of the piston that lowers the lifter plates 125. As the piston moves back, it pushes the used oil out of the cylinder in front of the piston, through the oil pipe 138, valve vent port 144, vent channel 147, and return pipe 149 into the main return line 54 for discharge or reuse.

The magazine B which receives the stack of strips A from the lifter plates 125 comprises a hollow rectangular shaped magazine frame 155 (Figs. 1, 2 and 3) which is open at top and bottom and which extends transversely of the mechanism at the loading station F. This magazine frame preferably is disposed at an angular or inclined position so that the lifter plates 125 may readily swing the stack into place within the frame when they move through a lifting stroke. The lower end of the magazine frame 155 is bolted to the main frame 18 while its upper end is secured to end brackets 156 which in turn are fastened to the main frame.

Along its transverse side walls, the magazine frame 155 carries a plurality of stack supporting fingers or elements 158 (Figs. 3 and 8) which are disposed in recesses 159 formed in the frame walls (see also Fig. 2). These fingers extend up into the magazine and at their lower ends are mounted on pivot pins 160 carried in the frame side walls. The upper ends of the fingers are formed with stop lugs 161 which normally engage against a pair of transverse guide plates 162 secured to the inner faces of the frame side walls. Flat springs 163 interposed between the fingers and the frame side walls within the recesses yieldably retain the fingers in place. The inner edges of the fingers, adjacent the stop lugs are formed with stack supporting ledges 164 which project inwardly beyond the guide plates 162.

Hence when the lifter plates 125 swing a stack of strips A into place within the magazine

B, the stack enters through the bottom of the magazine. The long edges of the strips engage the inner edges of the support fingers 158 and push them inwardly against the resistance of the springs 163 until the entire stack has been raised above the finger support ledges 164. The stroke of the lifter plates 125 is such as to raise the stack just enough to permit the bottom strip to just snap past the finger support ledges. The fingers 158 thereupon snap back toward the stack with their support ledges engaged under the stack.

Thus when the lifter plates 125 move down through their return stroke they leave the raised stack in the magazine, supported on the ledges 164 of the fingers. A curved portion 165 (Fig. 3) of the lower guide plate 162 guides the stack into place within the magazine. As subsequent stacks are deposited in the magazine they are raised into place below any strips which may already be in the magazine, thus leaving the top of the magazine free and clear for the individual feeding therefrom as desired.

Reference should now be had to the wiring diagram in Fig. 9 which schematically shows electric equipment for controlling and operating the various solenoids hereinbefore mentioned. In the mechanism, the placing of a stack of strips A on the platform D starts the train of operations that carries the stack through the mechanism and deposits it in the magazine B as described above.

When a stack is placed on the platform D, a starting circuit is established which includes the electric solenoid 91 and a normally open starting switch 175. In this circuit one side of the switch is connected by a wire 176 to a main lead wire 177 of a suitable source of electric current such as a generator 178. The other side of the switch is connected by a wire 181 to the solenoid 91. The solenoid is connected by a wire 182 to an auxiliary lead wire 183 of the generator.

The closing of the switch 175 may be effected in any suitable manner, as by contact with the stack of strips A as they are placed upon the platform D, or by engagement with the device which places the stack on the platform, or manually after a stack is on the platform, as desired. When the switch is closed, electric current from the generator 178 flows along the circuit and energizes the solenoid 91 and this shifts the slide valve 78 and thus starts the platform D through its down stroke for depositing the stack of strips onto the conveyor chains 11. The solenoid is energized only momentarily since the switch 175 opens as soon as the stack of strips or the depositing devices move away from the switch. However this is sufficient to shift the slide valve 78 and the valve thereupon remains stationary until returned by the solenoid 92.

As the descending platform D nears the lower limit of its down stroke it engages against and closes a normally open electric switch 185 which thus establishes a conveyor actuating circuit which includes the electric solenoid 55. In this circuit one side of the switch 185 is connected by a wire 186 to the generator auxiliary lead wire 183. The other side of the switch is connected by a wire 187 to the solenoid 55. The solenoid is also connected by a wire 188 to the generator main lead wire 177.

When the switch 185 is closed, electric current from the generator 178 passes along the circuit and energizes the solenoid 55 and shifts the slide valve 44 connected therewith and thus actuates the conveyor chains 11 through one step of its intermittent movement as hereinbefore described. The solenoid remains energized as long as the switch 185 remains closed, which in other words means as long as the platform D remains depressed.

It will be remembered that advancement of the conveyor chains 11 is effected by a conveyor actuating device which includes the reciprocating slide 33 which advances the chains on a back stroke, toward the left as viewed in Fig. 9. Near the end of this stroke, the slide engages and closes a normally open electric switch 191 which establishes a circuit which includes the stack locating solenoid 122 connecting with the slide valve 114 which controls the locating pads 95 for locating the stack at the loading station F. One side of the switch 191 is connected by a wire 192 to the generator main lead wire 177. The other side of the switch is connected by a wire 193 to the solenoid 122. The solenoid is also connected by a wire 194 to the generator auxiliary lead wire 183. When the switch 191 is closed, electric current from the generator 178 passes along this circuit and thus energizes the solenoid 122. This action in turn shifts the slide valve 114 and thus actuates the locating pads 95 through a locating stroke as hereinbefore explained.

Immediately following the closing of the switch 191, the conveyor actuating device slide 33 engages and closes a second normally open electric switch 196 which establishes a circuit including the solenoid 92 which controls the moving of the slide valve 78 into a position for returning the platform D to its original elevated position. In this circuit, one side of the switch 196 is connected by the wire 192 to the generator main lead wire 177. The other side of the switch is connected by a wire 198 to the solenoid 92. The solenoid is also connected by a wire 199 to the generator auxiliary lead wire 183. While the switch 196 is closed electric current from the generator 178 passes along the circuit and energizes the solenoid 92 and thus shifts the slide valve 114 back into its original position. The platform D thereupon rises to its original position.

Elevation of the platform D opens the switch 185 and this breaks the conveyor actuating circuit and thereby deenergizes the solenoid 55. The spring contained within the solenoid returns the slide valve 44 to its original position and thereby starts the conveyor actuating device slide 33 back through a return stroke.

Just as the conveyor actuating device slide 33 starts its return stroke, it rides off the adjacent switch 196 and thereby opens this switch and breaks the circuit which includes the platform solenoid 92. Breaking of this circuit deenergizes the solenoid 92 and thereby leaves the platform actuating solenoids 91, 92 in a condition for reenergization for a subsequent stack of strips A.

Just before the returning conveyor actuating device slide 33 rides off the adjacent switch 191 which controls the operation of the locating pads 95, the pads reach the limit of their forward or locating stroke. At the termination of this stroke, a pin 201 moving with the locating pad actuating device, engages against and closes a normally open electric switch 202 which establishes a lifter circuit including the lifter solenoid 151 which controls the lifting of the properly located stack of strips A from the conveyor chains 11 into the magazine B at the loading station F.

In this lifter circuit one side of the switch 202 is connected by a wire 204 to the generator auxiliary lead wire 183. The other side of the switch is connected by a wire 205 to the solenoid 151. The solenoid is also connected by a wire 206 to the generator main lead wire 177. While the switch 202 is closed, electric current from the generator 178 flows along the circuit and energizes the solenoid 151 and thus shifts the slide valve 142 into a position for actuating the lifter arms 126 and plates 125 for lifting the located stack of strips A into the magazine B as hereinbefore mentioned.

This stack lifting operation takes place just as the conveyor actuating device slide 33, during its return stroke, rides off the adjacent switch 191 and thereby opens the switch. Opening of the switch breaks the locating pad circuit and thereby deenergizes the solenoid 122. The spring contained within the solenoid returns the slide valve 114 to its original position and thereby returns the locating pads 95 to their original position in readiness for a subsequent locating operation.

Return of the locating pads 95, opens the switch 202 in the stack lifter circuit and this breaks the circuit. Breaking of this circuit deenergizes the lifter solenoid 151. The spring within this solenoid returns the connecting slide valve 142 to its original position and thereby returns the lifter arms 126 and plates 125 to their original positions in readiness for a subsequent lifting operation. This completes the cycle of operation of the electric apparatus used in the mechanism.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

We claim:

1. A mechanism for loading sheets of material into magazines for subsequent feeding therefrom, comprising in combination, a conveyor, a platform for receiving a stack of individual sheets, means for moving said platform across the path of travel of said conveyor for depositing a stack of sheets on said conveyor, actuating means operable by said platform in its stack depositing position for intermittently advancing said conveyor with its stack of sheets, a magazine disposed adjacent the path of travel of said conveyor for receiving the sheets, and inserting means disposed adjacent said magazine and operable during a rest period of said conveyor in the path of travel of the sheets on said conveyor for shifting the stack of sheets as a unit from said conveyor into said magazine.

2. A mechanism for loading sheets of material into magazines for subsequent feeding therefrom, comprising in combination, an endless conveyor for carrying stacks of sheets along a predetermined path of travel, delivery means for depositing a stack of sheets onto said conveyor, an endless actuating chain having driving connection with said conveyor, a dog carried by said actuating chain, actuating means operable by the deposit of a stack of sheets on said conveyor for engaging with said chain dog for intermittently moving said chain and the conveyor connected therewith for advancing said conveyor and the stack of sheets deposited thereon, a magazine disposed adjacent said conveyor for receiving said stack of sheets, and inserting means disposed adjacent said magazine and operable in the path of travel of the stack of sheets on said conveyor for shifting the stack as a unit from said conveyor into said magazine.

3. A mechanism for loading sheets of material into magazines for subsequent feeding therefrom, comprising in combination, an endless conveyor for carrying stacks of sheets along a predetermined path of travel, delivery means for depositing a stack of sheets onto said conveyor, an endless actuating chain having driving connection with said conveyor, a plurality of spaced dogs on said actuating chain, an actuating finger movable along the path of travel of said chain and engageable with a said dog for intermittently moving said chain and the conveyor connected therewith for advancing said conveyor and the stack of sheets, a piston connecting with said actuating finger and operable in a cylinder, fluid actuating means having circulation in said cylinder for moving said piston and its connected finger through an actuating stroke and a return stroke, a slide valve device connecting with said cylinder for controlling the flow of fluid actuating medium to determine the kind of stroke for the piston, electric means connecting said delivery means with said slide valve device and operable by said delivery means for operating the slide valve to make effective said fluid actuating means for the intermittent advancement of said conveyor, a magazine disposed adjacent said conveyor for receiving said stack of sheets, and inserting means disposed adjacent said magazine and operable in the path of travel of the stack of sheets on said conveyor for shifting the stack as a unit from said conveyor into said magazine.

4. A mechanism for loading sheets of material into magazines for subsequent feeding therefrom, comprising in combination, an endless chain conveyor for carrying stacks of sheets along a predetermined path of travel, conveyor actuating means for advancing said conveyor, a delivery platform movable relative to said conveyor for receiving a stack of sheets and for delivering it onto said conveyor, fluid actuating means connecting with said delivery platform for moving said platform, control means for said fluid actuating means, means operable by a stack of sheets being placed on said platform for actuating said control means for moving said platform into stack delivering position relative to said conveyor, a magazine disposed adjacent said conveyor for receiving said stack of sheets, and inserting means disposed adjacent said magazine and operable in the path of travel of the stack of sheets on said conveyor for shifting the stack as a unit from said conveyor into said magazine.

5. A mechanism for loading sheets of material into magazines for subsequent feeding therefrom, comprising in combination an endless chain conveyor for carrying stacks of sheets along a predetermined path of travel, conveyor actuating means for intermittently advancing said conveyor, electric control means for said conveyor actuating means, a delivery platform movable relative to said conveyor for receiving a stack of sheets and for delivering it onto said conveyor, fluid actuating means connecting with said delivery platform for moving said platform, control means for said fluid actuating means,

means operable when a stack of sheets is placed on said platform for actuating said control means for moving said platform into stack delivering position relative to said conveyor, electric means connecting with said electric control means and operable by said platform for setting said conveyor actuating means in motion, a magazine disposed adjacent said conveyor for receiving said stack of sheets, and inserting means disposed adjacent said magazine and in the path of travel of the stack of sheets on said conveyor for shifting the stack as a unit from said conveyor into said magazine.

6. A mechanism for loading sheets of material into magazines for subsequent feeding therefrom, comprising in combination a magazine for receiving and holding a stack of sheets of material, a conveyor disposed adjacent said magazine for carrying the stack of sheets along a path of travel toward and into a position adjacent said magazine, means for intermittently advancing said conveyor, reciprocable locating fingers movable adjacent the path of travel of the stack of sheets, means operable by said conveyor advancing means following movement of said conveyor for shifting said locating fingers into the path of travel of the stack for engagement behind the stack for aligning it with said magazine, and inserting means disposed adjacent said magazine for inserting the stack of sheets as a unit into said magazine.

7. A mechanism for loading sheets of material into magazines for subsequent feeding therefrom, comprising in combination a magazine for receiving and holding a stack of sheets of material, a conveyor disposed adjacent said magazine for carrying the stack of sheets along a path of travel toward and into a position adjacent said magazine, actuating means for said conveyor, reciprocable locating fingers movable adjacent the path of travel of the stack of sheets, fluid actuating means connecting with said fingers for reciprocating them, electric control means operable by and in time with said conveyor actuating means for controlling the reciprocation

of said fingers in time with the arrival of a stack of sheets at said magazine, means for shifting said moving locating fingers into the path of travel of the stack for engagement behind the stack for aligning it with said magazine, and inserting means disposed adjacent said magazine for inserting the stack of sheets as a unit into said magazine.

8. A mechanism for loading sheets of material into magazines for subsequent feeding therefrom, comprising in combination a magazine for receiving and holding a stack of sheets, a conveyor disposed adjacent said magazine for carrying the stack of sheets along a path of travel toward and into position at said magazine, locating means at said magazine for aligning the sheets with the magazine, a pivotally mounted lifter plate adjacent the stack of aligned sheets, fluid actuating means connecting said conveyor, said locating means and said lifter plate with a source of fluid pressure, and control means for making effective said fluid actuating means, said control means having a valve in the conveyor actuating connection to advance the conveyor, and having a valve in the locating actuating connection operable by said conveyor advancing means to actuate said locating means, said control means also having a valve in the lifter plate actuating connection and operable by said locating means to pivot said lifter plate and transfer said stack of sheets from the conveyor into said magazine.

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