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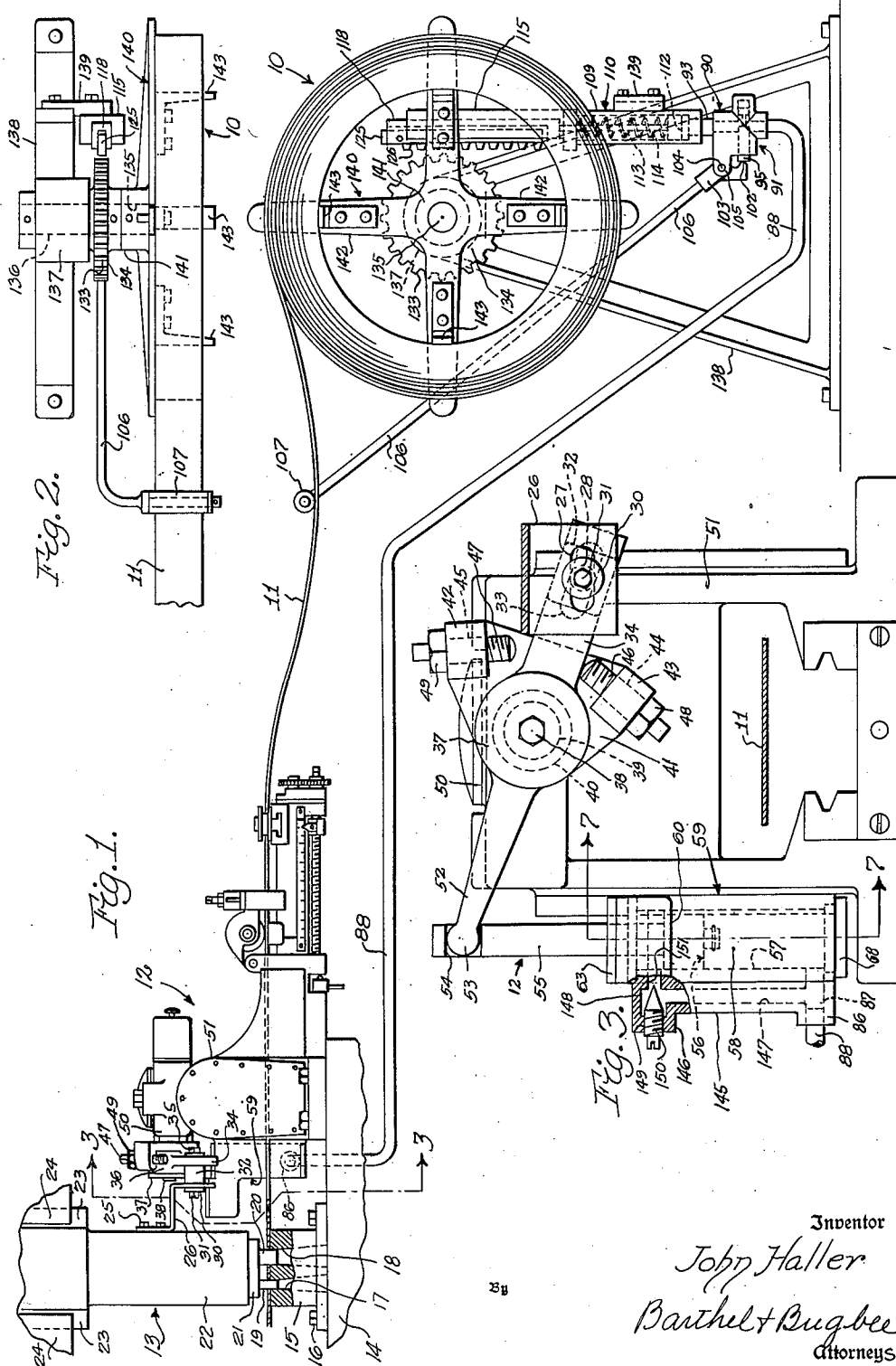
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2,630,277

COIL STOCK HOLDING AND FEEDING DEVICE

Filed Dec. 31, 1947

3 Sheets-Sheet 1



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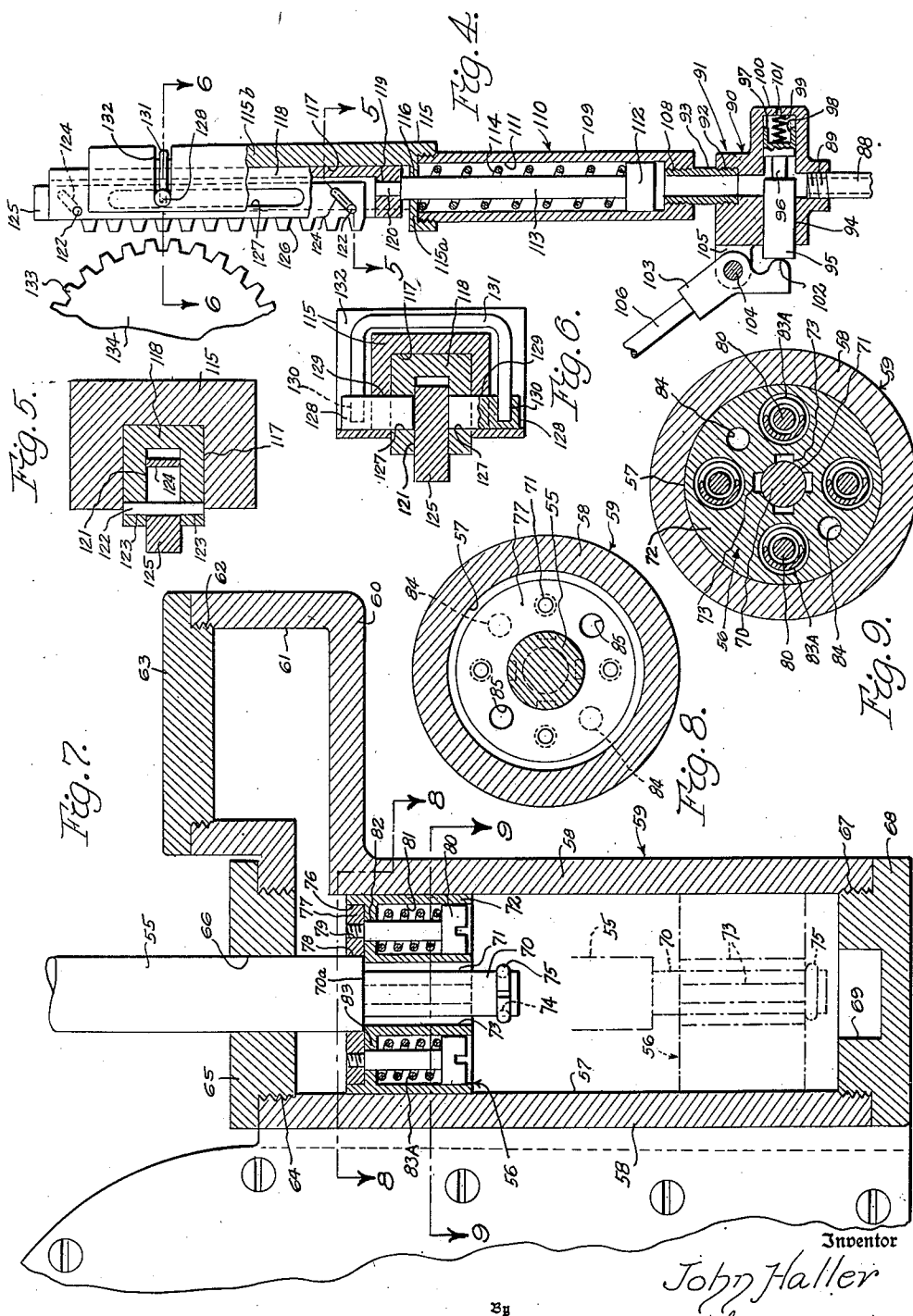
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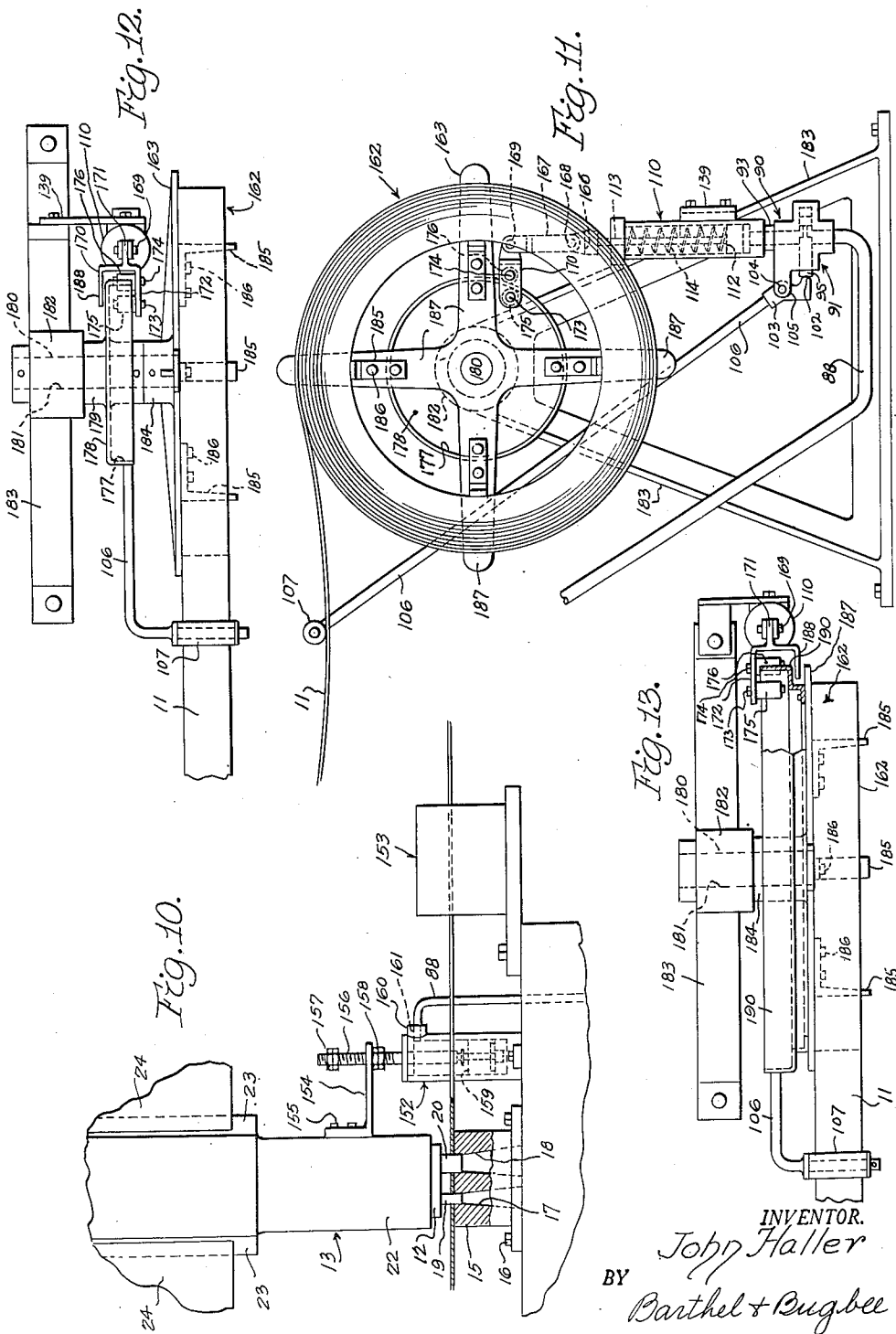
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COIL STOCK HOLDING AND FEEDING DEVICE

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,630,277

COIL STOCK HOLDING AND FEEDING
DEVICE

John Haller, Detroit, Mich.

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10 Claims. (Cl. 242—55)

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This invention relates to stock holding and feeding devices, and in particular, to reeling devices for automatically feeding coil or strip stock to machines such as punching, stamping or cutting machines.

One object of this invention is to provide a coil stock holding and feeding device which is operable automatically in timed relationship with a machine which it is serving, in such a manner that a predetermined amount of slack will be maintained in the coil stock being so fed.

Another object is to provide a coil stock holding and feeding device wherein the strip stock is mounted on a reel which is rotated intermittently in accordance with the operation of control mechanism responsive to the amount of slack momentarily existing in the stock between the reel and the machine being served.

Another object is to provide a coil stock holding and feeding device of the above character wherein the motion of the machine being served actuates a hydraulic pump which in turn actuates a hydraulic motor operatively connected to the reel, under the control of a valve actuated in response to the amount of slack momentarily existing between the reel and the machine being served.

Another object is to provide a coil stock holding and feeding device which will positively unreel the coil stock in accordance with the demand made upon the stock by the machine operating on the stock, thereby relieving the strain on the feeding mechanism associated with the machine being served and leaving it only the task of accurately feeding the stock step by step to the machine, thereby preventing the inaccurate feeding which would result from slippage of the stock due to the necessity of the feeding mechanism of the served machine having also to forcibly unreel the stock as well as feed it to the machine.

In the drawing:

Figure 1 is a diagrammatic side elevation of a coil stock holding and feeding device connected to and operated by a punch press having stock feeding mechanism associated therewith;

Figure 2 is a top plan view of the right-hand end of Figure 1, showing the stock holding reel and its associated mechanism;

Figure 3 is a vertical section along the line 3—3 in Figure 1;

Figure 4 is an enlarged side elevation, partly in vertical section, of the hydraulic motor and control valve for the stock holding reel shown in Figure 2;

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Figure 5 is an enlarged horizontal section along the line 5—5 in Figure 4;

Figure 6 is an enlarged horizontal section along the line 6—6 in Figure 4;

Figure 7 is an enlarged vertical section along the line 7—7 in Figure 3 showing the operating pump;

Figure 8 is a horizontal section along the line 8—8 in Figure 7, taken immediately above the pump piston head;

Figure 9 is a horizontal section along the line 9—9 in Figure 7 taken through the piston head;

Figure 10 is a fragmentary diagrammatic side elevation of a portion of Figure 1, showing a modified pump construction;

Figure 11 is a fragmentary side elevation of a modified coil stock holding and feeding device;

Figure 12 is a top plan view of the device shown in Figure 11; and

Figure 13 is a fragmentary top plan view of a further modified coil stock holding and feeding device.

Referring to the drawings in detail, Figures 1 and 3 show a coil stock holding and feeding device, generally designated 10, adapted to automatically feed coil stock 11 at a predetermined tension to an intermittent feeding mechanism, generally designated 12, which is operated by and in timed relationship with a stock working machine generally designated 13, such as a punching, stamping, or cutting machine. The machine 13 is conventional and is shown diagrammatically as including a bed 14 to which a die 15 is secured as by the bolts 16 and which has cavities 17 and 18 therein for receiving the punches 19 and 20 mounted on the punch support 21 which in turn is secured to the lower end of a ram or platen 22. The ram or platen 22 is provided with guide portions 23 which reciprocate in vertical guides 24 mounted on the frame of the machine 13 (not shown).

Bolted as at 25 to the platen 22 is a laterally-extending reciprocating arm 26, the outer end of which is slotted as at 27 to slidably engage a stud 28 which carries a washer 30 and bolt 31. The pin or stud 28 is mounted in a slide block 32 and passes through a radial adjustment slot 33 in a swinging arm 34. The slide block 32 is secured to the arm 34 by a bolt 35.

The arm 34 extends radially outward from a hub 36 (Figure 1) and is held in position by a retaining washer 37 and bolt 38. The hub 36 is loosely mounted upon a rock shaft 39. Keyed or otherwise secured to the rock shaft 39 (Figure 3) is a hub 40 having a radially extending web 41

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from which arms 42 and 43 project axially and are provided with tangential threaded bores 44 and 45 to receive adjusting screws 46 and 47 locked in position by lock nuts 48 and 49.

The rock shaft 39 is journaled in suitable bearings (not shown) in the upper portion 50 of a housing 51, forming a part of the intermittent feeding mechanism 12. The latter is disclosed and claimed in the Haller Patent No. 2,428,493, issued October 7, 1947, for Stock Feeding Mechanism for Punching, Stamping and Cutting Machines and its details form no part of the present invention. By the mechanism 12, the coil stock 11 is fed automatically step by step to the punches 19 and die 15 as the platen 22 reciprocates.

Extending radially outward from the hub 40 in the opposite direction from the web 41 (Figure 3) is a pump-operating arm 52 having a ball head 53 on the end thereof engageable with a socket 54 in the upper end of a pump piston rod 55 which, on its lower end, carries a pump piston head generally designated 56. The pump piston head 56 reciprocates in the bore 57 of a cylinder 58 forming a part of the housing 51, the foregoing piston and cylinder constituting a reel operating pump, generally designated 59 (Figure 7). The cylinder 58 is provided with a lateral extension 60 containing a reservoir 61 for the operating fluid, such as oil, the upper portion having a threaded opening 62 receiving a closure cap 63. Similarly, the cylinder 58 is provided at its upper end with a threaded opening 64 into which is threaded a closure cap 65 having a bore 66 through the center thereof for the passage of the piston rod 55. The lower end of the cylinder 58 also has a threaded opening 67 containing a screw cap 68 having an internal recess 69 in the center thereof permitting clearance for the lower end of the piston rod 55.

The piston rod 55 near its lower end is provided with an annular shoulder 70a (Figure 7) formed between it and a reduced diameter portion 70 which slidably engages the walls of a bore 71 (Figure 9) in the body 72 of the piston head 56. The bore 71 is also provided with longitudinal grooves 73 forming a fluid passageway through which fluid can pass from opposite sides of the piston head 56. The lower end of the reduced diameter portion 70 of the piston rod 55 is provided with an annular groove 74 for receiving a split retaining ring 75.

The piston head body 72 on its upper side is provided with a countersunk recess 76 into which fits an annular disc 77 having a central bore 78 adapted to slidably receive the piston rod 55 adjacent its junction with its reduced diameter portion 70 (Figure 7). The annular disc 77 is provided circumferentially spaced threaded holes 79 which receive the threaded upper ends of headed studs 80 which are mounted in bores 81. The shanks of the studs 80 pass through bores 82 in the upper wall 83 of the cylinder body 72 and are encircled by spiral compression springs 83A.

The piston head body 72 is pierced by fluid passageways 84 (Figure 9), the upper ends of which are closed by the annular disc 77 which thereby serves as a yielding closed valve member. The disc 77 is in turn provided with fluid passageways 85 spaced circumferentially from the passageways 84 (Figure 8) so that when the disc 77 is raised out of the countersunk recess 76 and thereby separated from engagement with the wall 83 (Figure 7) fluid can pass upward through

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the passageways 85. By this construction the piston head 56 is provided with spring-pressed separable portions by which compressed fluid can pass through the piston head when it becomes trapped at the lower end of the cylinder bore 57 or when the pressure therein rises to an amount sufficient to overcome the thrust of the coil spring 83A. On the upstroke, as shown in the chain line in Figure 7 and explained below in connection with the operation fluid can pass downward from the reservoir 61 and the upper end of the cylinder bore 57 through the grooves 73 into the lower end thereof. The lower end of the cylinder 58 is provided with a boss 86 which is provided with a threaded port 87 (Figure 3). Threaded into the port 87 is the upper end of a conduit 88 which extends from the pump 59 to the strip stock holding and feeding device 10, the lower end of the conduit 88 being threaded into the pump port 89 (Figure 4) in the casing 90 of a control valve 91.

Opposite the pump port 89 is a motor port 92 which is threaded to receive one end of a nipple 93. The ports 89 and 92 open into a valve bore 94 in which a valve plunger 95 is reciprocally mounted. The valve plunger 95 is provided with an annular cutaway portion 96 and an inner end 97 has a socket 98 which serves as an abutment for one end of a compression spring 99, the opposite end of which is seated against the inner end wall 100 of the bore 94. The cutaway portion 96 is of such width as to leave a slight opening when the valve plunger 95 is in its closed position, so that fluid can pass downward from the motor port 92 to the pump port 89 when the pump 59 is in suction. The end wall 100 contains an air vent 101. The valve plunger 95 is engaged by the rounded end 102 of a lever 103 which is pivotally mounted on the pin 104 between the yoke arms 105 extending outward from the valve casing 99. Mounted in the upper arm of the lever 103 is a control valve operating rod 106, the upper end of which is bent at right angles thereto and carries a roller 107 which rests on the upper surface of the stock strip 11 approximately at the point of maximum sag.

The upper end of the nipple 93 (Figure 4) is threaded into a port 108 in the cylinder 109 of a hydraulic motor 110 having a cylinder bore 111 in which reciprocates a piston 112. The latter is connected to a piston rod 113 which is surrounded by a compression spring 114 which urges the piston head 112 and piston rod 113 downward. Threaded upon the upper end of the cylinder 109 is a support 115 which has a bore 116 in its horizontal portion 115a for the passage of the piston rod 113. The vertical portion 115b of the support 115 is provided with a vertical groove 117 which serves as a guideway for a vertically reciprocable slide 118. The slide 118 is bored as at 119 to receive the reduced diameter portion 120 of the piston rod 113, and is provided with a vertical guide groove 121 therein (Figure 5). The groove 121 is crossed by a pair of pins 122 inserted in aligned holes 123, the pins passing through inclined slots 124 in a vertically slidable rack bar 125 having rack teeth 126 thereon. The rack bar 125 is thus slidable in an inclined direction into and out of the groove 121.

The slide 118 in its opposite side walls is provided with elongated slots 127 (Figure 4) through which direct access is gained to the opposite sides of the rack bar 125. In order to provide a frictional drag upon the rack bar 125, two friction

pins 128 (Figure 6) are reciprocally mounted in aligned bores 129 (Figures 4 and 6) in the side walls of the support 115. The friction pins 128 are provided with sockets 130 which receive the ends of a U-shaped spring 131. The latter is mounted in a U-shaped recess 132 in the support 115 and forces the friction pins 128 inward toward one another so that they form a retarding device with their inner ends yieldingly and frictionally engaging the sides of the rack bar 125, causing the latter to act as a friction plunger.

The rack teeth 126 on the rack bar 125 in the lowered position of the latter mesh with corresponding teeth 133 on a gear or pinion 134 which is pinned or otherwise secured to a shaft 135 which is journaled in a bore 136 in a bearing 137 mounted upon the upper end of an approximately triangular bearing bracket or coil holder supporting structure 138. Bolted to the bearing bracket 138 is an arm 139, the outer end of which is bolted to the motor cylinder 109 (Figures 1 and 2). Mounted on the outer end of the shaft 135 is a reel or coil stock holder 140 consisting of a hub 141 from which radial arms 142 extend outward and are provided with L-shaped supports 143 bolted thereto. The coil stock 11 is wound upon the reel 140 and is carried by the L-shaped supports 143.

In the operation of the invention, let it be assumed that the feeding mechanism 12 has been adjusted, as described in the previously-mentioned Haller Patent 2,428,493 of October 7, 1947, to feed the coil stock 11 to the left step-by-step in synchronism with the vertical reciprocation of the platen 22. This action is brought about by the up-and-down motion of the arm 26 (Figure 1) swinging the arm 34 around the axis of the rock shaft 39. As the arm 34 swings to and fro vertically, it alternately engages the ends of the screws 46 and 47, oscillating the web 41 (Figure 3) and with it the rock shaft 39 which operates the feeding mechanism 12 and advances the coil stock 11 step-by-step.

At the same time, the arm 52, which is also carried by the hub 49, swings to and fro vertically, reciprocating the piston rod 55. As the piston rod 55 moves downward, it forces liquid out of the lower end of the cylinder bore 57 (Figures 3 and 7) through the port 87 and conduit 88 into the pump port 89 of the control valve 91 (Figure 4). If the feeding operation of the feeding mechanism 12 has taken up a considerable amount of the slack in the coil stock 11 between the feeding devices 10 and 12, the roller 107 moves upward, swinging the rod 106 upward, permitting the coil spring 99 to push the reduced diameter portion 96 of the valve plunger 95 to the left, opening up the passageway between the pump and motor ports 89 and 92. The pressure fluid developed by the pump 59 thus passes into the lower end of the motor cylinder bore 111, pushing the piston head 112 and piston rod 113 upward against the urge of the coil spring 114. The friction pins 128, however, exert a drag or retarding effect upon the rack bar 125 as the support 115 moves upward. The co-action between the upwardly moving inclined slots 124 and the temporarily stationary pins 122 causes the rack bar 125 to be thrust horizontally to the left (Figure 1) meshing its teeth 126 with the teeth 133 on the gear or pinion 134. As soon as meshing takes place, the further upward motion of the slide 118 overcomes the frictional drag of the pins 128 when the pins 122 reach the upper ends of the slots 124, causing the rack bar 125 to move

upward, rotating the gear 133. This action rotates the reel shaft 135 and with it the reel 140 in a counterclockwise direction, causing the coil stock 11 to slacken.

When the coil stock 11 slackens, the roller 107 and rod 106 move downward, thrusting the valve plunger 105 to the right to close off the major portion of the passageway between the ports 89 and 92. The liquid pressure thus rises in the cylinder 58 of the pump 59 and, when it exceeds the force of the coil springs 83A, causes the annular disc 77 to move upward relatively to the piston head body 72 uncovering the passageways 84 (Figure 9). The fluid is thus enabled to pass through the passageways 84 and the space between the now separated piston head body 72 and annular disc 77, through the passageways 85 (Figure 8) into the upper end of the cylinder bore 57 and thence into the reservoir 61. On the upstroke of the piston head 56, however, the piston rod 55 moves upward ahead of the piston head 56 until the split ring 75 engages the lower end of the piston head body 72, as shown in the chain lines at the bottom of Figure 7. The continued upward movement of the piston rod 55 causes fluid in the upper end of the cylinder bore 57 to move downward through the grooves 73 (Figures 7 and 9) into the lower end of the cylinder bore 57, since the upper ends of the grooves 73 have been uncovered by the upward motion of the piston rod 55.

On the suction stroke of the piston head 56, fluid will be withdrawn from the lower end of the motor cylinder bore 11 through the valve 31, whereupon the coil spring 114 will force the motor piston 112 downward, carrying with it the slide 118. The friction pins 128, however, still exert their frictional drag upon the sides of the rack bar 125, causing the action between the pins 122 and inclined slots 124 to move the rack bar 125 horizontally to the right into the position shown in Figure 4, moving its teeth 126 out of mesh with the teeth 133 of the gear 134. Accordingly, on the downstroke of the motor piston 112, the gear 135 is not rotated. Thus, the feeding device 10 automatically regulates the unreeling of the stock from the reel 140 and causes a constant slack to be maintained between the feeding device 10 and the feeding mechanism 12 (Figure 1). As soon as this slack is taken up, the device 10 automatically unreels more of the coil stock 11 to maintain the slack.

In order to widen the range of operation of the reel-operating pump 59 and render it more adaptable to the varying requirement of different widths and thicknesses of coil material, the cylinder 58 of the pump 59 is preferably provided with a longitudinal boss or enlargement 145 extending from the boss 86 to a boss 146 and containing a by-pass passageway 147 (Figure 3). The passageway 147 at its lower end opens into the port 87 and at its upper end opens into a valve chamber 148 which is bored and threaded as at 149 to receive a valve member 150. The valve member 150 engages a seat at the mouth of a port 151 leading into the upper portion of the cylinder bore 57 above the point of highest ascent of the piston head 56.

The operation of the by-pass passageway 147 widens the range of operation of the pump 59 by permitting coil springs 83a (Figure 7) of the maximum desired pressure to be installed. The by-pass valve 150 can be adjusted to by-pass any desired portion of the fluid in the cylinder 58 during the down stroke of the piston 56, leaving

the springs 83a free to handle any pressure encountered above the pressure at which the springs 83a will hold the disc 77 closed against the ports 84 (Figures 7 and 8). Above this limiting pressure, the springs 83a will be compressed, lifting the plate 77 off the ports 84, as described previously, permitting excess fluid to escape through the ports 84 and 85 into the upper portion of the cylinder bore 57 and reservoir 61. If the by-pass valve 150 is screwed down tightly against its seat, closing the port 151, then the disc 77 will lift only by a pressure exceeding the resisting pressure of the coil springs 83a.

The modification shown in Figure 10 employs a pump 152 which is completely independent of the coil feeding mechanism 12 shown in Figure 1, so that an independent coil feeding mechanism 153 of any type may be used. The details of the coil-feeding mechanism 153 are conventional and form no part of the present invention. The pump 152 is operated by a bracket 154 secured as at 155 to the platen 22 and bored to receive the threaded piston rod 156 of the pump 152. Nuts 157 and 158 above and below the bracket 154 serve to regulate the stroke of the pump 152 for any given stroke of the platen 22.

The pump 152 is similar in construction to the pump 59 of Figure 7 except that its piston 159 is inverted as compared with the piston 56, the piston rod 156 extending in the opposite direction from the piston rod 55. The outlet boss 160 of the pump 152 is therefore at the top instead of at the bottom of the cylinder and the port 161 receives the upper end of the pipe 88. The remainder of the arrangement is similar to that shown in Figure 1, and similar parts are similarly designated. The operation is also the same, with the exception that the pump 152 is of course operated directly by the bracket 154 from the platen 22 instead of indirectly through the mechanism for operating the feeding mechanism 12, as in Figure 1.

The modified stock-holding and feeding device 162 of Figure 11 is similar in principle to that shown at 10 in Figure 1 and similar parts are similarly designated. The reel 163 of the feeding device 162 is intermittently rotated in a different manner from that shown in Figure 1. The upper end of the piston rod 113 of the fluid pressure motor cylinder 110 in Figure 11, however, instead of being connected to the rack and pinion mechanism shown in Figure 4, is connected to a clevis 165 to which a link or connecting member 167 is pivoted as at 168 (Figure 11), the upper end of the link 167 being pivoted as at 169 to an approximately U-shaped operating arm 170. The latter has an extension 171 which engages the pivot pin 169 and the arm 172 carries a pair of pivot pins 173 and 174 which in turn carry spaced rollers or driving elements 175 and 176 which engage the opposite sides of the rim flange or annular projection 177 of a drum 178, the hub 179 of which is pinned or otherwise secured to the reel shaft 180.

The reel shaft 180 is journaled in a bore 181 in the bearing portion 182 of a triangular bracket 183, the lower portion of the latter being bolted or otherwise secured to the floor. Pinned or otherwise secured to the outer end of the reel shaft 180 is the hub 184 of the reel 183. The latter is provided with L-shaped supports 185 which are secured as at 186 to the reel arms 187 which radiate outward from the hub 184. The coil stock 11 is carried upon the supports 185 in the same manner as described above in connec-

tion with Figure 1. The remaining arm 188 of the U-shaped operating arm 170 serves as a retaining member to prevent the rollers 175 from being disengaged from the flange 177 by moving in an axial direction.

The modification shown in Figure 13 is similar to that shown in Figures 11 and 12 except that the reel 162 is provided with an axially projecting flange 190 secured to the outer ends of the arms 191. The rollers 175 and 176 engage this flange 190 instead of the independent flange 177 on a drum 178 as in Figure 12.

The operation of the modifications shown in Figures 11 to 13 inclusive is generally similar to that described above in connection with Figure 1, and hence requires no repetition except where it differs. As the piston head 112 of the motor 113 moves upward in Figure 11, it swings the arm 170 upward at its pivotal connection 169, causing the rollers 175 and 176 to tightly grip the rim flange 177. The reciprocating motion of the piston rod 113 is thus converted into a rotary motion of the drum 178, accordingly rotating the reel 163. The modification of Figure 13 operates in a similar manner except that the rollers 175 and 176 directly engage the reel periphery without the intervention of the drum 178. In either modification, the reel 163 is rotated step-by-step as long as the slack portion of the coil 11 remains sufficiently taut. When the slack 11 increases beyond the desired point, the roller 167 and its rod 136 drop downward, closing the valve 91 and temporarily halting the reciprocation of the motor 113 as explained in connection with Figure 1.

What I claim is:

1. A coil stock holding and feeding device for a sheet-material-working machine comprising a supporting structure, a coil stock holder rotatably mounted on said structure and adapted to hold a coil of such stock with a slack portion thereof extending outwardly therefrom, a fluid pressure motor having a cylinder and a piston reciprocable therein, mechanism connected to said piston drivingly and selectively engaging said motor with and disengaging said motor from said holder to unreel stock therefrom, a fluid pressure pump, a hydraulic circuit connecting said pump to said motor, a power source drivingly connected to said pump, a control valve in said circuit interposed between said pump and said motor and having a shiftable valve member, a valve member operating structure engaging said stock between said holder and said machine, said control valve member operating structure being responsive to the attainment of a predetermined tautness in the slack portion of said stock for shifting said valve member to a position transmitting pressure fluid from said pump to said motor to unreel stock from said holder.

2. A coil stock holding and feeding device for a sheet-material-working machine comprising a supporting structure, a coil stock holder rotatably mounted on said structure and adapted to hold a coil of such stock with a slack portion thereof extending outwardly therefrom, a fluid pressure motor drivingly connected to said holder to unreel stock therefrom, a source of pressure fluid in circuit with said motor, and a control valve interposed between said source and said motor and engaging said stock between said holder and said machine, said control valve being responsive to the attainment of a predeter-

mined tautness in the slack portion of said stock for transmitting pressure fluid from said source to said motor, said motor comprising a fluid pressure cylinder and a piston reciprocable therein, a gear wheel on said holder and gearing interposed between said motor and said gear wheel, and mechanism selectively engaging and disengaging said gearing with and from said gear wheel respectively whereby to drivingly and disengageably connect said piston to said holder or disconnect said piston from said holder.

3. A coil stock holding and feeding device for a sheet-material-working machine comprising a supporting structure, a coil stock holder rotatably mounted on said structure and adapted to hold a coil of such stock with a slack portion thereof extending outwardly therefrom, a fluid pressure motor drivingly connected to said holder to unreel stock therefrom, a source of pressure fluid in circuit with said motor, and a control valve interposed between said source and said motor and engaging said stock between said holder and said machine, said control valve being responsive to the attainment of a predetermined tautness in said stock for transmitting pressure fluid from said source to said motor, said motor comprising a fluid pressure cylinder and a piston reciprocable therein, a rack connected to said piston, and a pinion on said holder, said rack being drivingly and selectively engageable with and disengageable from said pinion.

4. A coil stock holding and feeding device for a sheet-material-working machine comprising a supporting structure, a coil stock holder rotatably mounted on said structure and adapted to hold a coil of such stock with a slack portion thereof extending outwardly therefrom, a fluid pressure motor mounted on said supporting structure and having a cylinder and a piston reciprocable therein, a rack movably connected to said piston, a pinion on said holder, a retarding device yieldably engaging said rack for effecting motion thereof into mesh with said pinion in response to the motion of said piston, a fluid pressure pump, a power source drivingly connected to said pump, and a control valve connected in circuit between said pump and said motor and having an operating member engaging said stock between said holder and said machine, said operating member being operable to transmit pressure fluid from said pump to said motor in response to the attainment of a predetermined tautness in the slack portion of said stock.

5. A coil stock holding and feeding device for a sheet-material-working machine comprising a supporting structure, a coil stock holder rotatably mounted on said structure and adapted to hold a coil of such stock with a slack portion thereof extending outwardly therefrom, a fluid pressure motor mounted on said supporting structure and having a cylinder and a piston reciprocable therein, a rack movably connected to said piston and having a pin and inclined slot connection therewith, a pinion on said holder, a retarding device yieldably engaging said rack for effecting motion thereof into mesh with said pinion in response to the motion of said piston, a fluid pressure pump, a power source drivingly connected to said pump, and a control valve connected in circuit between said pump and said motor and having an operating member engaging said stock between said holder and said machine, said operating member being operable to transmit pressure fluid from said pump to said motor in re-

sponse to the attainment of a predetermined tautness in the slack portion of said stock.

6. A coil stock holding and feeding device for a sheet-material-working machine comprising a supporting structure, a coil stock holder rotatably mounted on said structure and adapted to hold a coil of such stock with a slack portion thereof extending outwardly therefrom, a fluid pressure motor mounted on said supporting structure and having a cylinder and a piston reciprocable therein, a rack movably connected to said piston, a pinion on said holder, a retarding device including a yieldingly urged friction plunger yieldably engaging said rack for effecting motion thereof into mesh with said pinion in response to the motion of said piston, a fluid pressure pump, a power source drivingly connected to said pump, and a control valve connected in circuit between said pump and said motor and having an operating member engaging said stock between said holder and said machine, said operating member being operable to transmit pressure fluid from said pump to said motor in response to the attainment of a predetermined tautness in the slack portion of said stock.

7. A coil stock holding and feeding device for a sheet-material-working machine comprising a supporting structure, a coil stock holder rotatably mounted on said structure and adapted to hold a coil of such stock with a slack portion thereof extending outwardly therefrom, a fluid pressure motor mounted on said supporting structure and having a cylinder and a piston reciprocable therein, a rack movably connected to said piston, and having a pin and inclined slot connection therewith, a pinion on said holder, a retarding device including a yieldingly urged friction plunger yieldably engaging said rack for effecting motion thereof into mesh with said pinion in response to the motion of said piston, a fluid pressure pump, a power source drivingly connected to said pump, and a control valve connected in circuit between said pump and said motor and having an operating member engaging said stock between said holder and said machine, said operating member being operable to transmit pressure fluid from said pump to said motor in response to the attainment of a predetermined tautness in the slack portion of said stock.

8. A coil stock holding and feeding device for a sheet-material-working machine comprising a supporting structure, a coil stock holder rotatably mounted on said structure and adapted to hold a coil of such stock with a slack portion thereof extending outwardly therefrom, a fluid pressure motor drivingly connected to said holder to unreel stock therefrom, a fluid pressure pump in circuit with said motor, a mechanism drivingly connecting said pump to a moving part of said machine, and a control valve interposed between said pump and said motor and having a valve operating structure engaging said stock between said holder and said machine, said control valve being responsive to the attainment of a predetermined tautness in the slack portion of said stock for transmitting pressure fluid from said pump to said motor, said pump having a cylinder and a piston reciprocable therein, said piston having a yieldingly closed valve therein for passing fluid through in response to the attainment of a predetermined pressure in said cylinder.

9. A coil stock holding and feeding device for a sheet-material-working machine comprising a

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supporting structure, a coil stock holder rotatably mounted on said structure and adapted to hold a coil of such stock with a slack portion thereof extending outwardly therefrom; a fluid pressure motor drivingly connected to said holder to unreel stock therefrom, a fluid pressure pump in circuit with said motor, a mechanism drivingly connecting said pump to a moving part of said machine, and a control valve interposed between said pump and said motor and having a valve operating structure engaging said stock between said holder and said machine, said control valve being responsive to the attainment of a predetermined tautness in the slack portion of said stock for transmitting pressure fluid from said pump to said motor, said pump having a cylinder, a piston head reciprocable in said cylinder and having a central bore and a fluid passageway adjacent said bore, and a piston rod slidably mounted in said bore and having a shoulder closing said passageway during reciprocation of said piston rod in one direction and opening said passageway during reciprocation thereof in the opposite direction.

10. A coil stock holding and feeding device for a sheet-material-working machine comprising a supporting structure, a coil stock holder rotatably mounted on said structure and adapted to hold a coil of such stock with a slack portion thereof extending outwardly therefrom, a fluid pressure motor mounted on said supporting structure and having a cylinder and a piston reciprocable therein, a connecting member at-

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tached to said piston, said stock holder having an annular projection thereon, a plurality of spaced driving elements engageable with the opposite sides of said projection and connected to said connecting member, said driving elements being responsive to the piston stroke in one direction to drivingly engage said projection to rotate said stock holder and responsive to the piston stroke in the opposite direction to slip relatively to said projection, a fluid pressure pump, a power source drivingly connected to said pump, and a control valve connected in circuit between said pump and said motor and having an operating member engaging said stock between said holder and said machine, said operating member being operable to transmit pressure fluid from said pump to said motor in response to the attainment of a predetermined tautness in the slack portion of said stock.

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