

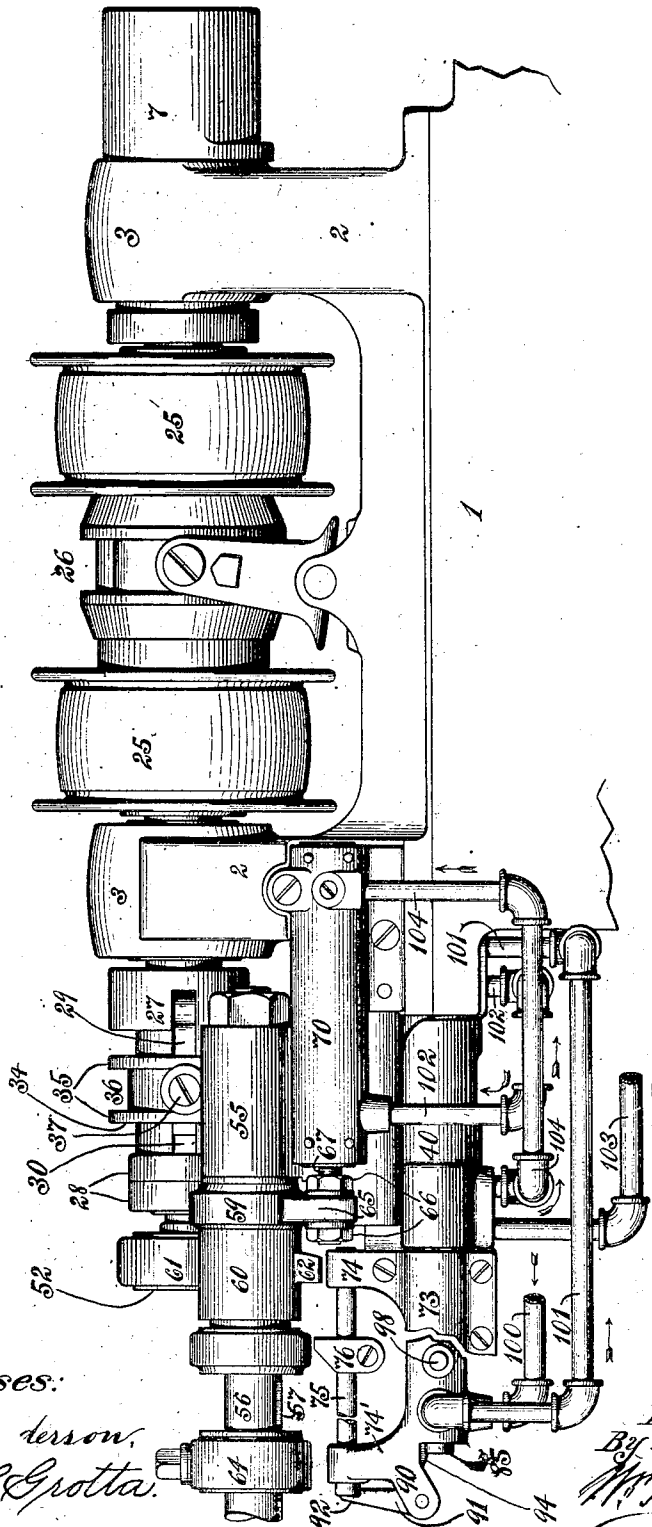
B. M. W. HANSON.
 FEED AND ALARM MECHANISM FOR METAL WORKING MACHINES.
 APPLICATION FILED FEB. 28, 1906.

915,173.

Patented Mar. 16, 1909.

4 SHEETS—SHEET 1.

Fig. 1.



Witness:
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 S. S. Grotta.

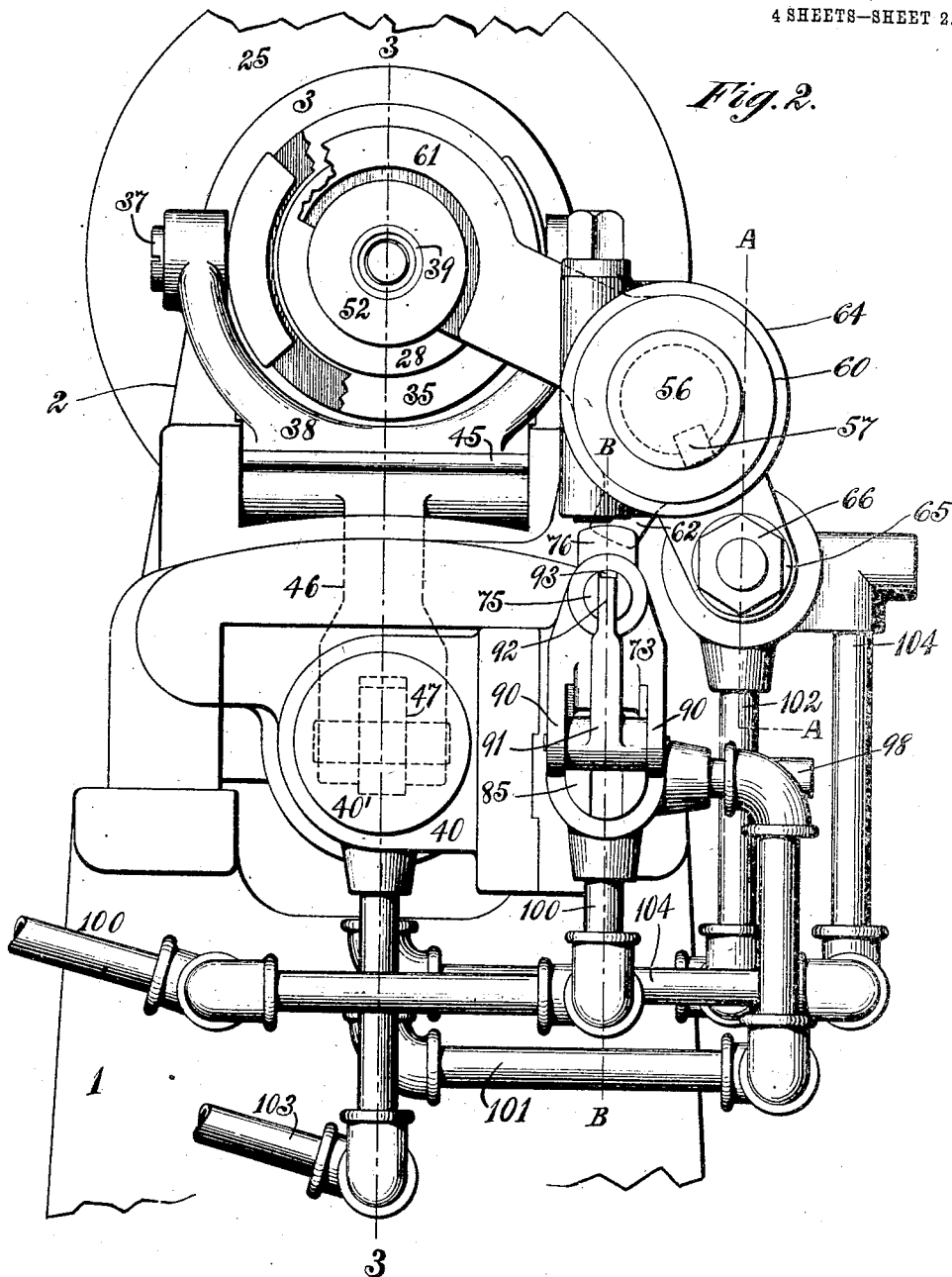
Inventor:
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4 SHEETS—SHEET 2.



Witnesses:

J. E. Anderson.
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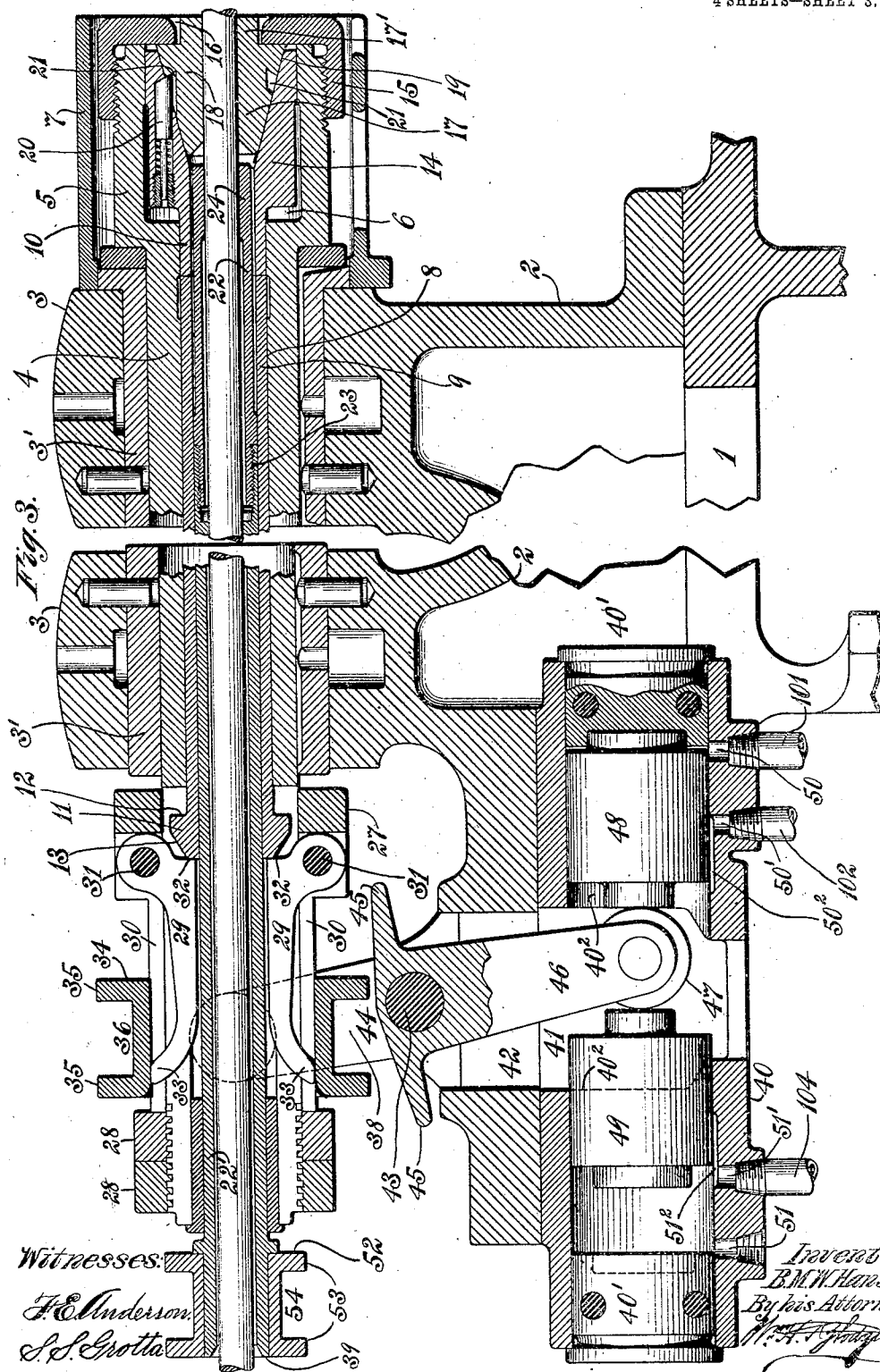
B. M. W. Hanson,
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4 SHEETS—SHEET 3.



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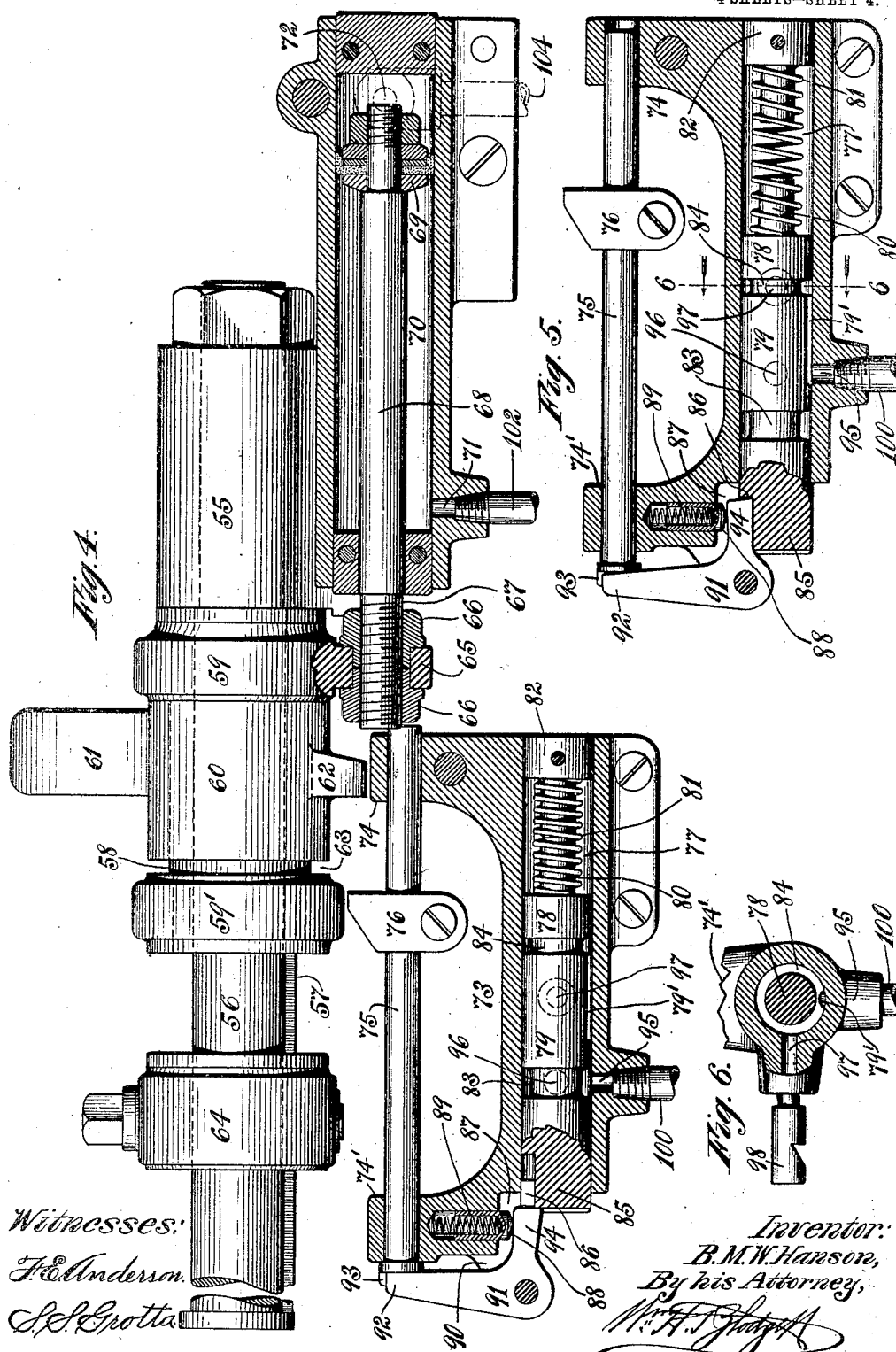
Inventor:
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

BENGT M. W. HANSON, OF HARTFORD, CONNECTICUT, ASSIGNOR TO PRATT & WHITNEY COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF NEW JERSEY.

FEED AND ALARM MECHANISM FOR METAL-WORKING MACHINES.

No. 915,173.

Specification of Letters Patent.

Patented March 16, 1909.

Application filed February 28, 1906. Serial No. 303,452.

To all whom it may concern:

Be it known that I, BENGT M. W. HANSON, a citizen of Sweden, who have declared my intention of becoming a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Feed and Alarm Mechanism for Metal-Working Machines, of which the following is a specification.

This invention relates to a new and useful improvement in stock-feeders or devices for feeding the material-operated upon in metal working machines, and has for its object the production of a device wherein the stock will be automatically fed, the feeding device retracted, the device stopped when the stock is exhausted, and an alarm given. These objects are obtained by the mechanism herein-after described, wherein are combined with a stock-feeder several automatic devices by means of which the various operations of moving the feed-grip endwise, clamping the chuck against the stock, and stopping the mechanism when the stock is exhausted are all performed automatically and with recurring certainty.

In the accompanying drawings, Figure 1 represents a side view of one form of machine in which my invention may be embodied. Fig. 2 is an end view; Fig. 3 is a vertical section on line 3, 3 of Fig. 2; Fig. 4 is a side view of the feed-actuating device with the mechanism in section on line A—A Fig. 2, and the shut-off and alarm in section on line B—B Fig. 2; Fig. 5 is a sectional view of the cut-off and alarm mechanism in tripped position; and Fig. 6 shows the open alarm on line 6—6 Fig. 5.

Like numerals designate similar parts throughout the several views.

Referring to the drawings, the numeral 1 indicates a bed-plate, from which rise the supports 2, 2 carrying the bearings 3, 3 in which is journaled a spindle provided with a stock-feed-grip hereinafter described.

As the present invention relates to adjunctive parts and not to the stock-feed grip itself any form of feed-grip for which the present invention is adapted may be employed and only as much of feed mechanism carried by the spindle will be described as may be necessary for a clear understanding of the machine.

In the present instance there is shown a

tubular spindle 4 having a head 5 with the chamber 6, the spindle and head fitting within the bushings 3', 3' of the bearings 3, 3 and the hood 7. Within the bore 8 of this spindle 4 is snugly fitted a cylindrical sleeve 9 bearing against a chuck-actuator 10, the latter having an outer conical end 13, and provided with an outer enlarged head 14 within the chamber 6 of the head 5. Secured on the end of this head 5 is a cap 15 having a central hole 16, and in this hole are fitted projections 17' on the conical jaws of stock-chuck 17, the main portion or body 18 of which is within a conical recess 19 of the head 14 of the chuck-actuator 10. In this head 14 are placed spring-actuated plungers 20 one for each jaw of the chuck, the outer end of each plunger engaging a pocket 21 in the chuck 17. Within the sleeve of the chuck-actuator 10 is placed a feed-grip 22 threaded into a tubular spindle 22' at 23 and having stock-gripping jaws 24 at its front end. Between the bearings 3, 3 are sleeved upon the spindle the loose pulleys 25, 25' and between them is a clutch 26, this construction being as usual. Back of the bearings 3, 3 are secured the devices for forcing the chuck-actuator 10 upon the chuck.

A sleeve 27 is held upon the spindle 4 by nuts 28, 28' and levers 29 are pivoted in slots of said sleeve at 31, 31 adjacent to the conical end 13 of the inner head 11 of the chuck-actuator-sleeve 9, and are provided with shoulders 32 32 just within the pivots 31 at the conical end 13, and with outwardly-curved free ends 33, 33 projecting through the slots 30, 30. Surrounding the sleeve and the levers 29, 29 is a collar 34 having annular flanges 35, forming a groove 36 between them. Within this groove 36 are roller-studs 37, 37 carried by a yoke 38 pivoted to an adjacent part of the machine.

To the construction thus far described and to which no claim is made herein, the present invention is connected.

Below the stock-feeder and the yoke 38 there is secured to the frame of the machine a cylinder 40 having passing therethrough an opening 41 registering above with an opening 42 in the frame. The yoke 38 is carried by a rock-shaft 43 and said shaft has a depending arm 46 extending through the opening 42 and entering the opening 41 in the cylinder 40. At 44 said yoke has extensions 45 to protect the opening 42, and is

provided at its lower end with a roller 47. In the ends of the cylinder 40 are placed the cylindrical pistons 48 and 49, and the cylinder is provided with two sets of induction and eduction-ports 50, 50', 51, 51' one set at each end, to which ports are connected pipes for carrying the motive-fluid to and from each end of the cylinder.

While but a single cylinder is shown for the reception of the pistons it is obvious that other means may be employed to receive them, the two compartments constituting in effect independent cylinders, although joined in the present instance.

The cylinder 40 is closed at each outer end 40' and open at the inner portions 40²—40² leading into the opening 41. At the ports on the inside are the recesses 50², 51² with which the ports 50' and 51' communicate, and which recesses lead from these ports to the opening 41.

On the protruding end 39 of the stem 22 is secured a collar 52 having the flanges 53 and groove 54. Near this collar 52 is located in bearing 55 a guide-rod 56 having the feather 57. Sleeved on this guide-rod 56 and secured from rotation is a spool 58 having the heads 59, 59'. On this spool loosely sleeved is a barrel 60 having a curved finger 61 which fits within the groove 54 of the collar 52 and a depending lug 62. The length of the barrel 60 is less than the distance between the heads 59', 59 of the spool 57, there being a space 63 as shown in Fig. 4. On the guide-rod 56 is fastened an adjustable limiting stop 64. Extending from the head 59 of the spool 58 is an eye 65 in which by double nuts 66 is held the end 67 of a piston-rod 68 extending from a piston head 69 within a cylinder 70 secured to the machine-frame in convenient juxtaposition to the spool 58. The cylinder 70 is provided with ports 71, 72, one on each side of the piston head 69, to which the pipes for the motive-fluid are connected.

Located near the spool 58 and substantially in line with the cylinder 70 is a frame 73 provided with the supports 74, 74' in which is loosely held a rod 75 to which is rigidly but adjustably attached a dog 76. In the frame 73 is formed the cylinder 77 in which is located the piston-valve 78, having the head 79 and stem 80. Around the stem 80 is a spiral spring 81 which bears between the head 79 and an end bearing 82. The piston-head 79 has two circumferential grooves 83, 84, and at its end 85 a notch 86, opening outside of the open end of the cylinder 77. At this end the cylinder frame has a rabbet 87 over which projects the outer end 88 of a spring-actuated plunger 89, which is located in a recess in the support 74'. Projecting out from the frame 73 at this end are ears 90 in which is pivoted an angle-lever 91, the upper end 92 of which rests in a

notch 93 in the end of the rod 75, and the lower end or heel 94 of which is turned in under the lower end of the plunger 89 and aligned with the notch 86 of the piston-head 79. Communicating with the interior of the cylinder 77 at the piston-head 79 are the induction and eduction ports 95, 96 for the motive-fluid and the eduction-port 97 connected with a whistle or other signal or alarm 98,—the position of the ports being properly located in relation to the grooves 83, 84. The piston-head also has a recess 79' communicating with the groove 84, but not with the groove 83.

Leading to the induction-port 95 of the cylinder 77 is a motive-fluid supply-pipe 100, and connected with the eduction-pipe 96 of the cylinder 77 is a pipe 101 which is connected with the induction-port 50 of the cylinder 40, while a pipe 102 connects the eduction-port 50' of the cylinder 40 with the port 71 of the cylinder 70.

Leading to the induction-port 51 of the cylinder 40 is a motive-fluid supply pipe 103, and connected with the eduction-port 51' of the cylinder 40 is a pipe 104 which is connected with the port 72 of the cylinder 70.

With the various parts in the position shown in the drawings the stock is at its extreme forward movement, and the clutch-actuator 10 is binding the chuck 18 against the stock, holding it firmly for the operation to be had upon it.

The motive-fluid is admitted through the pipe 103 and induction-port 51 to the cylinder 40, passes out through the eduction-port 51' through the pipe 104, and through the port 72 of the cylinder 70, and moves the piston-head 69. The fluid in the cylinder 70 in front of the piston-head 69 is forced through the port 71, pipe 102, port 50' and recess 50² out through the opening 41 in the cylinder 40. The pressure upon the piston-head 69, through the piston-rod 68, moves the spool 58 which carries the secondary sleeve 60 and through the arm 61 acts upon the rear of the primary sleeve 22 retracting it along the stock and with it the feed-grip to a position where it is ready to move the stock forward. By valve-mechanism not necessary to be shown the motive-fluid is now cut off from the pipe 103, and supplied to the pipe 100, passes through said pipe 100 and induction port 95 to the cylinder 77, (the piston-valve 78 being in the normal position shown in Fig. 4) and through the groove 83, pipe 101 and eduction-port 50 into the cylinder 40 back of the piston 48. The pressure now moves the piston 48 forward and through the arm 46 and yoke 38 slides the collar 34 forward releasing the levers 29. The spring-plungers 20 force the chuck-actuator 10 from off the chuck 17 releasing the grip of the latter upon the stock, the conical end 13 of the head 11

passing between the levers 29 and by the shoulders 32 of said levers. As soon as the piston 48 has made its traverse accomplishing the result thus described the motive-fluid passes through the port 50', through the pipe 102 and port 71 into the cylinder 70 behind the piston-head 69 causing it to move backward and through mechanism already described, causing the feed-grip 22 to move the stock forward another space. As the piston-head 69 moves away from the port 71 the air in front of the piston is exhausted through the port 72, pipe 104, port 51', and recess 51² out through the opening 41 of the cylinder 40.

As soon as the stock is in its forward or operative position, the motive-fluid is cut off from pipe 100 by a valve (not shown) which opens an exhaust to the atmosphere, and is then admitted through pipe 103 and induction port 51 to act upon the fluid-piston 49, moving said piston to the position shown in Fig. 3, and the levers 29 are forced toward each other, the shoulders 32 moving on the conical end 12 of head 13, and advancing the sleeve and chuck actuator 10 to close the chuck 17, thus causing the chuck to grip the stock and hold it for operation. As the motive-fluid operates the piston 49, the fluid back of the piston 48 exhausts through the port 50, pipe 101, ports 96 and 95, and pipe 100 to the atmosphere through the valve above mentioned. Further operations continue as already described.

In the operation of the device should the stock become exhausted and the sleeve 22' be empty when retracted, the momentum of the secondary sleeve 60 would overcome its friction upon the spool 58 and said sleeve will move up against the head 59' on spool 58. Now the lug 62 and adjusted tappet 76 are so spaced apart that under normal positions when there is stock in the machine the drag of the feed-grip on said stock keeps the secondary sleeve 60 from sliding on the spool 58 and the lug 62 from striking the tappet 76, but should the sleeve 22' be empty and the secondary sleeve 60 slide on said spool 58, the lug 62 will strike the tappet 76, causing the rod 75 to be actuated. This causes the angle-lever 91 to turn on its pivot and force its lower end 94 into line with the notch 86 of the piston-valve 78, and the spring 81 then presses said valve 78 inwardly until the induction-port 96 is closed and the end of the recess 79' of the valve covers the induction-port 95 in the cylinder. The motive-fluid supply is thus cut off to the cylinder 77 and the cylinders 40 and 70, the exhaust-fluid passing through the recess 79', groove 84, port 97, and whistle 98, as indicated in Fig. 5, and sounding an alarm during each rotation of the spindle. To restore the piston 78 to normal position, it is pushed back by hand and again locked by the angle-lever 91.

The adjustable stop 64 and tappet 76 may be placed in different locations on their supports to suit different throws of the devices for varying lengths of feed.

Changes may be made in the various details of the invention without departure from the invention, which is not limited to the exact devices shown and described, and while a fluid-operated alarm is set forth, other kinds of alarms may be substituted therefor without departure from the invention.

Having thus described my invention, what I claim is—

1. The combination, with a tubular spindle and its chuck, and with means for actuating said chuck, said means disposed within the spindle, of a stock-feed grip; a sleeve carrying said stock-feed grip; a collar on said sleeve; a guide-rod; a spool located on said guide-rod, and having abutments at each end; a sleeve frictionally held upon the spool, said sleeve having an arm engaging the collar of the sleeve carrying the feed-grip; means for actuating the spool, and thereby the feed-grip; an alarm; means actuated by the sleeve on the spool, when the stock in the feed-grip is exhausted, for operating the alarm.

2. The combination with a tubular spindle of a chuck; a device within the spindle for actuating said chuck; a stock feed-grip within the spindle; a grooved collar on a part of said stock-feed grip; an arm fitted in said collar; a guide; a spool sleeved upon the guide, and having heads; a sleeve mounted on the spool between the heads thereof, said sleeve being shorter than the spool, and carrying said arm for actuating the feed-grip; means for sliding the spool upon the guide; an alarm; and means actuated by the sleeve upon the spool for operating said alarm.

3. The combination, with a stock feed-grip, of a tubular spindle in which said stock feed-grip is mounted; a spooled sleeve upon the guide, and having heads; a rod connected to one of said heads; means for actuating the rod; a stop for limiting the movement of the spool; a sleeve upon the spool connected with the stock-feed-grip; an alarm; and means actuated by the sleeve when the stock feed-grip is empty for sounding the alarm.

4. The combination, with a spindle and its chuck, of means within the spindle for actuating said chuck; a stock feed-grip; a collar on said feed-grip; a guide; a spool movable on the guide; means for actuating the spool; a sleeve slidable upon the spool; an arm connecting said sleeve with the collar of the stock feed-grip; a lug projecting from said sleeve; and alarm devices actuated by said lug for sounding the alarm.

5. The combination, with a spindle, and its chuck, of means for actuating said chuck; a stock feed-grip; a guide; a stop adjustable upon the guide; a spool having heads, said spool being movable upon the guide; a sleeve

surrounding the spool, and shorter than said
spool, and located between the heads thereof;
means actuated by the sleeve for operating
the stock-feed-grip; means for reciprocating
5 the spool; an alarm; and means operated by
the sleeve on the spool for actuating said
alarm.

6. The combination, with stock feed-
mechanism including a feed-grip, of a mov-
10 able spool; a sleeve surrounding, and shorter
than said spool; means for connecting said

sleeve with the stock feed-grip mechanism;
means for actuating the spool; an alarm; and
means actuated by the sleeve for sounding
said alarm.

In testimony whereof I affix my signature
in presence of two witnesses this 14th day of
February 1906.

BENGT M. W. HANSON.

Witnesses:

SOLON E. DAVIS,
J. W. JOHNSON.