

[54] STOCK STOP CONTROL ASSEMBLY

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[51] Int. Cl. **B21b 31/34, B21j 13/10**

[58] Field of Search **72/427, 421, 428; 269/304, 269/319, 320; 83/467, 468**

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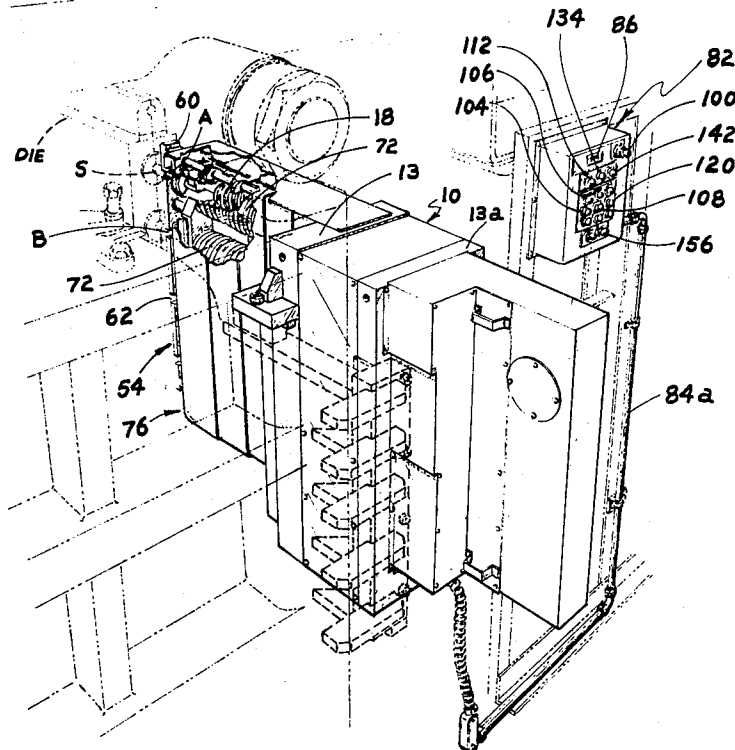
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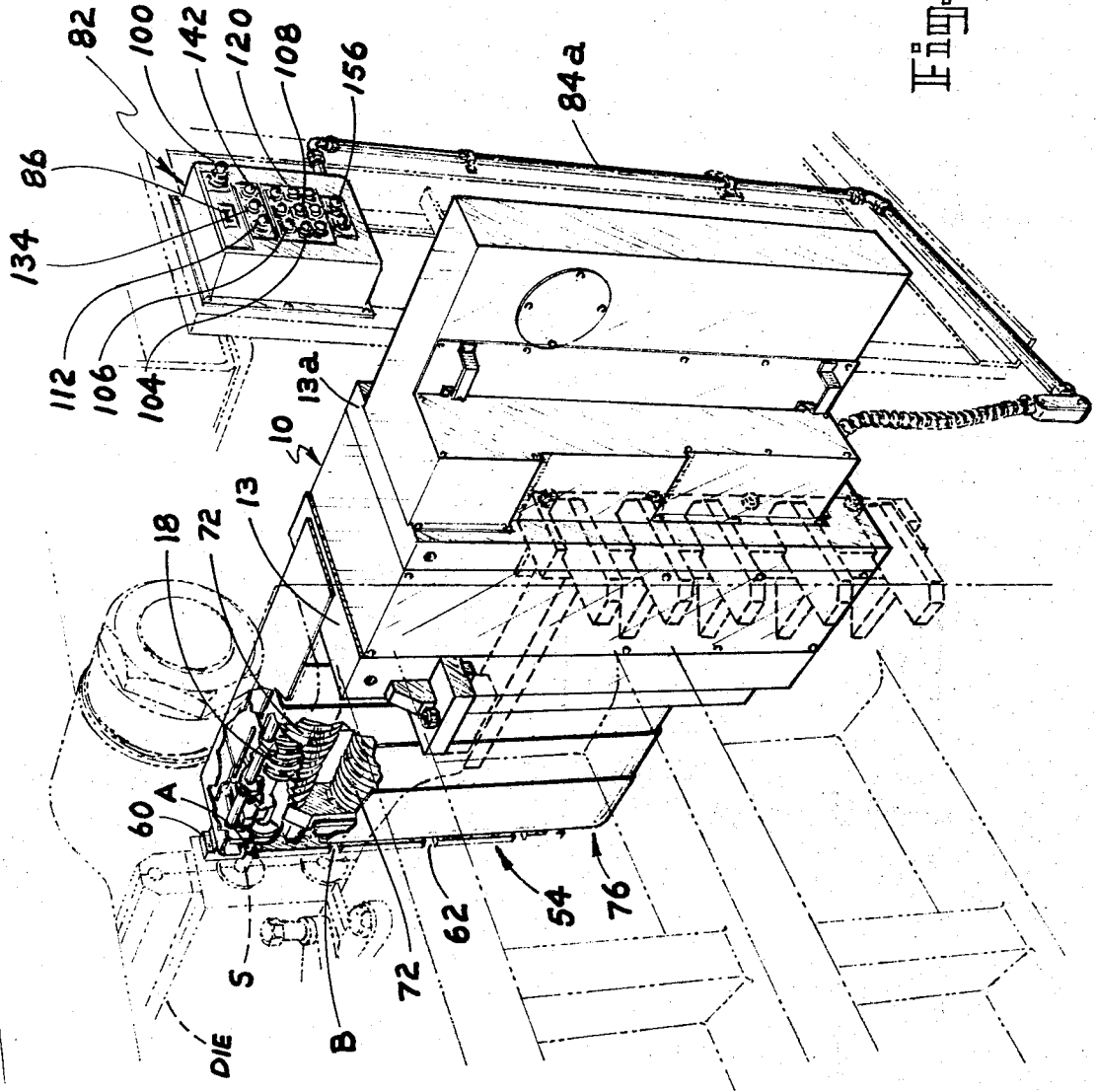
stock forming machines, such as for instance a metal upsetting machine, for positioning the bar or rod of stock material with respect to the work area or die area of the machine. The assembly comprises a support embodying elongated movable abutments mounted on the support with one end of each abutment being adapted for positioning a respective bar or rod of stock relative to the machine. A control panel, disposed remote from the support and movable abutments, is provided, with control mechanism for expeditiously positioning the movable abutments relative to the support, and thus providing for the remote control adjusting of the position of the stock stop abutments with respect to the work area of die area of the machine. Means are provided for locking the stock stop abutments in selected position, and means are provided for sensing the movement of the abutments and visually indicating on the control panel the distance that the stock stop abutments are positioned from the work area of the machine. The highly compact assembly is adapted for use in different types of stock forming machines, and the stock stop abutments thereof can be expeditiously controlled remote from the location of the actual stock stop abutment mechanism.

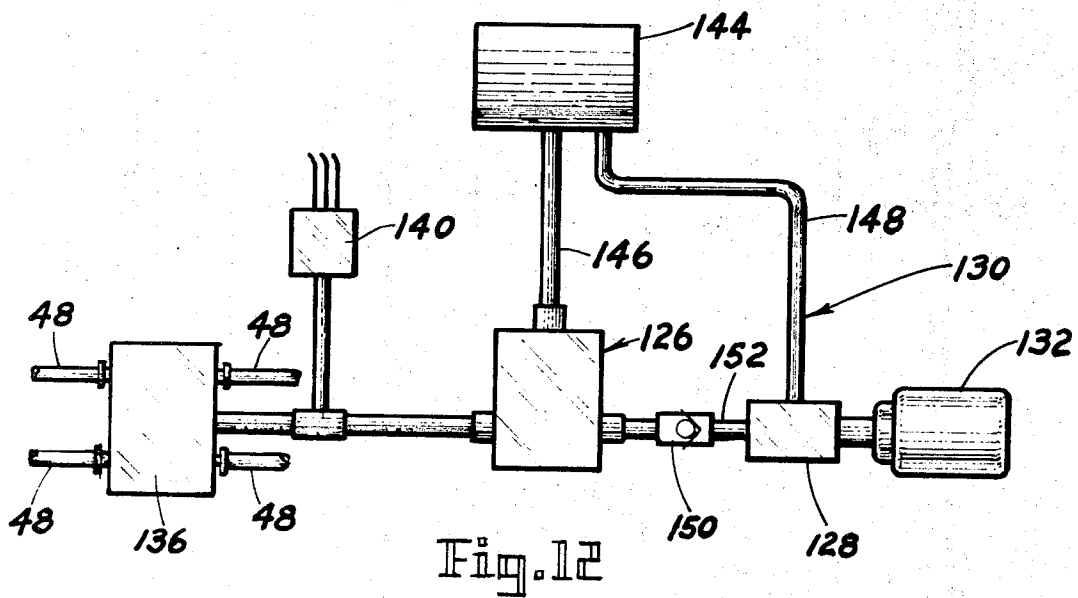
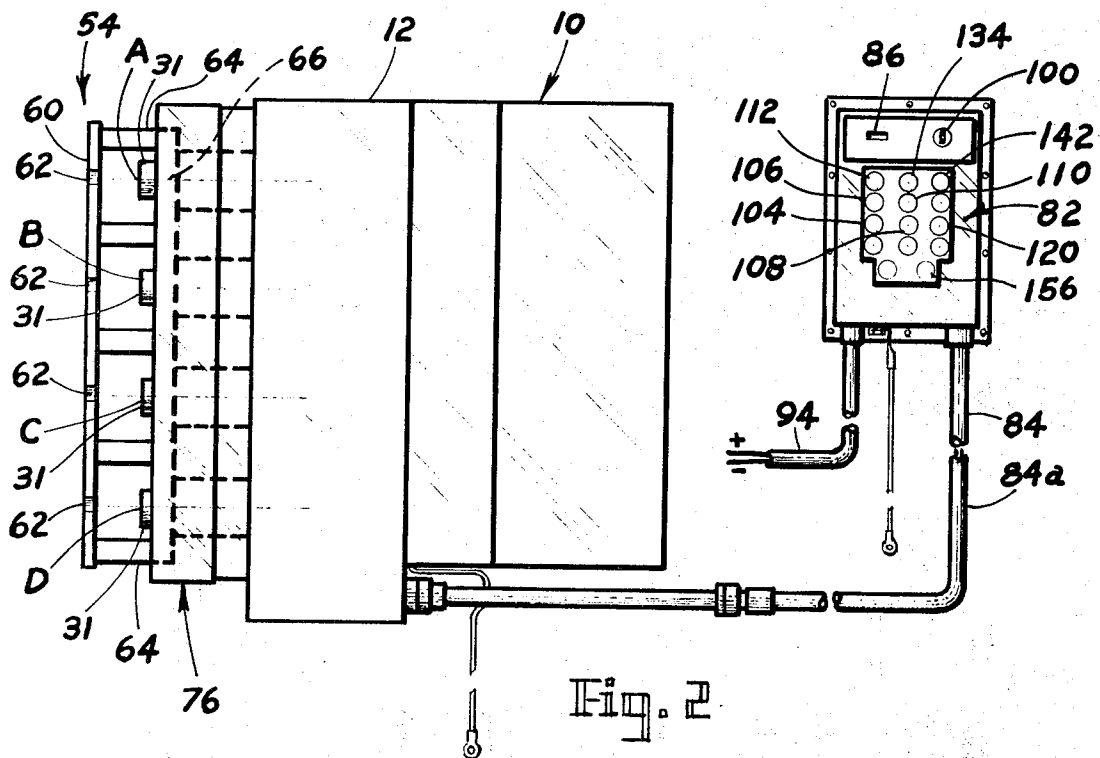
[57] **ABSTRACT**

A compact stock stop control assembly for use in

15 Claims, 19 Drawing Figures







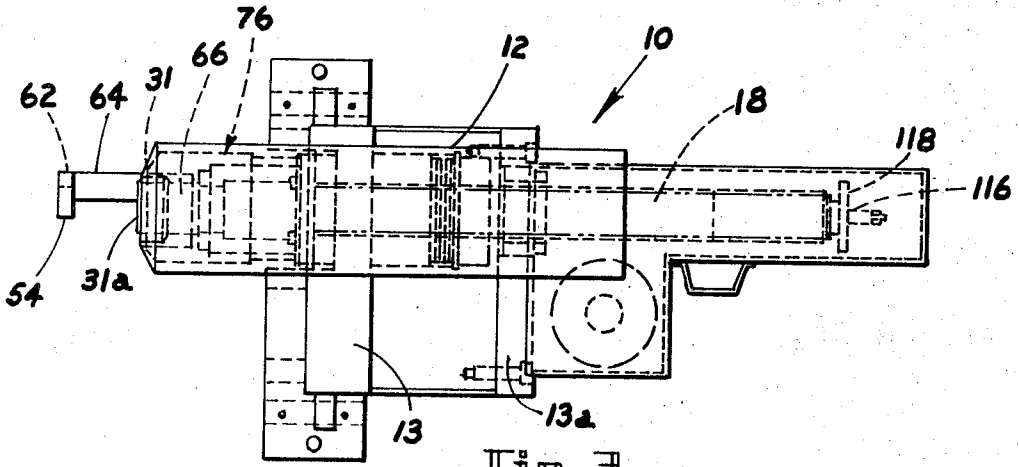


Fig. 3

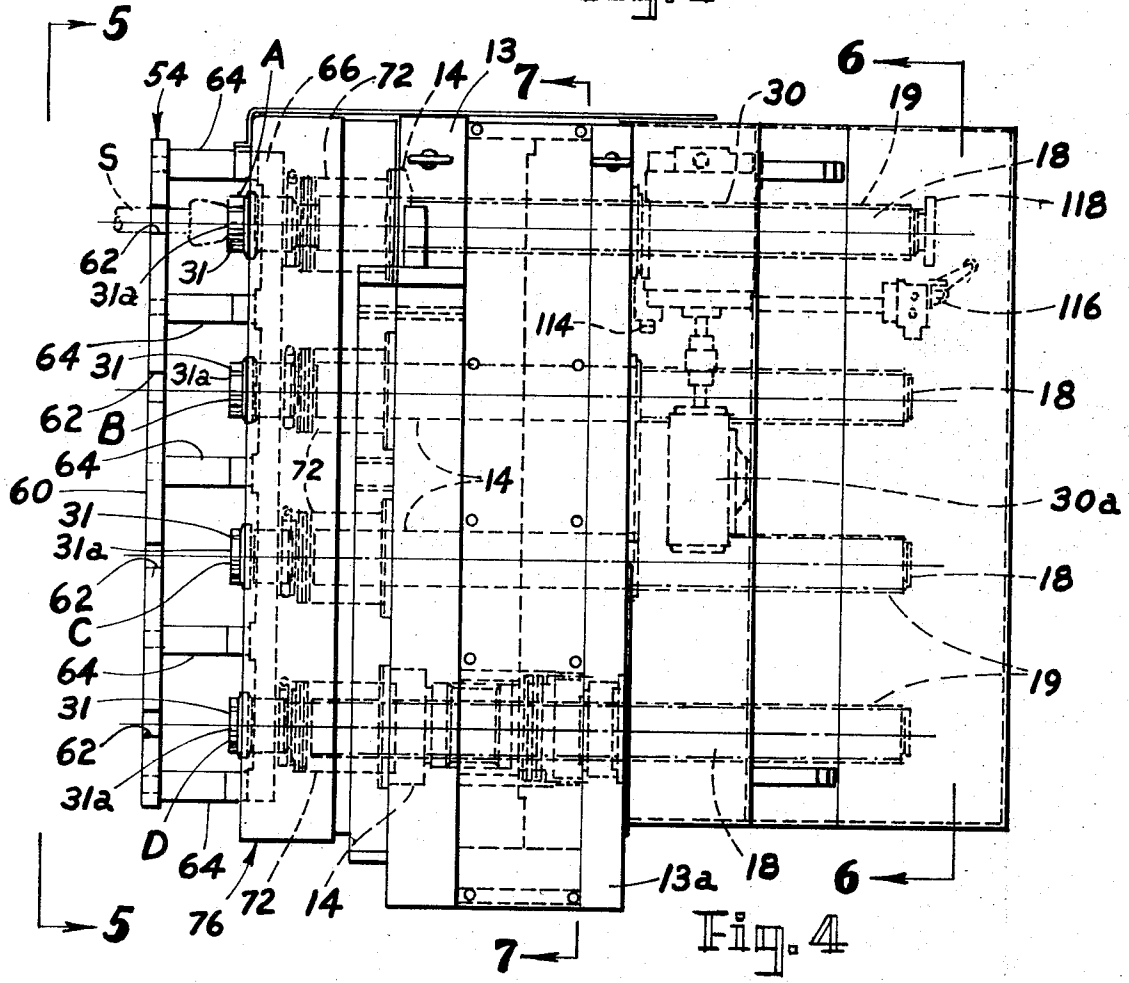
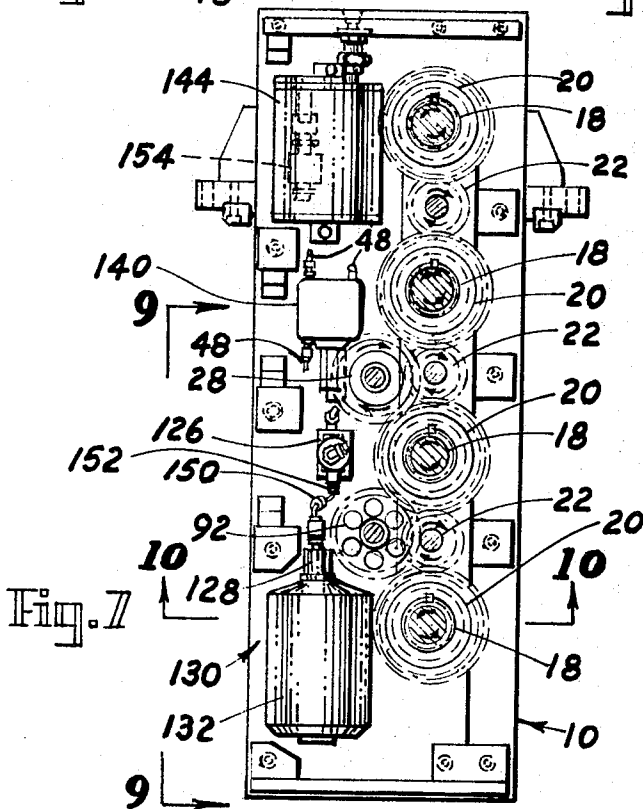
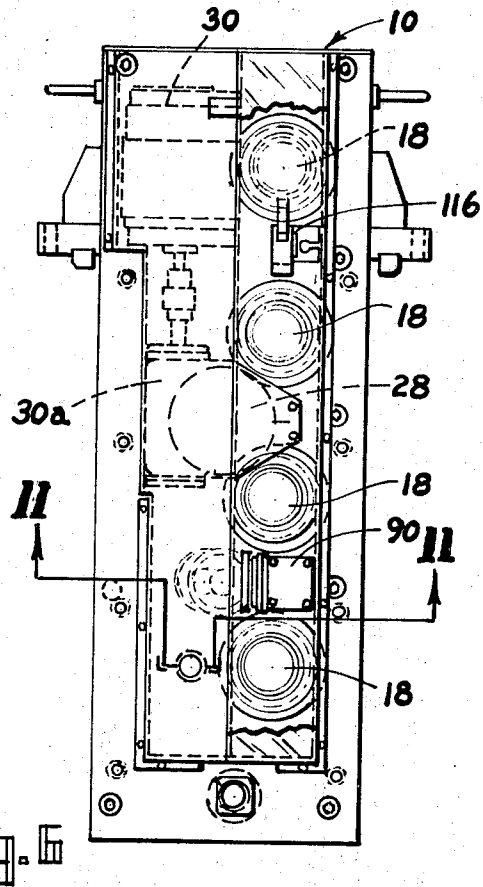
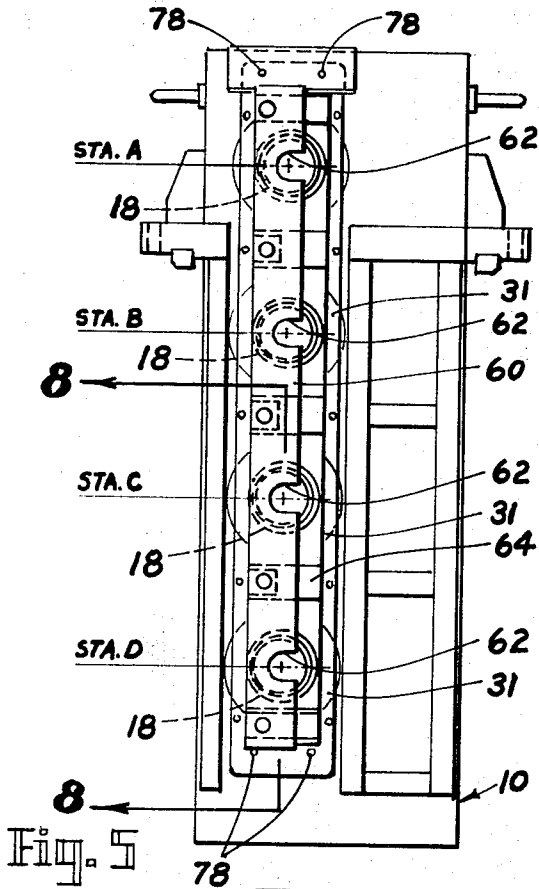


Fig. 4



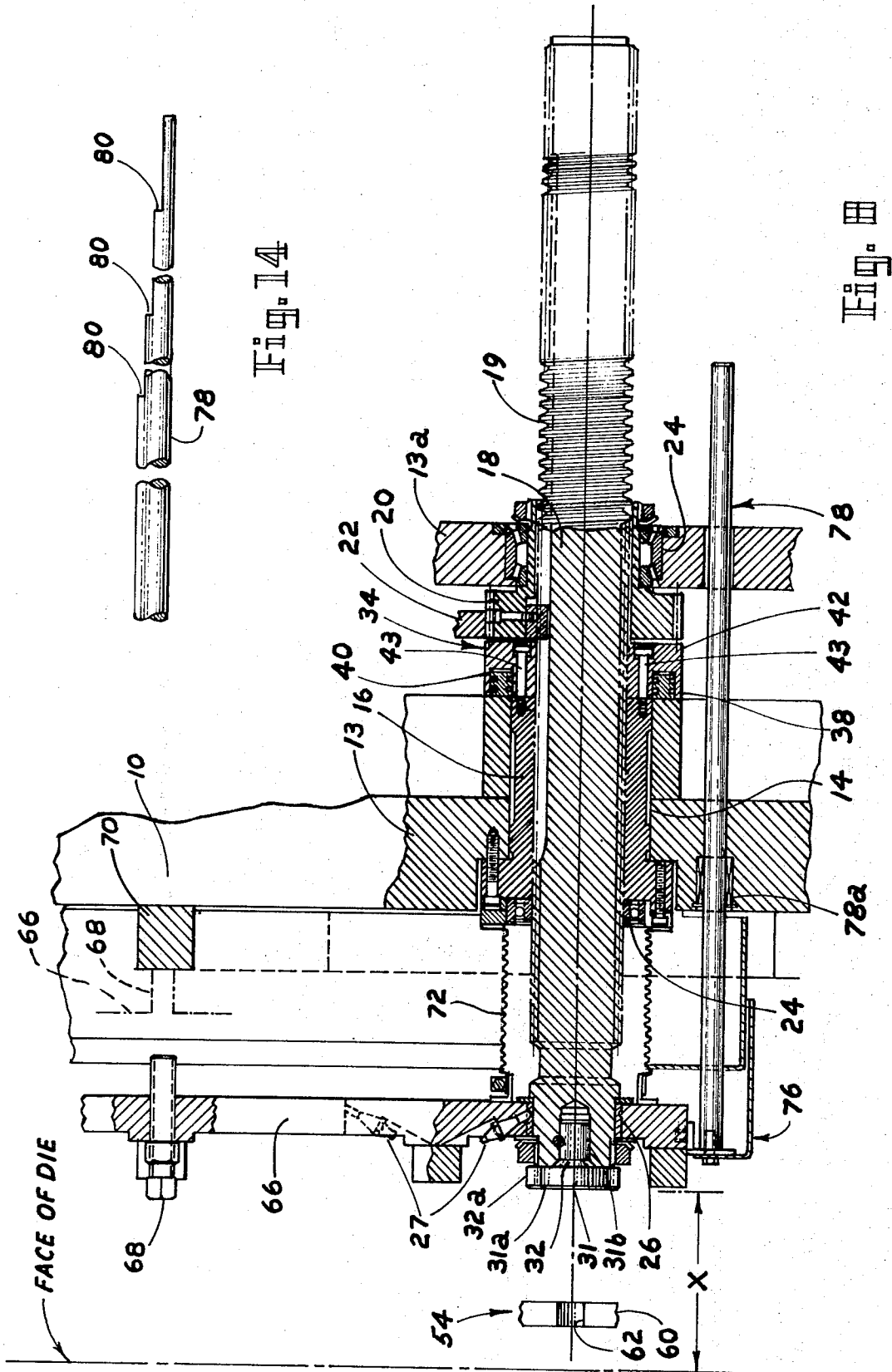


Fig. 14

Fig. 15

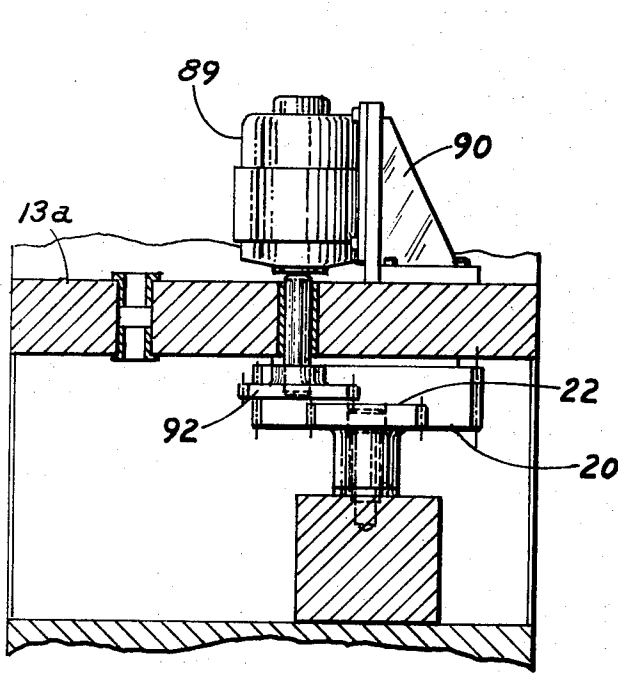


Fig. 11

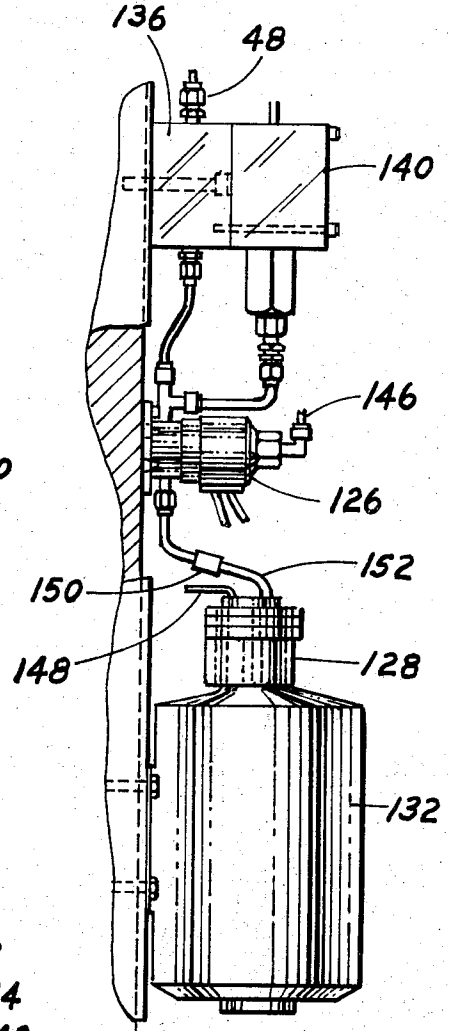


Fig. 9

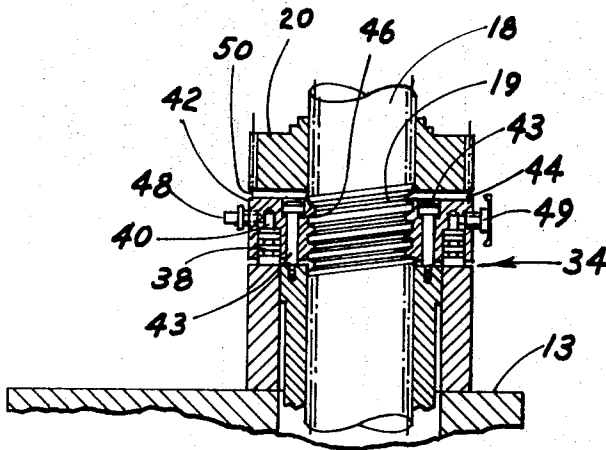
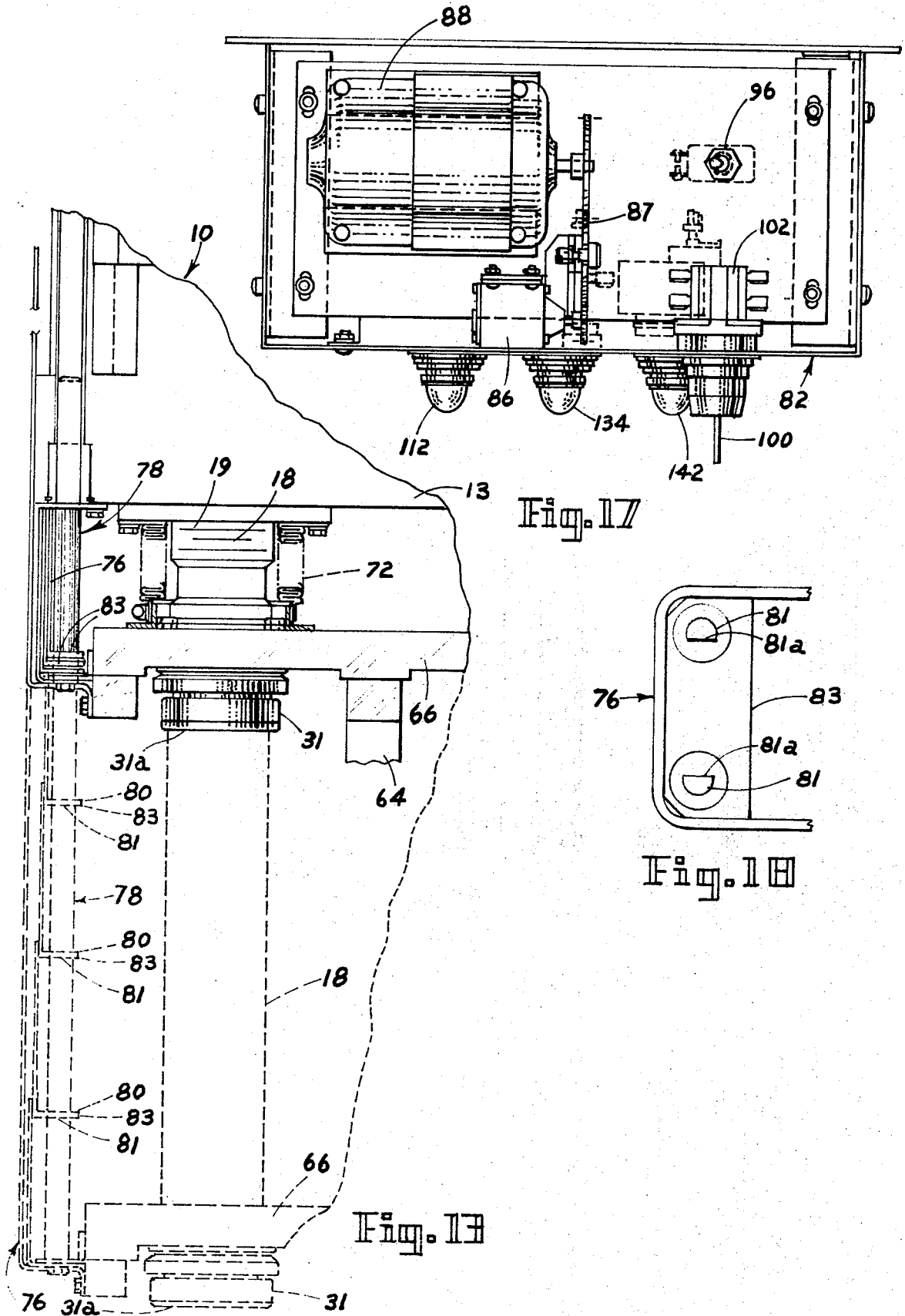


Fig. 10



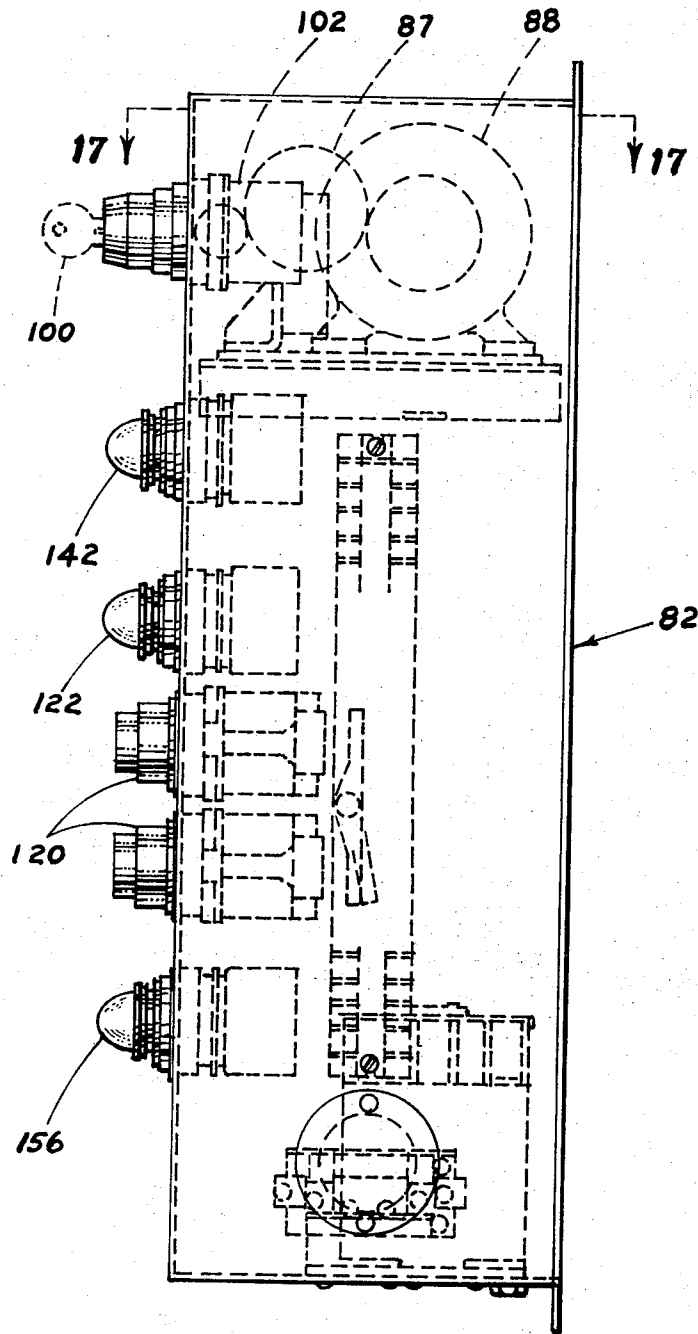


Fig. 15

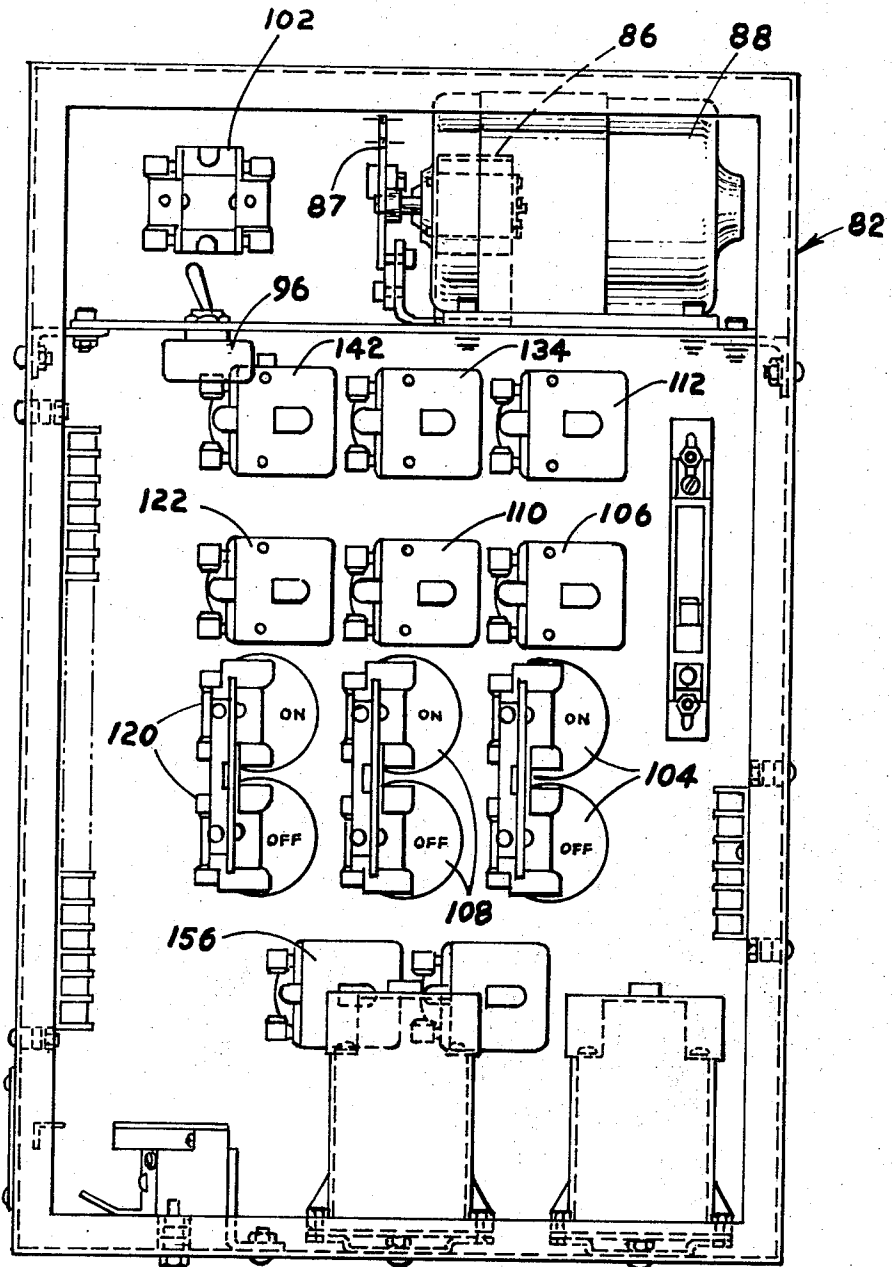
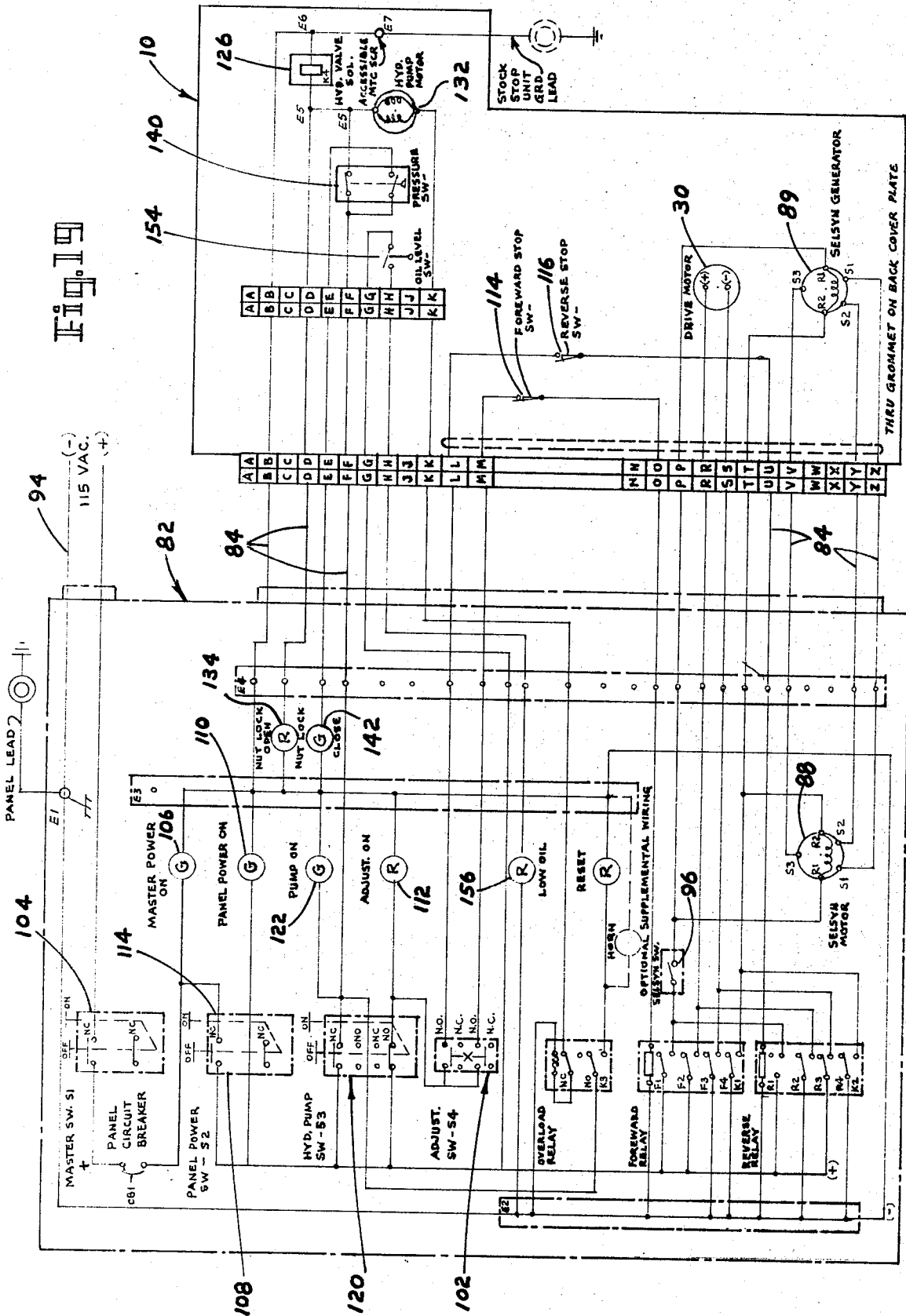


Fig. 16

FIG. 19



STOCK STOP CONTROL ASSEMBLY

This application relates to adjustable abutment means for stock utilized in a forming machine, and more particularly, a highly compact stock stop abutment assembly which can be utilized with various types of forming machines, and wherein the abutment for the stock is driven or actuated in a novel and compact manner to change its position, to thereby adjust the abutment with respect to the work area or die area of the forming machine, and wherein adjustment of the stock stop abutment is performed from a control area which is remote from the abutment per se.

BACKGROUND OF THE INVENTION

Various types of powered stock stop mechanisms or gauging mechanisms for metal forming machines are known in the prior art. However, most of these prior art devices are specially designed for one particular type of machine, and are generally not universally adaptable to various types of machines. Moreover, most of the prior art mechanisms are highly complex and bulky in structure, resulting in high costs for the mechanism. One type of apparatus for gauging work lengths in connection with cut-off tools is shown in U.S. Pat. No. 3,552,254 dated Jan. 5, 1971 and entitled Apparatus For Gauging Work Lengths. However, such mechanism is complex and is not readily adaptable for use in various types of forming machines.

SUMMARY OF THE INVENTION

The present invention provides a novel, highly compact stock stop assembly which is adaptable for use in various types of forming machines, and which can be expeditiously controlled from a remote control area for rapidly adjusting the position of the stock stop abutment with respect to the work area or die area of the machine. The assembly provides means for sensing the movement of the abutment and for visually indicating the distance of the stock stop abutment from the work area, and also provides means for locking the abutment in selected position.

Accordingly, an object of the invention is to provide a novel stock stop assembly for use in a forming machine.

Another object of the invention is to provide a novel stock stop assembly which is of highly compact nature for use in forming machines, and including control means adapted for mounting remote from the stock stop abutment of the assembly, to control the positioning movements of the stock stop abutment or abutments in the adjustment of the latter to vary the distance between the stock stop abutments and the work area or die area of the machine.

A still further object of the invention is to provide a novel compact stock stop assembly for use in a forming machine, and which can be readily utilized in various types of forming machines, and wherein the stock stops comprise a plurality of elongated spindles, with drive means coupling the spindles together for simultaneous rotation thereof about their respective lengthwise axis, and including means for moving the spindles axially relative to their support upon rotation of the spindles, to adjust the position of the stock stop spindles with respect to the work area or die of the machine.

A still further object of the invention is to provide an assembly of the latter mentioned type which includes

means for locking the stock stop spindles in selected axially adjusted position, and wherein visual means are provided on a control panel remote from the stock stop spindles, for visually indicating to an operator the distance that the stock stop spindles are located relative to the work area or die area of the machine.

Other objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view illustrating a forming machine embodying the compact stock stop assembly of the invention;

FIG. 2 is a generally diagrammatic illustration of the stock stop assembly showing the stock stop abutments mounted on a support which is adapted for insertion in a forming machine, and coupled to a control panel adapted to be disposed remote from the stock stop module, for controlling the adjustment movement of the stock stop abutments with respect to the support;

FIG. 3 is a top plan view of the stock stop abutment module of the stock stop assembly;

FIG. 4 is a side elevational view of the module of FIG. 3;

FIG. 5 is a view taken generally along the plane of line 5—5 of FIG. 4 looking in the direction of the arrows;

FIG. 6 is a view taken generally along the line 6—6 of FIG. 4;

FIG. 7 is a sectional view taken generally along the plane of line 7—7 of FIG. 4, looking in the direction of the arrows, and illustrating particularly the drive mechanism for simultaneously rotating the stock stop spindles;

FIG. 8 is an enlarged fragmentary sectional view taken generally along the plane of line 8—8 of FIG. 5 looking in the direction of the arrows and showing in detail one of the threaded stock stop spindles and associated driving mechanism for the spindle, for rotating the spindle to cause extension and retraction movements thereof during adjustment positioning of the spindle on the support;

FIG. 9 is an enlarged, diagrammatic illustration taken generally along the plane of line 9—9 of FIG. 7, and illustrating the pump, valving and pressure switch assembly which furnishes the fluid power for powering the locking mechanism of the stock stop assembly, and for controlling the application of the power to the locking mechanism for the spindles;

FIG. 10 is an enlarged fragmentary, sectional view taken generally along the plane of line 10—10 of FIG. 7, and illustrating the locking mechanism for the stock stop abutment spindles, for locking the respective spindle in selected position with respect to the support;

FIG. 11 is a fragmentary, sectional view taken generally along the plane of line 11—11 of FIG. 6, and which illustrates the selsyn generator connected to the drive system for the stock stop abutment spindles, for indicating visually the distance that the stock stops are positioned from the work area or die area of the forming machine;

FIG. 12 is a schematic illustration of the hydraulic system, including the valving and pressure switch, which is utilized for locking each stock stop spindle in selected position with respect to the support;

FIG. 13 is a fragmentary, diagrammatic, sectional illustration of the telescopic sectional housing assembly which is adapted for encompassing the forward end portions of the stock stop spindles for protecting the latter against injury, the sectional housing in full lines is shown in retracted condition, and in phantom lines is shown in fully extended condition;

FIG. 14 is an enlarged detailed illustration of one of the stepped support rods on which the housing sections of FIG. 13 are mounted, for extension and retraction movements;

FIG. 15 is a side elevational view of the remotely disposed control panel of the stock stop assembly;

FIG. 16 is a rear elevational view of the control panel of FIG. 15;

FIG. 17 is a sectional view of the control panel taken generally along the plane of line 17—17 of FIG. 15;

FIG. 18 is a fragmentary front end elevational view of a side segment of one of the housing sections of FIG. 13, illustrating the openings through which the rods of FIG. 14 are adapted to extend; and

FIG. 19 is a schematic diagrammatic illustration of the electrical control system for the stock stop assembly.

DESCRIPTION OF PREFERRED EMBODIMENTS

The stock stop assembly has been chosen to be illustrated in a forming machine of the metal upsetting type, and the compact stock stop abutment module 10 is illustrated as having been inserted into the machine at a predetermined location L with respect to the work area or die area 12 of the forming machine. In the embodiment illustrated, four stop abutment stations A, B, C and D for stock are shown on module 10, but it will be understood that there could be a greater or lesser number of stock stops without departing from the scope of the invention.

Referring now to FIG. 2, the stock stop abutment module 10 comprises, in the embodiment illustrated, a base support plate 13 which has been provided with openings 14 (FIG. 8) in which are received internally threaded nuts 16 in mounted relation on the base plate 13. A stock stop spindle 18 having a threaded exterior as at 19 (FIG. 8) extends through the respective nut 16 and coacts in threaded relation with the internal threads on the respective nut, so that upon rotation of the spindle 18 in a predetermined direction about its lengthwise axis, it moves lengthwise of the base support plate 13 for extension and retraction movements with respect thereto. Keyed to the spindle for rotation therewith is a drive gear 20. While gear 20 is rotatable with the spindle, the latter can move lengthwise relative to the gear during axial or lengthwise movement of the spindle with respect to the support. Thus the gear 20 will remain substantially stationary in its position with respect to the support but the spindle 18 will move lengthwise relative thereto during rotation of the gear and the spindle.

Disposed intermediate each drive gear 20 and coacting therewith in meshed relation is an idler gear 22 (FIG. 7). Each gear 22 is in meshing relation with the opposed drive gears 20, and therefore it will be seen that in the stock stop module illustrated, all of the spindles 18 are simultaneously rotatable in the same direction upon rotation of one of the spindles.

As can be best seen in FIG. 8, the gears 20, 22 are rotatably mounted on the support portion 13a by means

of the roller bearing mechanism 24. The front or forward end of each spindle 18 is rotatably mounted in the embodiment illustrated, in a bearing 26, with such bearing being provided with a grease fitting 27. Drivably coupled to one of the spindle gears 20 is a main drive gear 28 (FIG. 7) which is driven by means of an electric motor 30 (FIG. 4) drivably coupled to gear 28 by right angle speed reducer 30a.

The front end of each spindle 18 is provided with an abutment pad 31, preferably detachable from the respective spindle end, and which includes a front abutment surface 31a and a stem 31b received in an axial opening 32 in the respective spindle. A means, such as retainer pin 32a may be provided for retaining or locking the respective abutment pad to the respective spindle. A rod or bar S of stock is adapted to be abutted against surface 31a for locating the stock with respect to the die area of the machine, as will be hereinafter discussed in greater detail.

A locking mechanism 34 (FIGS. 8 and 10) is provided for selectively locking the respective spindle 18 in its selected position on the support. The locking mechanism illustrated is of the hydraulic type and which includes a piston portion 38 disposed in cylindrical chamber 40 in the locking housing 42. Chamber 40 encircles the associated spindle with housing 42 being movable axially of the associated spindle upon application of fluid pressure to chamber 40. As can be seen, housing 42 is limited in its axial movement by headed bolts 43 which anchor the housing 42 to the associated nut 16.

Housing 42 has internal threads 46 thereon which coact in threaded relation with the threads 19 on the respective spindle, with bolts 43 providing for limited axial movement of the housing 42 with respect to the base support plate 12. Pressure inlet line 48 is adapted to supply pressurized fluid to the chamber 40, thereby causing the housing 42 to move rearwardly, lengthwise of the spindle 18, and thus causing jamming of the threads 46 on the locking housing 42 with respect to the threads 19 on the spindle, to positively lock the spindle in place against rotation. Release of the fluid pressure from chamber 40 will relieve the jamming action of threads 46, thereby permitting selective rotation of the stock stop spindles upon energization of the drive motor 30.

As can be best seen from FIG. 10, clearance as at 50 is provided between the spindle drive gear 20 and the movable locking housing 42, so that the housing 42 can move a limited amount axially of the spindle, and thus jam the threads thereon into coaction with the threads on the spindle, to hold the spindle in selected position. Bleed valve 49 may be provided for manually bleeding pressurized fluid from chamber 40.

A stripper mechanism 54 (FIGS. 3 and 4) is provided on the stock stop module, for stripping stock from the associated die of the machine, upon adjustment movement of the stock stop spindles 18. Such stripping mechanism comprises a bar 60 having a plurality of slots 62 therein with bar 60 being disposed forwardly of the abutment heads 31 of the spindles 18. Bar 60 is connected by spaced webs 64 to collar portion 66 which as can be best seen in FIGS. 4 and 8, is attached to and mounted on the heads of the spindles for movement therewith lengthwise of the module housing.

Adjustable stop bolt 68 mounted on collar portion 66 is adapted to engage an abutment 70 affixed to the base

plate 13 (FIG. 8) for limiting the maximum inward movement of stripper mechanism 54 relative to base support plate 13. Collapsible and expansible boots 72 may be provided in encompassing relation to the forward end portion of the respective spindle 18. Boot 72 (FIGS. 4 and 8) is attached at one end thereof to the collar 66 portion of the stripper mechanism, and at the other end thereof is secured to the base plate 13. During extension and retraction movements of the spindles 18 and associated stripper mechanism 54, the boots 72, which may be formed for instance of pleated rubberized fabric, or the like, extend and retract therewith. Boots 72 prevent dirt and other contaminants from fouling the drive mechanism for extension and retraction movements of the spindles.

In order to protect the forward portions of the spindles and associated boot members 72 which project forwardly of base plate 13, a sectional telescopically arranged housing 76 is preferably provided (FIGS. 13 and 8) which is supported on four rods 78 (FIGS. 8 and 14) slidingly mounted on base plate 13 by bearings 78a (FIG. 8) for extension and retraction movements of the housing sections with lengthwise positioning movements of the spindles with respect to the forward surface of the base plate 13. As can be seen, the rods 78 at their forward ends are secured to the collar portion 66 of the stripper mechanism 54.

Thus the sectional housing 76 is adapted to move with the stripper mechanism and with the spindles during positioning movement of the spindles with respect to the base plate 13. FIG. 14 illustrates in detail the stepped arrangement, as at 80, of each of the rods 78, and FIG. 18 illustrates a side fragment of one of the housing sections, showing the openings which are adapted to receive the support rods 78, on which the housing sections are mounted, but which because of the semi-circular configuration thereof, as at 81 (FIG. 18) will prevent sliding movement of the housing section with respect to the supporting rods 78 when the respective housing opening edge, as at 81a, engages the respective step portion 80 on the supporting rod, and thus causing movement of the housing section with movement of the rod. Accordingly, extension of the telescoped housing section is accomplished during extension movements of the stop spindles, during positioning of the latter. Rearward or telescopic collapsing movements of the housing sections are provided by engagement of the vertical flange portions 83 (FIG. 18) of one housing section with the adjacent housing section, to thus cause telescopic collapsing of the sectional housing 76 during rearward positioning movement of the spindles.

Referring now particularly to FIG. 19, there is illustrated diagrammatically circuitry for the stock stop assembly, which enables control of the stock stop module from a distance remote therefrom. The workman actuated controls for controlling the assembly can be mounted on a control panel 82 (FIGS. 1, 2 and 15) which control panel as can be seen in FIG. 1 is remotely disposed with respect to the stock stop module 10 and is connected thereto by electrical conducting lines 84 (FIG. 19) disposed, in the embodiment illustrated in conduit 84a (FIG. 2).

Referring in particular to FIGS. 2, 7, 15, 16 and 17, means are provided for sensing the rotatable and thus lengthwise movement of the spindles 18 with respect to the base plate 13, and for automatically indicating to or

telling the workman the distance that the abutment surfaces 31a on the abutment pads 31 are disposed from the work or die area of the machine wherein the stock is adapted to be formed into the desired configuration.

The indicating means comprises a numerical or digital meter 86 mounted on panel 82 (FIG. 2) which is coupled by gearing, as at 87 (FIGS. 16 and 17) to a selsyn motor 88. Selsyn motor 88 is electrically coupled (FIG. 19) to selsyn generator 89 (FIGS. 11 and 19) which is mounted on bracket 90 attached to wall or plate 13a of the stock stop module 10. Generator 89 is driven by selsyn gear 92 which meshes with one of the drive gears 20 affixed to its respective rotatable stop spindle 18. Thus, it will be seen that the rotation of the spindle on which gear 20 is mounted will cause synchronized rotation of the selsyn generator 89, which drives the selsyn motor 88. Measured rotation of the selsyn motor 88 causes actuation of the meter 86 on the control panel 82, to indicate the distance between the front abutment surface 31a of each of the stock stop spindles 18 and the work forming die area of the associated machine. As can be seen in FIG. 4, the abutment surfaces 31a of the abutment pads are offset 1/16 inch with respect to the adjacent surfaces, so that there is a slightly decreasing distance between the respective pad surface and the die area of the machine, commencing with the lowermost pad in FIG. 4 to the uppermost pad. This small offset distance illustrated is for the purpose of the particular positioning arrangement shown, and has no material effect on the distances registered by meter 86 during positioning movements of the stock stop spindles 18. In the embodiment illustrated a maximum distance X (FIG. 8) is initially provided between the die face and pad surfaces 31a of station D, during initial set up of the machine.

Power to the control panel is supplied by a conventional 115 volt AC line 94 (FIG. 19). In one embodiment of the invention, the actual maximum lengthwise travel of the stock stop spindles 18 is 17 inches with readings on the meter 86 running from approximately 19 inches away from the die area, to approximately 2 inches away from the die area. A switch 96 (FIGS. 16 and 19) may be provided for disconnecting the selsyn motor 88 from the power circuit and its actuation of the meter 86 during its initial installation and also providing disconnecting for subsequent adjustment of the selsyn motor arrangement.

Actuation of the travel of the stock stop spindles 18 is obtained with the key 100 (FIGS. 2 and 15) and associated switch 102 (FIGS. 16 and 19). Turning of the key 100 left from center will energize the drive motor 30 of the module 10 to cause rotation of the stock stop spindles and thus drive the stops forward. Turning key 100 right from center position will cause rotation of the stock stop spindles 18 in the opposite direction, and thus cause the stop abutments to move inwardly or away from the die area. In the center position of the key 100 the module is off and in locked condition.

Referring now in particular to FIGS. 2, 15 and 19, in order to operate the module, the pushbutton master power switch 104 on the control panel 82 is actuated by the workman to turn on the circuitry. A green light 106 indicates that the master power switch is closed, and that the power is on. The pushbutton panel power switch 108 (FIGS. 2 and 19) is then pushed on by the workman and a green light 110 indicates that power on

the panel is on. With the panel power switch 108 on, the adjust light 112 will likewise go on as can be seen in FIG. 19. The stock stop adjust switch 102 can then be actuated by key 100 to energize motor 30 and to position the stock stop abutment spindles 18 to desired position with respect to the support plate 13, thus adjusting the position of the abutments and the position of the stock used in the machine, with respect to the die area of the machine. In this connection, forward travel of the stock stop spindles will be stopped automatically by the forward travel stop switch 114 approximately 2 inches from the die, and reverse or rearward travel of the stock stop spindles will be stopped automatically by the reverse stop switch 116 at approximately 19 inches from the die in the embodiment illustrated. Switches 114 and 116 each of which includes a pivotal actuating arm, are actuated or opened by a cam 118 (FIG. 4) mounted on the rear end of the spindle of station A.

With the stock stop abutments 31 located in the desired position, the hydraulic power switch 120 (FIG. 19) is then actuated and a green light 122 indicates that the pump power circuit is on.

Energization of the hydraulic pump circuit causes automatic energization of hydraulic solenoid valve 126 (FIGS. 7, 12 and 19) which will open, allowing the hydraulic pump 128 of the hydraulic system 130 (FIGS. 7 and 12) to build up pressure at the locking mechanism 34 for the respective spindles 18. Pump 128 may be driven by electric motor 132 which, as can be seen from FIG. 19, automatically comes on upon actuation of switch 120 to "on" condition.

When the pump power circuit is first turned on, the lock mechanism 34 will be in an open or unlocked condition, and the red light 134 (FIGS. 2 and 19) will be automatically placed in on condition. With the red light 134 on, this indicates that the pressure at the lock mechanism 34 is low, and the hydraulic solenoid valve 126 is automatically energized to open condition to allow hydraulic pump 128 to build up pressure at the locking mechanism. Pressurized fluid is fed to each lock mechanism at each of the stations A through D via manifold 136 and pressure lines 48. Lines 48 feed into chamber 40 of the respective locking mechanism 34, to jam the threads 46 against the threads 19 of the respective spindles, as aforedescribed.

When the predetermined pressure is reached, the pressure switch 140 senses this and is actuated to cause the indicator light 142 to go on while the lock light 134 is de-energized. Also pump motor 132 is de-energized and the hydraulic solenoid valve 126 is de-energized and thus will close, holding the fluid pressure in the hydraulic circuit, and locking the position of the stock stop spindles 18 with respect to their support. Accordingly, with the locking mechanism 34 at each station energized by the hydraulic fluid and in closed condition with the green indicator light 142 on, the pump 128 of the hydraulic system is not running.

As can be seen in FIGS. 7 and 12, the system is provided with a reservoir tank 144 which is coupled to solenoid valve 126 by conduit 146 and to the pump 128 by conduit 148. Flow control valve 150 may be provided in the line 152 between the pump 128 and the solenoid valve 126. The system may be provided with a low oil level switch 154 and indicator light 156 (FIG. 19) which switch detects the level of the oil in the reservoir 144 and if it is too low, shuts off the motor 132

to the pump 128 until the oil is reinstated to the desired level.

From the foregoing description and accompanying drawings, it will be seen that the invention provides a novel compact stock stop assembly for use in a forming machine, and a stock stop assembly which comprises a compact abutment module coupled to a remotely disposed control, whereby the stop abutment or abutments of the module can be expeditiously controlled and positioned to adjust the position of the stock stops with respect to the work area or die area of the machine. Means are provided for locking the stock stop abutments in selected position, and means are provided on the control panel for visually indicating the distance that the stock stop abutments are positioned from the work or die area of the machine, so that positioning of the stock stops can be accomplished by a workman in a rapid and expeditious manner.

The terms and expressions which have been used are used as terms of description and not of limitation, and there is no intention in the use of such terms and expressions of excluding any equivalents of any of the features shown or described, or portions thereof, and it is recognized that various modifications are possible within the scope of the invention claimed.

I claim:

1. In a compact stock stop control assembly for use in a stock forming machine comprising, a support, movable abutments mounted on said support and adapted for positioning stock relative to the machine, drive means coaxing with said abutments for moving the latter, control means remote from said abutments and coupled to said drive means for selectively controlling energization of said drive means, each of said abutments comprising an elongated spindle, one end of the spindle comprising a stop for the stock, said drive means including means for moving said spindle axially relative to said support, means for locking said spindle in selected axially adjusted position relative to said support, and said abutments providing a plurality of said stock stops disposed generally laterally of one another, said drive means including means coupling the spindles together for causing simultaneous rotation of said spindles about their respective lengthwise axes, and motor power means for actuating said coupling means to cause axial positioning of said spindles relative to said support.

2. An assembly in accordance with claim 1 wherein said means for moving each said spindle axially comprises screw threads on each said spindle and a respective threaded nut stationary on said support coaxing with the screw threads on each said spindle, said spindles upon rotation thereof by said drive means being caused to move axially relative to the respective nut.

3. An assembly in accordance with claim 1 wherein said one end of each of said spindles includes a pad-like member detachable from the respective spindle and providing said stop for the stock.

4. In a compact stock stop control assembly for use in a stock forming machine comprising, a support, a movable abutment mounted on said support and adapted for positioning stock relative to the machine, drive means coaxing with said abutment for moving the latter, control means remote from said abutment and coupled to said drive means for selectively controlling energization of said drive means, said abutment comprising an elongated spindle, one end of the spindle

comprising a stop for the stock, said drive means including means for moving said spindle axially relative to said support, means for locking said spindle in selected axial position relative to said support, and wherein said means for locking said spindle in selected axial position relative to said support comprises fluid pressure jamming means coacting with said spindle.

5. In a compact stock stop control assembly for use in a stock forming machine comprising, a support, a movable abutment mounted on said support and adapted for positioning stock relative to the machine, drive means coacting with said abutment for moving the latter, control means remote from said abutment and coupled to said drive means for selectively controlling energization of said drive means, said abutment comprising an elongated spindle, one end of the spindle comprising a stop for the stock, said drive means including means for moving said spindle axially relative to said support, means including fluid pressure means for locking said spindle in selected axially adjusted position relative to said support, and wherein said locking means comprises an internally threaded nut coacting in mounted relation with complementary thread-like means on said spindle, and means providing for limited axial movement of said nut upon actuation of said fluid pressure means whereby said nut is moved into jammed relation with said spindle to lock the latter in selected position relative to said support.

6. An assembly in accordance with claim 1 including means limiting the axial travel of said spindles.

7. An assembly in accordance with claim 1 wherein said support comprises a housing of multiple sections telescopically oriented for extensible and retractable movement with said spindles, said housing sections protecting said drive means during extension and retraction movements of said spindles.

8. An assembly in accordance with claim 7 including means coupled to said spindles and coacting with said

housing sections for supporting said housing sections and being operable for actuating the latter to cause extension of said housing during said extension movements of said spindles.

9. An assembly in accordance with claim 1 wherein said means coupling said spindles together comprises a gear connected to each spindle and circumscribing the latter, said gear being adapted for rotation with the respective spindle, and idler gears coacting with said spindle gears for causing simultaneous rotation of said spindles upon energization of said power means.

10. An assembly in accordance with claim 4 including means for automatically indicating visually the distance between the abutment and a predetermined work area of the machine.

11. An assembly in accordance with claim 10 wherein the last mentioned indicating means comprises a selsyn gear coacting with said drive means, and a synchro system coupled to said gear and to a counter, the latter visually indicating the distance between said stop and said work area of the machine.

12. An assembly in accordance with claim 4 wherein said jamming means comprises a hydraulic jamming mechanism.

13. An assembly in accordance with claim 1 including stripper means coupled to said abutments.

14. An assembly in accordance with claim 1 including separable abutment pads on said one end of each of said spindles, and means attaching the pad to the spindle end.

15. An assembly in accordance with claim 1 wherein said control means includes a control panel remote with respect to said abutments, and a plurality of operator actuated controls mounted on said panel for controlling the positioning of said abutments with respect to said support, and for locking said abutments in selected position.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,835,683 Dated September 17, 1974

Inventor(s) RUDOLPH A. BRADICK

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Under Item (76) the inventor's address should read:

14816 Lakewood Heights Boulevard, Lakewood, Ohio

Signed and sealed this 10th day of December 1974.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents