

Nov. 15, 1960

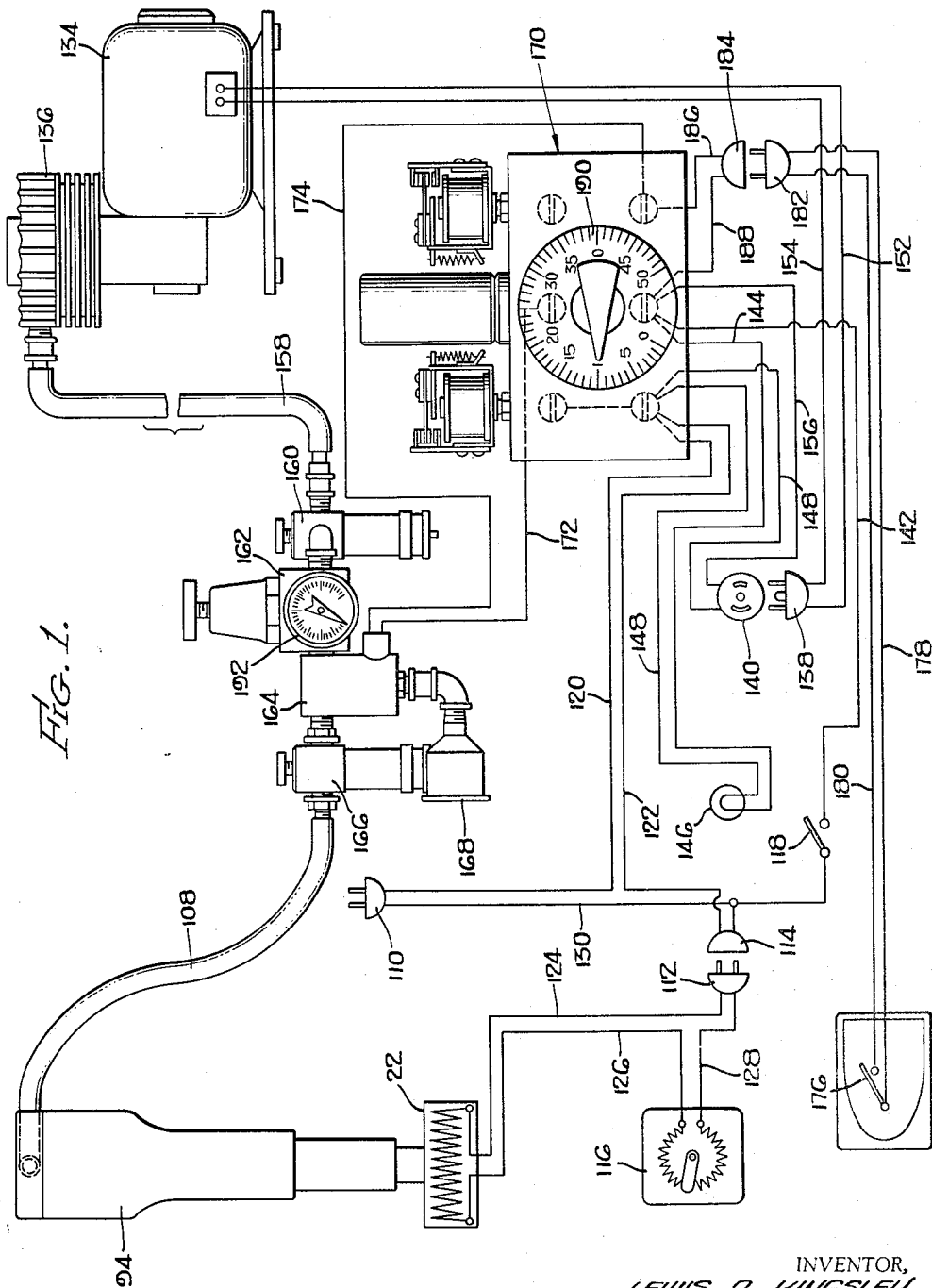
L. A. KINGSLEY

2,960,024

AIR OPERATED STAMPING MACHINE

Filed May 27, 1957

7 Sheets-Sheet 1



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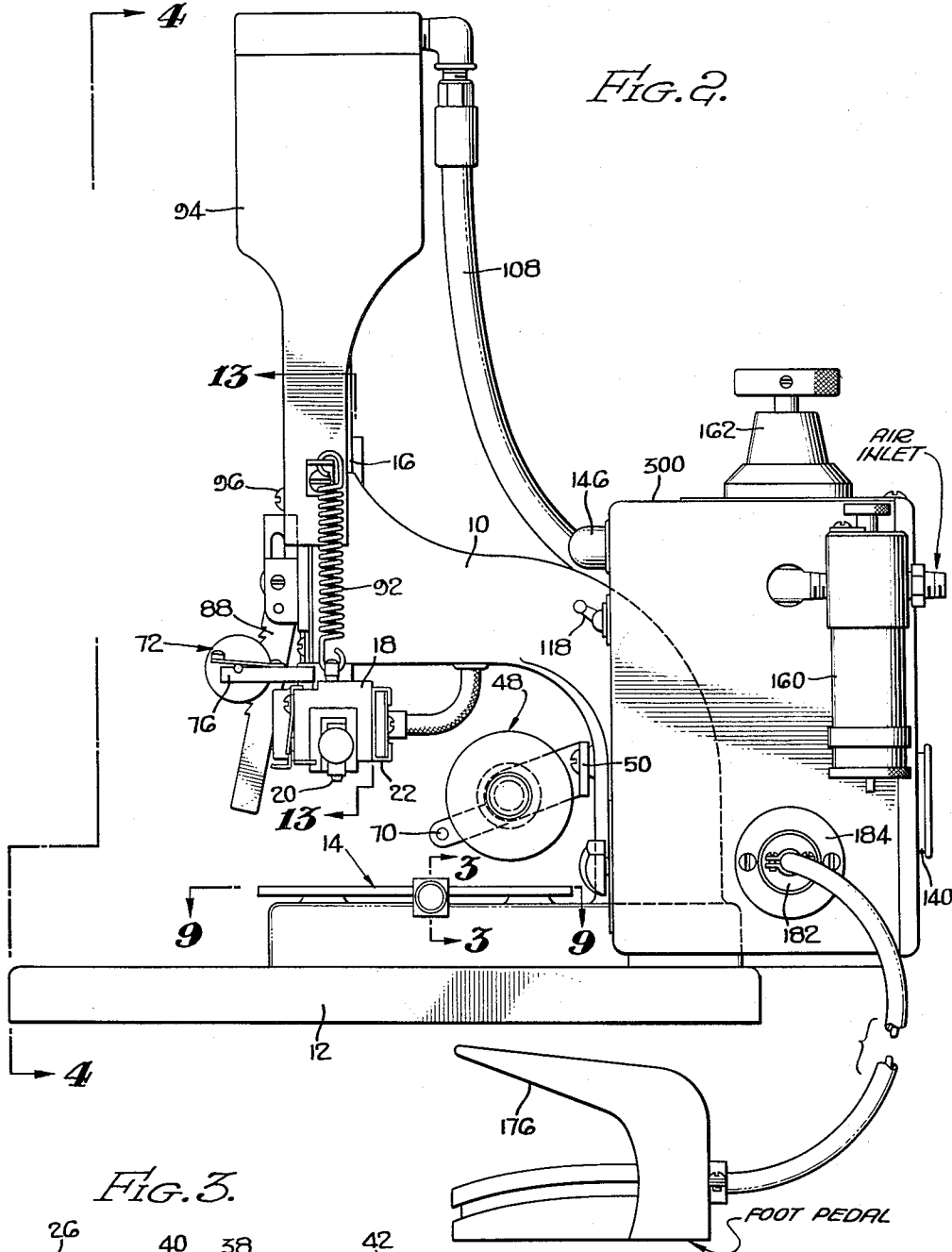
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7 Sheets-Sheet 2



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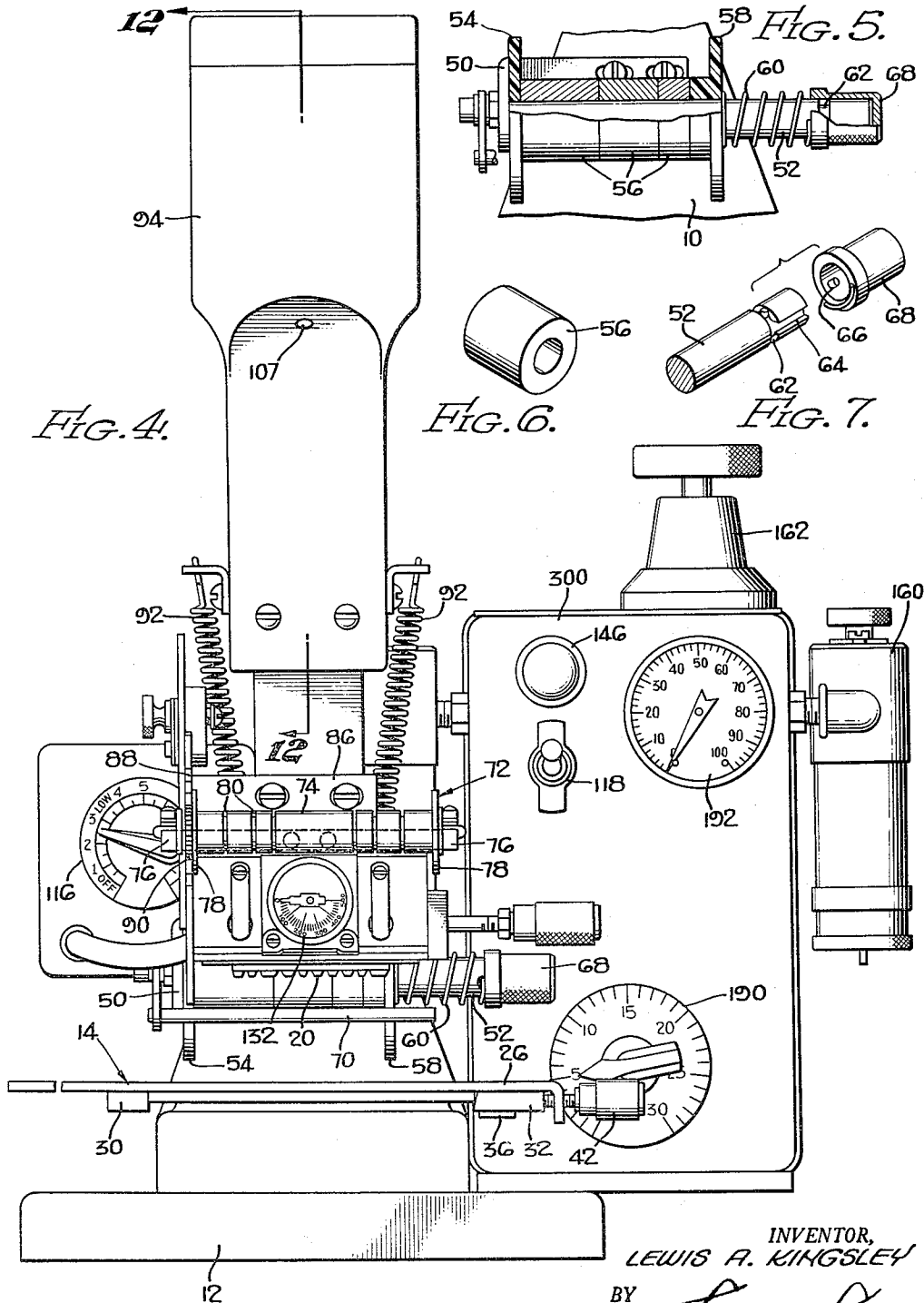
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AIR OPERATED STAMPING MACHINE

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7 Sheets-Sheet 3



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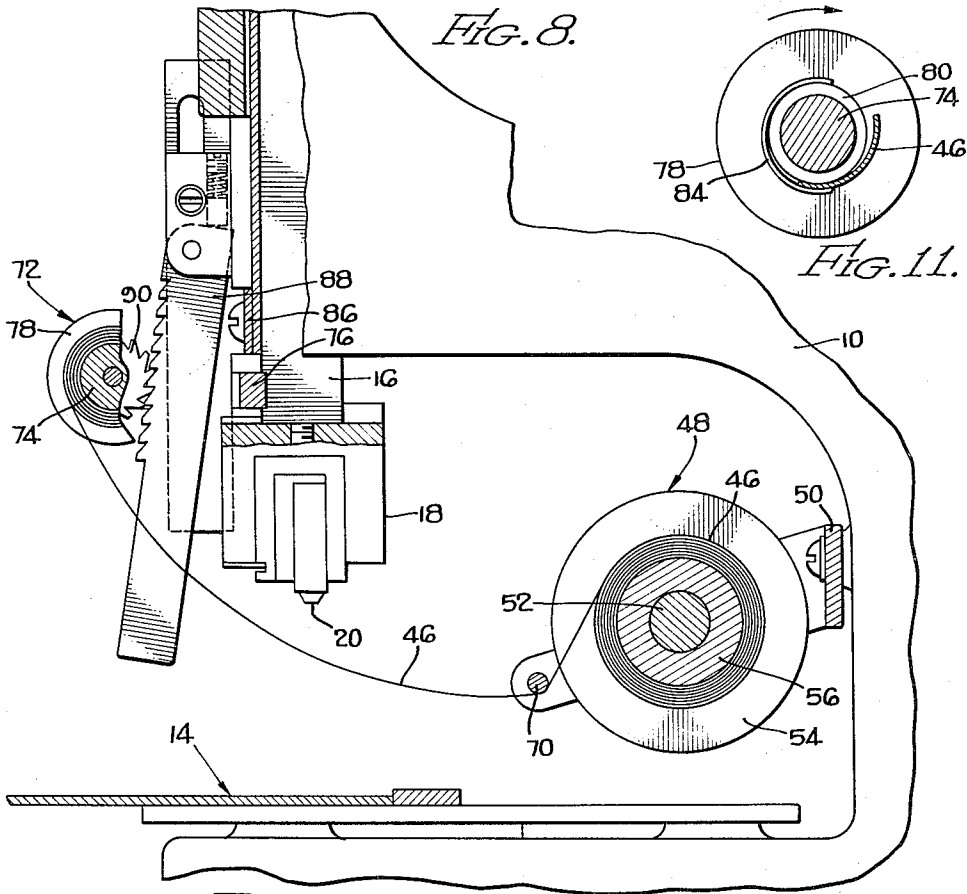
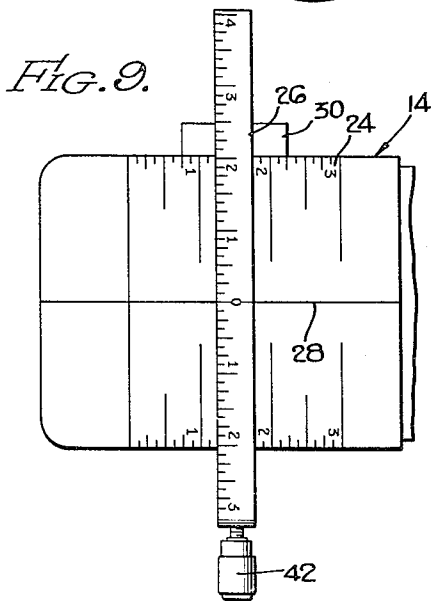
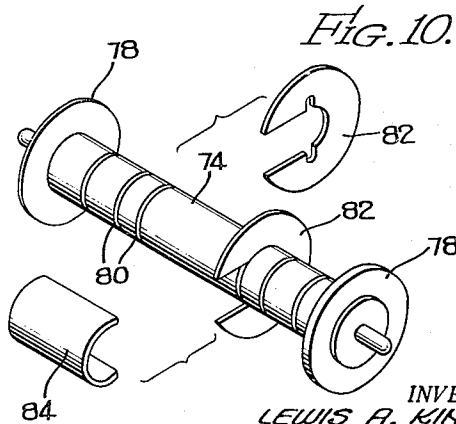
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AIR OPERATED STAMPING MACHINE

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7 Sheets-Sheet 4



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AIR OPERATED STAMPING MACHINE

Filed May 27, 1957

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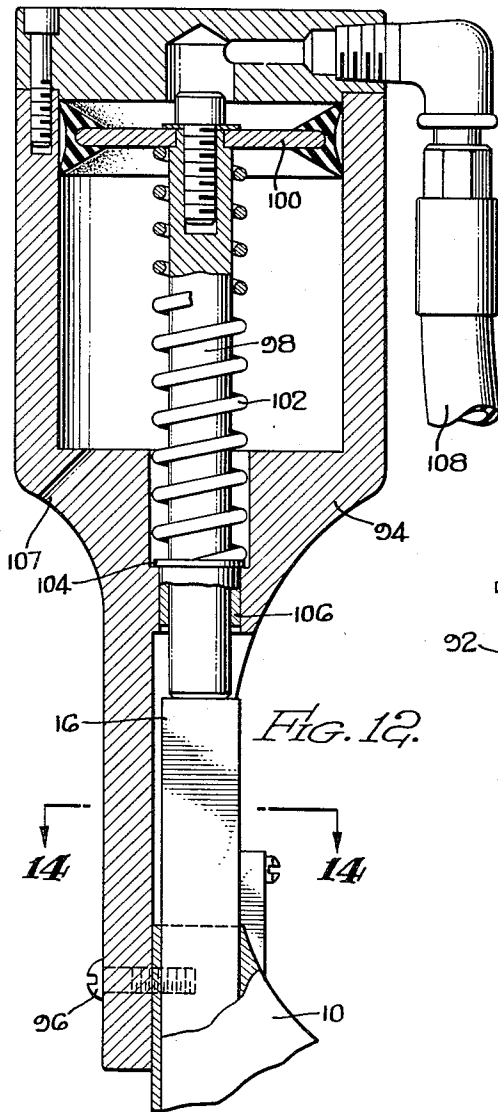


FIG. 12.

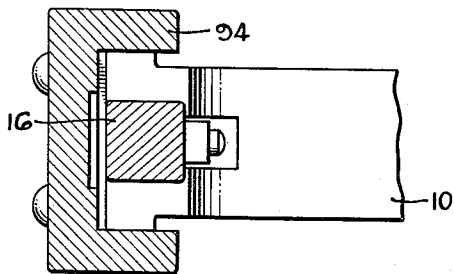


FIG. 14.

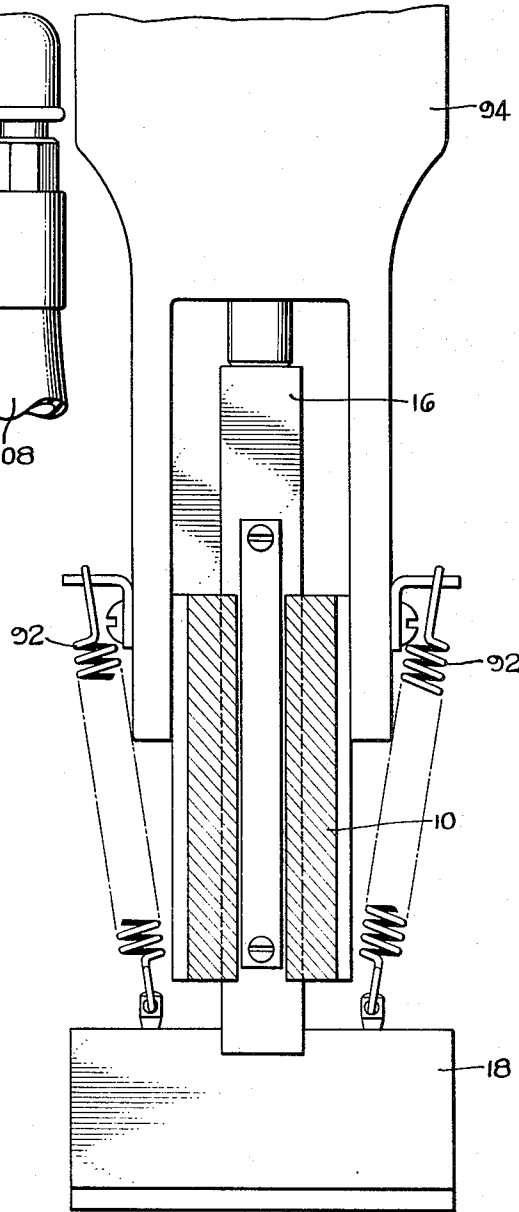


FIG. 13.

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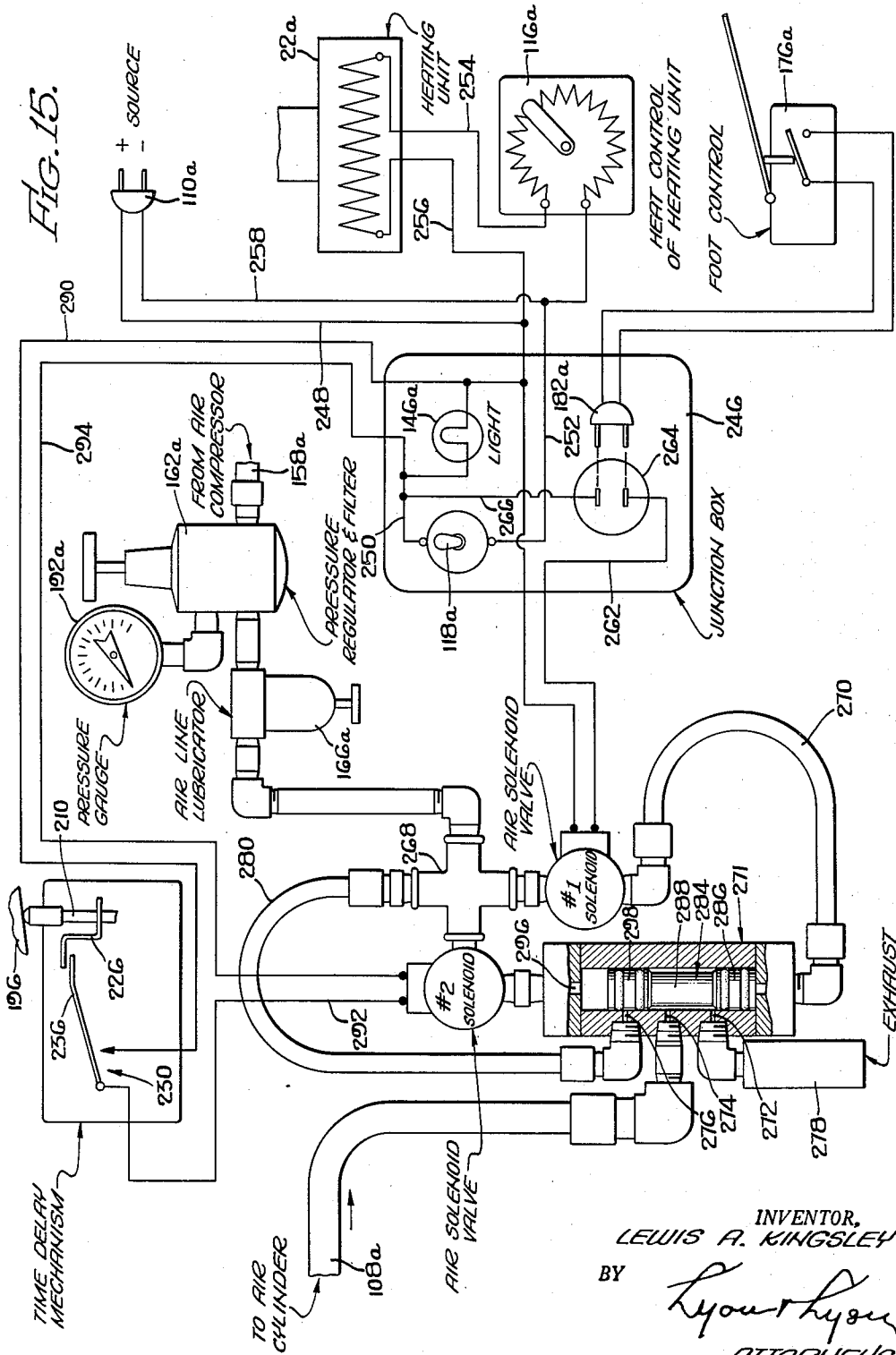
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FIG. 18.

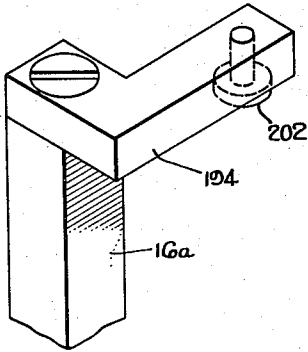


FIG. 16.

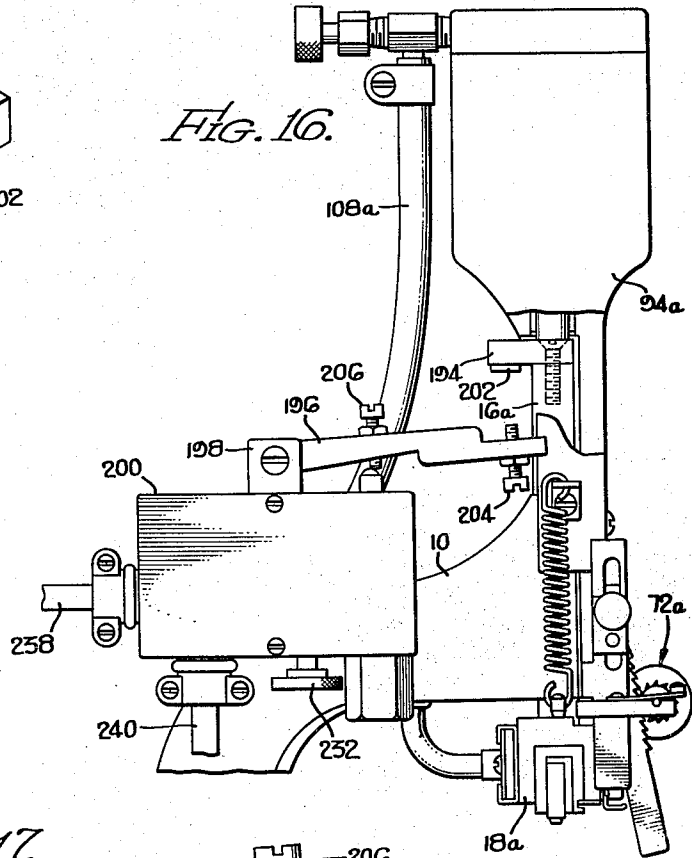
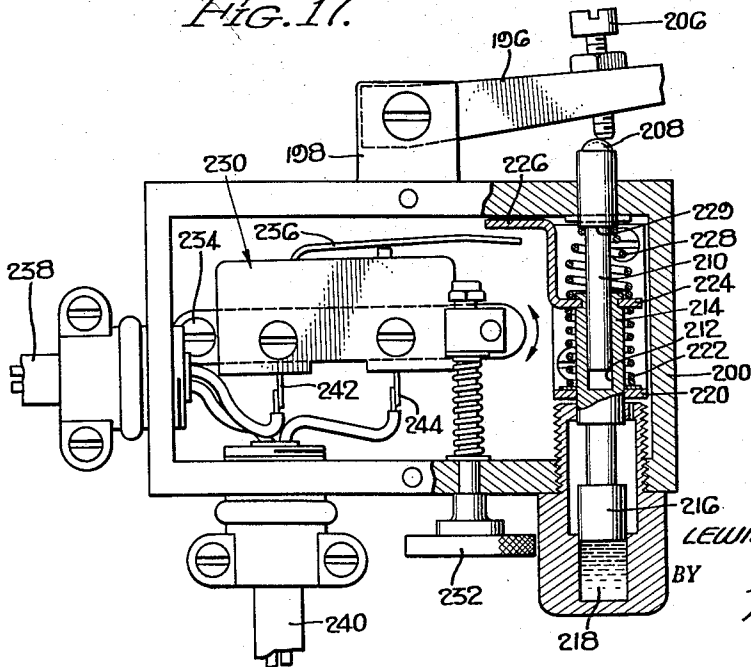


FIG. 17.



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AIR OPERATED STAMPING MACHINE

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Filed May 27, 1957, Ser. No. 661,801

2 Claims. (Cl. 101—27)

This invention relates to an air operated hot stamping machine.

It is an object of this invention to provide a stamping machine which is operated by air under pressure.

It is a further object of this invention to provide means for controlling and timing the stamping stroke of a hot stamping machine.

Other objects and advantages will be readily apparent from the following description.

In the drawings:

Figure 1 is a diagrammatic view of the control system.

Figure 2 is a side elevation of a stamping machine embodying this invention.

Figure 3 is a view taken along line 3—3 of Figure 2.

Figure 4 is a view taken along line 4—4 of Figure 3.

Figure 5 is front elevation partially in section of the foil dispensing mechanism.

Figure 6 is a perspective view of a spacing element of the foil dispensing mechanism.

Figure 7 is a perspective view of the locking of the foil dispensing mechanism.

Figure 8 is a fragmentary side elevation with parts broken away illustrating the foil feeding operation.

Figure 9 is a view taken along line 9—9 of Figure 2.

Figure 10 is a perspective view of the components of the foil take-up reel.

Figure 11 is a sectional view of the foil holder showing the foil clip.

Figure 12 is a view taken along line 12—12 of Figure 4.

Figure 13 is a view taken along line 13—13 of Figure 2.

Figure 14 is a view taken along line 14—14 of Figure 12.

Figure 15 is a schematic drawing of a modified form of this invention.

Figure 16 is a fragmentary side elevation of the modification of Figure 15.

Figure 17 is a side elevation of the time delay mechanism of Figure 16.

Figure 18 is a fragmentary perspective view of the time delay mechanism actuator.

Referring first to the embodiment of Figures 1 through 14, a stamping machine of the type described in Kingsley Patent No. 2,047,373, issued July 14, 1936 is modified to be operated by air under pressure actuated by a treadle. A gooseneck arm 10 is mounted above base 12 upon which is supported printing bed 14. The gooseneck arm 10 at its uppermost portion has a vertical guideway formed therein to reciprocally mount operating bar 16 which at its lowermost portion carries a type holder head 18 in which type 20 may be inserted in any manner such as, for example, is disclosed in Kingsley Patent No. 2,740,352, issued April 3, 1956. A heating element 22 is connected to an electrical source to heat the type in the conventional manner.

The printing bed 14 is horizontally disposed beneath reciprocating operating bar 16 and has indicia 24 on either

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side thereof as well as a centering bar 26 having indicia thereon to locate the items being stamped with reference to the type. Thus the center of bar 26 falls upon center line 28 of bed 14. The bar 26 may be moved along bed 14 to accommodate items of varying sizes. For this purpose a block 30 is rigidly fixed upon the underside of bar 26 adjacent one side of bed 14 and a movable block 32 on the underside of bar 26 adjacent the other side of bed 14. The block 32 has in its innermost face a groove 34 which receives pin 36. Also a bore 38 is formed in the block receiving spring 40 which also bears against pin 36 urging the block 32 outwardly from the side of bed 14. The extremity of bar 26 is bent downwardly forming a flange receiving set screw 42 which bears against block 32 and protrudes into a recess 44 therein to permit clamping of bar 26 on bed 14 at a predetermined position.

The stamping foil 46 is supported upon foil supporting means 48. A bracket 50 is bolted to arm 10 which supports rod 52. A disk 54 of plastic or other suitable material has a central bore and slides along rod 52 into engagement with bracket 50. A plurality of spacing elements 56 are positioned upon rod 52 freely rotatable thereon and a roll of foil 46 is mounted upon the spacing elements. The number and size of the spacing elements is governed by the width of foil being used. A second plastic disk 58 is then mounted upon rod 52. Around the extremity of rod 52 a coil spring 60 is mounted, also annular groove 62 and longitudinal groove 64 to receive lug 66 on cap 68 forming a bayonet lock with spring 60 retaining disks 54, 58 and spacers 56 together without interfering with rotation of same.

At the extremity of bracket 50 a pin 70 is provided which is parallel to the axis of rod 52 and beneath which the foil 46 is trained. The foil is then reeved over the stamping bed 14 between same and type 20 to a take-up mechanism 72.

In this embodiment the take-up mechanism utilizes a wooden shaft 74 rotatably mounted between opposed arms of bracket 76 in turn fixed upon operating bar 16.

A pair of disks 78 are fixed upon opposite extremities of shaft 74 and a plurality of annular grooves 80 are formed in the shaft between the disks. A pair of split washers 82 fit on said shaft in said grooves and are spaced apart a distance equal to the width of foil being used. A foil clip 84 is clamped upon the shaft 74 to fix the end of foil 46 thereto.

Fixed above movable bracket 76 is a stationary bracket 86 on arm 10 which supports rack 88 which meshes with pinion 90 on shaft 74 and causes shaft 74 to rotate upon reciprocation of operating bar 16. A pair of springs 92 are secured to arm 10 and type holder head 18 urging the operating bar 16 to the uppermost position. In this embodiment an air cylinder 94 is mounted upon arm 10 by bolts 96. The cylinder houses a plunger 98 having a piston 100 secured thereon and bearing against the upper extremity of operating bar 16. A spring 102 surrounds plunger 98 bearing against piston 100 and flange 104 formed on sleeve 106 through which plunger 98 passes urging the piston and hence plunger 98 to the uppermost position. An air bleed hole 107 is provided to permit a full stroke of piston 100 and return thereof without vacuum action retarding same.

Air under pressure is supplied to cylinder 94 through hose 108 above piston 100 which forces the piston down likewise lowering plunger 98 which strikes and lowers operator bar 16 lowering type 20 onto foil 46 and onto the item resting on bed 14 melting a portion of the foil and depositing same upon the item to be stamped.

In Figure 1 a diagrammatic sketch of the operating circuit is illustrated.

First plug 110 is connected to a suitable source of electrical power. A second plug 112 is inserted into

socket 114 completing a circuit including heating element 22, rheostat 116 and switch 118 by means of lines 120, 122, 124, 126, 128 and 130. When switch 118 is closed the rheostat is set at the desired temperature heating element 22 preparatory to actuating the machine, the temperature can be checked by thermometer 132 on type holder head 18.

An electric motor 134 drives air compressor 136 to supply compressed air to hose 108. The motor has a plug 138 attached thereto which is inserted in plug 140 to energize same through the motor energizing circuit. This latter circuit includes lines 130, switch 118, line 142, line 144, signal lamp 146, lines 148, line 150 and lines 152 and 154 to motor 134 and line 156. Thus switch 118 when closed also actuates motor 134.

Air from compressor 136 passes through a hose 158 and through an air filter 160 to a pressure regulator 162, and a solenoid valve 164, and an air line lubricator 166 to hose 108. Since the filter, pressure regulator, solenoid valve and air line lubricator are all standard equipment well known to those skilled in the art, a detailed description thereof is unnecessary. Any well known equipment can be utilized. To control operation of the solenoid valve which passes air to hose 108 or discharges same through exhaust 168 a timing device 170 is supplied. The preferred timing device utilized is described in United States Patent No. 2,650,301, issued August 25, 1953 although other well known timers may be utilized. The solenoid valve 164 is connected to the timer 170 by lines 172 and 174. A treadle 176 is connected by lines 178 and 180 to plug 182 which is inserted into socket 184 which is connected to timer 170 by lines 186 and 188. Dial 190 is set for the desired time interval as described in Patent No. 2,650,301. Consequently upon closing of the switch or treadle 176 the circuit to the solenoid valve 164 is completed energizing the solenoid therein to move the valve to pass the compressed air to cylinder 94 lowering operator bar 16 to the stamping position. With the treadle released, the timing device will hold the solenoid valve circuit closed the amount of time set on dial 190 before breaking same. This permits the type 20 to dwell upon foil 46 and the item being stamped sufficient time to permit transfer from the foil to the item being stamped.

Upon expiration of this time the solenoid valve control circuit is opened and the valve 164 shifts to the exhaust position, releasing the pressure in hose 108 and cylinder 94 permitting piston 100 and hence type 20 to rise, completing the stamping operation.

Air pressure in hose 158 is registered upon dial 192 and is adjusted by regulator 162 to the desired pressure.

Figures 15 through 18 illustrate a modified form of this invention wherein like parts are given the same numerical designation with the addition of the exponent *a*. This embodiment differs from the previous one in the means utilized to produce the desired dwell of the type on the foil and item being stamped.

The operating bar 16a has an L-shaped switch actuating member 194 supported upon the upper extremity thereof which reciprocates with bar 16a. On the down stroke of the actuating member 194 it strikes arm 196 which is pivotally mounted in clevis 198 on housing 200 which in turn is bolted to arm 10. A hardened steel pin 202 in actuating member 194 strikes screw 204 in arm 196. Upon descent of the operating bar 16a the point of impact is varied by adjusting screw 204.

Arm 196 also carries a second adjustable screw 206 which bears against the rounded tip 208 of plunger 210 which projects through housing 200 and has the lower extremity thereof reciprocating in bore 212 in sleeve 214. The sleeve at its lower extremity carries a piston 216 which fits into a well 218 filled with a suitable fluid. Mounted within housing 200 is a bracket 220 having a bore permitting reciprocation of sleeve 214 therethrough and providing a stationary base for spring 222. Spring

222 also bears against washer 224 fixed upon sleeve 214 and carrying switch arm 226. Thus spring 222 biases sleeve 214 upwardly. A second spring 228 surrounds plunger 210 and bears against washer 224 and shoulder 229. Thus, when the bar 16a is lowered, the pin 202 on the actuating member 194 strikes the screw 204, depressing the arm 196, and the screw 206 strikes plunger 210, depressing same, permitting the plunger to move further into bore 212. This movement compresses spring 228 to a point where it overcomes spring 222 and the resistance offered by piston 216 in dashpot or well 218, permitting sleeve 214, and hence switch arm 226, to lower. By adjustment of the strength of springs 222 and 228, a considerable time delay is interposed between the downward movement of operating bar 16a and switch arm 226.

Mounted within housing 200 is a switch 230 which has one extremity supported upon screw 232 and the other extremity pivotally supported by screw 234. The switch contact arm 236 is positioned in the downward path of switch arm 226 so that contact of the arms closes switch 230. By adjustment of screw 232, arm 236 may be pivoted with respect to arm 226 to alter the point of contact of the two with respect to the downward movement of the operating bar 16a.

A pair of cords 238 and 240 lead to housing 200 and to the contacts 242 and 244 of the switch 230.

Referring now to the schematic of Figure 15, the plug 110a is connected to a suitable electrical source and treadle 176 is plugged in by plug 182a to a junction box 246.

When switch 118a is closed, the heating element 22a is energized through the circuit, including line 248, light 146a, line 250, switch 118a, line 252, control unit 116a, line 254, heating element 22a, line 256 and line 258. When the treadle is depressed, a circuit is completed which includes number 1 solenoid, lines 248, 260, 262, socket 264, line 266, switch 118a, lines 252 and 258. When solenoid number 1 is energized, compressed air from hose 158a passed through pressure regulator 162a and lubricator 166a to cross 268 to line 270 and hence the underside of control valve 271. The valve 271 has three ports, 272, 274 and 276 on one side thereof. Port 272 is connected by hose 278 to the atmosphere while port 274 receives hose 108a connected to the air cylinder 94a. Port 276 is connected by line 280 to a branch of cross 268 and hence always is in communication with compressed air.

When solenoid valve number 1 is actuated by depressing treadle 176a it permits compressed air to flow to the lower end of the valve 271 through line 270 and hence through port 282 moving piston 284 upwardly so that the lower enlarged extremity 286 thereof blocks off exhaust port 272 and the reduced central section 288 of piston 284 permits flow from port 276 to port 274 supplying compressed air to the cylinder 94a.

The time delay switch 230 when closed completes a circuit to energize solenoid number 2. This circuit includes line 290, switch 230, line 292, solenoid valve number 2, line 294, switch 118a, and lines 252 and 258. When solenoid number 2 is actuated, it opens a valve and permits air to flow through the cross 268 to inlet port 296. In the meantime treadle 176a has been released, shutting solenoid valve number 1, discharging compressed air from port 282 to the atmosphere. Flow through port 296 forces the piston to the down position of Figure 15, head 298 blocks port 276, and the air cylinder is exhausted to the atmosphere through ports 274 and 272.

When operating bar 16a starts its upward stroke upon exhausting of cylinder 94a, spring 222 returns the time delay mechanism to the position seen in Figure 17 breaking the circuit to solenoid valve number 2 which then vents the air from port 296 to atmosphere in preparation for the next operation of the machine.

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An electrical central switch box 300 is removably mounted upon base 12 and houses the control switch 118, lamp 146, dial 190, pressure regulator 162, dial 192, air filter 160 and air lubricator 166 in the first described embodiment and the equivalent parts in the second described embodiment. This permits the entire air control apparatus to be mounted as a unit where desired by a single air line 108. This permits complete replacement with minimum loss of operating time and also by multiple lines 108 to operate multiple stamping machines simultaneously.

While what hereinbefore has been described is the preferred embodiment of this invention it is readily apparent that alterations and modifications can be resorted to without departing from the scope of this invention and such alterations and modifications are intended to be included within the scope of the appended claims.

I claim:

1. In a stamping machine, the combination of: a printing bed; a type bar; a support including a guide, said bar being mounted in said guide for reciprocation toward and away from said bed; type carried by said bar on the extremity thereof adjacent said bed for printing on work supported on said bed; drive means for said bar comprising a readily disconnectible fluid pressure operable motor mounted on said support adjacent the other extremity of said bar, said motor including a cylinder, a piston movable within said cylinder responsive to fluid supplied thereto; means projecting from said piston in axial alignment with said bar and loosely abutting the other extremity of said bar for actuating said bar to move the type carrying extremity of said bar in a direction toward said bed in response to fluid pressure operation of said piston; and spring means urging said bar to move in an opposite direction and to maintain said bar in contact with said actuating means.

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2. A stamping machine, comprising: a base; a printing bed and a support mounted on said base, said support including a guide; a type bar mounted in said guide for reciprocation toward and away from said bed; type carried by said bar at the extremity thereof adjacent said bed for printing on work supported on said bed; drive means for said bar comprising a readily disconnectible fluid pressure operable motor mounted on said support adjacent the other extremity of said bar, said motor including a cylinder, a piston movable within said cylinder responsive to pressure fluid supplied thereto; means projecting from said piston in axial alignment with said bar and loosely abutting the other extremity of said bar for actuating said bar to move the type-carrying extremity of said bar in a direction toward said bed in response to the fluid pressure operation of said piston; spring means urging said bar to move in an opposite direction and to maintain said bar in contact with said actuating means; a supply line connected between a fluid pressure source and the cylinder, said supply line including a variable pressure regulator, and a regulable timing means for continuing the feeding of fluid under pressure to maintain the type on the bar in contact with the work on the bed for predetermined intervals; a housing enclosing said regulator and timing means; and means mounting said housing on said base adjacent the printing bed.

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