Dec. 19, 1939. F. G. LOUGEE ET AL 2,183,720

INKING MECHANISM FOR PRINTING MACHINES

Filed Aug. 25, 1937 4 Sheets-Sheet 1

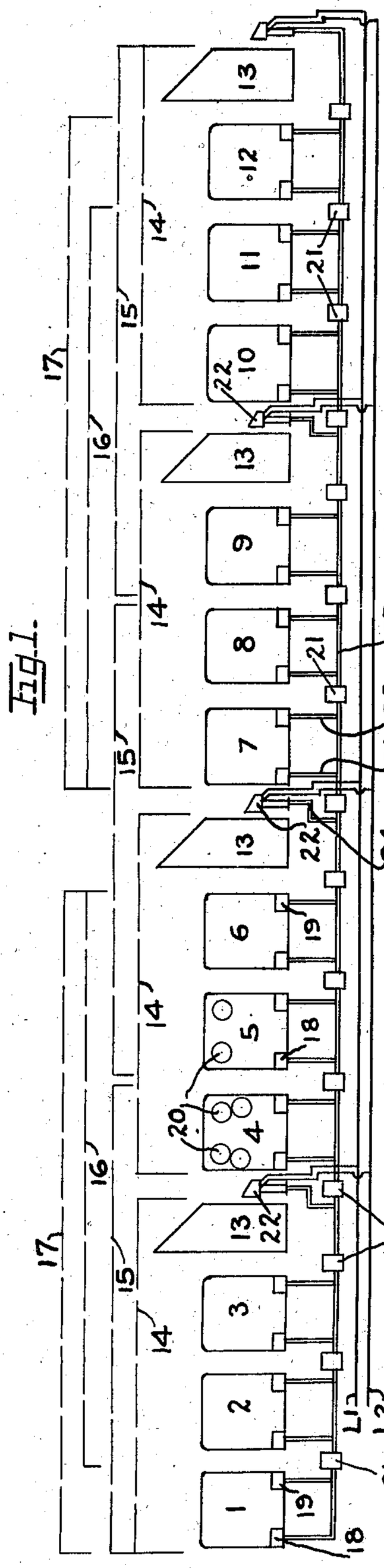

Fig. 1.

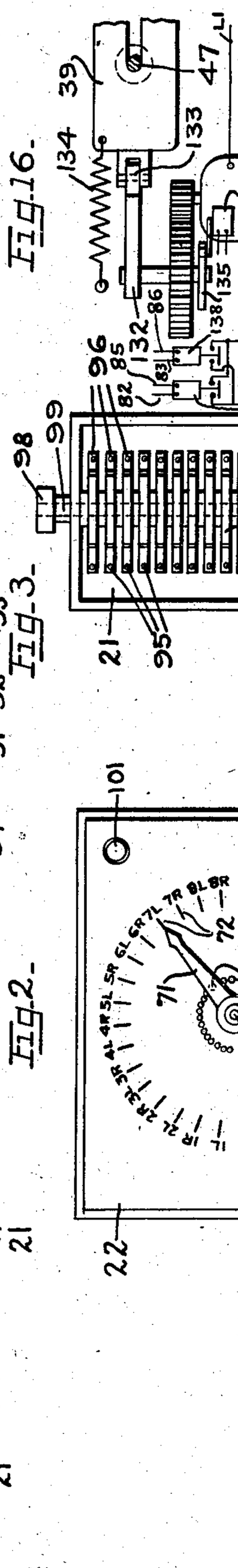

Fig. 16.

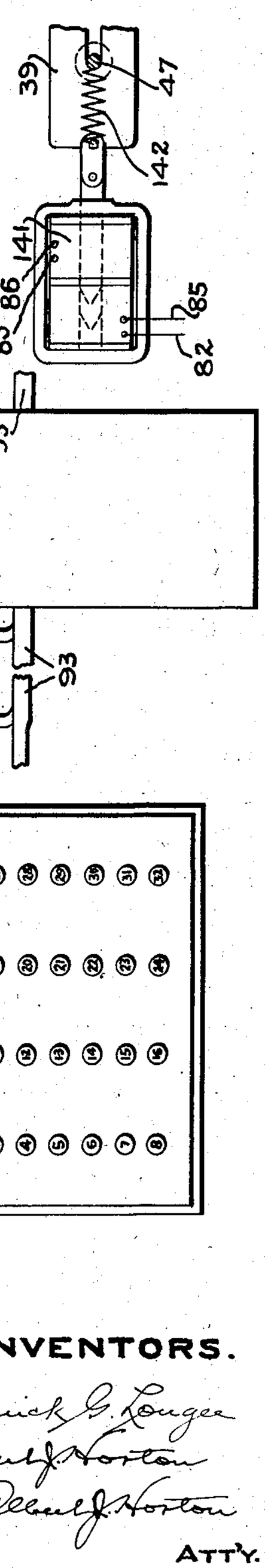

Fig. 17.

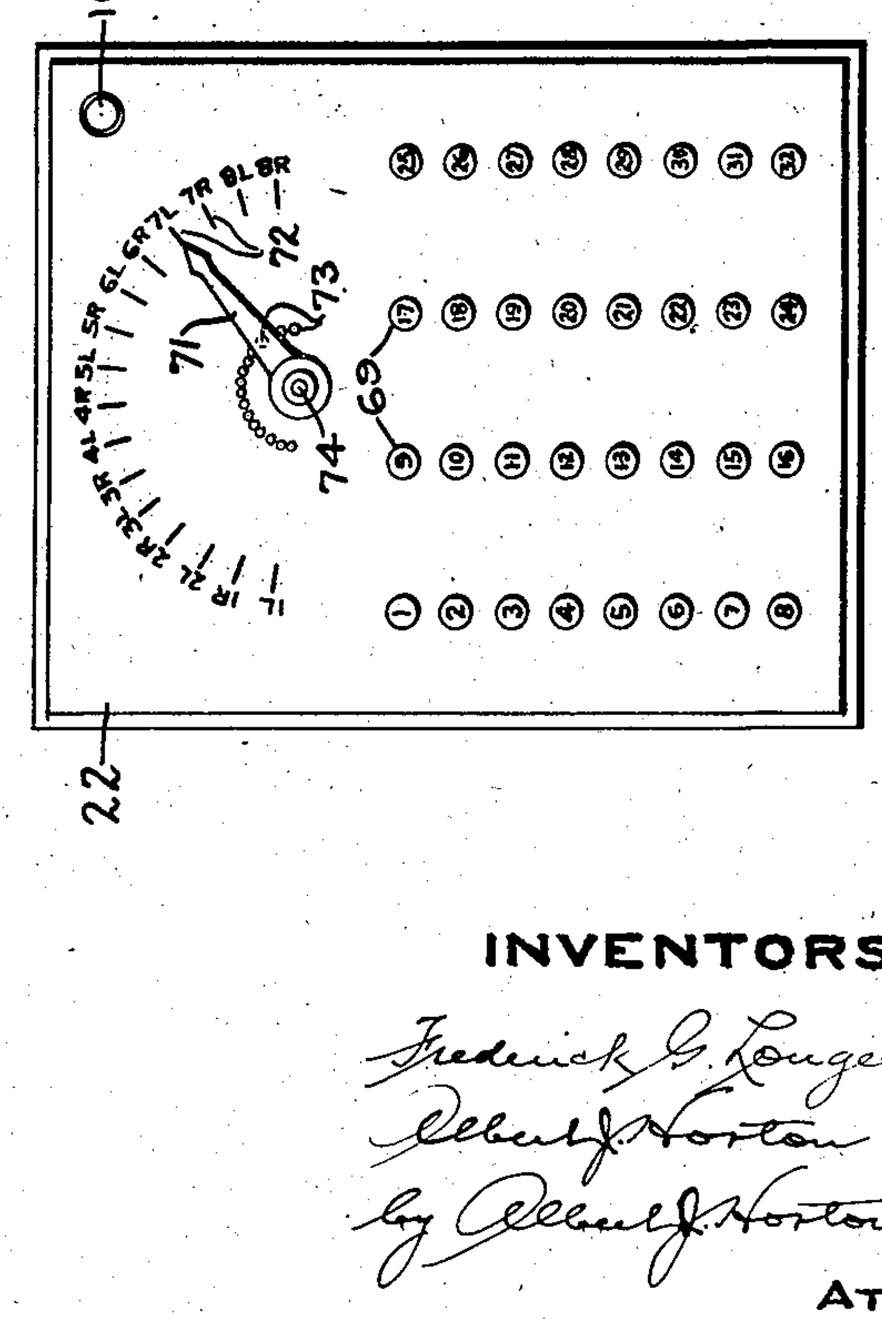

Fig. 3.

Fig. 2.

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INKING MECHANISM FOR PRINTING MACHINES

Filed Aug. 25, 1937 4 Sheets-Sheet 2

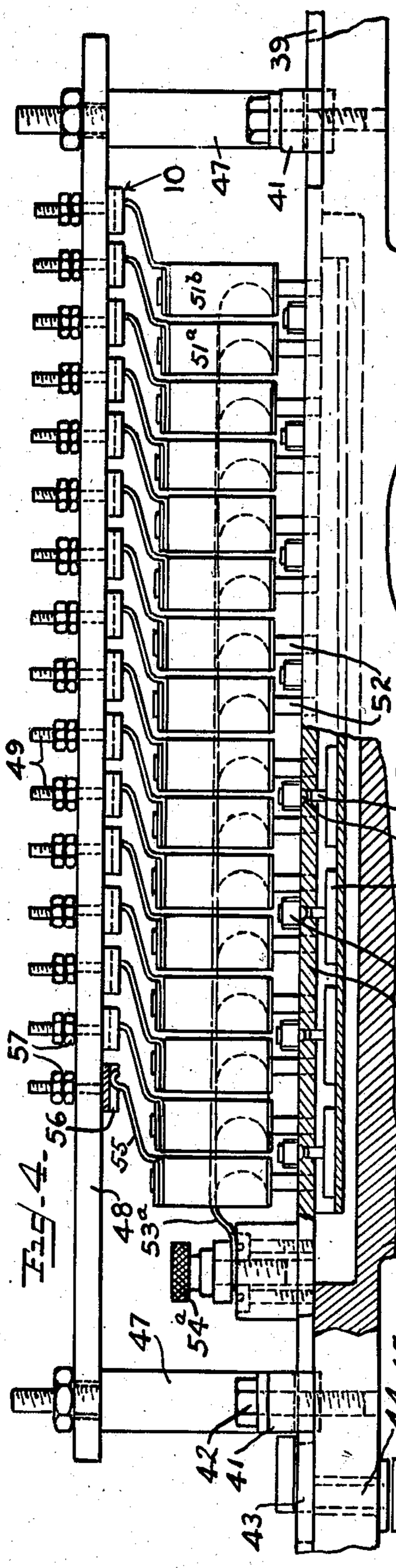

Fig-4-

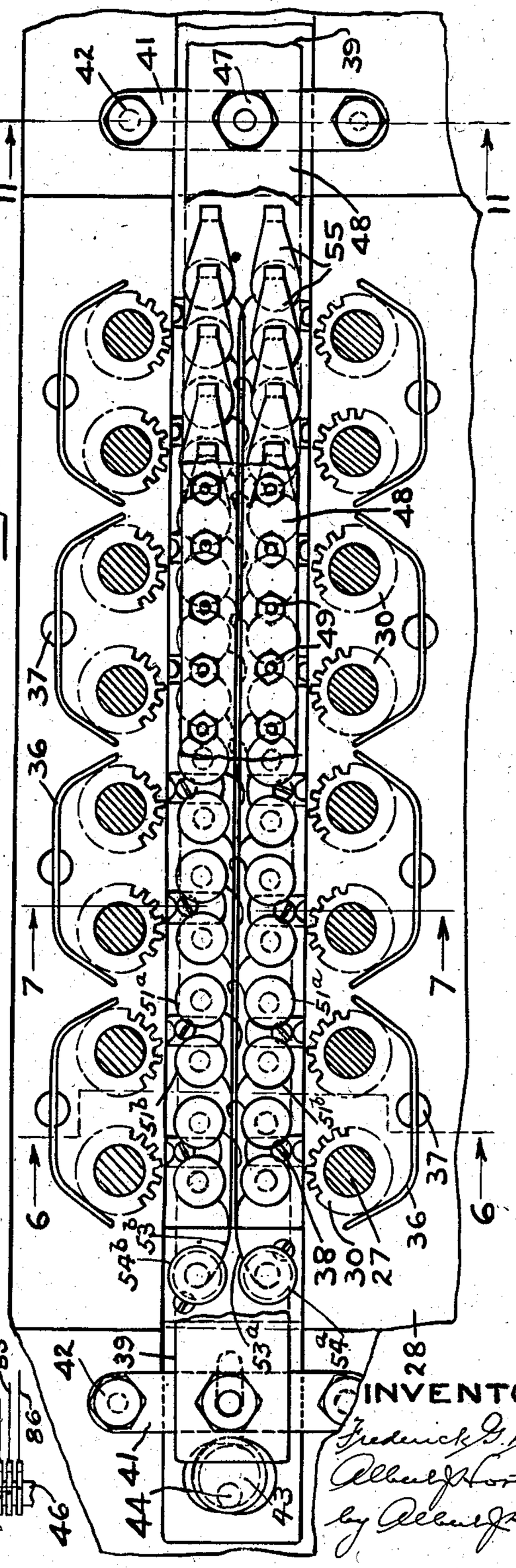

Fig-5.

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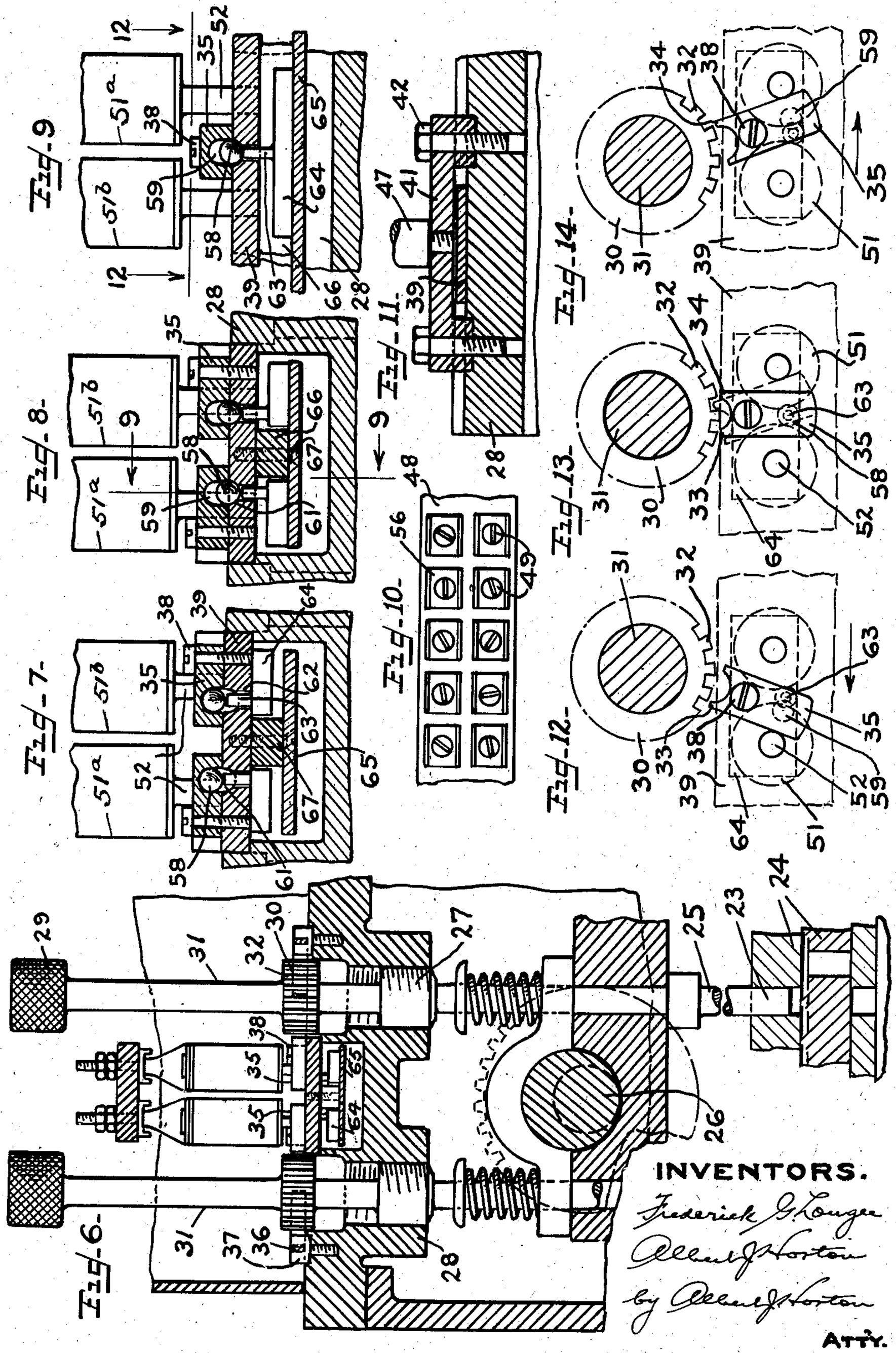
INKING MECHANISM FOR PRINTING MACHINES

Filed Aug. 25, 1937 4 Sheets-Sheet 3



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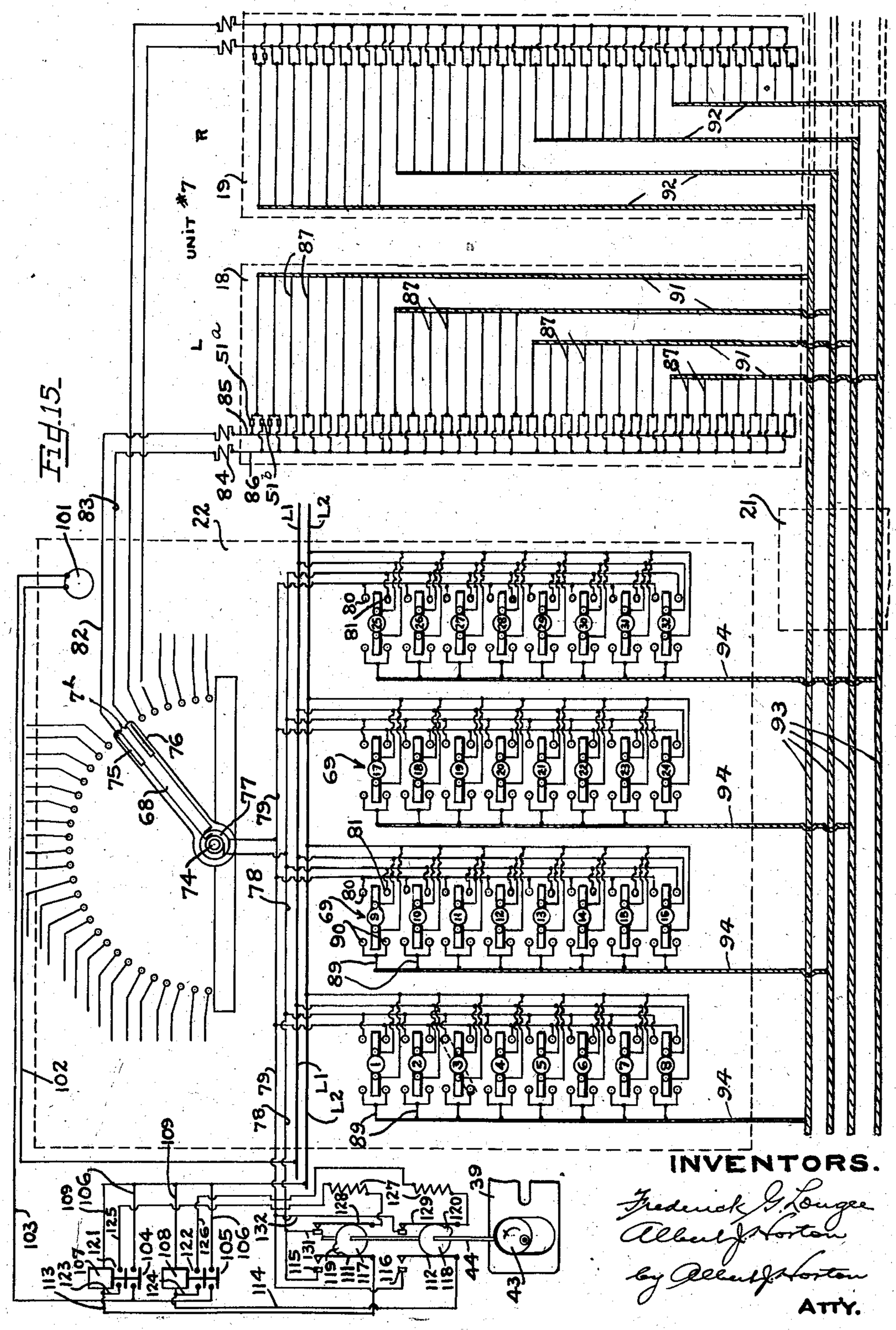
INKING MECHANISM FOR PRINTING MACHINES

Filed Aug. 25, 1937 4 Sheets-Sheet 4

Fig. 15



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Patented Dec. 19, 1939 2,183,720

UNITED STATES PATENT OFFICE

2,183,720

INKING MECHANISM FOR PRINTING MACHINES

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Application August 25, 1937, Serial No. 160,792

25 Claims. (Cl. 270—5)

This invention relates to ink supply mechanisms for printing machines having a plurality of printing units and more particularly to an adjusting mechanism for such an ink supply mechanism which is especially adapted to be controlled by means located remotely from the printing units.

The features and principles of this invention are particularly adapted for use with an ink supply mechanism wherein provision is made to increase or decrease the amount of ink supplied to any section of a printing cylinder, whereby uniformly inked impressions may be maintained upon the web.

One of the objects of this invention is to provide an improved adjusting mechanism for an ink supply mechanism adapted to be remotely controlled.

Another object is to provide for such an adjusting mechanism an improved remote controlling means.

Other objects include, the provision in an ink supply mechanism in which separately adjustable ink flow controlling members are provided, means to adjust these members from a position remote from the ink supply mechanism, means whereby the members of a plurality of such ink supply mechanisms may be adjusted from a common position remote from all of the printing units, and means whereby any set of members may be operably disconnected from any one of the remotely positioned controls.

It is also an object of this invention to provide an ink supply mechanism of generally improved construction, whereby the device will be simple, durable and inexpensive in construction as well as convenient, practical, serviceable and efficient in its use.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts, and in the details of construction hereinafter described and claimed.

A preferred embodiment of the invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a schematic side view of a printing machine having a plurality of printing units to which the features and principles of this invention are particularly and usefully applicable;

Figure 2 is a top plan view of a control device which is adapted to be positioned remote from the ink supply mechanism, for instance adjacent a folder of such a printing machine;

Figure 3 is a broken away view of a disconnecting device by means of which any one of a plurality of ink supply mechanism adjusting devices may be disconnected from a control device;

Figure 4 is a side view partly in vertical section, of an improved form of adjusting mechanism for an ink supply mechanism;

Figure 5 is a top plan view of the mechanism shown in Figure 4, certain parts being broken away to more clearly expose others;

Figure 6 is a vertical cross section taken on line 6—6 of Figure 5 through part of an ink supply mechanism of a particular design and showing the application of the improved adjusting mechanism of this invention thereto;

Figures 7 and 8 are cross sectional views taken on line 7—7 of Figure 5 and showing different positions of certain parts during the operation of the mechanism;

Figure 9 is a sectional view taken on line 9—9 of Figure 8;

Figure 10 is a partial underneath view looking in the direction of arrow 10 of Figure 4;

Figure 11 is a sectional view taken on line 11—11 of Figure 5;

Figures 12, 13 and 14 are partial sectional views taken on line 12—12 of Figure 9;

Figure 15 is an electrical control circuit diagram for the adjusting mechanisms for the ink supply mechanism of one printing unit of the machine;

Figure 16 is a top plan view of a somewhat modified form of reciprocating device for a part of the ink supply mechanism; and

Figure 17 is a top plan view of still another form of reciprocating device.

The printing machine illustrated in Figure 1, selected to show the application of this invention thereto, comprises a plurality of printing units 1–12 inclusive arranged in groups of three, as indicated by the brackets 14, with a folder 13 for each group. Such a machine, arranged in four groups of units, is adapted to print and fold four complete products. Occasionally, the product requires more units than three and provision is made to regroup the units in groups of four units with a folder, as indicated by the brackets 15, also in groups of five units and a folder, as shown by brackets 16, or in groups of six units and a folder, as indicated by brackets 17.

Each unit of each of such groups is usually provided with a first and a second printing mechanism, including printing members or cylinders 20 that they may be arranged as shown in right and left hand relation and each requiring an ink supply mechanism 18 and 19 respectively, and

this invention is particularly adapted for adjusting these ink supply mechanisms to insure uniform printing of the respective printing mechanisms supplied with ink therefrom.

The mechanism of this invention is also adapted to facilitate the change over of the groups from one number of units to another by means of disconnecting devices 21 and to efficiently control the adjustments in the ink supply mechanisms from a control box 22 positioned adjacent each folder 13.

Inasmuch as the ink supply mechanisms 18 and 19, the disconnecting switches 21, and the control boxes 22 are identical in form and are similarly operable, only the mechanism, devices and parts associated with one printing unit, for instance the unit numbered 7, will be described.

In printing machines of the type illustrated in Figure 1, each side of each unit may be provided with the required printing cylinders to print thirty-two columns of printed matter upon one side of a web of paper, which then has printed upon its other side thirty-two other columns by other printing cylinders. The webs from the various units of each group are then associated, cut and folded to form a product such as a newspaper.

Each ink supply mechanism 18 and 19 is provided with an ink pump 23 (Figure 6) and an associated valve mechanism 24 for each column of printed matter required, and these may be arranged in four side by side rows, of eight in each row. Only two rows of eight or one pair of rows constituting a total of sixteen pumps and associated mechanism is shown in Figures 4 and 5. Each of the ink pumps 23 is provided with a piston rod 25 (see Figure 6) which is reciprocated by a suitably driven eccentric 26.

The stroke of each of the pump pistons is arranged to be controlled and adjusted by an adjusting screw 27 threaded into a plate 28 and directly overlying the upper end of each of the rods 25. The stroke of the piston rod is limited as desired by adjustment of the screws 27. Each of these screws is provided with a knurled head 29 at its upper end, whereby it may be manually adjusted. A detailed description of the structure and operation of the ink pumps 23 will be found in the specification of Patent Number 1,348,900 issued August 10, 1920, to Louis A. Schmidt.

In order to adapt each of the screws 27 for adjustment from a position remote from the ink supply mechanism, for instance at the folder 13 of each group of units, a pinion 30 is secured to, or formed integral with, the upwardly extending shank 31 of the screw 27 (see Figures 5, 6, 12, 13 and 14).

The pinions 30 are herein shown as each being disposed in a counterbore formed in the upper surface of the plate 28, which bore is of sufficient depth to permit the required vertical adjustment of the screw 27 without the respective pinion 30 engaging the plate 28. The pinions 30 are arranged to be positioned with a sufficient length of their peripheral teeth 32 above the upper surface of the plate 28 to insure the teeth 32 being engaged by one or the other of a pair of pawls 33 and 34 formed one tooth on each side of one end of a swingable armature or pawl member 35 when it is swung to move its pawl carrying end to one side or the other.

The pinions 30 are retained against accidental rotation, by each being engaged by one end of a leaf spring 36 held by a stud 37 secured to the plate 28.

The armatures 35 are each pivoted on a screw 38 to a bar 39 which is slidably mounted upon the plate 28 by brackets 41, one at each end of the bar 39, and secured to the plate 28 by screws 42. The bar 39 may be reciprocated by a rotatable eccentric 43 mounted upon one end of a stud shaft 44, the other end of which is secured to one part of a two coil magnetic clutch 45. The other part of the magnetic clutch 45 is secured to a rotatable shaft 46 which is adapted by suitable connections (not shown) to be connected preferably to a driven shaft of the machine or any other suitable source of power. The arrangement is such that when the magnetic clutch 45 is energized, the eccentric 43 will rotate causing the bar 39 to be reciprocated longitudinally.

A post 47 extending upwardly from each bracket 41 supports a terminal supporting bar 48 to which a plurality of electrical terminal posts 49 are secured and arranged in this instance, in two rows of sixteen posts each. The bar 48 may be formed of any suitable insulating material.

Two rows of sixteen each of electromagnets 51 are mounted on and carried by the bar 39 by having their cores 52 extending into suitable openings. The magnets 51 are arranged in pairs indicated respectively 51^a and 51^b, one magnet 51^a of each pair being disposed on one side of each armature 35 and another magnet 51^b being disposed on the other side, as clearly shown in Figures 4 and 5. One terminal of each of the magnets 51^a in the upper row and 51^b in the lower row, is collected into a cable 53^a which in turn is connected to an insulated binding post 54^a also mounted on and carried by the bar 39, and one terminal of each of the magnets 51^b in the upper row and 51^a in the lower row, is collected into a cable 53^b which is connected to a binding post 54^b similarly mounted. The other terminal of each of the magnets 51 is connected to a spring brush 55 carried on the upper end of each magnet and which extends upwardly therefrom and resiliently engages a plate 56 connected through the bar 48 to one of the terminal posts 49. Each post 49 is provided with the usual conductor binding nuts 57.

A locking ball 58 is disposed between each armature 35 and the bar 39 in sockets 59 and 61, formed in each (see Figures 7, 8 and 9). The socket 61 in the bar 39 is shallower than the socket 59, to limit the ball 58 dropping below the abutting surfaces of the armature and bar, but the socket 59 in the armature is of sufficient depth to permit the ball 58 to be moved above these abutting surfaces. An opening 62 extends from each socket 61 through the bar 39 and is adapted to slidingly receive a stud 63 extending upwardly from a magnet armature plate 64. The plate 64 extends on each side of the stud 63 to a position below the lower end of the cores 52 of the magnets 51, disposed on either side of each armature 35, and is normally supported on a shelf plate 65 spaced from the undersurface of the bar 39 by a spacing strip 66 and secured with it to the bar 39 by screws 67.

Energization of any magnet 51 magnetizes its respective core 52 which attracts the free end of the adjacent armature 35. At the same time, the core 52 attracts the plate 64 directly beneath it, raises this plate and by means of the stud 63, it lifts the respective ball 58 into the relatively deep socket 59 in the armature, whereupon the armature is unlocked and swings toward the core 52 of the magnet 51 which is energized. The armature 35 thus unlocked and swung assumes one or the other of the positions shown in Figure

12 or 14. The arrangement is such that whenever a magnet 51 is energized, the magnetic clutch 45 is also energized to drivingly connect the rotating shaft 46 to the stud shaft 44 whereupon the bar 39 is reciprocated by the rotating eccentric 43.

Reciprocation of the bar 39 carrying the armatures 35, causes the tooth 33 or 34 of the respective armature which has been swung, to engage a tooth on the pinion 30 and through it to rotate the adjusting screw 27 to effect an adjustment of the stroke of the associated pump 23, to either increase or decrease the amount of ink supplied thereby to its respective column on the web being printed. Deenergization of the magnet 51 releases the armature 35 from the attraction of the core 52, whereby during the next stroke of the bar 39 the armature 35 is swung into its normal inoperative position, as shown in Figure 13, by the engagement thereof with the pinion 30 which is being held by the spring 36, and the ball 58 drops into the socket 61 in the bar 39 to lock the armature 35 thereto.

Figure 12 illustrates the position of the armature 35 at the completion of one stroke of the bar 39 to the left, the tooth 33 having rotated the pinion 30 an amount equivalent to one tooth. Figure 14 illustrates the position of the parts at the completion of a stroke of the bar to the right, and a movement of one tooth of the pinion 30 by the tooth 34 of the armature 35. On the reverse stroke, the respective tooth 33 or 34 if maintained by a continued energization of the magnet 51 under urge toward the core 52 will snap by a tooth 32 and engage the next tooth on the following stroke.

In order to selectively energize a magnet 51 desired to actuate the associated armature 35 to either increase or decrease the amount of ink fed by the associated pump to a particular column of the printed matter, the control box (Figure 15) is provided with a unit selector switch 68 and a plurality of switches 69 preferably of the type wherein a centering spring tends to maintain it in a neutral position but permits the switch to be moved in either of two directions. One selector switch 68 is herein shown arranged to control eight units, and one switch 69 for each pair of electromagnets 51, of each mechanism 18 or 19. The magnets of each pair are indicated individually by the numerals 51a and 51b. The selector switch 68 is adapted to select either the right or left hand mechanism of any one of the eight units, and is shown in Figure 15 as being positioned to permit the energization of any pair of electromagnets 51 of the left hand mechanism 19 of the unit 7, as further selected by the actuation of the proper one of the switches 69, each switch 69 being actuated to energize either one of a pair of magnets to increase or to decrease the ink supply to a certain column as above described.

It will be understood that while the control box is shown with knob operated switches 68 and 69 in order to simplify the drawings, these switches may be replaced if desired by any other suitable switches, such as push button switches, or the lever type jack switches commonly used on telephone switch boards.

The top plan view of the control box 22 (see Figure 2) shows an indicator pointer 71 pointing toward an indicating mark 72, inscribed 7—L, thereby indicating that the switch 68 is in position to control the left hand ink supply mechanism of the printing unit #7. The pointer 71 or the switch 68, both of which are secured upon a common shaft 74, may be provided with a spring pressed catch 73 of suitable form to insure its proper location at each indicating mark 72. As shown in Figure 15, the shaft 74 carries a pair of contacts 75 and 76, which are connected respectively through a suitable commutator 77 to conductors 78 and 79, which in turn are respectively connected to contacts 80 and 81. The contacts 80 and 81 are adapted to be selectively contacted by the switch 69 to connect either one or the other of the conductors 78 or 79 to the main line conductor L1. The contacts 75 and 76 respectively connect with the terminals of conductors 82 and 83 which lead through the coils 84 of the magnetic clutch 45 to conductors 85 and 86 respectively. The conductors 85 and 86 are connected to terminal posts 54a and 54b.

As shown in Figure 5, the post 54a is connected by cable 53a with one terminal of each "on" magnet 51a in the upper row which magnets when actuated to increase the ink supply, and the post 54b is connected by cable 53b with one terminal of each of the "off" magnets 51b in the upper row, the actuation of which act to decrease the ink supply. The second terminal of each magnet 51a is connected to the second terminal of its mate 51b and to a conductor 87, as shown in Figure 15. Each pair of magnets thus act selectively on the same adjusting screw.

As hereinbefore shown, the connections of the lower row of magnets in Figure 5 are the reverse of those in the upper row, the "on" magnets 51a being connected to the cable 53b, while the "off" magnets 51b are connected to the cable 53a. Thus, the "on" magnets in both rows, are those that would have even numbers when counting from the left end, and the "off" magnets are those that would have odd numbers.

In Figure 15, the conductors 87 of each ink supply mechanism 18 and 19 are shown grouped in several cables 91 which are connected to four trunk cables 93 that extend lengthwise of the printing machine. There is one conductor in the trunk cable for each of the conductors 87 that are included in the cables in an inking mechanism 18, and thus as there are thirty-two conductors 87 shown leading from the inking mechanism 18, they will each be connected to one of thirty-two conductors in the trunk cables 93. The thirty-two conductors 87 leading from the inking mechanism 19 are also connected to the conductors in the trunk cable 93 and in the same relative arrangement. Thus, the ink pumps for corresponding columns of each ink supply mechanism may all be controlled through the same conductor of the trunk cables 93.

In Figure 15, four cables 91 are shown leading from each of the ink supply mechanisms 18 and 19 and joining the trunk cables. Similarly, four cables 94 are shown, one leading to each group of switches 69 of the control box 22, but in Figure 1, the trunk cable is shown as a single cable with single branch cables leading to each inking mechanism 18 and 19, and a single branch to each control box 22.

Conductors 89, as shown in Figure 15, are connected to contacts 90 of each switch 69 which connect them to the main line conductor L2 when the switch 69 is turned in either direction. Conductors 89 are grouped in the cable 94 and the individual conductors are each connected to one of the conductors in the trunk cable 93, the connections being such that each of the switches 69 controls the similarly located individual pumps

of the several ink supply mechanisms. It will be seen that turning the switch 69 to complete the circuit to either contact 80 or 81, will energize the desired magnet 51a or 51b and cause an adjustment of the stroke of the piston rod 25 of the desired pump 23.

The trunk cable 93 is made up of short sections, each of which extends between adjacent disconnecting switches 21. One of these disconnecting switches is located between each two adjacent printing units, and also one is between each folder and printing unit that are adjacent. As shown in Figure 3, the conductors of the cable that lead to the left hand side of the disconnecting switch are connected to contacts 95 and those that lead to the right hand side of disconnecting switch are connected to contacts 96. The disconnecting switches may be of a well known drum type having insulated bars 97 secured to a shaft 99 that may be rotated by a handle 98, the arrangement being such that with the shaft in one position, a connection is made through the switch, from each contact 95 to a corresponding contact 96, but with the handle in another position, all circuits from contacts 95 to contacts 96 are broken.

It will be understood that by turning the disconnecting switch to the open circuit position, all portions of the trunk cable to the left of the switch are disconnected from all portions of the cable to the right of the switch, and that by a proper manipulation of these switches, that the units of a press arranged as herein shown can be variously grouped to include desired numbers of units and a folder, and with the inking mechanism controlled by the control box located at the folder in use. Thus, if the disconnecting switch 21 located to the left of printing unit #4 is opened, the inking mechanism for printing units 1, 2 and 3 will be controlled by the control box 22 located at the folder adjacent printing unit #3. If, however, the disconnecting switch between units 4 and 5 is opened instead, the same control box will control the inking mechanisms of units 1, 2, 3 and 4. From the above, it is obvious that by opening only certain disconnecting switches that the inking mechanism control for various groupings of units may be obtained.

An indicating device 101 is shown mounted on the top of the control box 21 (Figures 2 and 15), which is preferably an electric lamp that is arranged to light up substantially at the start of each operative stroke of the bar 39 and remain lighted until the stroke is completed. The lamp 101 has one of its terminals connected by a conductor 102 to the main line conductor L1 and has the other of its terminals connected by a conductor 103 to one terminal of each of a pair of normally open solenoid switches 104 and 105. The other terminals of the switches 104 and 105 are connected to the main line conductor L2 by a conductor 106. The solenoids 107 and 108, when energized, actuate the switches 104 and 105 respectively, to close the circuit and light the lamp.

Energization of the solenoids 107 and 108 is accomplished as follows. Each solenoid has one of its terminals connected to the main line conductor L2 by a conductor 109 and its other terminal connected to one terminal of each of a pair of cam controlled switches 111 and 112 by conductors 113 and 114 respectively. The other terminals 115 and 116 of the switches 111 and 112 respectively are connected to the conductors 78 and 79 respectively, whereby the terminals 115 and 116 are connected to the main line conductor L1 from the respective contact 80 or 81 contacted by the switch 69, and the respective solenoid will be energized when the respective switch 111 or 112 is closed by its actuating cam 117 or 118.

As shown in Figure 15, the cams 117 and 118 are mounted upon the shaft 44 of the eccentric disc 43, and each is provided with a switch operating camming lug 119 and 120 respectively. The lugs 119 and 120 are adapted to engage the operating arm of the respective switch 111 or 112 to close the circuit controlled thereby. Upon release of the spring opened switch 69 by which the respective solenoid was initially energized, the solenoid remains energized through a maintaining circuit. The solenoids 107 and 108 actuate switches 121 and 122 respectively, one terminal of each of which is connected to the solenoid by a conductor 123 and 124 respectively. The other terminal of each switch 121 and 122 is connected through a conductor 125 and 126 respectively, and resistances 127 to one terminal of each of the normally closed switches 128 and 129 respectively. The other terminal of each of the switches 128 and 129 is connected by conductors 131 and 132 respectively to the conductors 78 and 79. Hence, when the solenoid is once energized, it will remain so until the respective switch 121 or 122 is opened.

The switches 121 and 122 are disposed in proper position in respect to the cams 117 and 118 respectively to be opened by the camming lug 119 or 120 thereof. The location of the camming lugs 119 and 120 peripherally upon the cams 117 and 118 is such that the lug 119 will actuate the switch 111 to close it during one portion of a revolution of the eccentric disc 43, thereby actuating the solenoid 107 and lighting the lamp 101, and during a later portion of the same revolution of the eccentric 43, after the operating stroke is completed, the switch 128 opens the solenoid circuit and the light is extinguished. The portions of the revolution of the eccentric 43 during which the camming lug 119 acts, corresponding to a complete stroke of the bar 39 in one direction, as to increase the ink supply.

The camming lug 120 similarly acts on the switches 112 and 122 during another portion of a revolution of the eccentric 43, corresponding to a stroke of the bar 39 in the other direction. By this arrangement, the lamp 101 is lighted and extinguished to indicate to the attendant that the bar 39 has reciprocated one stroke and that in so doing the screw 27 selected has been turned the amount caused by the engagement of an armature 35 with a pinion 30. By observing the flashes of the lamp 101 while the selected switch 69 is held in closed position, the attendant can make any desired number of steps of adjustment. As shown in Figure 15, whenever one of the switches 69 is operated to either increase or decrease the ink supply to any column, observation of the light will indicate when each adjusting stroke is completed. The cam 117 is adapted by means of its lug 119, to cause lighting of the lamp 101 during the portion of one revolution of the eccentric 43 which actuates the pinion 30, to cause an increase in the amount of ink supplied and the cam 118 is adapted to be operative for the same purpose when the mechanism is being operated to cause a decrease in the ink supply.

Although a driven eccentric disc 43 has been shown for the purpose of reciprocating the bar 39, in view of this disclosure, it is obvious that as

shown in Figure 16 the bar 39 may be reciprocated by other mechanism, for instance by an electric motor 131, either geared to a cam 132, against which a roller 133 carried by the bar 39 is held by a spring 134, or by means of a suitably connected crank or eccentric device.

The motor 131 is adapted to be operated to complete one cycle in the reciprocation of the bar 39 by having a cam 135 arranged to control a switch 136 which is placed in the circuit in place of the magnetic clutch coils 84 when the desired switch 69 is actuated, there being solenoids 137 and 138 provided which are energized to close a circuit to the switch 136. The arrangement is such that the switch 136 permits one revolution of the cam 132 and then is opened to stop the motor 131 by a camming lug 139. When the motor 131 is used to reciprocate the bar 39 as above described, the cams 118 and 119 and the associated switches are not required.

It is also possible to reciprocate the bar 39 by means of a double coil solenoid 141, as shown in Figure 17, which solenoid may be connected into the electrical circuit shown in Figure 15 in place of the magnetic clutch coils 84. When a solenoid 141 is used, each actuation of any one of the switches 69 will cause the corresponding pinion 30 to be adjusted one step, thus requiring repeated actuation of the switch 69 for further adjustment, the bar 39 being retracted upon deenergization of the solenoid 141 by a spring 142. When a solenoid 141 is used, the cams 118 and 119 are also not required.

In operating the mechanism above described, the machine illustrated in Figure 1 is first arranged with the units grouped as desired, with a folder 13 for each group of units. The adjusting screws 27 are set in a position believed suitable to permit the proper amount of ink to be supplied to the inking roller for each column of printed matter, and the machine is started. As the first printed copies begin to appear, the attendant notes the impressions thereon and, when required, actuates the proper control at the folder to increase or decrease the amount of ink being supplied for the printing of any column.

For instance, referring to Figure 15, assuming that the ink being supplied from the left hand ink supply mechanism 18 of the unit #7 for column #3 is not sufficient to produce a clear impression, the attendant swings the switch 68 into the position shown in Figure 15, for the left hand mechanism of #7 unit then moves and holds the switch 69, marked "3", against its spring to the dotted position shown in this figure, to connect the contact 80 to the main line conductor L1 by one blade of the switch 69, and one of the contacts 90 to the main line conductor L2 by the other blade of the switch 69, whereby the corresponding "on" magnet 51a with the magnetic clutch 45 will be energized. The complete circuit is from the conductor L1 through the switch 69 to the contact 80, then to the conductor 78, then through the commutator 77 to the contact 75, conductor 82, magnetic clutch coil 84 to the magnet 51a, and then back to the main line conductor L2 through the conductor 87, cable 91, trunk cable 93, branch cable 94 to the conductor 89, and the contact 90, which is in connection with the main line conductor L2.

Energization of the magnet 51a will unlock the armature 35 by causing the ball 58 to be lifted out of the socket 61 in the bar 39, and swing the armature 35 into position to have one of its pawls engage the teeth 32 on the pinion 30 to rotate it as the bar 39 is reciprocated by the eccentric 43. Rotation of the pinion 30 turns the screw 27 and adjusts it, in this instance, to increase the stroke of the pump 23 through its piston rod 25. The amount of adjustment may be controlled by the length of time the selected switch 69 is held in contact with the contact 80. By the number of intervals the lamp 101 is lighted during one adjustment, the attendant will know the amount of adjustment given to the screw 27, as above pointed out.

The conductors 82 and 83 which connect the points of the switch 68 with the ink supply mechanism 7L are shown in Figure 15 as running directly from the control box to the ink supply mechanism in order to simplify the drawing. In practice, these conductors together with other similar conductors connecting the control boxes with the magnetic clutch coils 84 of the other ink supply mechanisms are carried to the disconnecting switches 21 in the same manner as the conductors of the trunk cables 93. Hence, when any disconnecting switch is opened, the circuit through the conductors leading from the switch points of the selector switch 68 to certain ink supply mechanisms, as well as conductors in the cables 93 would be broken, thus electrically isolating all ink supply mechanisms and control boxes at one side of that switch from those at the other side. The line conductors L1 and L2 are not affected by the opening of the disconnecting switches.

It will be understood that the invention may be embodied in other specific forms without departing from its spirit or essential attributes thereof, and it is therefore desired that the present embodiment be considered in all respects as illustrative and not restrictive, and it will be further understood that each and every novel feature and combination present in or possessed by the mechanism herein disclosed forms a part of the invention included in this application.

What we claim is:

1. In combination with a printing machine having a plurality of printing units, each unit having a printing member and an ink supply mechanism, each ink supply mechanism having means to feed ink to any one of a plurality of areas on said printing member and including separately adjustable parts for varying the amount of ink fed by each of said means, an electrically operated device for each ink supply mechanism adapted to adjust each one of said adjustable parts, a controller having switches arranged to select any one of said units, and other switches interlocked with the unit selecting switches and arranged to selectively control any one of said adjusting devices of the selected unit.

2. The combination of a printing machine having a plurality of printing units, each unit having a printing member and an ink supply mechanism, each ink supply mechanism having means to feed ink to any one of a plurality of areas on said printing member and including separately adjustable parts for varying the amount of ink fed by each of said means, with an electrically operated device for each ink supply mechanism adapted to adjust each one of said adjustable parts, a controller having switches arranged to selectively control any one of said adjusting devices, and means to indicate that such adjustment has been made.

3. In combination with a printing machine having a plurality of printing units, each unit having a printing member and an ink supply

mechanism, each ink supply mechanism having means to feed ink to any one of a plurality of areas on said printing member and including separately adjustable parts for varying the amount of ink fed by each of said means, an electrically operated device for each ink supply mechanism adapted to adjust each one of said adjustable parts, a controller having switches arranged to select any one of said units and to selectively control any one of said adjusting devices of the selected unit, and means to indicate that such adjustment has been made.

4. In combination with a printing machine having a plurality of printing units, each unit having a printing member and a plurality of ink supply mechanisms, each ink supply mechanism having means to feed ink to any one of a plurality of areas on said printing member and including separately adjustable parts for increasing and decreasing the amount of ink fed by each of said means, an electrically operated device for each ink supply mechanism adapted to adjust each of said adjustable parts, and a controller having switches arranged to selectively control any one of said adjusting devices of any ink supply mechanism of any of said units.

5. In a printing machine having a plurality of printing units, an inking mechanism at each unit having a plurality of devices to adjust the feed of ink to the printing units, means to actuate each of said adjusting devices to selectively increase and decrease the ink fed, means to control said actuating means at a position remote from said printing units including a printing unit selector, and an adjusting device selector electrically interlocked with the printing unit selector.

6. In a printing machine having a plurality of printing units, an inking mechanism at each unit having a plurality of devices to adjust the feed of ink to the printing units, means to actuate each of said adjusting devices to selectively increase and decrease the ink fed, means to control said actuating means at a position remote from said printing units including a printing unit selector, an adjusting device selector, and an increase and decrease ink flow selector.

7. In a printing machine having a plurality of printing units, an inking mechanism at each unit, having a plurality of devices to regulate the ink fed to each unit, means to actuate each of said regulating devices to selectively increase and decrease the ink, means to control said actuating means at a position remote from said printing units including a printing unit selector having separate connections to the inking mechanism of each unit, an adjusting device selector having separate connections with each adjusting device of each mechanism, and an increase and decrease in flow selector connected to each of said adjusting device selectors and to the corresponding adjusting device.

8. In an inking mechanism, a plurality of threaded ink flow controlling members adapted to be rotated in either direction to increase and decrease respectively the flow of ink controlled thereby, means to selectively rotate each of the threaded members in either direction including a pinion operably connected to each member, a bar mounted for reciprocating movement past said pinions, means to reciprocate the bar, a pawl member pivoted on the bar adjacent each pinion for free swinging movement, each pawl member having a pair of spaced apart pawl ends disposed one adjacent each side of each pinion, and means to selectively swing said pawl member to present either one of said pawl ends in pinion engaging position, whereby said pinion will be rotated thereby as the bar is reciprocated.

9. In an inking mechanism, a plurality of threaded ink flow controlling members adapted to be rotated in either direction to increase and decrease respectively the flow of ink controlled thereby, means to selectively rotate each of the threaded members in either direction including a pinion operably connected to each member, a bar mounted for reciprocating movement past said pinions, means to reciprocate the bar, a pawl member pivoted on the bar adjacent each pinion for free swinging movement, each of said pawl members having a pair of spaced apart pawl ends disposed one adjacent each side of each pinion, means to selectively swing said pawl member to present either of said pawl ends in pinion engaging position whereby said pinion will be rotated by a pawl as the bar is reciprocated, and means interlocking said pawl member swinging means and said bar reciprocating means to insure their simultaneous actuation.

10. In an inking mechanism, a plurality of threaded ink flow controlling members adapted to be rotated in either direction to increase and decrease respectively the flow of ink controlled thereby, means to selectively rotate each of the threaded members in either direction including a pinion operably connected to each member, a bar mounted for reciprocating movement past said pinions, means to reciprocate the bar, a pawl member pivoted on the bar adjacent each pinion for free swinging movement, each of said pawl members having a pair of spaced apart pawl ends disposed one adjacent each side of each pinion, means to selectively swing said pawl member to present either one of said pawl ends in pinion engaging position whereby said pinion will be rotated by a pawl as the bar is reciprocated, releasable means to lock said pawl member in non-pinion engaging position, said pawl member swinging means being adapted to unlock the locking means of the selected pawl member and to then immediately swing it.

11. In an inking mechanism, a plurality of threaded ink flow controlling members adapted to be rotated in either direction to increase and decrease respectively the flow of ink controlled thereby, means to selectively rotate each of the threaded members in either direction including a pinion operably connected to each member, a bar mounted for reciprocating movement past said pinions, means to reciprocate the bar, a pawl member pivoted on the bar adjacent each pinion for free swinging movement, each of said pawl members having a pair of spaced apart teeth disposed one adjacent each side of each pinion, means to selectively swing said pawl member to present either of said teeth in pinion engaging position, whereby said pinion will be rotated by said pawl as the bar is reciprocated, releasable means to lock said pawl member in non-pinion engaging position, said swinging means being adapted to unlock the locking means of the selected pawl member and then immediately swing said pawl member, and means interlocking said pawl member swinging means and said bar reciprocating means to insure their simultaneous actuation.

12. In an inking mechanism, a plurality of threaded ink flow controlling members adapted to be rotated in either direction to increase and decrease respectively the flow of ink controlled thereby, a pinion operably connected to each

threaded member, a bar mounted for reciprocating movement past said pinions, means to reciprocate said bar, a single pawl member pivoted for free swinging movement on said bar adjacent each pinion and having a pair of spaced apart teeth adapted to selectively engage either side of teeth on said pinion to rotate it when said pawl member is swung in either direction and said bar is reciprocated, means to selectively swing said pawl member in either direction including an electromagnet disposed on each side of said pawl member, and means to selectively energize said electromagnets.

13. In an inking mechanism, a plurality of threaded ink flow controlling members adapted to be rotated in either direction to increase and decrease respectively the flow of ink controlled thereby, a pinion operably connected to each threaded member, a bar mounted for reciprocating movement past said pinions, means to reciprocate said bar, a single pawl member pivoted for free swinging movement on said bar adjacent each pinion and having a pair of spaced apart pawl ends adapted to selectively engage either side of teeth on said pinion to rotate it when said pawl member is swung in either direction and said bar is reciprocated, releasable locking means adapted to retain said pawl member in non-pinion engaging position, means to unlock said pawl member and selectively swing it in either direction, including an electromagnet disposed on each side of said pawl member, and means to selectively energize said electromagnets.

14. In an inking mechanism, a plurality of threaded ink flow controlling members adapted to be rotated in either direction to increase and decrease respectively the flow of ink controlled thereby, a pinion operably connected to each threaded member, a bar mounted for reciprocating movement past said pinions, means to reciprocate said bar, a single pawl member pivoted for free swinging movement on said bar adjacent each pinion and having a pair of spaced apart pawl ends adapted to selectively engage either side of teeth on said pinion to rotate it when said pawl member is swung in either direction and said bar is reciprocated, means to selectively swing said pawl member in either direction including an electromagnet disposed on each side of said pawl member, and means to selectively energize said electromagnets, said bar reciprocating means including an electromagnetic clutch, and interlocking electrical connections between said clutch and said electromagnets to insure substantially simultaneous actuation thereof.

15. In a remotely controlled ink regulating system for a multi-unit printing machine, a controllable ink feeding device for each printing unit, electrical circuits to each of which corresponding ink feeding devices of each printing unit are connected, and a controller arranged to selectively control the ink feeding devices of any unit.

16. In a remotely controlled ink regulating system for a multi-unit printing machine, a controllable ink feeding device for each printing unit, a plurality of controllers each arranged to selectively control several ink feeding devices, and means to disconnect one ink feeding device from its control by one controller and to connect that ink feeding device for its control by another controller.

17. In a remotely controlled ink regulating system for a multi-unit printing machine, an electrically controlled ink feeding device for each printing unit, a controller and circuits arranged to selectively control each of the ink feeding devices, means for disconnecting the circuits of one of the ink feeding devices from its controller to prevent its control by said controller, and means for connecting the circuits of the said one ink feeding device to another controller to be operated thereby.

18. In a remotely controlled ink regulating system for a multi-unit printing machine, an electrically controlled ink feeding device for each printing unit, a controller to selectively control each of the said ink feeding devices, conductors connecting similar parts of each ink feeding device to the controller, and means for simultaneously disconnecting the conductors connecting one of the ink feeding devices from the controller.

19. In a multi-unit printing machine, inking mechanism including a plurality of ink pumps for each unit, each pump having associated therewith a mechanism for regulating the supply of ink delivered by the said pump, and a manually operated controller for effecting remote control of the regulating mechanisms, the said controller comprising a group selector for selecting any one of a plurality of groups of pump regulating mechanisms, and an individual selector for selecting any one regulating mechanism in a pre-selected group.

20. In a multi-unit printing machine, inking mechanism including a plurality of ink pumps for each unit, each pump having associated therewith a mechanism for regulating the supply of ink delivered by the said pump, an electrically operable device for causing the operation of the regulating means, and a manually operated controller for transmitting electrical control impulses to the said electrically operable device, the said controller comprising a group selector for selecting any one of a plurality of groups of electrically operable devices, and an individual selector for selecting any one of the said devices of a pre-selected group.

21. In a printing machine having a plurality of printing units, inking mechanism including a plurality of ink pumps for each unit, each pump having a reciprocable piston for causing a supply of ink to be delivered to and at spaced apart points on a member of the printing unit, means to manually regulate the stroke of each piston, and a manually operated electrically controlled device having a unit selector and a pump for selectively effecting remote control of each regulating means on each printing unit including a rotatable member operably connected to each regulating means, a single rockable member adapted to be swung into driving engagement with each of said rotatable members to rotate it selectively in either direction, and means to reciprocate said rockable members past said rotatable members to cause rotation of the latter by the former.

22. In a printing machine having a printing unit, inking mechanism including a plurality of ink pumps for said unit, each pump having a reciprocable piston for causing a supply of ink to be delivered to and at spaced apart points along said printing unit, a manually operable rotatable threaded member to regulate the stroke of each piston, and a mechanism to selectively rotate each of the threaded members in either direction including a pinion operably connected to each member, a bar mounted for reciprocating

movement past said pinions, means to reciprocate the bar, a pawl member pivoted on the bar adjacent each pinion for free swinging movement, each pawl member having a pair of spaced apart teeth disposed one adjacent each side of each pinion, and electrically operated means disposed remote from said inking mechanism to selectively swing said pawl member to present either one of said teeth in pinion engaging position, whereby said pinion will be rotated thereby as the bar is reciprocated.

23. In combination with a printing machine, a plurality of printing units, each unit having a printing member and an ink supply mechanism, each ink supply mechanism having means to feed ink to any one of a plurality of areas on said printing member and including separately adjustable parts for varying the amount of ink fed by each of said means, an electrically operated device for each ink supply mechanism adapted to adjust each of said adjustable parts, a plurality of electrical circuits to each of which a device of each mechanism is connected, and a disconnecting switch operable to interrupt the said circuits simultaneously.

24. In combination, a printing machine including a folder, a plurality of printing units in alignment, said units being disposed on each side of the folder, a remotely controlled ink regulating system having a controllable ink feeding device for each printing unit, a controller arranged to selectively control the ink feeding device of any of the printing units, and means to disconnect the ink feeding device for a unit on one side of the folder from the controller, whereby the inking mechanism of printing units on both sides of the folder may be selectively regulated by the controller when the machine is operated with a unit on each side of the folder in operation, and whereby the inking mechanism of printing units on one side only of the folder may be selectively regulated by the controller when the machine is operated with units on one side only of the folder in operation.

25. In combination, a printing machine including a folder and a plurality of printing units in alignment, said units being disposed on each side of the folder, a remotely controlled ink regulating system having a controllable ink feeding device for each printing unit, a controller arranged to selectively control the ink feeding device of any of the printing units, means to disconnect the ink feeding device for a unit on one side of the folder from the controller, and means to disconnect the ink feeding device for a unit on the other side of the folder from the controller, whereby the inking mechanism of printing units on both sides of the folder may be selectively regulated by the controller when the machine is operated with a unit on each side of the folder in operation, and whereby when units on either one side of the folder only are in operation, the ink feeding devices of printing units only on the side in operation may be selectively regulated by the controller.

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