

Nov. 11, 1941.

R. J. WISE ET AL

2,262,715

SYSTEM AND APPARATUS FOR AUTOMATIC FACSIMILE TELEGRAPHY

Filed April 22, 1939

6 Sheets-Sheet 1

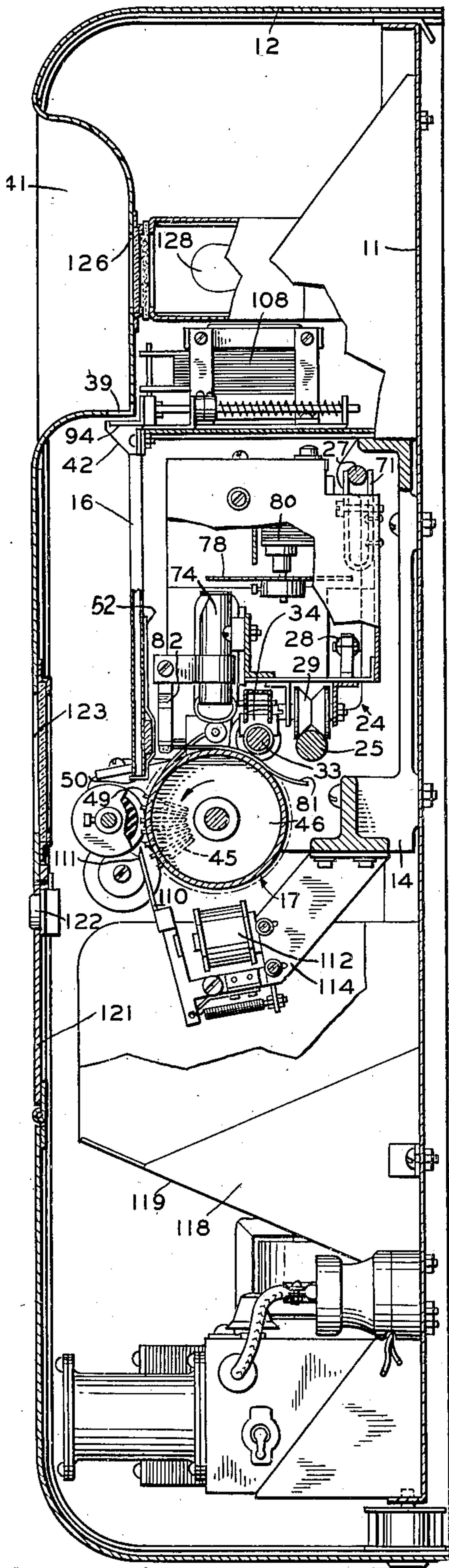


FIG. 3

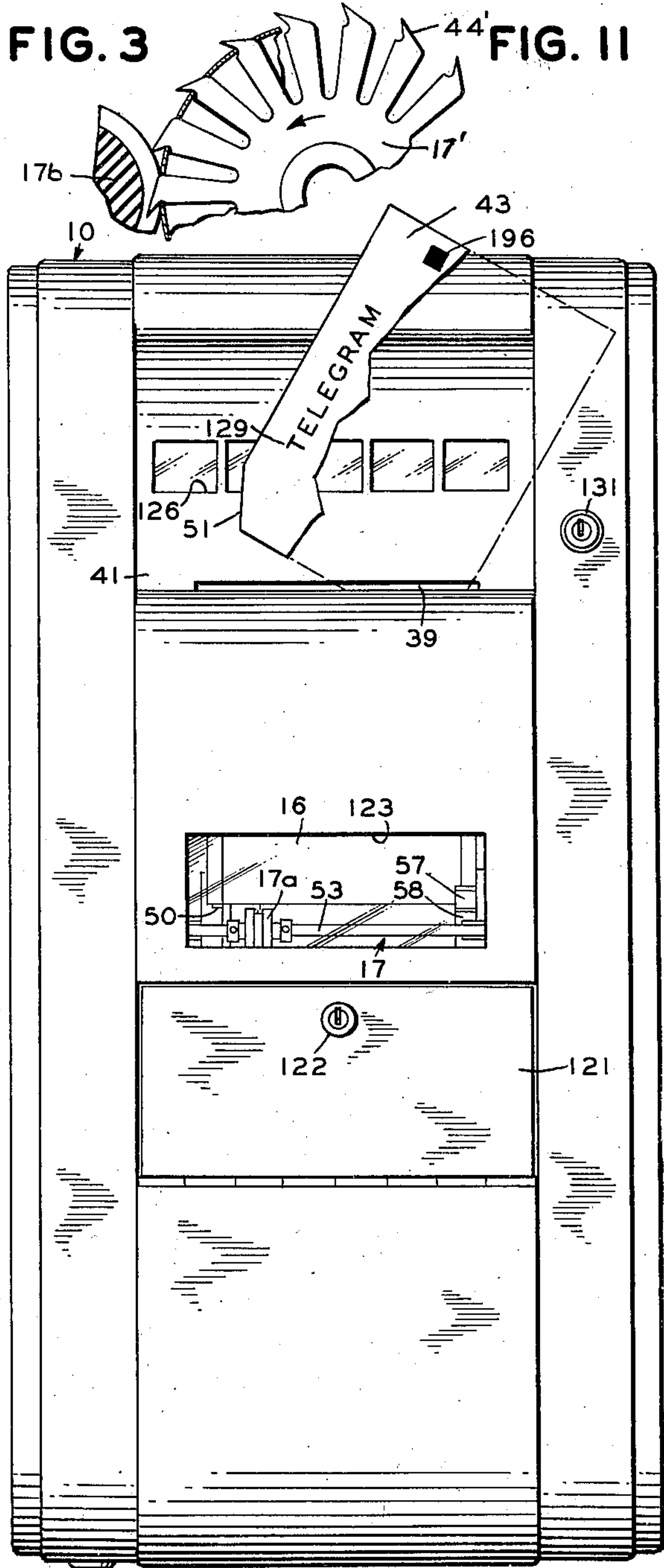


FIG. I

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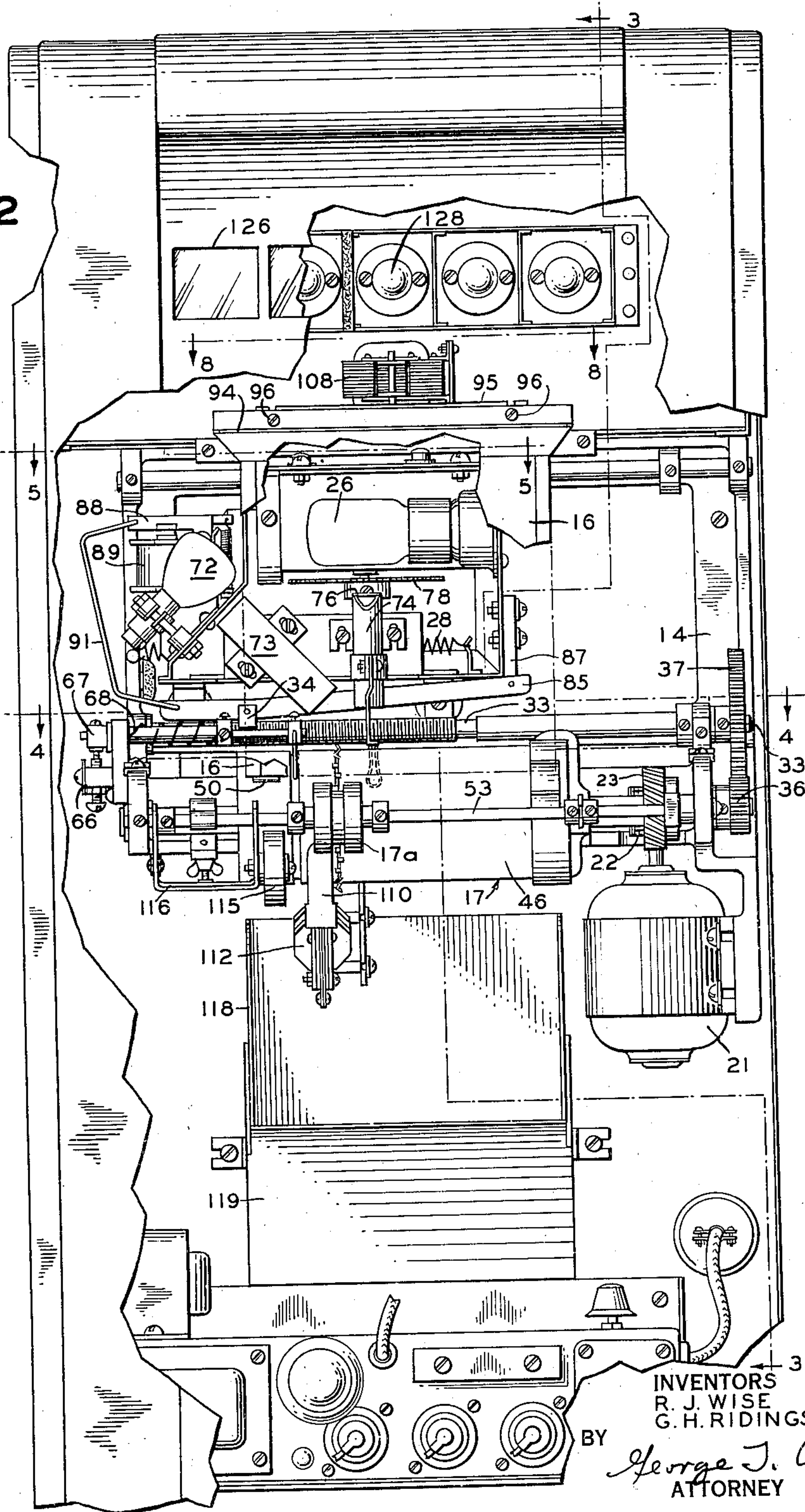
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SYSTEM AND APPARATUS FOR AUTOMATIC FACSIMILE TELEGRAPHY

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6 Sheets-Sheet 2

FIG. 2



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6 Sheets-Sheet 3

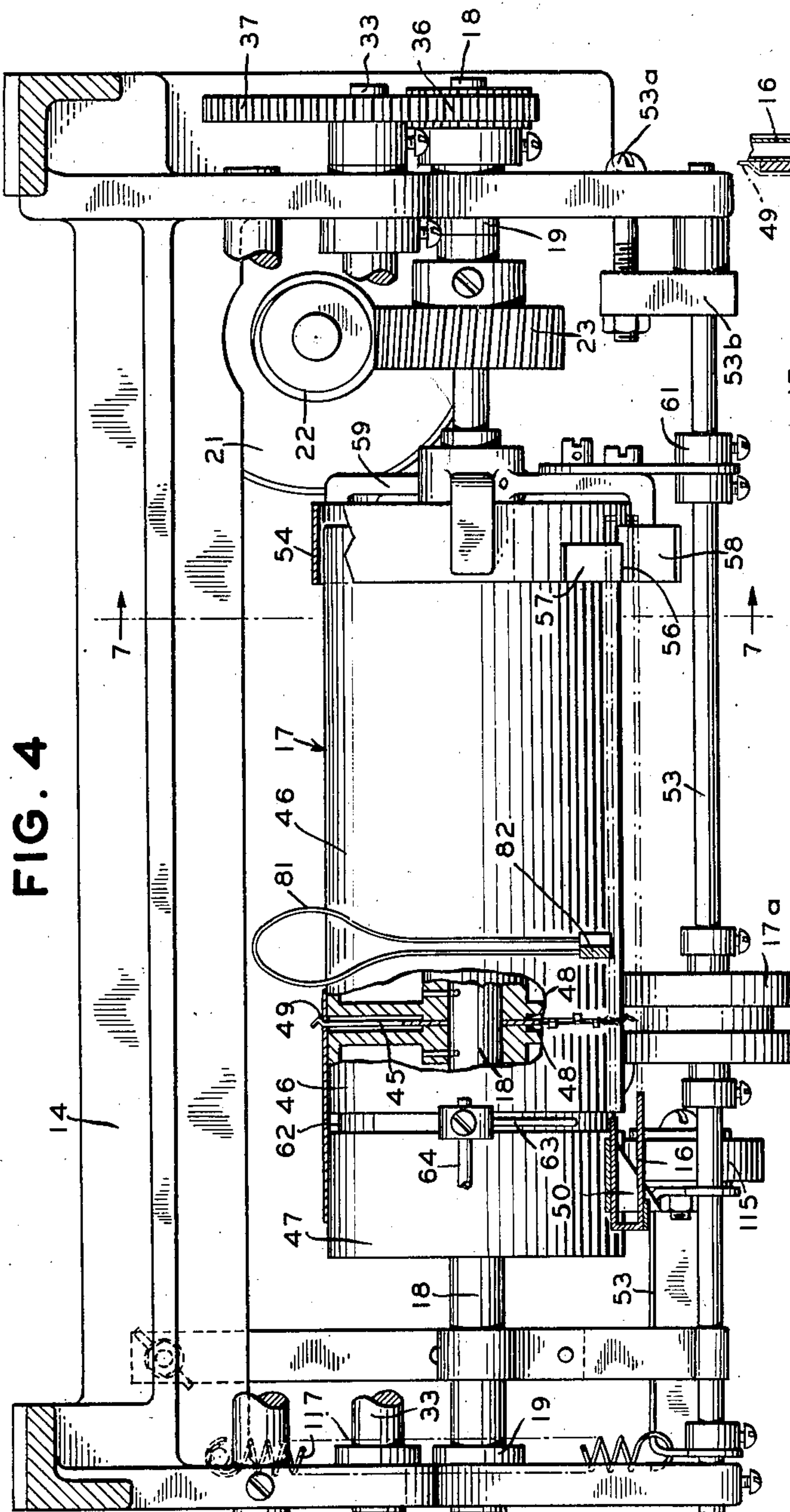


FIG. 4

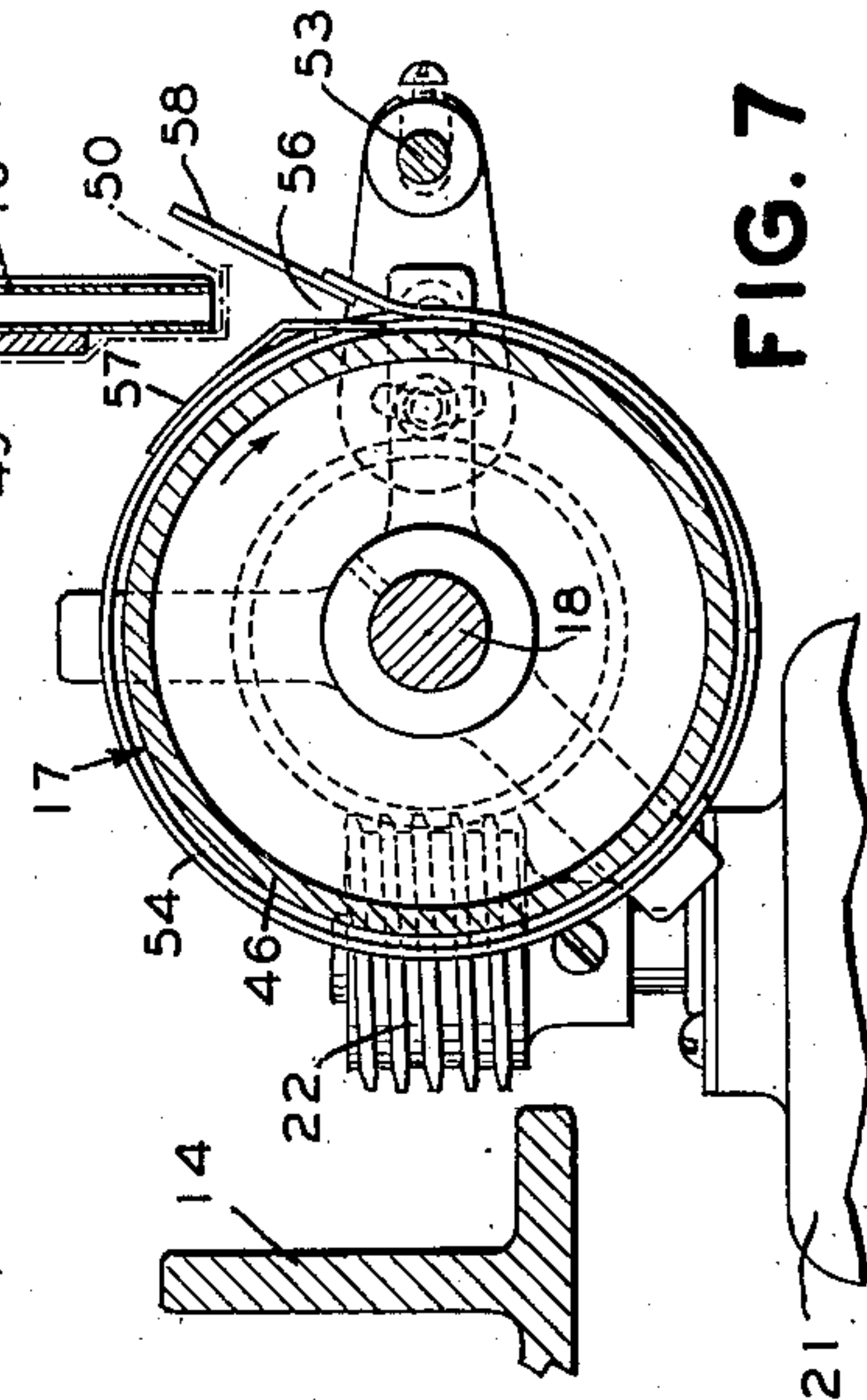


FIG. 7

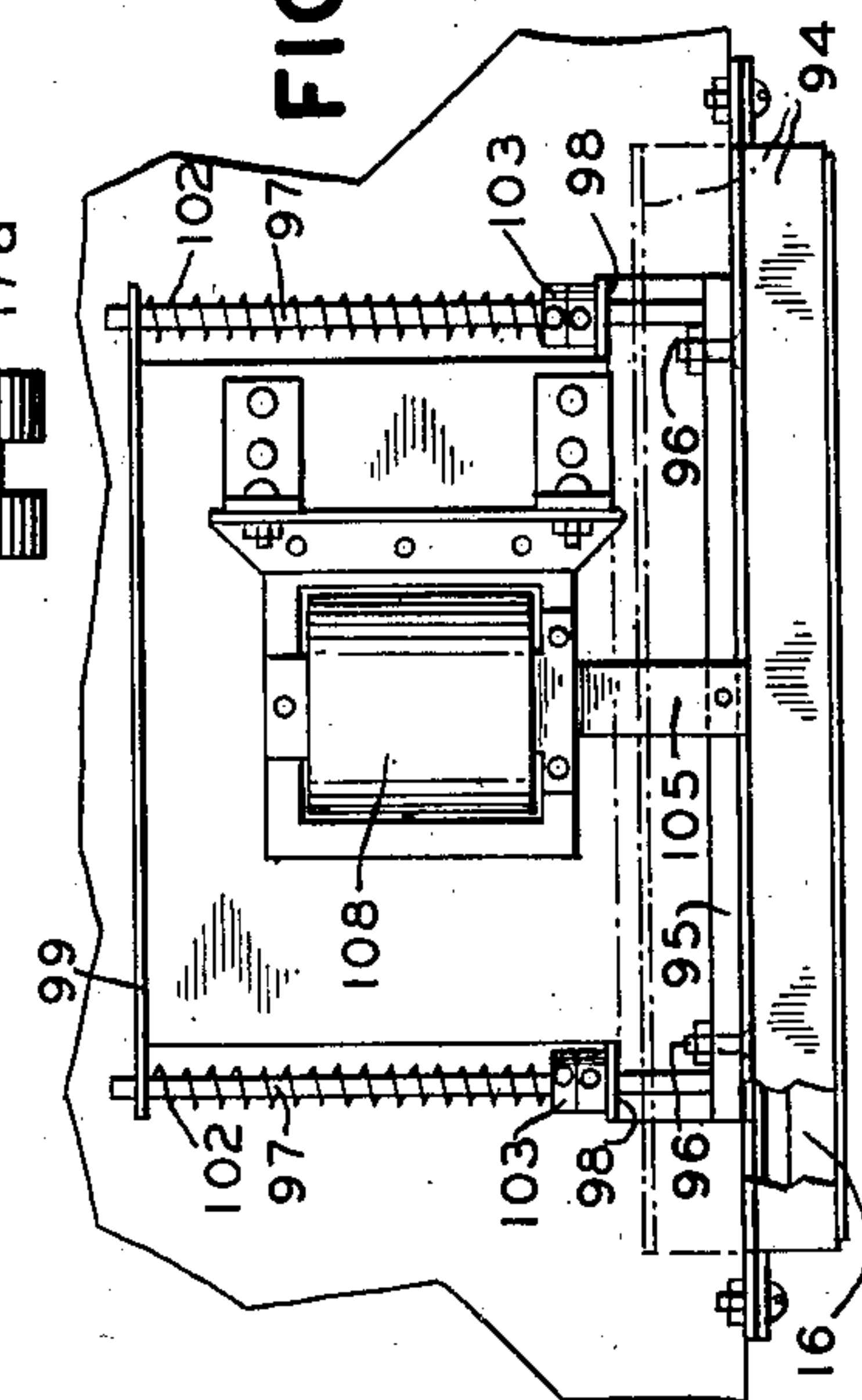


FIG. 8

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FIG. 5

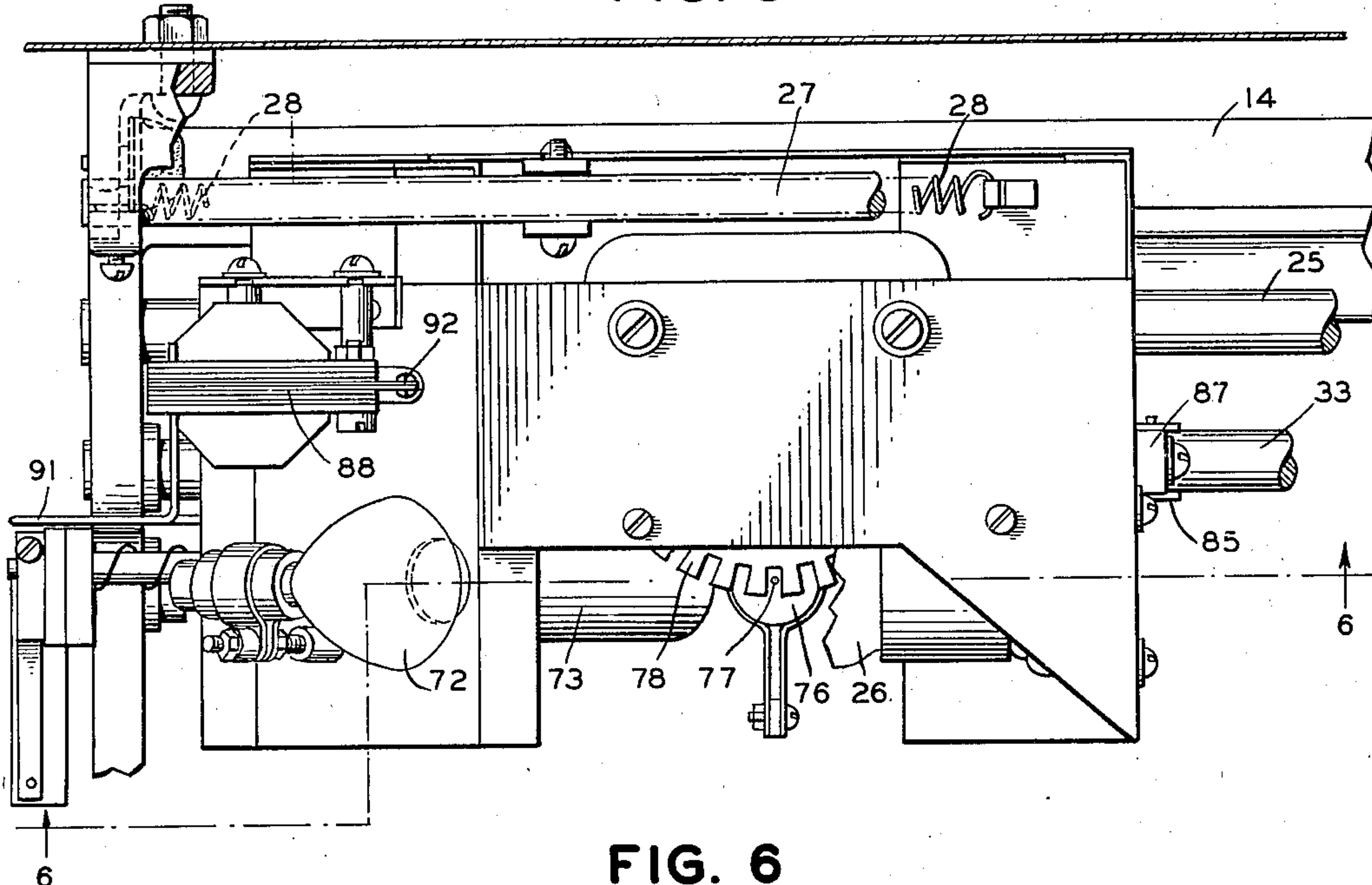
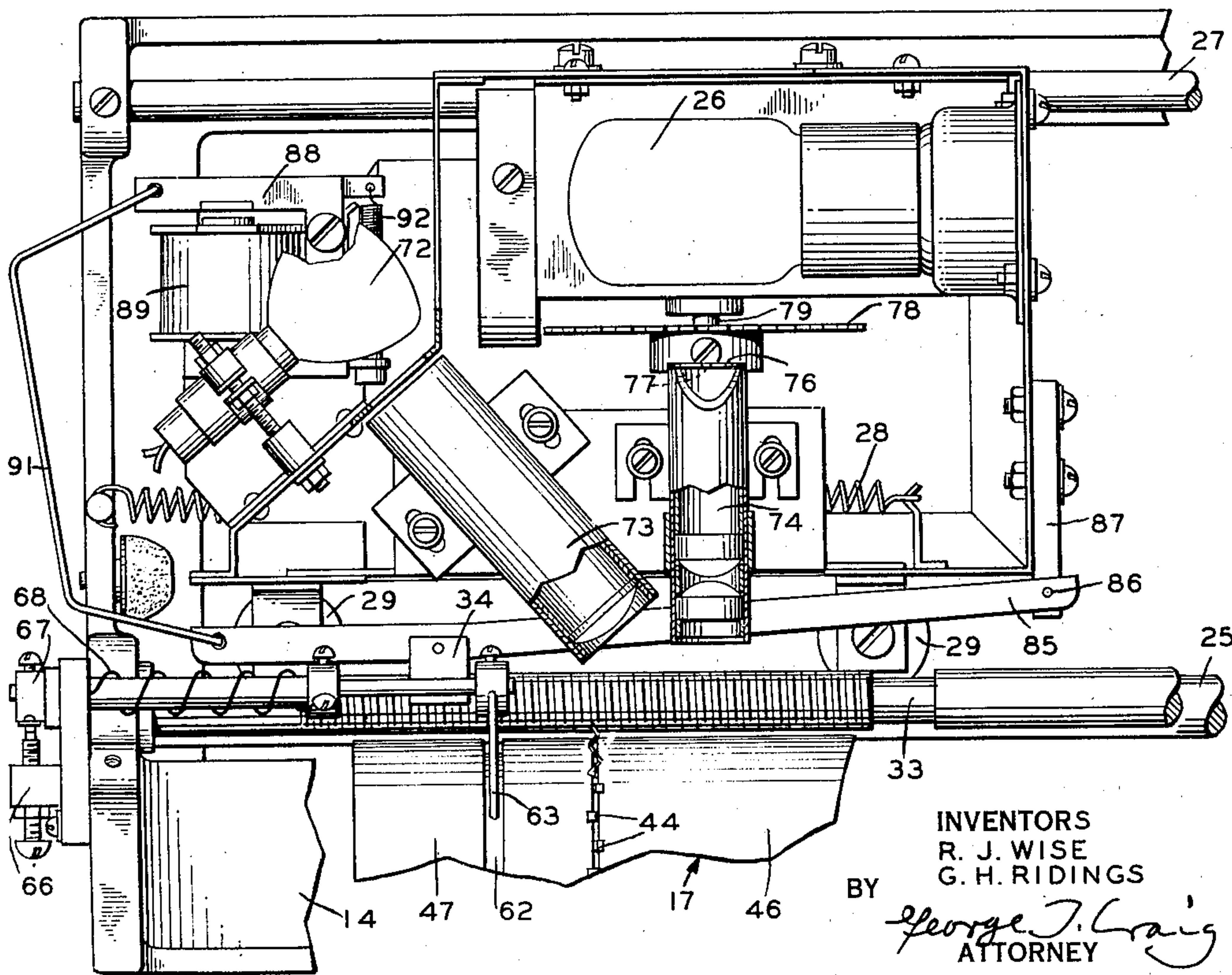


FIG. 6



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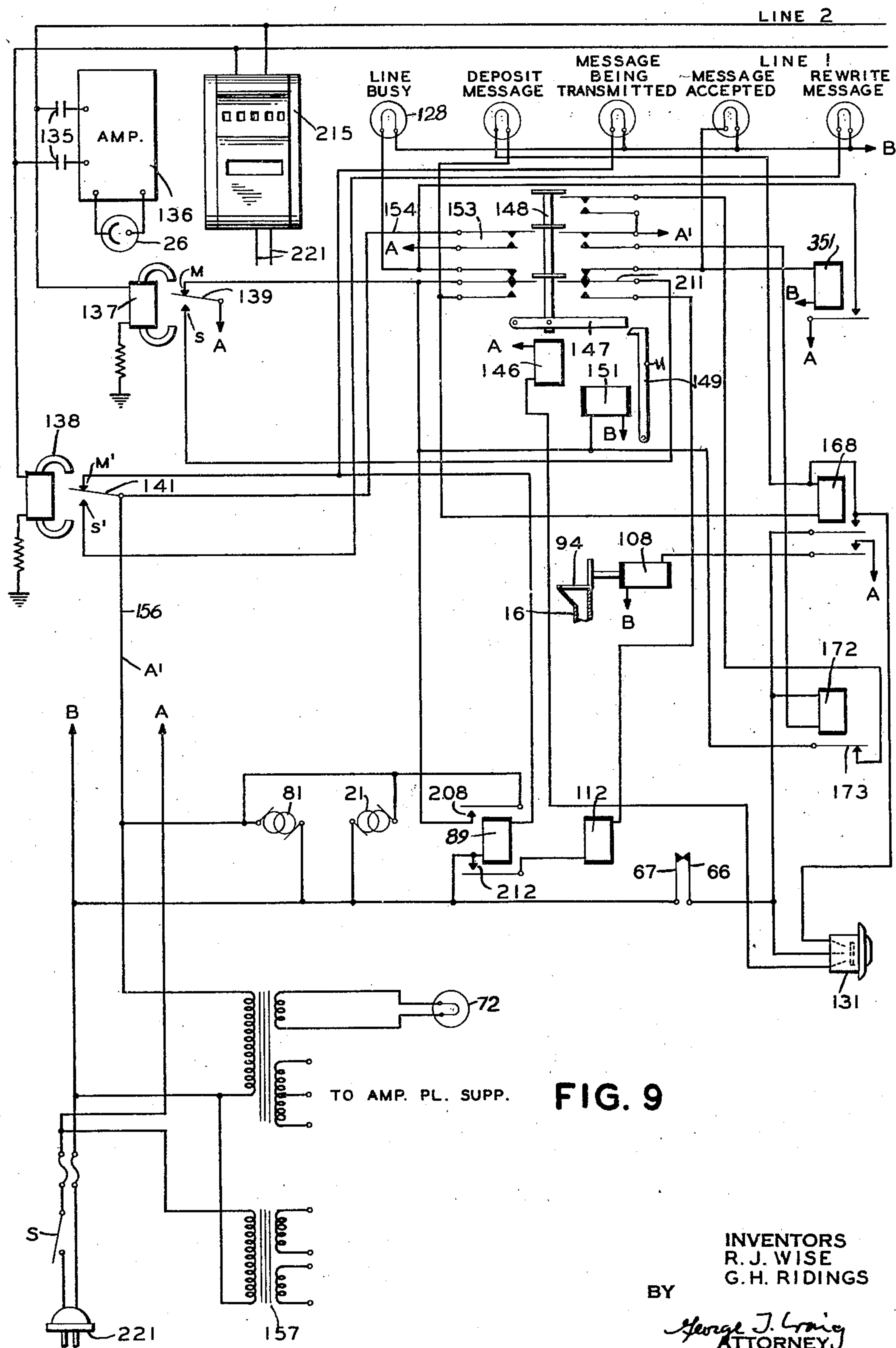
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SYSTEM AND APPARATUS FOR AUTOMATIC FACSIMILE TELEGRAPHY

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6 Sheets-Sheet 5



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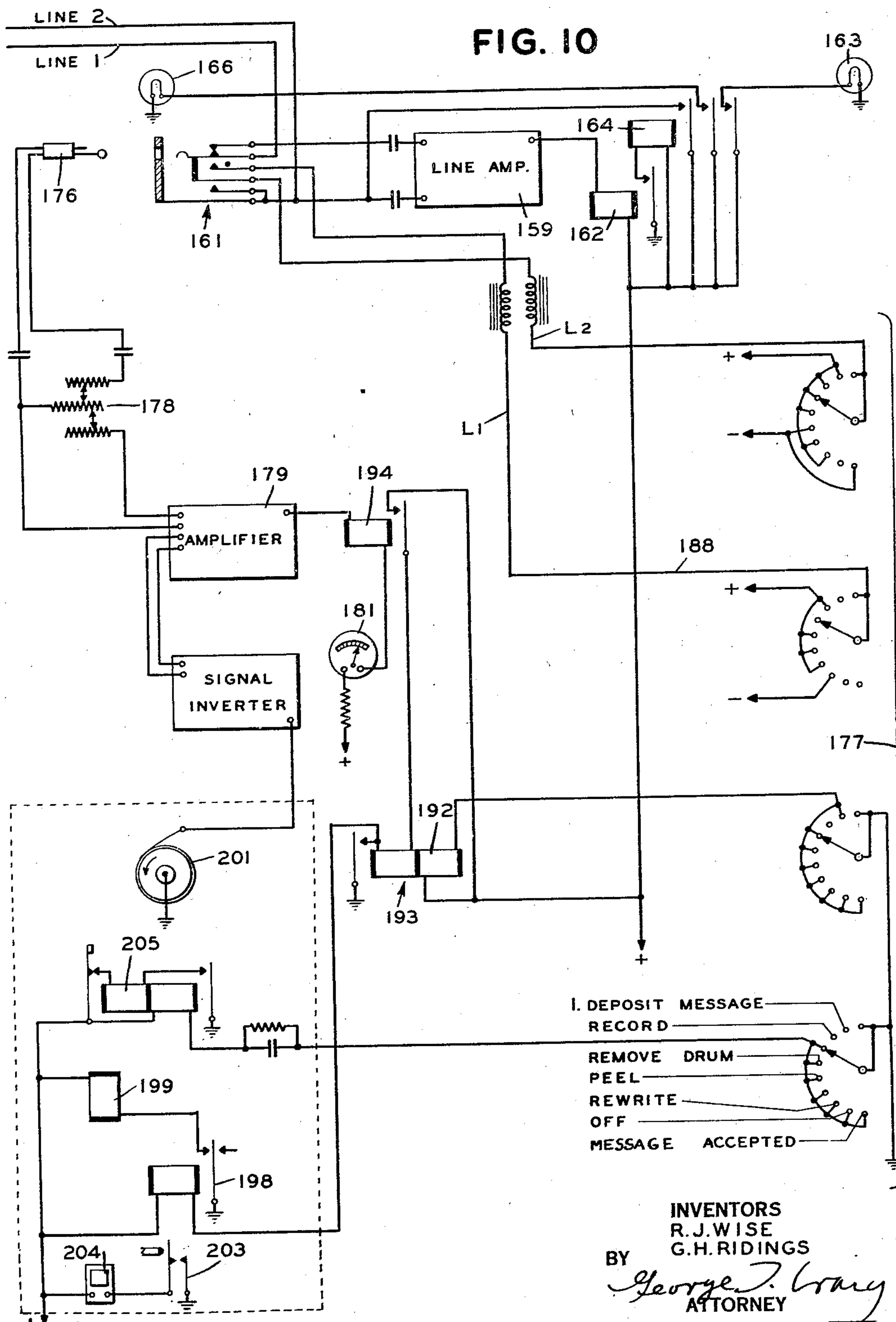
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SYSTEM AND APPARATUS FOR AUTOMATIC FACSIMILE TELEGRAPHY

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6 Sheets-Sheet 6



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UNITED STATES PATENT OFFICE

2,262,715

SYSTEM AND APPARATUS FOR AUTOMATIC
FACSIMILE TELEGRAPHY

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Application April 22, 1939, Serial No. 269,314

25 Claims. (Cl. 178—6.6)

The present invention relates to automatic telegraph systems and more particularly to automatic systems for transmitting messages, photographs and other forms of copy in facsimile.

An object of this invention is to provide a telegraph system having an automatic transmitting apparatus constructed and arranged to be operated by an inexperienced person such, for example, as a member of the general public.

A further object is to provide an automatic telegraph system in which a plurality of transmitters are connected to a single communication circuit in the manner of a party line system, the arrangement being such that when one transmitter is in operation the others connected to the same circuit are automatically locked against use.

A further object is to provide a facsimile transmitter for use by the general public provided with a plurality of signs indicating steps to be followed by a customer in using the transmitter, the illumination of the signs being controlled from a central office receiving apparatus.

A further object is to provide a facsimile telegraph constructed and arranged to automatically position a copy or message sheet on a suitable copyholder, for scanning purposes.

The foregoing and other objects of the invention will appear from the following description of an illustrated embodiment of the invention:

In the drawings:

Fig. 1 is a view in front elevation of a facsimile machine embodying the invention in its preferred form;

Fig. 2 is an enlarged elevational view similar to Fig. 1, but having parts thereof broken away to afford a clear view of certain details of the apparatus;

Fig. 3 is an enlarged elevational view taken partly in section on line 3—3 of Fig. 2;

Fig. 4 is an enlarged detailed sectional view in plan taken on line 4—4 of Fig. 2;

Figs. 5 and 6 are fragmentary sectional views disclosing details of the optical scanning system, the latter being taken on lines 6—6 of Fig. 2;

Fig. 7 is a fragmentary detailed showing of the message feeding device for the copyholder;

Fig. 8 is a fragmentary plan view of the automatically operated closure for the message feeding device;

Fig. 9 is a diagrammatic showing of the electrical features of a control system in accordance with the invention;

Fig. 10 is a diagrammatic showing of the electrical features of terminal equipment of a line

which is in communication with one or more of the facsimile machines of the present invention; and

Fig. 11 is a fragmentary view of a modification.

In the present invention, a compact transmitting apparatus is provided for transmitting messages, pictures or other suitable copy to a central receiving office from which it is retransmitted to its destination. The transmitter has means for indicating to a customer the progress of operations and for directing him in the steps to be followed by him in operating the transmitter, all controlled by the operator at the central office. The transmitter can be located in any public or private place depending on whether it is to be used by the public at large or by a single subscriber.

Referring to the drawings, and for the present to Figs. 1 to 8 thereof, a machine constructed to embody the present invention is disclosed which comprises automatic equipment enclosed in a box adapted to be secured to a wall or other suitable support by appropriate fastening means. This box, 10 (Fig. 1) comprises a base or frame 11, a cover 12, special features of which will be pointed out hereinafter, and a frame 14 designed to support the scanning apparatus and a message receiving chute 16.

As shown more clearly in Fig. 4 of the drawings the scanning mechanism comprises a copyholder 17 in the form of a scanning cylinder carried upon a shaft 18, mounted in suitable bearings 19 which are provided in the frame 14. The shaft 18 is driven from a synchronous or other speed controlled motor 21 through a worm pinion 22 and a worm wheel 23, the latter being secured to the shaft 18. A movable carriage 24 supports the photo cell 25 and associated parts comprising an optical scanner. This carriage is free to move laterally upon lower and upper guide rails 25 and 27 which extend transversely of the frame 14 and is biased to the left, as viewed in Fig. 5, by a spring 28. A lead screw 33 propels the carriage at proper scanning speed when it is engaged by a half nut 34, in a manner to be described, and this lead screw is driven from the shaft 18 by a pinion 36 thereon meshing with the gear 37 secured to the end of the lead screw shaft, see Figs. 2 and 4.

A message chute 16, of elongated rectangular box-shape extends from a slot or opening 39 in a recess 41 of the cover 12 to a point adjacent the copyholder 17, and is positioned substantially tangentially thereto. The chute has a flared

mouth 42 so that it will readily receive a flexible sheet such as a message form 43 (Fig. 1).

The copyholder 17 has teeth 44 or cleats arranged circumferentially and extending beyond the periphery thereof. These teeth may be conveniently stamped from a sheet metal annulus of greater diameter than the cylinder 17, the annulus having an aperture which fits the shaft 18 and the teeth being formed at the end of spokes 45 extending beyond the periphery of the scanning cylinder 17. The cylinder 17 is made up of two parts 46 and 47 with the hub of the annulus clamped between them. The spokes 45, extending from the hub, are free to flex by reason of fillers or washers 48, which may be integral bosses of small diameter formed on adjacent faces of the cylinder parts 46 and 47.

The teeth pierce the flexible sheet when it is held against them by a roller 17a. As shown in Fig. 4 the teeth 44 will first pierce the sheet approximately in the center line of the hub of the annulus. Then as the cylinder 17 rotates, the tooth which has just pierced the sheet moves laterally, the spoke flexing to permit this movement. Further rotation of the cylinder allows the spoke to return to its normal plane and when this occurs, the paper is firmly held under the hook-like contour of the tooth provided by reason of its sloping portion 49. The approximate center of the sloping portion 49 of each tooth is located in the periphery of the cylinder 17. It will be understood that if the cylinder 17 is of considerable length, a plurality of sets of teeth spaced at axial intervals may be provided. A modified form of tooth configuration is shown in Fig. 11 of the drawings. The teeth 44', illustrated thereon, all lie in the same plane and are hook-shaped as shown and point in the direction of rotation of the cylinder 17' so that they will catch and hold the message blank when it projects slightly beyond the end of the chute 16. The paper is in contact with the drum, the edge thereof having been gripped between the roller 17b and the drum 17'. The approaching tooth pierces the paper at some distance from the surface of the drum. The subsequent gripping action as the drum revolves swings the paper just pierced by the tooth under the leading edge of the hook-shaped tooth. Each tooth acting in this manner causes the paper to be held at each point under the sloping leading edge of a tooth. The drag placed on the sheet by the continuous rotation against the roller 17b keeps the paper securely seated at the root of each tooth. It will be understood that the roller 17b is mounted in the same position as roller 17a. The mounting means will be explained later.

In order to enable the recording apparatus at the central station to correctly record a message it is necessary to have the copy sheet at the transmitter properly mounted on the scanning cylinder. For this purpose mechanism is provided to prevent the message or copy sheet from being inserted in the chute 16 in any but the correct position. The message blank 43 has a beveled edge 51. A stop member 50, see Fig. 4, supported on a spring 52 extends across one end of the chute slot and has an inclined edge in position to be engaged by the beveled edge of the message sheet. When the sheet is inserted in the chute in such a way that the beveled edge 51 engages the inclined edge of the stop 50, the latter will be pushed aside against the pressure of the spring support 52 and the sheet will pass down the chute. If the sheet is introduced into the

chute in any other manner the square corner will strike the top face of the stop 50 and further insertion thereof blocked. To facilitate wrapping of the message sheet upon the drum, guide roller 17a is provided, which is journaled on a shaft 53. The guide roller is grooved to accommodate the teeth and holds the paper while it is pierced by the teeth, as explained above. Adjustment of the pressure of the roller 17a on the drum is provided by a screw 53a which draws the arm 53b on the shaft 53 to flex the shaft slightly. To still further assure proper reception of the message blank on the cylinder, a cylindrical guide 54 is provided which surrounds one end of the cylinder. This guide has an opening therein, as indicated at 56, and flaring members 57 and 58 serve to guide the edge of the message sheet into the opening 56. The entire guide member 54 is supported on a stationary spider 59, the hub of which is journaled on the cylinder shaft 18. Rotation of the spider on the shaft is prevented by its connection at 61 to the stationary shaft 53.

To indicate the presence of a message sheet on the cylinder 17, a groove 62 is provided therein in which in the absence of a message blank receives a lever 63 which is secured to a rock shaft 64. It will be seen that when a message blank overlies the surface of the cylinder 17, the lever 63 will be raised from the groove thereby rocking the shaft 64 which separates a pair of contacts 66 and 67 (Fig. 2), the latter extending radially from the shaft and being moved thereby. A torsion spring 68 tends to press the lever 63 into the groove 62.

The carriage 24 previously referred to will now be described in some detail. As previously stated, it is supported for movement on the lower guide rail 25 by the rollers 29 and is guided and maintained in its proper plane of movement by a U-shaped member 71 affixed to the carriage and embracing the upper guide rail 27. The optical scanning system supported within the carriage comprises a lamp 72 positioned to project light through a lens tube 73 upon the surface of the copy on the scanning cylinder. Light is reflected from the copy through a lens tube 74, the lenses therein projecting an enlarged image of the illuminated surface of the paper and the markings thereon upon a non-reflective screen 76. The screen 76 is apertured as indicated at 77 and a portion of the magnified image on the screen 76 is projected through the aperture 77 and the teeth of a light chopping wheel 78 on to the photo cell 26. The light chopping wheel 78 is carried on the armature shaft 79 of a motor 80, the latter being rigidly secured to the framework of the carriage. A spring member 81 which may be conveniently formed as a loop of wire is secured to a bracket 82 fastened to the lens tube 74. The spring member 81, see Figs. 3 and 4, presses the copy sheet 43 into close contact with the cylinder adjacent the spot of light which is projected by the lens tube 73.

The previously mentioned half nut 34 which cooperates with the lead screw 33 to propel the carriage to the right, as is viewed on Fig. 6 of the drawings, is carried between the ends of a lever 85 pivoted at 86 to a member 87 which is secured on the carriage. The pivoted armature 88 of a magnet 89 is connected to operate the lever 85 through a pivoted link 91 when the magnet 89 is deenergized. The biasing spring 92 for the armature 88 causes the armature to move and lift the half nut 34 from meshing engagement with the lead screw 33. The preferred circuit con-

nections for the magnet 89 will be described hereinafter in connection with Figs. 9 and 10 of the drawings.

To prevent insertion of the message blank 43 at an inappropriate time as described herein-after, a slide 94 (Figs. 3 and 8) is adapted to be moved into position over the end of the chute 16. The member 94 is of angle shape, the upwardly extending flange being secured by fastening means 96 to a member 95 which is carried by the rods 97, the latter sliding in apertured brackets 98 and another spaced apertured bracket 99. Compression springs 102, one encircling each rod, tend to retain the stop member 94 in position over the chute, forward movement of the rods being limited by stop members in the form of collars 103. The stop member 94 may be retracted by a link member 105 connected to the bracket 95 and the plunger of a solenoid magnet 108, the control of which will be described hereinafter.

When scanning of a message sheet in position on the cylinder 17 is completed, it may be removed by member 110 having a knife edge 111 which is brought in contact with the surface of the cylinder 17 by energization of the magnet 112, the armature of which carries the member 110. Since the blank is shorter than the circumference of the cylinder its leading edge is exposed to the action of member 110. The knife edge 111 slips under the leading edge of sheet 43 thereby progressively peeling the sheet away from the drum and disengaging it from the teeth 44. The magnet 112 is supported in a stationary position beneath the cylinder upon a bracket 114 secured to the framework 14. A roller 115 pivotally mounted on the U-shaped bracket 116 is caused to bear on the drum or paper at all times by a spring 117. The point of contact of this roller with the drum lies forward of the point of contact of the roller 17a and is also somewhat forward of the point of engagement of the edge 111 of the member 110. This roller serves to insure movement to the paper after the major part thereof has been unwrapped by the edge 111 and to hold the edge of the paper in contact with the cylinder until all of the teeth have been disengaged.

A box or bin 118 having a sloping bottom 119 is positioned beneath the cylinder 17 and catches and retains the message sheets 43 after they have been stripped from the cylinder 17 by the member 110. Access to the bin 118 is obtained through a hinged portion 121 of the front panel which is securely locked against unauthorized access by the lock 122.

The front of the casing 12 is provided with a transparent window 123 through which operation of the more essential parts of the machine may be observed. However, indications of the performance of the machine in operation are provided by the signs 126, five in number in the specific embodiment selected for the purpose of illustration, which are illuminated at appropriate times by the lamps 128 (Figs. 2 and 9). The circuits governing operation of these lamps will be described in detail in connection with Figs. 9 and 10 of the drawings.

In operation of the mechanical parts of the apparatus thus far described, a person wishing to transmit a message by facsimile prepares a suitable copy or message sheet 43. Where the machine is to be used for a commercial service, the message sheet 43 is generally provided with printed matter thereon indicated by the reference character 129 and the message will be placed be-

neath this printed matter. In order that the message will be recorded on the receiving sheet in its proper position with respect to printed matter also appearing thereon, the blank is inserted in the slot 39 in the recess 41 with the cut-away portion thereof extending to the left as shown in Fig. 1 of the drawings. Preparatory to the insertion of the blank, however, a key switch indicated by the reference character 131 is operated which conditions the circuits in a manner to be described hereinafter. The blank as it descends the chute 16 presses the stop member 50 to one side in the manner previously explained and is caught by the teeth 44 of the cylinder which pierce the blank and cause it to be rolled around the cylinder, the guide ring 54 and the roller 17a insuring a snug and even fit of the blank on the cylinder. The electrical equipment to be described causes the lamp 72 to light and the driving motor and scanning motor to be started upon operation of the key switch 131. The electromagnet 89 is energized by control apparatus located in the remote receiving station and the half nut 34 engages the lead screw 33 which causes the message to be scanned. Upon completion of the scanning operation the magnet 112 is energized which removes the message from the cylinder and it is deposited by gravity in the bin 118 where it is guarded against unauthorized inspection until its removal through the hinged panel 121 by an authorized person having a key for the lock 122. It will be understood that while in the preferred arrangement of the control equipment to be described operation of the magnets 108, 89 and 112 are controlled from a distant receiver, these may be operated locally if desired or the magnet 108 and its stop member 94 may be omitted. Furthermore, the peeler blade 110 may be mechanically operated. In this manner a simple facsimile transmitting or receiving machine is provided in which message copies which are wrapped on the copyholder may be mounted on and removed therefrom at any time without stopping the copyholder.

Referring to Fig. 9 of the drawings diagrammatically showing electrical features of the machine disclosed by Figs. 1 to 8 of the drawings, the lamps 128 for illuminating the signs 126 (Fig. 2) are shown in the upper part of the figure. They are labeled as shown to correspond to the condition desired to be displayed by each sign upon illumination thereof and the lamps 128 will be referred to in the following description by the assigned labels in Fig. 9. L indicates a communication circuit consisting of a pair of line wires L1 and L2 which communicates with a distant receiver, shown in Fig. 10. The circuit is connected by way of condensers 135 and an amplifier 136 to the photocell 26. One of the line wires L2 is connected to a three position polar relay 137, the other terminal of which is grounded, and the other line wire L1 is connected in a similar manner to a three position polar relay 138. The tongue 139 of the polar relay 137 is capable of occupying three different positions depending upon whether its associated line wire is unenergized or is connected to a positive or a negative source of potential. The tongue 139 of the relay cooperates with two contacts m and s. The tongue 141 of the relay 138 cooperates with contacts m' and s'.

The transmitter is started by operating the lock switch 131 causing the coil of a relay 145 (Fig. 9) to be energized, the armature 147 of which operates a plurality of contacts by means of the multi-contact switch arm 148. The ar-

armature 147 is adapted to be locked in the energized position by the armature 149 of a magnet 151. The armature 149 may also function to prevent movement of the armature 147 to its energized position under circumstances of operation to be pointed out hereinafter. One set of contacts 153 operated by the rod 148 connects power to the machine including the driving motor 21, the chopper motor 81 and the plate supply to the tubes of the amplifier 136. This is accomplished over the conductors 154 and 156. The filaments of the amplifier fed from the transformer 157 are left on at all times. The exciter lamp beam reflected from the drum through the pickup lens, the aperture and the light chopper to the photocell 26 causes a carrier to be generated and passed through the amplifier to the two line wires L1 and L2. This is an important feature of the invention since it indicates clearly that the transmitter and other parts of the system are ready to operate. At the central station (Fig. 10), this carrier signal is picked up by a line amplifier 159 which is floating on the circuit at all times through normalization of the line jack 161. This signal causes a relay 162 in the plate circuit of an output tube to operate, lighting a light 163 by a relay 164, the purpose of which is to attract the attention of a station attendant. One of the contacts of the relay 164 lights a lamp 166 over the line jack 161 associated with the transmitter and places plus potential on line L2, which causes the tongue of polar relay 137 (Fig. 9) to go to its marking contact *m*. This causes the armature 149 of the magnet 151 to lock the armature 147 in the operated position, operates a relay 168 and lights the "deposit message" light. The pushbutton or lock switch 131 may now be released. Relay 168 operates the chute magnet 108 which opens the entrance to the chute 16, allowing the patron to deposit the telegram. The telegram is deposited in the chute in the proper manner. When it is completely wrapped around the drum, the drum contacts 66 and 67 open turning out the "deposit message" light, and releasing the relay 168 which, in turn, releases relay 108 and closes the entrance to the chute. Operation of the multi-contact switch arm 148 by the relay 146 has previously operated a relay 172 to disconnect a back contact 173. As the drum contacts 66, 67 control the circuit of relay 172, it will be apparent that opening the drum contacts releases the relay 172 permitting the contact 173 to close. The effect of this is to keep power on the machine as long as a copy sheet is on the scanning cylinder and to prevent the turning off of the machine through error by the main office attendant. The attendant at the main office, seeing the lights 163 and 166, plugs into the jack 161 with the plug 176 associated with the recording equipment, disconnecting the line amplifier 159 from the lines L1 and L2 and connecting a rotary switch 177 and the recording amplifier 179 to the line. An adjustment is made by means of a pad 178 at the input of the recording amplifiers 179 until the indicator of the meter 181 associated with the amplifier indicates a predetermined value. The rotary switch 177 has four sets of contacts and four switch arms which are operated together. The contact on each switch arm is in the form of a brush so that as the switch arms are moved, the contact of each maintains connection so that contact is made with the next point before the brush leaves the last succeeding point. During the above operations the rotary switch

has been on the No. 1 position marked in Fig. 10 "Deposit message."

After adjustment of the pad, the rotary switch is moved to the No. 2 position indicated on the drawings by the word "Record." This No. 2 position places plus potential to line L1 by way of the conductor 188 and the second brush of the switch. At the transmitter this operates polar relay 138 to the marking contact *m'* causing the half nut magnet to be energized, moving the carriage along the copy to scan the same and at the same time lighting the light "message-being-transmitted." Also the No. 2 position of the rotary switch 177 at the main office releases a coil 192 of a relay 193, allowing the other coil to be released by the action of a relay 194, which is in the plate circuit of one of the recording amplifier tubes. The relay 194 responds to the black printed square 196 (Fig. 1) on the transmitting blank at the transmitter. Response of the relay 194 occurs in the following manner: While the scanning light at the transmitter is on, a carrier is received by the amplifier 179 (with the plug 176 in the jack). Incidence of the scanning light on the spot 196 causes the received carrier to drop in amplitude, releasing the relay 194. This releases the relay 193 and deenergizes a phasing relay 198 which opens the circuit of a phasing latch magnet 199 on the recorder 201 (not shown in detail). A recorder suitable for the purpose is shown in the Wise et al. application, Ser. No. 110,760, filed Nov. 13, 1936. The rotary switch 177 is left in the No. 2 position until the message has been transmitted. A contact 203 associated with the traveling scanner (not shown) on the recorder 201, operates a buzzer 204 or other signal after the traveling scanner of the recorder has traveled a sufficient distance to have recorded the message from the transmitter.

The rotary switch 177 is then moved to position No. 3 which removes plus potential from line L1, causing the carriage to return at the transmitter to the starting position and turning out the "message - being - transmitted light." This is brought about by movement of the tongue 141 of the polar relay 138 to its central position. At the recorder the No. 3 position of the rotary switch 177 locks up the phasing relay 193 and operates a relay 205 which causes the recorded drum to be removed from the recorder and a new one inserted in its place.

The central office attendant may now read the facsimile message received from the transmitter and if it is satisfactory, the rotary switch 177 will be moved by the attendant through the No. 4 to its No. 5 position. The No. 4 position of the switch 177 is to permit reversal of the potential to one line before reversing it on the second. In passing through the No. 4 position a positive potential is again put on line L1, operating the polar relay 138 to its *m'* contact and energizing the half-nut magnet 89. This closes a set of contacts 208, the purpose of which is to keep the multi-switch locking relay 151 operative when positive potential is removed from line L2. The No. 5 position of the switch 177 applies negative potential to the line L2 which causes the relay 137 to move to the spacing contact which, through contacts 211 on the relay 146 and contacts 212 on the half nut magnet, operates the peel magnet 112 to remove the blank from the drum.

After the message has been removed the rotary switch 177 is moved to the last position, No. 9, in which there is no potential on line L1

and negative potential on line L2. This places the tongue of the polar relay 138 in neutral position releasing the half-nut magnet 89 and opening the contacts 208 and 212. Simultaneously the tongue of the relay 137 engages the spacing contact s. The multi-contact switch is released and the switch arm 148 raised to the position shown in Fig. 9. This lights the "message accepted" light at the transmitter.

If, on the other hand, the recorded copy of the message is not satisfactory, the operator at the recording station may rerun the message with either increased or decreased power. That is, after the rotary switch has been placed in No. 3 position and the recorded copy has been read, if a lighter or darker copy is desired, the operator can make a suitable adjustment of the pad 178 and then return the switch to its No. 2 position in which the recording operation will be repeated. If, on the other hand, the original message is not legible, it will be impossible to obtain a legible copy. In this event, the operator moves the rotary switch from its No. 3 position through the Nos. 4, 5 and 6 positions to the No. 7 position. The No. 6 position functions in the same way as No. 4 described above in that it puts a positive potential on both lines L1 and L2 and provides for a change in potential on one line at a time.

In No. 7 position a negative potential is applied on line L1 and a positive on line L2. Hence, the polar relay 138 is on the spacing contact s which lights the "please rewrite message" light and may also operate a buzzer to call the customer's attention or that of an attendant at the transmitter. The rotary switch is then turned off and the plug 176 removed from the jack. When the customer has rewritten his message, he operates the button 131 again and proceeds as before.

The magnet 151 at the transmitter has a dual purpose. On the busy machine it will lock the relay 146 in the operated position. Where more than one machine are on a circuit as shown in Fig. 9 and assuming that machine 215 is busy the magnet 151 of each machine will lock the idle machine or machines in the unoperated position so that the idle machines may not be started as long as one machine on the circuit is busy. On the idle machines of the circuit a light reading "line busy" will appear while the circuit is being used by one of the other machines. This condition is maintained on the idle machines when the machine in use in having the blank removed from its cylinder by the relay 351. The power supply connection to each transmitter is indicated by reference characters 221 on Fig. 9, the alternating current leads from the source 221 being labeled A and B and certain connections thereto also being labeled in this manner.

The condensers 216 and 217 at the receiving station afford an easy path for the carrier current from the transmitters on Fig. 9 to the amplifiers 159 and 179 respectively and the chokes 218 keep the carrier frequencies from entering the control apparatus.

The output of the amplifier 179 is fed to the recorder 201 by way of a signal inverter 219 of any known type if the recorder is of the electrochemical type.

From the foregoing complete description of an illustrated embodiment and its operation, it will be seen that an automatic telegraph system is provided by the present invention. The inven-

tion also provides facsimile machines, which because of inventive features thereof, can be operated by unskilled persons.

While the invention has been explained in detail in connection with an illustrative embodiment thereof, it is to be understood that the invention may be embodied in other forms and, therefore, the invention is not limited except as indicated by the terms and scope of the appended claims.

What is claimed is:

1. Automatic rotatable telegraph apparatus comprising a telegraph message sheet copyholder, means arranged circumferentially on said copyholder to receive and retain a telegraph message sheet and means independent of said first named means for conveying said message sheet to said receiving means on the copyholder in position to be received by said copyholder during movement at scanning speed for transmission of the message.

2. Automatic receiving means for the copyholders of a facsimile scanner comprising members on said copyholders designed to pierce and retain a flexible copy sheet in position on said copyholder and means to receive and position said flexible sheet within reach of said members whereby the sheet will be pierced by said members in succession and drawn onto said copyholder during movement thereof.

3. In combination with a rotatable telegraph message sheet copyholder, means arranged circumferentially on said copyholder to receive a flexible telegraph message sheet during movement at scanning speed and to retain the same for transmission of the message thereon, means to position said flexible sheet adjacent to said copyholder and to permit movement of said sheet toward said copyholder as said copyholder receiving means engages said sheet, and means for automatically removing said sheet from said copyholder upon the completion of the transmission of said message.

4. In a facsimile machine, a rotatable cylinder to receive a flexible sheet to be scanned, means arranged circumferentially on said cylinder adapted to engage and retain said sheet on said cylinder during rotation at scanning speed, a feed chute for the sheet ending adjacent to said cylinder and means for engaging an end of the sheet to remove the sheet from the cylinder after a scanning operation.

5. An automatic telegraph system comprising a transmitting device, conveying means for delivering a message carrying sheet to said transmitting device, means in said transmitting device for receiving said sheet and automatically transmitting signals representative of the message on the sheet, and means for preventing said conveying means from delivering another message carrying sheet to the transmitting device during transmission by the device of the message on the first named message sheet.

6. An automatic telegraph system comprising a transmitting device, conveying means for delivering a message carrying sheet to said transmitting device, means in said transmitting device for receiving said sheet when presented thereto in properly oriented position relative to said transmitting device, means for automatically transmitting signals representative of the message on said sheet, and means to reject said sheet when presented to said transmitting device in other positions relative thereto.

7. An automatic telegraph system comprising

a transmitting device, conveying means for delivering a message carrying sheet of predetermined configuration to said transmitting device, means in said transmitting device for receiving said sheet and automatically transmitting signals representative of the message on the sheet, and means associated with said conveying means and coacting with said predetermined configuration of the message sheet for causing the same to be received by the transmitting device in proper position for transmission of the message on the sheet.

8. An automatic telegraph system comprising a transmitting device, conveying means for delivering a message carrying sheet to said transmitting device, means in said transmitting device for receiving said sheet and automatically transmitting signals representative of the message on the sheet, and selectively operable means associated with said conveying means for preventing the sheet from being delivered to the transmitting device until after a predetermined operation of said selectively operable means.

9. An automatic telegraph system comprising transmitting apparatus for transmitting signals in accordance with a message control form, means for operatively associating said message control form with said transmitting apparatus for automatic transmission of the message, receiving apparatus responsive to said signals for receiving the transmitted message, and signaling means including means at the receiving apparatus for selectively effecting retransmission of said message by said transmission apparatus to said receiving apparatus.

10. In a facsimile machine, a scanner comprising a rotatable cylinder, tooth members projecting from said cylinder to pierce and retain a flexible sheet closely in contact with the periphery of said cylinder and means for pressing a sheet against said toothed members.

11. A facsimile machine comprising a copyholding cylinder, a cover for said machine, said cover having an aperture therein adapted to receive a message sheet, means for conveying said message sheet to said cylinder, a closure for said aperture, and means for operating said closure from a point remote from said closure.

12. Message sheet feeding and retaining means for the copyholder of a facsimile scanner, comprising means on said copyholder designed to pierce and retain a flexible sheet in position on said copyholder, and means to receive and position a flexible sheet within reach of said first named means whereby the sheet will be pierced by said first named means and drawn on to said copyholder during movement thereof.

13. In a facsimile machine, a scanner comprising a rotatable cylinder, toothed members projecting from said cylinder to pierce and retain a flexible sheet closely in contact with the periphery of said cylinder, and a roller in contact with said cylinder adjacent said toothed members to smooth said sheet on said cylinder.

14. A facsimile telegraph machine including a scanner comprising a rotatable cylinder, toothed members on said cylinder for piercing and retaining a message sheet in close contact with the surface of said cylinder, a chute substantially tangential to said cylinder and having one end thereof positioned adjacent said cylinder whereby a flexible sheet passing through said chute towards the cylinder will be seized by said toothed members and wrapped upon said cylinder.

15. A facsimile machine including a scanner comprising a rotatable cylinder, toothed members projecting from said cylinder to pierce and retain a flexible sheet in contact with the periphery thereof, a message chute spaced from a line tangent to said cylinder and having one end thereof adjacent the periphery of said cylinder whereby a message sheet moved through said chute towards the cylinder will be seized by said toothed members and wrapped upon said cylinder during rotation thereof, a closure member for said message chute at its end opposite said cylinder, and means to operate said closure member from a remote point thereby to prevent the reception of a message sheet by said cylinder.

16. A facsimile telegraph system comprising in combination a scanning mechanism, a movable cylindrical copyholder therefor, means for feeding copy to said copy holder, and copy retaining means carried by said copy holder and actuated solely by operation thereof for securing copies thereon for scanning.

17. A facsimile telegraph system comprising in combination a transmitting device, a receiving device, a rotary copy holder for said transmitting device, a chute for feeding copy to said copy holder, means actuated automatically by movement of said copy holder to secure said copy in place thereon for scanning, and means responsive to a signal transmitted from said receiving mechanism for removing said copy from said holder.

18. A facsimile telegraph system comprising in combination a scanning mechanism, a movable copy holder therefor, means for delivering copy to said copy holder during movement thereof, and means actuated automatically by movement thereof for positioning and securing said copy thereon.

19. A facsimile telegraph system comprising in combination a scanning mechanism, a rotary cylindrical copy holder therefor, means for delivering copy to said copy holder during movement thereof, and means actuated by movement thereof for engaging said copy circumferentially thereof to position and secure said copy thereon.

20. A facsimile telegraph system including a communication circuit, a plurality of transmitting devices connected to said circuit, a receiving device connected to said circuit, a locking mechanism associated with each transmitting device for preventing operation thereof, and means responsive to a predetermined potential characteristic of said circuit for actuating said locking mechanisms.

21. A facsimile telegraph system including a communication circuit, a plurality of transmitting devices connected to said circuit, a receiving device connected to said circuit, a locking mechanism associated with each transmitting device for preventing operation thereof, and means for actuating said locking mechanisms from said receiving device.

22. A facsimile telegraph system including a communication circuit, a plurality of transmitting devices connected to said circuit, a receiving device connected to said circuit, a locking mechanism associated with each transmitting device for preventing operation thereof, and means actuated by operation of one of said transmitting devices for affecting the potential characteristic of said circuit, and means responsive to said potential characteristic for actuating the locking mechanisms on said other transmitting devices to prevent interfering operation thereof.

23. An automatic facsimile system comprising a scanning device, conveying means for delivering a message sheet to said scanning device, means in said scanning device for receiving said sheet when presented thereto in properly oriented position relative to said scanning device, means for automatically scanning said sheet, and means to reject said sheet when presented to said scanning device in other positions relative thereto.

24. An automatic telegraph system comprising a scanning mechanism, a chute for delivering to said mechanism a sheet having a beveled corner, means normally closing said chute against the passage of said sheet, said last means being operable by engagement with the beveled corner of said sheet when introduced into said chute in a predetermined position, to open said

chute and permit the passage of the sheet there-through.

25. An automatic telegraph system comprising a scanning mechanism, a chute for delivering to said mechanism a sheet having a beveled corner, and a yielding stop extending into said chute to block the passage of a sheet there-through, said stop adapted to be engaged and moved to inoperative position by the beveled corner of a sheet when introduced into said chute in a predetermined position relative to said mechanism, to permit the passage of said sheet there-through, but to engage and prevent the passage of a sheet introduced into said chute in other relative positions.

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