

Aug. 15, 1944.

G. H. RIDINGS

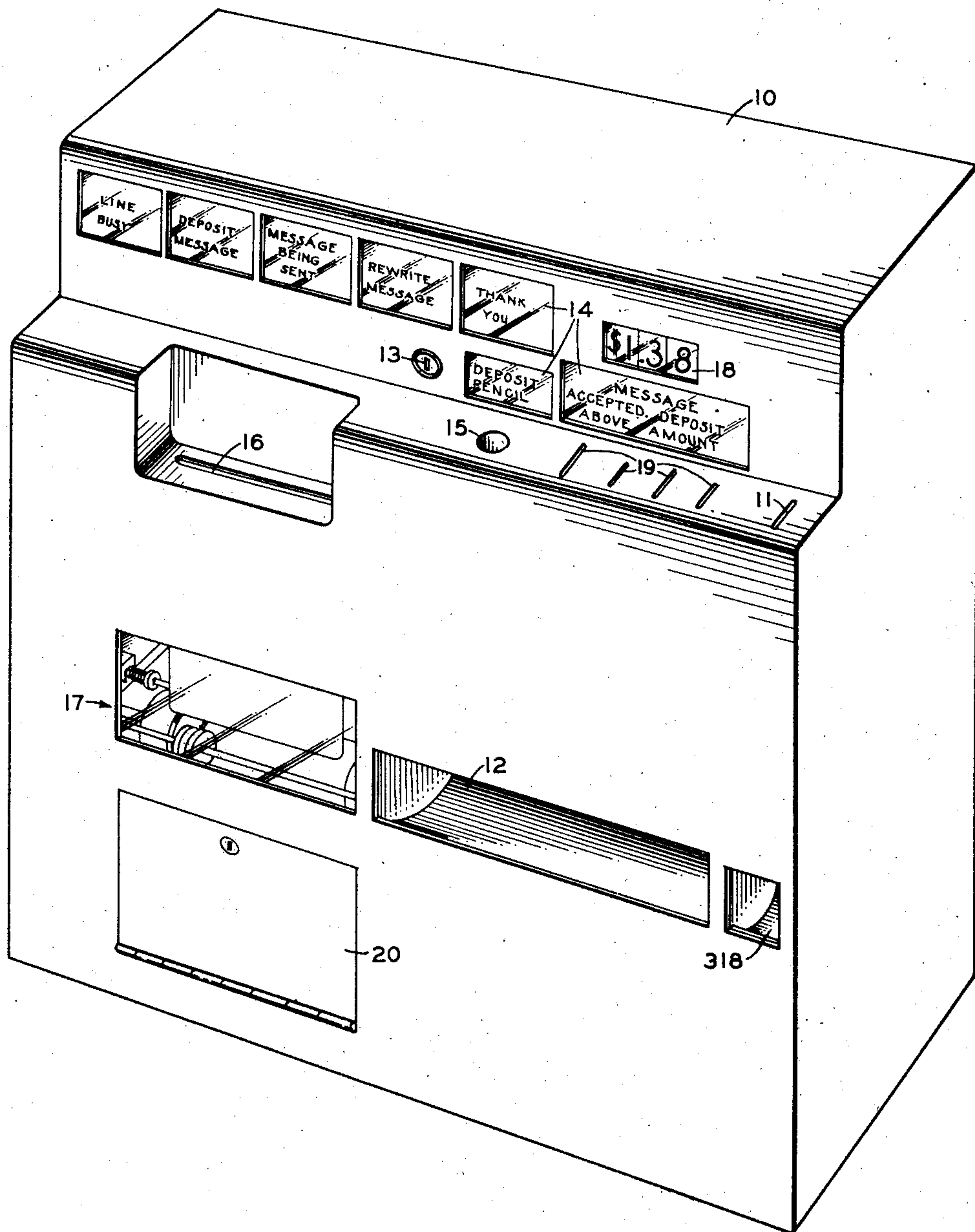
2,356,116

SYSTEM AND APPARATUS FOR FACSIMILE TELEGRAPHY

Filed Sept. 26, 1941

4 Sheets-Sheet 1

FIG. 1



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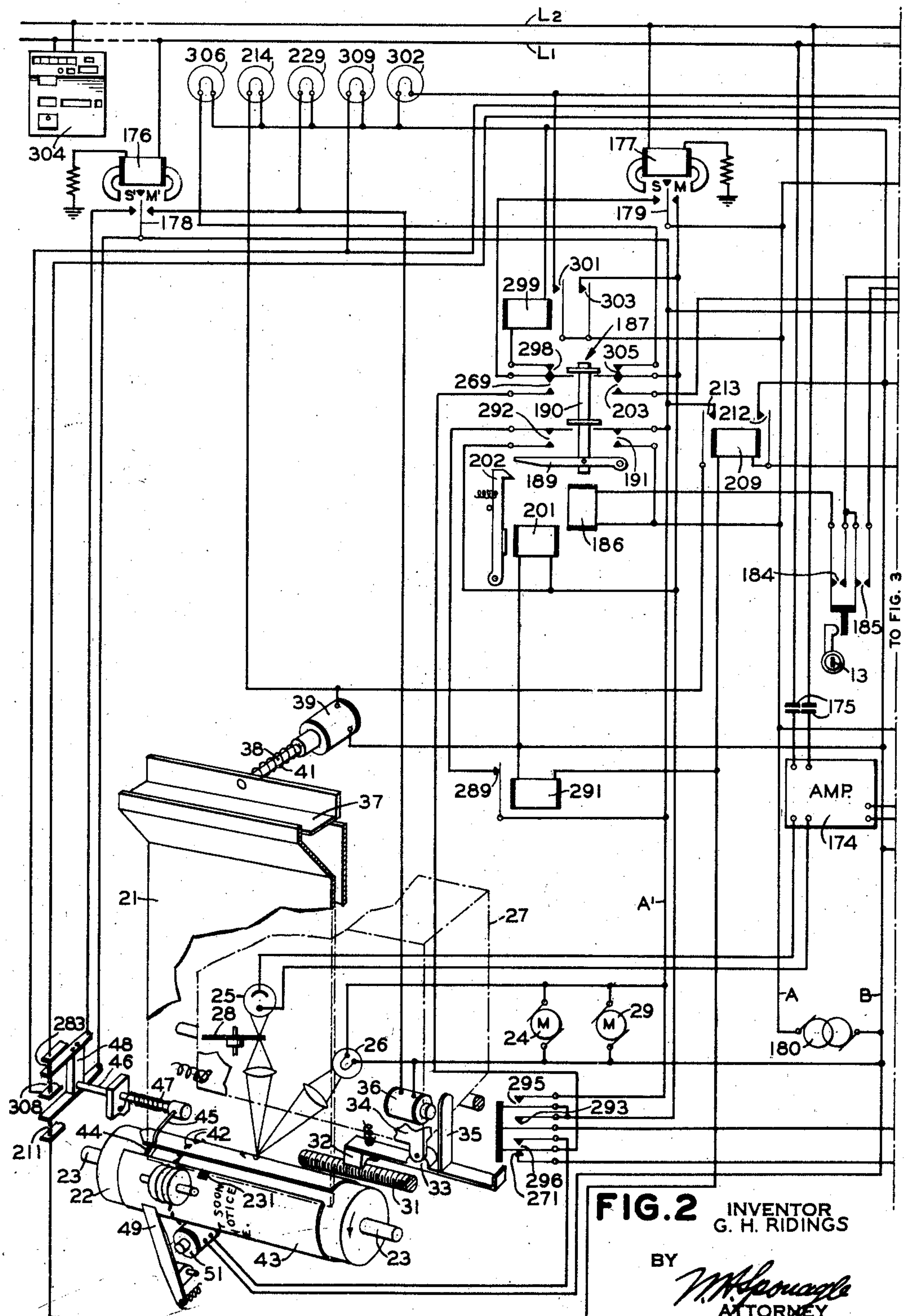
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SYSTEM AND APPARATUS FOR FACSIMILE TELEGRAPHY

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SYSTEM AND APPARATUS FOR FACSIMILE TELEGRAPHY

Filed Sept. 26, 1941

4 Sheets-Sheet 3

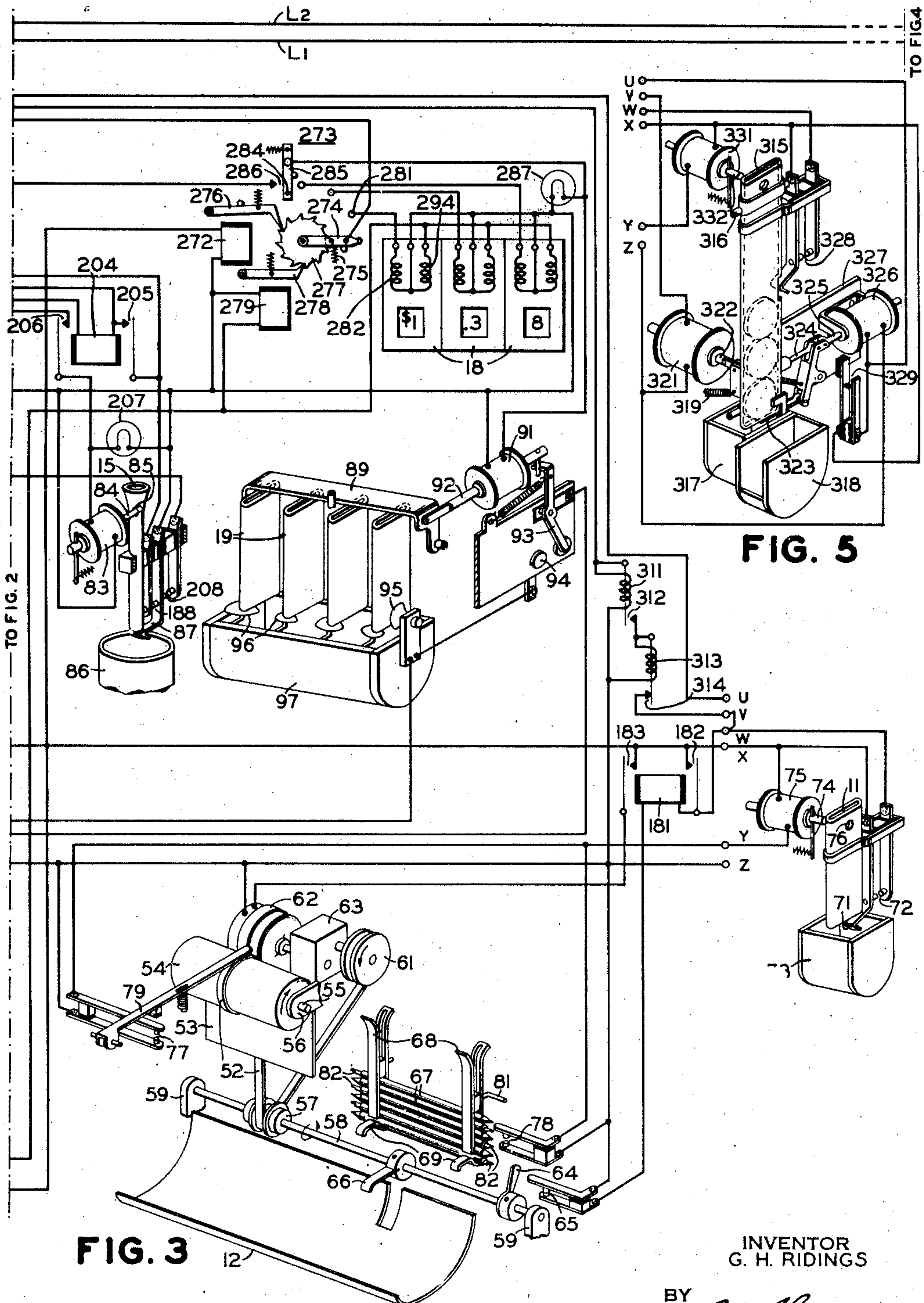


FIG. 5

FIG. 3

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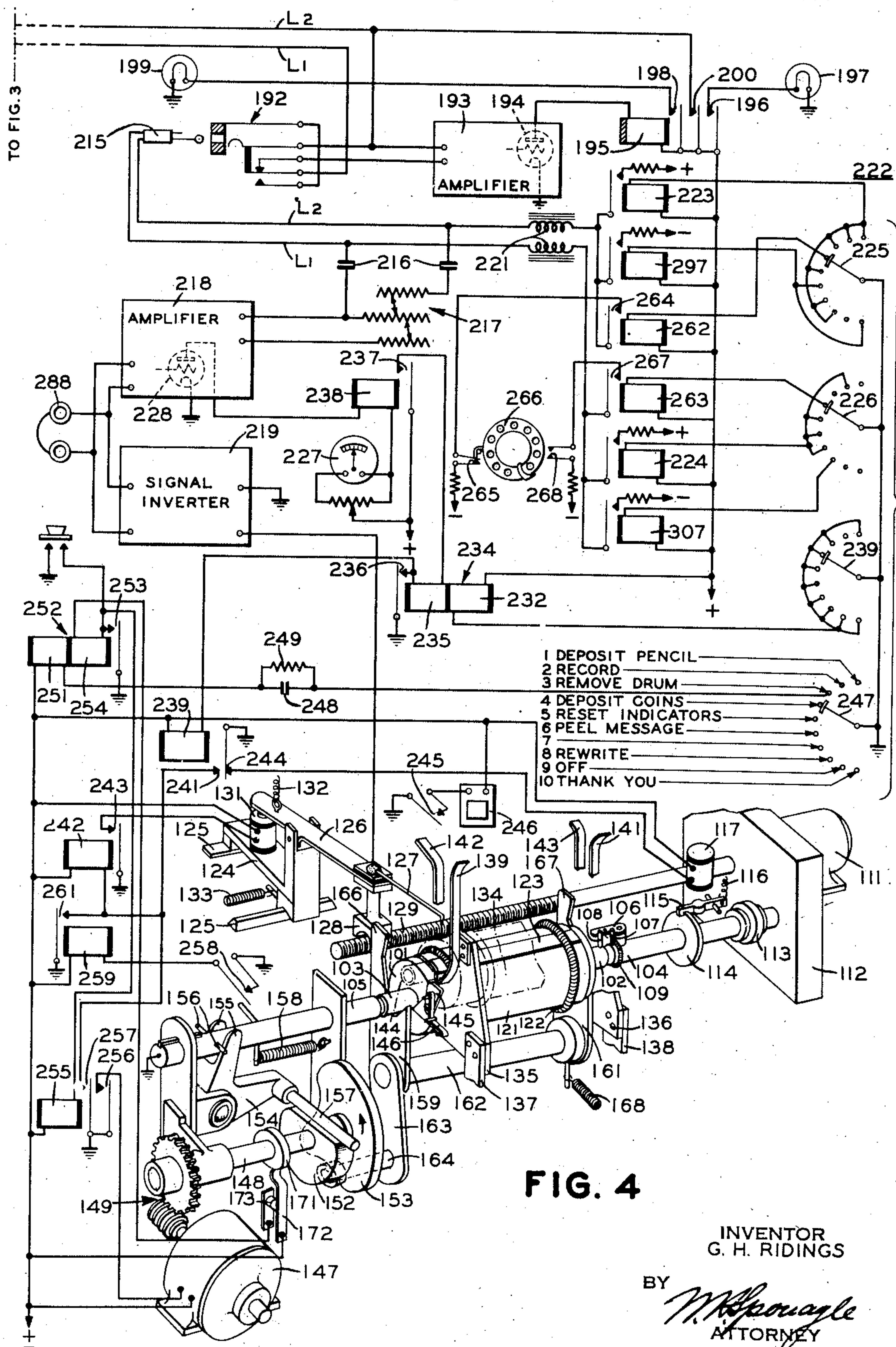
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SYSTEM AND APPARATUS FOR FACSIMILE TELEGRAPHY

Filed Sept. 26, 1941

4 Sheets-Sheet 4



UNITED STATES PATENT OFFICE

2,356,116

SYSTEM AND APPARATUS FOR FACSIMILE TELEGRAPHY

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Application September 26, 1941, Serial No. 412,405

19 Claims. (Cl. 178—6.6)

This invention relates to telegraph systems and particularly to facsimile systems capable of transmitting messages, pictures and other material in facsimile, and it should be understood the term messages as generally used herein is intended to cover all material capable of facsimile transmission.

An object of this invention is to provide a facsimile system constructed and arranged to make accessible to a customer the material for preparing a message and to then transmit the message to a central office receiving apparatus, or the like.

A further object is to provide an automatic facsimile system having means for indicating to and collecting from a customer the cost of any message the customer wishes sent.

A still further object is to provide an automatic facsimile system the operation of which is adapted to be started by a customer after he has made a preliminary deposit of a minimum amount of money.

Another object of the invention is to provide a facsimile system in which a customer, after procuring the material for preparing a message from a coin controlled dispensing mechanism, may be provided with additional material at no extra cost if for any reason the first message is unsuitable for recording purposes.

These and other objects which will be apparent to those skilled in the art are accomplished by the present invention, one embodiment of which is shown in the accompanying drawings, in which:

Fig. 1 is a perspective view of the transmitting apparatus;

Figs. 2 and 3 taken together illustrate diagrammatically the essential parts of the transmitting apparatus, together with the control circuits therefor;

Fig. 4 shows diagrammatically one type of recorder which may be employed, together with the control circuits therefor; and

Fig. 5 is a modified form of coin handling mechanism which may be employed at the transmitter.

In the present invention an automatic facsimile transmitting apparatus is connected by a communication circuit to a receiving apparatus arranged to automatically record in facsimile from the signal impulses transmitted thereto. Mechanism is provided at the transmitter to supply a customer, upon deposit of a minimum amount of money, with means for starting and operating the transmitting apparatus. As illustrated, this

device is arranged to supply a message blank and a pencil with which to prepare the message to be sent, together with a key for operating the transmitter.

The facsimile transmitting apparatus is located in a box adapted to be mounted on any suitable support such, for example, as a wall, a pedestal or the like. The transmitting apparatus may be similar to that described in the application of Wise et al., Serial No. 269,314, filed April 22, 1939, now Patent No. 2,262,715, granted Nov. 11 1941, for "System and apparatus for automatic facsimile telegraphy" and reference is made thereto for a detailed mechanical description thereof. In the present disclosure only such mechanical details are shown as are necessary to a complete understanding of this invention.

Transmitting apparatus

The transmitting apparatus is housed in a box 10 which may be placed in any convenient location for operation by a customer. A coin slot 11 is provided for the reception of a coin of predetermined minimum denomination which the customer may use to secure a blank sheet and a pencil. This material is deposited by mechanism to be described in a pan 12 which is accessible to the customer through a suitable opening formed in the housing 10. After the message has been inscribed on the blank, a key which may be attached to the pencil is inserted in a lock 13 to start the transmitting apparatus. The transmitter is also provided with a plurality of signs or legends 14 which are adapted to be selectively illuminated so as to instruct him in the manipulation of the apparatus. When the transmitter has been operatively conditioned by means of the key and lock 13, the "Deposit pencil" sign is illuminated adjacent to a chute 15 which is provided for the reception of the pencil after the customer has finished with it. Following the deposit of the pencil in the chute 15, a slot 16 which, prior to the deposit of the pencil, has been blocked, is opened so that the customer may insert the message bearing sheet therein. The sheet is conveyed by a chute, in the manner set forth in the copending application referred to, to the scanning mechanism 17, a portion of which is visible to the customer through a window formed in the housing 10 for that purpose. When the message has been transmitted and examined by the receiving operator who computes the cost of forwarding it to its ultimate destination, this additional cost is registered by means to be disclosed hereinafter on the indicators 18. Also,

the "Message accepted—deposit above amount" sign is illuminated. The customer then deposits the correct amount in the appropriate coin slots 19 provided for this purpose. Following the acceptance of the message, the sheet on which it is inscribed is removed from the scanning apparatus 17 and deposited in a bin which is accessible only to authorized persons through a locked door 20.

For the description of the rest of the transmitting apparatus and its operation reference will be made particularly to Figs. 2 and 3. A chute 21 of elongated boxlike form extends from the slot 16 (Fig. 1) to a point adjacent a copyholder or message scanning cylinder 22 which is mounted on a shaft 23 adapted to be driven through suitable gearing by a synchronous or other speed controlled motor 24. A photocell 25, an exciter lamp 26 and appropriate optical mechanism forming the scanning apparatus are mounted on a carriage 27 which is movable longitudinally of the rotary cylinder 22 to scan a message mounted thereon. A serrated disc 23 constituting a light chopper is included as part of the scanning mechanism and is rotated by a motor 29.

The scanning carriage is moved longitudinally of the cylinder 22 by a rotary feed screw 31 which is also driven by the synchronous motor 24 and is adapted to be connected to the carriage by a half-nut 32 formed at one end of a lever 33 which is pivoted on a supporting bracket 34 on the carriage. An armature 35 is attached to the lever 33 so that the latter may be moved into engagement with the feed screw 31 by means of a half-nut operating magnet 36.

The chute 21 extends from the slot 16 downwardly to a point adjacent the cylinder 22 and is positioned substantially tangent thereto. The upper end or mouth of the chute is normally closed by a slide 37 connected to the end of an armature 33 of a chute closure magnet 39. A spring 41 normally holds the slide in chute closing position when the magnet is deenergized.

The scanning cylinder 22 is provided with a circumferential row of teeth 42 by means of which a message sheet 43 which is fed downwardly through the chute 21 is seized and wrapped around the scanning cylinder as described in the copending application referred to. The sheet is so formed as to require its insertion in the chute in the manner necessary to insure its being properly positioned on the cylinder for correct scanning of the subject matter inscribed thereon.

The scanning cylinder is provided with a circumferential groove 44 in which an arm 45 travels when there is no sheet mounted on the cylinder. The arm 45 is fastened to the end of a rock shaft 46 and is normally urged into groove 44 by a spring 47. The other end of the rock shaft 46 has affixed thereto a contact arm 48. As soon as a message bearing sheet is mounted on the scanning cylinder 22, the arm 45 is lifted from the groove 44 and bears on the surface of the sheet, thereby operating the contacts controlled by the arm 48 for a purpose to be described hereinafter.

When the message inscribed on the sheet has been scanned and the signals generated by the scanning operation transmitted to a receiver for recording, the sheet 43 is removed from the scanning cylinder 22 by means of a stripper blade 49. A stripper or peel magnet 51 when energized moves the blade 49 so that the upper end thereof is moved into position against the sheet 43. The

dimensions of the sheet are such that a gap is left between the edges thereof when it is wrapped around the cylinder so that when the end of the stripper blade 49 is moved against the cylinder, the upper edge thereof slips under one edge of the message sheet as it is rotated, thereby pulling the sheet away from the teeth 42 and permitting the sheet to fall into a bin or other convenient receptacle.

The dispensing mechanism and the coin controlled apparatus is illustrated diagrammatically in Fig. 3 to which reference will now be had. The supply of blank sheets is formed by laying out in slightly overlapping relation on a belt 52 a series of blanks such as 53. The blanks and the belt are then rolled up to form a supply roll 54 around a mandrel 55 which is mounted for rotation in a pair of spaced brackets such as 56. As the belt 52 leaves the supply roll 54, it is passed around a pulley 57 mounted on a shaft 58 journaled at the ends thereof in brackets 59. The belt 52 is then attached to a takeup reel or pulley 61 which is driven by a motor 62 through suitable reduction gearing 63.

Also attached to the shaft 58 is a cam 64 by means of which a pair of contacts 65 is periodically opened to control the motor 62 in a manner to be described. The shaft 58 also has attached thereto a finger 66 which is adapted to cooperate with a supply of pencils 67 stacked in a rack 68 which has formed at the bottom thereof a pair of yieldable clips 69.

When the motor 62 is started in response to the deposit by a customer of a coin of predetermined denomination, the belt 52 is drawn from the supply roll 54 by the takeup reel 61 until one of the blanks 53 has been unwrapped sufficiently to be freed from the roll. The sheet thus freed falls into the pan 12 from which it may be taken by the customer. At the same time the shaft 58 in making one complete revolution moves the finger 66 so as to force the lowermost pencil of the supply 67 from the yieldable clips 69 from which it is permitted to fall into the pan 12 along with the sheet. After this sequence of operation the cam 64 opens the contact 65 thereby stopping the motor.

In order to start the motor 62, the customer deposits a coin in the slot 11 by which it is conveyed downward to strike a switch arm 71 moving it to close a contact 72. The coin then falls into a receptacle 73. The closure of the contact 72 starts the paper and pencil dispensing mechanism in a manner to be subsequently described. A plunger 74 forms the movable core of a solenoid 75 which when energized moves the plunger through suitable openings 76 formed in the slot 11 adjacent the mouth thereof, thereby blocking the coin chute and preventing the insertion of a coin therein. This solenoid is controlled either by contact 77 or by contact 78. The contact 77 is closed in response to the downward movement of a pivoted arm 79, the free end of which is in constant contact with the outside of the roll 54. This mechanism is arranged so that when the supply roll becomes exhausted the contact 77 is closed to block the coin chute 11. Similarly, the contact 78 is closed by means of a sliding member 81 which is maintained in contact with the uppermost one of the pencils 67. When the supply of pencils is exhausted, the contact 78 is closed to disable the coin slot 11.

Each one of the pencils 67 is provided with a

key 82 which is employed to operate the lock 13 (Fig. 2) by means of which the transmitting apparatus is started. The starting of this apparatus is communicated by suitable signals to the receiving station to operate apparatus thereat to transmit another signal back to the transmitting station causing the "Deposit pencil" sign to be illuminated. A solenoid 83 having a movable plunger 84 cooperating with an opening 85 in the pencil chute 15 is provided to normally block the chute. Simultaneously with the lighting of the "Deposit pencil" sign, the solenoid 83 is energized to unblock the pencil chute. The pencil is then deposited by the customer in the chute 15 and in passing therethrough to a receptacle 86 strikes a switch arm 87 to operate a set of contacts. These contacts perform control functions which will be described more fully hereinafter.

Following the transmission of the message and its inspection at the recording station by an operator, the group of registers 18 is operated by the receiving operator to indicate the additional amount of money to be deposited by the customer. Simultaneously with this operation the "Message accepted—deposit above amount" sign is illuminated and a closure member 89 is withdrawn from the mouths of the coin chutes 19. The movement of the closure member is effected by energizing the solenoid 91 to actuate its armature 92 which also causes the movement of a switch arm 93 into engagement with a contact 94. This latter operation connects a microphone 95 into the sending circuit. The microphone is located adjacent the lower ends of the coin chutes 19 so as to pick up the sounds made by the coins striking bells 96 in passing from the chutes 19 into a receptacle 97. Each one of the coin chutes 19 is dimensioned to take a different denomination of coin and each one of the bells 96 has a distinctive tone so that both the number and denomination of the coins deposited may be determined by the receiving operator who is listening while the customer deposits the additional money required.

Recording apparatus

The receiving or recording apparatus is usually installed at a central office. It is shown diagrammatically in Fig. 4 and in complete detail in Patent 2,255,868, granted to R. J. Wise et al. on September 16, 1941, for "System and apparatus for facsimile telegraphy." The blanks upon which the messages are to be recorded are mounted on recording cylinders which are inserted in the receiving apparatus one at a time. The recording cylinder is rotated and during rotation a marking stylus which bears on the recording blank and has impressed thereon electrical impulses received over the communication circuit, scans the blank in a direction parallel to the axis of the recording cylinder. Mechanism is provided for removing a recording cylinder and blank after a message recording operation, and replacing them with a fresh blank and cylinder. Mechanism is also provided for storing a plurality of blank bearing recording cylinders in a magazine from which they can be automatically fed in succession to the receiving apparatus.

As illustrated in Fig. 4, a cylinder 101 is shown in position. It has axial arbors 102 and 103 by which it is suspended for rotation between centering spindles 104 and 105, respectively. An arm 106 is pivoted on the spindle 104 and extends in the direction of the cylinder to engage a pin 107 projecting radially from the spindle and also

a pin 108 extending radially from the arbor 102. The arm 106 is urged into engagement with the pins by a spring 109, one end of which is attached to the arm and the other end to the spindle 104.

This device serves to rotate the recording cylinder 101 when the spindle 104 is rotated. The spindle is rotated by a motor 111 through suitable reduction gearing 112 and a friction clutch 113 which permits stopping rotation of the spindle 104 without stopping the motor. A disc 114 having a notch formed in its periphery is secured to the centering spindle 104. An arm or latch 115, pivotally mounted on a support (not shown) engages the notch when acted upon solely by a retractile spring 116. An electromagnet 117, termed the framing magnet, is adapted when energized to lift the latch 115 out of the disc notch and permit rotation of the centering spindle 104.

A recording blank 121 is wrapped around the recording cylinder 101, and is secured thereto by suitable means such, for example, as the elastic rings or holding members 122. The blank is mounted on the cylinder so that the location of the lap 123 of the blank edges invariably bears a definite relation to the location of the notch in the disc 114. This arrangement is to secure proper phasing between the receiving apparatus and the transmitting apparatus, as will be described more fully hereinafter.

A scanning carriage 124 is slidably mounted on guide rails 125 parallel to the axis of rotation of the cylinder 101. A lever 126 pivotally supported on the carriage carries at one end a recording stylus 127 and a half nut 128 adapted to engage a threaded feed screw 129 rotated at a suitable speed by the motor 111 through the reduction gearing 112. The other end of the lever 126 is operatively associated with a half nut magnet 131. When the latter is deenergized, a spring 132 moves the lever to cause the half nut to engage the feed screw, and the stylus to contact a recording blank on the cylinder 101. As shown in Fig. 4, engagement of the half nut and feed screw moves the carriage 124 to the right against the tension of a retractile spring 133. At the end of a scanning and recording operation, energizing the half nut magnet 131 disengages the half nut from the screw and the carriage is returned to its initial position, as illustrated, by the spring 133.

As illustrated, the recording machine has facilities for automatically discharging a recording cylinder after a recording operation and for feeding a fresh cylinder and blank into the machine. A magazine or supply of fresh cylinders is provided (one of which 134 is indicated in dotted lines). A rack for storing fresh cylinders is formed by two rail members 135 and 136, mounted on a pair of supporting brackets 137 and 138, respectively, and spaced apart slightly more than the length of a cylinder 101. A pair of resilient upright members 139 and 141 are secured to the rail members 135 and 136, respectively, and cooperate with an auxiliary pair of spaced rails 142 and 143 respectively, to guide the stored cylinders toward the scanning device. The cylinder 134 next to be positioned in the machine is held in readiness by having its arbors 144 supported by the upper ends of a pair of detents, one of which 145 is shown. Each detent is pivoted at its lower end on the associated rail member and is normally held in cylinder restraining position by a resilient member such as a spring 146.

At the end of a scanning and recording operation a cylinder changing motor 147 is operated to

drive a shaft 143 through a worm and gear drive 149. Cams 152 and 153 are secured to this shaft. A pivoted bell crank 154 has a fork 155 on one end engaging a pair of pins 156 on the centering spindle 105, and a cam follower 157 on the other end engaging the cam 152. Obviously, rotation of the cam 152 moves the spindle longitudinally against the tension of a spring 158.

Longitudinal movement of the spindle withdraws it from engagement with the cylinder arbor 103 permitting the cylinder to drop onto a cradle formed by grooves in a pair of members 159 and 161, mounted on a rocker shaft 162 journaled in any convenient bearings. Means for rocking the shaft includes a crank arm 163 secured thereto and having a cam follower 164 secured to its end and engaging the cam 153. Hence, rotation of the shaft 148 by the motor 147 causes the cam 153 to rock the shaft 162 clockwise as viewed in Fig. 4, thereby imparting a similar movement to the cradle members 159 and 161. This moves the latter outwardly until a position is reached in which the cylinder 101 rolls by gravity from the cradle recesses into any suitable receptacle, conveyor or the like. Further rocking movement moves extensions 165 and 167 of the cradle members 159 and 161, respectively, into engagement with the associated detents 145 which are thus moved out of the downward path of the arbors of recording cylinders stacked in the racks 139, 142 and 141, 143, permitting the next cylinder to drop so that its arbors rest on the upper edges of the extensions arms 166 and 167. Continued rotation of the cam 153 returns the cradle members to upright position under influence of a spring 168 connected to one of the cradle members. This withdraws the arms 166 and 167 permitting the cylinder arbors to roll into the cradle recesses and the fresh cylinder is carried into position to be engaged by the centering points on the spindles 104 and 105. When in the cradle recesses the axis of the cylinder lies slightly below the center of rotation provided by the centering spindles but the conical form of the supporting centers lifts the cylinder when the spindle 105 is moved inwardly. The cylinder is thereby held free to rotate.

Operation of the cylinder changing cycle is initiated by applying power to the motor 147 after a recording operation by means to be more fully described hereinafter. A cam 171 is so oriented on the cam shaft 148 with respect to the cams 152 and 153 that, at the completion of a cylinder changing cycle, it operates an associated switch 172 to momentarily break the contacts 173. Through means to be described, this cuts off power to the motor. The arrangement is such that before the motor is brought to a stop by its braking system, the cam 171 moves sufficiently to permit reclosing of the contacts 173.

Communication circuit

The communication circuit connecting the transmitting apparatus and the receiving apparatus comprises a pair of conductors L1 and L2 which are used simultaneously for the transmission of the alternating current facsimile signals or message impulses and the direct current control signals by which the operation of the transmitting and receiving apparatus is controlled.

The facsimile signals originate at the photoelectric cell 25 (Fig. 2) which is connected to an amplifier 174, the output circuit of which is connected through a pair of blocking condensers 175 to the conductors L1 and L2. The purpose of the

blocking condensers is to isolate the alternating current facsimile signals from the direct current control signals. The polarity of the direct current potentials which are applied to the conductor L1 is controlled by apparatus at the receiving station for the purpose of operating a polar relay 176 connected to this conductor at the transmitting station. Similarly, the polarity of the direct current potential applied to the conductor L2 is controlled by the apparatus at the receiving station for the purpose of operating a polar relay 177 connected to this conductor at the transmitting station. Each of these polar relays is of the three-position type whereby the tongue is moved to one extreme contact in response to one polarity of potential, to the other extreme contact in response to the opposite polarity of potential, and to a mid-position disengaged from both of the extreme contacts in response to a no-current condition. The tongue 178 of the relay 176 cooperates with contacts M' and S'. The tongue 179 of the relay 177 cooperates with contacts M and S.

It should be understood that a number of separate transmitting mechanisms will normally be connected to a single communication circuit in a party line system and that each transmitter is adapted to be locked against operation when any other transmitter on the same line is operating, as will be described hereinafter and as is fully set forth in the copending application, Serial No. 269,314.

Operation

The operation of the system will be described in connection with Figs. 2, 3 and 4 taken together. It is assumed that power is supplied at the transmitting apparatus by connecting a suitable source of alternating current 130 to the bus bars A and B. In connection with the description of Figs. 2 and 3, the bus bar A' is an electrical extension of the bus bar A when the transmitting apparatus is operatively conditioned.

To obtain a blank and a pencil the customer inserts a coin of predetermined denomination in the slot 11. In passing through the chute into the receptacle 73 the coin completes a circuit which may be traced from the A bus bar, through contact 72, through the winding of relay 181 and contacts 65 to the B bus bar. Relay 181 operates and locks at a make contact 182. Contact 183 completes a circuit for the operation of the motor 62. The dispensing apparatus thus is started upon the cycle of operation previously described to supply a blank 53 and a pencil 67 to the customer, following which the contact 65 is momentarily opened to unlock relay 181 and stop the motor 62.

The customer then prepares the blank in the usual manner and, by means of the key 82 mounted at one end of the pencil, operates the lock 13. This operation closes contacts 184 and 185 causing the energization of the operating winding 186 for the multicontact switch 137. The operating circuit for this winding may be traced from the A bus bar through the winding, the closed contact 184 and contact 183 adjacent the pencil chute 15 to the bus bar B. The energization of the multicontact switch operating winding 186 causes the downward movement of the armature 189 thereby moving the switch arm 190 to control the plurality of contacts associated therewith. Closure of one of these contacts 191 connects the A bus bar to the A' bus bar. Connected between the A' bus bar and the B bus bar is the

synchronous driving motor 24 for the transmitting apparatus, the chopper motor 29 and the exciter lamp 26 of the optical scanning apparatus. The starting of these motors causes the drum 22 to revolve and light from the lamp 26 to be reflected from the revolving drum onto the photocell 25, the light being periodically interrupted by the light chopper 28. Thus an alternating current carrier current is generated and, after being amplified by the amplifier 174, is transmitted over the line conductors L1 and L2 to the receiving station.

At this station, the line jack 192 being in a normal condition, the line conductors L1 and L2 are connected to a line amplifier 193. One of the vacuum tubes 194 of the line amplifier is connected to the positive terminal of a grounded source of plate current through the winding of a relay 195. Thus, when the amplifier is operated by the receipt of the carrier signaling frequency, the relay 195 is operated. One of the contacts 196 of this relay operates a signal lamp 197 to attract the attention of an attendant to the fact that a call has been received. Another contact 198 operates a second signal lamp 199 which is located adjacent the jack 192 to identify the line circuit over which the call is being made. Another contact 200 of the relay 195 connects positive direct current potential to the line conductor L2.

The effect of this positive potential on line conductor L2 is to move the armature 179 of the three position line relay 177 at the transmitter from its mid-position into engagement with its marking contact M. Thus the bus bar A is connected to one terminal of a locking winding 201, the other terminal of which is connected to the B bus bar. This winding becomes energized to attract its armature 202 which has formed adjacent the upper end thereof a hooked portion which is adapted to move over the top of the armature 189, thereby securing this member in its lower position independently of the operating winding 186. Also, the engagement of armature 179 of relay 177 with its marking contact M closes a circuit from the A bus bar through this contact, through contact 203 of the multicontact switch, the winding of relay 204, the key controlled contact 185, the contact 188 associated with the pencil chute 15 to the B bus bar. Relay 204 is operated and becomes locked through its make contact 205 so that it remains operated independently of the key controlled contact. The closure of contact 206 of this relay connects the A' bus bar to one terminal of the "Deposit pencil" lamp 207 and to one terminal of the pencil chute control magnet 83. The other terminals of these devices are connected to the B bus bar. Thus the pencil chute 15 is unblocked and the "Deposit pencil" sign is illuminated. Since the multicontact switch 187 and the relay 204 are locked up independently of the key controlled contacts 184 and 185 respectively, the key may be removed from the lock 13 and the pencil deposited in the chute 15.

The passage of the pencil through the chute into the receptacle 86 momentarily opens contact 189 thereby releasing relay 204 to extinguish the "Pencil deposit" lamp 207 and to deenergize the chute control magnet 83. At the same time the pencil momentarily closes contact 208 thereby closing the operating circuit for relay 209. This circuit may be traced from the A' bus bar by way of armature 178 of line relay 176 through the closed drum contact 211, through

the winding of the relay 209 and the contact 208 to the B bus bar. Closure of contact 212 of relay 209 locks the relay independently of the operating circuit. Also, closure of a make contact 213 connects the A' bus bar to one terminal of the message chute magnet 39 and to one terminal of the "Deposit message" lamp 214. The other terminals of these devices are connected to the B bus bar. Thus the "Deposit message" sign is illuminated and the closure 37 is removed from its blocking position, thereby providing access to the chute 21 from the slot 16 formed in the housing 10 of the apparatus.

The customer then deposits the sheet bearing the inscribed message into the chute 21 by means of which it is conveyed to the scanning apparatus where it is seized by the teeth 42 and wrapped upon the drum 22 in the manner set forth in the copending application Serial No. 269,314. When the sheet 43 has been completely mounted upon the cylinder 22, the arm 45 is forced out of the groove 44, thereby opening the drum contact 211. This deenergizes relay 209 causing the chute magnet 39 to be deenergized and the "Deposit message" lamp to be extinguished.

While these operations are being performed at the transmitting station, an attendant at the receiving station responding to the call indicated by the illumination of lamps 197 and 199 inserts a plug 215 into the line jack 192 which is effective to connect recording and control apparatus to the line conductors L1 and L2 and to disconnect the line amplifier 193 and its associated equipment from the line conductors. Thus the line conductors L1 and L2 are connected through a pair of blocking condensers 216 and through a power level adjustment pad 217 to the input side of an amplifier 218. The output of the amplifier 218 is connected through a signal inverter 219 to the recording stylus 127.

The line conductors L1 and L2 are also connected to the control signaling apparatus through a pair of inductances or choke coils 221. The control apparatus consists of a plurality of relays, the contacts of which apply signaling potentials to the line conductors and which are themselves controlled by a rotary switch 222. The rotary switch is made up of four levels, each of which is provided with ten contact studs and a movable arm for cooperation therewith. The four contact arms are moved simultaneously and each is provided with a bridging wiper whereby connection is made with each of the studs before the previous connection with another of the studs is broken.

It should be noted that while the rotary switch is in its No. 1 or idle position, relay 223 is energized and relay 224 is deenergized under the respective control of switch arms 225 and 226. Thus when the plug 215 is inserted in the line jack 192, the make contact of relay 223 connects positive potential to line conductor L2 leaving the line conductor L1 with no direct current potential applied thereto. These are the signaling conditions in effect before the plugging up operation and it is seen that they are not disturbed when this operation is performed.

After having inserted the plug 215 into the line jack 192, the receiving attendant adjusts the power level of the received signals by means of the pad 217. He is aided in making this adjustment by a meter 227 connected in the output circuit of one of the amplifier tubes 228. This adjustment is made for the signals generated by the transmitter in scanning the heading of the

blank from which the transmission is to be made.

After securing the proper adjustment of the power of the received signals, the receiving attendant moves the rotary switch 222 to its No. 2 position for recording. Thus by means of contact arms 225 and 226 of this switch in cooperation with their No. 2 studs, both relays 223 and 224 are energized, thereby connecting positive potential to line conductor L1 as well as L2.

At the transmitting station this positive potential on conductor L1 is applied to the three position polar relay 176 thereby moving its armature 178 from its mid-position into engagement with its marking contact M'. Thus a circuit is closed from the A' bus bar through the marking contact of relay 176 to one terminal of the "Message being transmitted" lamp 229 and also to one terminal of the half-nut magnet 36. The other terminals of these devices are connected to the B bus bar, thus causing them to be energized. The energization of the half-nut magnet 36 causes the half-nut 32 to become energized with the feed screw 31 thereby imparting a horizontal movement to the carriage 27 to initiate scanning of the message sheet 43. As soon as the scanning operation has progressed sufficiently to cause the impingement of the light spot upon a black spot 231 placed adjacent one edge of the blank 43, an abrupt decrease in the amplitude of the carrier signal generated is effected.

At the recording station as long as the rotary switch 222 is in its No. 1 position, winding 232 of relay 234 is energized. Also, winding 235 of this relay is energized through a circuit which extends from ground through the make contact 236 of this relay, through the winding 235 and make contact 237 of relay 238 to positive potential. As soon as the rotary switch 222 is moved to its No. 2 position, the switch arm 239 in moving off its No. 1 stud opens the circuit of winding 232 of relay 234. However, this relay remains operated under the control of its left hand winding 235. But, as soon as the amplitude of the facsimile carrier signal is decreased in the manner described, the relay 238, being in the output circuit of one of the amplifier tubes 228, is momentarily deenergized to open its make contact 237. Thus the left hand winding 235 of relay 234 is also deenergized permitting the opening of contact 236. This causes the ground to be removed from the operating circuit of relay 239. This relay in releasing opens its make contact 241 thereby deenergizing relay 242. This latter relay in releasing opens its make contact 243 to interrupt the operating circuit for the half-nut magnet 36. Thus the half-nut 32 is lowered into engagement with the feed screw 31 and the recording stylus 127 is brought into engagement with the surface of the recording sheet 121. In addition, the release of relay 239 effects the engagement of its back contact 244 to energize the phasing magnet 117 thereby lifting the latch 115 out of the notched disc 114 to permit rotation of the copyholder mechanism. Thus the recording apparatus is started upon a scanning operation simultaneously with the initiation of scanning by the transmitting apparatus.

When the recorder carriage 124 has traveled far enough to the right, as viewed in Fig. 4, to completely record the transmitted signals, it closes a contact 245 to operate a buzzer 246 by means of which the attendant is informed that recording has been completed. The attendant then moves the rotary switch 222 to its No. 3

position. Switch arm 239 on its third stud re-energizes winding 232 of relay 234 to reoperate this relay. Relay 234 in turn reoperates relay 229 which deenergizes the phasing magnet 117 to stop rotation of the copyholder 121. The operation of relay 239 also reoperates relay 242 to release the stylus 127 and the half-nut 128 permitting the spring 133 to return the carriage 124 to its starting position. The fourth arm 247 of the rotary switch 222 connects a ground to a circuit which includes a serially connected condenser 248 shunted by a relatively high resistance 249 and also the left hand winding 251 of a relay 252. The charging current taken by the condenser is sufficient to energize the winding 251 to operate the relay 252. The closure of the make contact 253 of this relay closes a circuit through the right hand locking winding 254 which also includes the cam contact 173. The relay is thus locked in its operated position independently of the winding 251. After the condenser 248 has become completely charged, the current which continues to flow through the winding 251 is limited by the resistance 249 to a value which is insufficient to maintain the relay 252 in its operated condition. The closure of contact 253 also completes the operating circuit of a relay 255. This relay in operating closes a contact 256 to energize the drum changing motor 147 to start a drum changing cycle as previously described. A second contact 257 of relay 255 is also closed to complete an auxiliary operating circuit for the relay 242 so that this relay is prevented from releasing to initiate a scanning movement of the carriage 124 while a copyholder change is being made. At the completion of a drum changing cycle the contact 173 is momentarily opened, as described, and thus interrupts the locking circuit through the winding 254 of relay 252 long enough to permit the release of this relay.

In the event that a fresh copyholder is not installed in the recording apparatus during a drum changing cycle, the centering spindle 105 is permitted to move far enough to the right, as viewed in Fig. 4, to close a contact 258 which completes the operating circuit of a relay 259. The make contact 261 of this relay then maintains the relay 242 operated to prevent the starting of a scanning operation.

The movement of the rotary switch 222 to its No. 3 position also performs signaling functions over the line conductors L1 and L2. Relay 223 is maintained operated, thereby holding positive potential on line conductor L2. Relay 224 is released, thereby disconnecting positive potential from line conductor L1.

The removal of positive potential from line conductor L1 deenergizes relay 176 at the transmitter, thereby disengaging the armature 178 from its marking contact M'. Thus, the operating circuit of the half-nut magnet 36 is interrupted, effecting the release of the half-nut 32 from the feed screw 31 and permitting the return of the carriage 27. The "Message being transmitted" lamp 229 is also extinguished.

At the recorder the attendant removes the sheet 121 bearing the recorded message and notes the destination, the number of words, and other pertinent data of the message necessary for the computation of the additional charge to be made for forwarding it to its destination. When the additional charge has been determined, the attendant moves the rotary switch 222 to its No. 4

position. In this position the contact arm 247 is disengaged from its No. 3 contact, thereby restoring the operating circuit for relay 252 to its normal condition. The relay 234 is maintained operated under the control of the contact arm 239 in the No. 4 and all higher numbered positions of the rotary switch. The disengagement of contact arm 225 from its No. 3 contact releases relay 223, thereby disconnecting positive potential from line conductor L2. The engagement of contact arms 225 and 226 with their respective fourth contacts operates respectively relays 262 and 263. A make contact 264 of relay 262 connects line conductor L2 through an off-normal contact 265 of an impulse transmitting dial 266 to negative potential. Make contact 267 of relay 263 connects line conductor L1 to negative potential under the control of the dial impulse transmitting contacts 268.

The negative potential which is thus connected to line conductor L2 operates the armature 179 of the transmitter line relay 177 to its spacing contact S. A circuit is thus completed which may be traced from the A bus bar through the spacing contact of relay 177, through contact 269 of the multi-contact switch 187, through contact 271 associated with the half-nut mechanism, through the winding 272 of a stepping magnet to the B bus bar. The stepping switch 273 with which the magnet 272 is associated comprises a rotary switch arm 274 which is normally urged by means of a spring 275 toward the position in which it is shown in the drawings. The arm 274 is thus maintained in its idle condition in contact with an idle stud. An operating pawl 276 is controlled by the stepping magnet 272 and cooperates with a ratchet 277 so that upon one downward movement of the operating pawl the arm 274 which is attached to the ratchet is moved counter-clockwise a distance of one stud. A retaining pawl 278 also cooperates with the ratchet 277 to maintain the ratchet and switch arm in the positions to which they have been last operated by the operating pawl. Thus, the switch arm 274 is moved step-by-step successively over its associated contacts by successive operations of the stepping mechanism. The retaining pawl 278 is arranged to be disengaged from the ratchet by a releasing magnet 279, thus permitting the restoration of the switch arm 274 to its normal idle position.

Upon the initial energization of the stepping magnet 272 as described, the switch arm 274 is moved into engagement with its first operating stud 281. A circuit is thus prepared to the operating winding 282 of the left hand indicator 18.

The recording operator then by means of the dial 266 transmits a number of negative impulses over line conductor L1 corresponding to the number of dollars of the additional charge. During the transmission of these impulses the off-normal contact 265 is open, thereby removing negative potential from line conductor L2, but following the transmission of the dial impulses this contact is again closed.

At the transmitter the negative impulses sent over the line conductor L1 effect successive momentary engagements between the armature 178 of line relay 176 with its spacing contact S'. During each engagement the A' bus bar is connected through the spacing contact of this relay, through drum contact 283, stepping switch arm 274 and its first operating contact 281, and through the operating winding 282 of the left

hand indicator 18 to the B bus bar. Thus, the dialed impulses are applied to the dollars indicator to step it to indicate the necessary amount. Each of the indicators may be constructed similarly to the stepping switch 273, being provided with operating and releasing windings. Following the dialing impulses over the line conductor L1, the negative potential is again applied to line conductor L2 by means of the off-normal contact of the dial transmitter to again close the spacing contact of transmitter line relay 177, thereby stepping the switch arm 274 to its second operating contact to which is connected the middle indicator 18. This indicator and the right hand indicator are operated in a similar manner by successive operations of the dial transmitter.

Following the dialing of the last group of impulses the final closure of the off-normal contact of the dial transmitter steps the switch arm 274 from its last operating contact and into engagement with an insulating stud 284 mounted on a switch arm 285 and located in the path of the stepping switch arm. This results in the closure of a contact 286 which connects the A bus bar to one terminal of a lamp 287 and one terminal of the coin chute closure magnet 91. The other terminals of these devices are connected to the B bus bar, thus causing their operation. The lamp 287 illuminates the "Message accepted—please deposit above amount" sign and the magnet 91 withdraws the closure 89 from over the coin chutes 19. The operation of the magnet 91 also effects the engagement of the switch arm 93 with its contact 94 thereby connecting the microphone 95 to the input side of the amplifier 174. As the customer deposits the coins in payment of the additional charge indicated, the number and denomination of the coins are detected by the microphone 95.

Signals corresponding to the sounds thus detected are transmitted to the recording station where the attendant by means of a telephone receiver 288 determines when the required amount of money has been deposited. He then turns the rotary switch 222 to its No. 5 position. In this position the switch arm 225 operates relay 223 to apply positive potential to line conductor L2 and switch arm 226 operates relay 224 to apply positive potential to line conductor L1.

At the transmitting station the line relays 176 and 177 are energized to operate their respective armatures 178 and 179 into engagement with their marking contacts M' and M respectively. It should be noted at this point that normally armature 179 is maintained in engagement with its marking contact M to connect the A bus bar to one terminal of the holding magnet 201 for the multi-contact switch 187. However, an additional lock for this switch is provided as long as there is a sheet mounted on the scanning cylinder 22. This circuit may be traced from the A' bus bar through a break contact 289 of a relay 291 and a make contact 292 on the multi-contact switch to the holding magnet 201. The operating circuit for relay 291 includes the drum contact 211 which is closed only when there is no sheet mounted on the cylinder. Consequently during the previously described dialing operations the multi-contact switch is maintained operated even though the armature 179 of relay 177 is disengaged from its marking contact M since at this time the sheet 43 is still mounted on the scanning cylinder 22.

The above described engagement of armature 179 with its marking contact M reconnects the

A bus bar with the multi-contact switch locking magnet 201. Also, the engagement of armature 178 with its marking contact M' reenergizes the half-nut magnet 36 in the manner described. A circuit is then established from the A bus bar through marking contact M of relay 177, through the half-nut contact 203 to one terminal of the stepping switch release magnet 279 and to one terminal of each of the release magnets such as 294 of the indicators 18. The other terminals of these devices are connected to the B bus bar thereby resulting in the operation thereof. The stepping switch arm 274 is thus returned to its normal unoperated position and the indicators 18 reset to their normal positions. The opening of contact 236 of the stepping switch extinguishes the lamp 287 and deenergizes the magnet 31 thereby closing the openings to the coin chutes 13 and disconnecting the microphone 35. Operation of the half-nut magnet 36 also closes contacts 295 and 296 for purposes to be described presently.

The attendant at the receiving station then moves the rotary switch 222 to its No. 6 position. Switch arm 225 releases relay 223 and operates relay 297 which applies negative potential to the line conductor L2. Positive potential is maintained on line conductor L1 by the maintenance of relay 224 in operation under the control of the switch arm 226.

At the transmitting station the positive potential connected to line conductor L1 keeps the armature 178 of the line relay 176 in engagement with its marking contact M' thereby continuing the energization of the half-nut magnet 36. The negative potential applied to the line conductor L2 effects the engagement of armature 179 of line relay 177 with its spacing contact S to close a circuit which may be traced from the A bus bar through the line relay spacing contact, contact 269 of the multi-contact switch 187, through the half-nut contact 203 and the winding of the stripping magnet 51 to the B bus bar. Thus the stripping blade 49 is operated to remove the sheet 43 from the scanning cylinder 22 in the manner described in the copending application Serial No. 269,314.

As soon as the sheet has been removed from the scanning cylinder the drum contact 211 closes to operate relay 291. This operating circuit may be traced from the A' bus bar by way of armature 178 of line relay 176 through the drum contact 211 and through the winding of relay 291 to the B bus bar. Thus the multi-contact switch locking magnet 201 has its operating circuit open at the marking contact M of the line relay 177 and also at the contact 289 of relay 291. However, the closed half-nut contact 203 maintains a connection from the A' bus bar to the winding of the holding magnet 201 to keep it energized thereby preventing the release of the multi-contact switch 187 at this time.

The attendant at the recording station then moves the rotary switch 222 to its No. 10 position in which relay 224 is released, thereby disconnecting the positive potential from line conductor L1 and relay 297 is kept operated by the switch arm 225 to maintain negative potential applied to line conductor L2.

At the transmitting station the disconnection of positive potential from line conductor L1 releases the armature 178 of line relay 176 to its mid-position thereby deenergizing the half-nut magnet 36. The negative potential applied to line conductor L2 keeps the armature 179 of line relay 177 engaged with its spacing contact S.

Under these conditions all three circuits for energizing the holding magnet 201 are open thereby permitting the release of the armature 202. Thus the multi-contact switch 187 is restored to its normal unoperated position opening contact 191 to disconnect power from the transmitting apparatus. As soon as this switch is released a circuit is established from the A bus bar through the armature 179 and spacing contact S of relay 177, through a contact 238 of the multi-contact switch and the winding of relay 299 to the B bus bar. This relay is operated to close its contacts, one of which 301 lights a "Thank you" lamp 302. Also, by means of another contact 303 of relay 299 a connection is established from the A bus bar to one terminal of the multi-contact switch magnet 201, the other terminal of which is connected to the B bus bar. This results in the movement toward the right as viewed in the drawings of armature 202. In this case the hooked portion of this armature is moved under the armature 189 of the multi-contact switch thereby locking it in its unoperated position. This prevents the reoperation of this switch until the circuit has been restored to normal by the attendant at the recording station. This may be accomplished by removing the plug 215 from the line jack 192, thereby disconnecting all of the direct current control potentials from the line conductors L1 and L2. At the transmitting station this results in the restoration of the armature 179 of line relay 177 to its mid-position thereby releasing relay 299 to completely restore the transmitting apparatus to its normal idle condition.

The above described lockout feature whereby the multi-contact switch 187 is prevented from being operated is useful where other transmitting apparatus such as 394 is connected to the same two line conductors as the apparatus shown in detail. Each transmitting station is provided with a relay which corresponds to polar relay 177 which during the greater part of the operations has applied to it positive potential. Thus at the locked out stations the armature such as 179 in engagement with its marking contact M connects the A bus bar to the multi-contact switch locking magnet 201 and thereby holds the armature 202 under the switch arm 189 preventing its operation. Also at the locked out stations the A bus bar is connected through a multi-contact switch contact 305 to the "Line busy" lamp 306, thus indicating that the line circuit is busy at another point. While negative potential is connected to the line conductor L2 the polar relays at the locked out stations corresponding to 177 have their armatures 179 operated to their spacing contacts S thereby operating relays corresponding to 299 in the manner described to maintain the locking magnet 201 energized.

If, after having moved the rotary switch 222 at the recording station to its No. 3 position to remove the copyholder containing the recorded subject matter, the attendant upon inspection of the recording finds it unsatisfactory, he may make an adjustment of the power level by means of the pad 217 and move the rotary switch back to its No. 2 position for recording and make another record.

However, it may be that the original message inscribed by the customer is unsatisfactory for making a good copy. In this case after removing the copyholder, the rotary switch 222 is moved from its No. 3 position to its No. 6 position. Ac-

According to the foregoing description this places negative potential on line conductor L2 and positive potential on line conductor L1 which when received at the transmitting station results in the stripping of the message sheet from the transmitting cylinder. The recorder attendant then moves the rotary switch 222 through its No. 7 position to its No. 8 position. In passing through No. 7 position positive potential is applied to both line conductors L1 and L2. The reason for this operation is that with positive potential on line conductor L1 and negative potential on line conductor L2 to perform the sheet removal function, the line relay 176 at the transmitter is operated to energize the half-nut magnet 36. So long as the auxiliary contacts controlled by this magnet are operated, the multi-contact switch 187 remains operated after the sheet has been removed from the scanning cylinder. Thus when positive potential is again applied to line conductor L2 the line relay 177 also operates to maintain the operation of the multi-contact switch 187 independently of the half-nut contact as described.

With the rotary switch 222 at the recorder in the No. 8 position positive potential is maintained on line conductor L2 thereby continuing the operation of the transmitter multi-contact switch and by means of the switch arm 226 relay 307 is operated to apply negative potential to line conductor L1.

At the transmitter this condition results in the positioning of armature 178 of line relay 176 on its spacing contact S'. A circuit is thus closed from the A' bus bar through this spacing contact, through the drum contact 308, which is closed because the sheet 43 has been removed from the scanning cylinder, to one terminal of a "Rewrite message" lamp 309 which is illuminated since the other terminal is connected to the B bus bar. The connection of the A' bus bar is continued from the lamp 309 to one terminal of the winding of a thermal unit 311 which becomes energized since the other terminal is connected to the B bus bar. The armature of this thermal unit is also connected to the A' bus bar through the described circuit and after the lapse of a predetermined time closes a make contact 312 to energize the winding of a second thermal unit 313. The closure of contact 312 also completes a circuit through a break contact 314 of the second thermal unit 313 to the winding of relay 181, thereby operating this relay which immediately locks up through its make contact 182 in the manner previously described. The operation of this relay starts the operation of the motor 62 to supply the customer with another sheet of paper and a pencil. The adjustment of the thermal unit 313 is such that its contact 314 will open before the completion of the cycle of operation of the dispensing mechanism so that if the recorder attendant leaves the rotary switch 222 in its No. 8 position for a longer time than is required to supply the customer with an additional sheet of paper and a pencil, the dispensing mechanism will be stopped in the manner described and will not be restarted.

The recorder attendant then moves the rotary switch 222 to its No. 9 position in which all direct current potentials are removed from the line conductors L1 and L2. This operation releases the transmitter apparatus in the manner described and completely restores it to its idle condition. The customer after rewriting the message as

directed starts the transmitter apparatus from the beginning as described.

In Fig. 5 is shown a modified arrangement for returning to the customer his initially deposited coin instead of supplying him directly with a fresh sheet of paper and a pencil in case the original message is unsatisfactory for making a good recording. This apparatus comprises a coin chute 315 which is mounted on a pivot 316 adjacent its upper end. By means of this structure the lower end of the chute may be selectively positioned over either one of two coin receivers 317 or 318. The latter is so constructed and located that it is accessible to the customer through a suitable opening formed in the housing 10 of the apparatus. Normally, the coin chute is held by means of a spring 319 over the receptacle 317. A solenoid 321 when energized operates a plunger 322 connected to the coin chute 315 to swing the lower end of the chute over the receptacle 318.

The chute is provided with facilities for holding one or more coins therein and for releasing them one at a time for deposit in either one of the coin receptacles. By such an arrangement several customers may procure paper and pencils for the preparation of their messages while the transmitting apparatus is in operation. The lower end of the chute 315 is normally closed by a movable member 323 which forms a part of a sort of escapement mechanism, another part of which is a plunger 324 normally held away from the coin chute but which may be inserted therein over the lowermost coin held in the chute. The escapement members 323 and 324 are linked to a plunger 325 which forms the movable core of a solenoid 326. When this solenoid is energized, the member 323 is withdrawn from its blocking position and the member 324 is inserted through suitable openings in the chute to prevent the downward movement of any other coins which may be resting in the chute 315. Thus, only the lowermost coin is released from the chute for deposit in one of the coin receptacles 317 or 318.

The escapement mechanism and the operating solenoid therefor are mounted on a supporting member 327 which, in turn, is attached to the coin chute so that the chute and the escapement mechanism form a unitary structure. A pair of contacts 328 is provided to detect the passage of a coin through the chute to control the dispensing mechanism in a manner to be described. Another contact 329 is provided and is arranged to be operated when the coin chute 315 is moved over the return receptacle 318. Also, this mechanism is provided with a solenoid 331 to control a blocking plunger 332 to disable the coin chute when the supply of paper or pencils is exhausted.

The operating circuits for the modified coin handling apparatus may be incorporated in the circuits of Figs. 2 and 3 by disconnecting from terminals V, W, X and Y of Fig. 3 the apparatus shown to the right of these terminals and by connecting terminals U, V, W, X, Y and Z of Fig. 3 to corresponding terminals of Fig. 5. When the customer deposits the coin of predetermined denomination in the coin chute 315, the contact 328 is closed to complete a circuit extending from the A bus bar through the X terminal, through the coin control contact, through the W terminal through the winding of relay 181 and the contact 65, to the B bus bar. Thus, relay 181 is operated and locked as before to start a cycle of operation of the dispensing mechanism as described. The coin which is thus deposited is held

in the chute 315 by the escapement member 323. After having secured a pencil and paper, the customer prepares his message and uses the key to operate the transmitting apparatus as described. While this apparatus is operating, another customer may deposit a coin in the chute 315 to secure a blank sheet and pencil for the preparation of his message.

Following the transmission and satisfactory recording of the customer's message, the recording attendant operates the indicators 18 and collects the additional amount of money necessary, as described, and moves the rotary switch 222 at the recorder to its No. 10 position to illuminate the "Thank you" lamp 302. In this case, the connection of the A bus bar to the "Thank you" lamp 302 is also extended through terminal U to one terminal of the escapement solenoid 326 causing its operation, since the other terminal is connected through terminal Z to the B bus bar. Thus, the first customer's coin is released into the receptacle 317, while the coins of the other customers are held in the chute by the escapement mechanism. When the "Thank you" lamp is extinguished by the restoration of the circuit to its idle condition by the recording attendant, the solenoid 326 is also deenergized to permit another coin to be dropped to the bottom of the chute.

In the case where the recorder attendant finds it necessary to require the customer to rewrite his message, the rotary switch 222 is moved to its No. 8 position to illuminate the "Rewrite message" lamp 309 and to energize in sequence the thermal units 311 and 313 as described. The closure of contact 312 of the thermal unit 311 connects the A' bus bar through the break contact 314 of thermal unit 313 to the V terminal and thence through the winding of the solenoid 321 to the Z terminal and the B bus bar. The operation of the plunger 322 swings the lower end of the coin chute 315 over the return receptacle 318. Having reached this position the contact 329 is closed to connect the A bus bar through terminal X to the escapement solenoid 326 which thus is energized. The operation of the escapement mechanism releases the lowermost coin so that it is free to fall into the return receptacle 318, from which it may be retrieved by the customer. The opening of the break contact 314 of the thermal unit 313 as described releases the coin chute mechanism, restoring it to its normal condition as shown in the drawings. In this case the customer removes the coin from the return receptacle 318 and reinserts it in the coin chute 315 to procure another sheet of paper and a pencil by means of which he may rewrite his message.

The nature of the invention may be ascertained from the foregoing description of an illustrative embodiment thereof. The scope of the invention is set forth in the appended claims.

What is claimed is:

1. A facsimile system including a communication circuit, transmitting apparatus connected to said circuit for transmitting message signals over said circuit representative of the subject matter on a customer's message blank, receiving apparatus connected to said circuit for recording said signals, customer operated means for conditioning said transmitting apparatus for transmitting the message on said blank over said circuit, a cost indicating mechanism at said transmitting apparatus, means controlled from said receiving apparatus for operating said mechanism to indicate to the customer the cost of

said message, a normally closed coin slot, and means controlled from said receiving apparatus for opening said slot to receive a coin.

2. A facsimile system including a communication circuit, transmitting apparatus connected to said circuit for transmitting message signals over said circuit representative of the subject matter on a customer's message blank, receiving apparatus connected to said circuit for recording said signals, customer operated means for conditioning said transmitting apparatus for transmitting the message on said blank over said circuit, a cost indicating mechanism at said transmitting apparatus, means controlled from said receiving apparatus for operating said mechanism to indicate to the customer the cost of said message, a normally closed coin slot, means controlled from said receiving apparatus for opening said slot to receive a coin, and means enabling an operator at the receiving apparatus to detect the deposit of a coin in said slot.

3. In a facsimile system, a transmitting station and a receiving station interconnected for communication, scanning apparatus at said transmitting station, mechanism operable by coins of predetermined denomination and in predetermined number for making accessible to a customer an impression receiving medium of special configuration for the inscription thereon by the customer of subject matter to be transmitted, means including said subject matter bearing medium for operatively associating the same with said scanning mechanism for the transmission of signals representative of the subject matter to said receiving station, means operable after the completion of signal transmission for dissociating said subject matter bearing medium from said scanning apparatus, and means operable after said dissociation to make accessible to the customer another impression receiving medium for the reinscription thereon of subject matter at no additional cost to the customer.

4. In a facsimile system, a transmitting station and a receiving station interconnected for communication, scanning apparatus at said transmitting station, a coin controlled mechanism for delivering to a customer a sheet of special configuration for the inscription thereon by the customer of a message, means including said message bearing sheet for operatively associating the same with said scanning mechanism for the transmission of signals representative of said message to said receiving station, means operable after the completion of signal transmission for dissociating said message bearing sheet from said scanning apparatus, and means operable after said dissociation for delivering another sheet to the customer.

5. In a facsimile system, a transmitting station and a receiving station interconnected for communication, scanning apparatus at said transmitting station, mechanism operable by a coin of predetermined denomination for delivering to a customer a sheet of special configuration for the inscription thereon by the customer of subject matter to be transmitted, means including said subject matter bearing sheet for operatively associating the same with said scanning mechanism for the transmission of signals representative of said subject matter to said receiving station, means operable after the completion of signal transmission for dissociating said subject matter bearing sheet from said scanning apparatus, and means operable after said dissociation for returning said coin to the customer.

6. In a facsimile system, a transmitting station and a receiving station interconnected for communication, scanning apparatus at said transmitting station, mechanism operable by a coin of predetermined denomination for delivering to a customer a sheet of special configuration for the inscription thereon by the customer of subject matter to be transmitted, means including said subject matter bearing sheet for operatively associating the same with said scanning mechanism for the transmission of signals representative of said subject matter to said receiving station, means operable after the completion of signal transmission for dissociating said subject matter bearing sheet from said scanning apparatus, and means selectively operable after said dissociation either to accept said coin or to return the same to the customer.

7. In a facsimile system, a facsimile transmitter, a means for containing a normally inaccessible impression receiving medium having special characteristics, means for securing access to said medium by an operator for the application thereto of subject matter to be transmitted, and means controlled by the special characteristics of said subject matter bearing medium to initiate a scanning operation of said transmitter for the generation of signals representative of said subject matter.

8. In a facsimile system, a facsimile transmitter having a scanning mechanism, a magazine of blanks of a special character, means for delivering one of said blanks to a customer for the inscription of a message thereon by the customer, and means utilizing a special characteristic of said message inscribed blank for initiating operation of said scanning mechanism for the generation of signals representative of said message.

9. A facsimile system including transmitting apparatus having scanning mechanism for transmitting facsimile message signals, receiving apparatus responsive to said signals for recording the subject matter represented thereby, and means for preventing unauthorized use of said transmitting apparatus comprising mechanism operative upon the insertion by a customer at said transmitting apparatus of a predetermined controlling object for delivering a message blank having a special controlling characteristic embodied therein to the customer for inscription thereon of subject matter to be transmitted, and means accessible to said customer and utilizing said special controlling characteristic of the blank for conditioning said transmitting apparatus for the transmission of the subject matter inscribed thereon to said receiving station.

10. A facsimile system including transmitting apparatus having scanning mechanism for transmitting facsimile message signals, receiving apparatus responsive to said signals for recording the subject matter represented thereby, and means for preventing unauthorized use of said transmitting apparatus comprising a coin controlled mechanism operative upon the insertion by a customer at said transmitting apparatus of a coin of predetermined character for delivering a message blank having a special controlling characteristic embodied therein to the customer for inscription thereon of subject matter to be transmitted, and means accessible to said customer and utilizing said special controlling characteristic of the blank for conditioning said transmitting apparatus for the

transmission of the subject matter inscribed thereon to said receiving station.

11. A facsimile system including transmitting apparatus having scanning mechanism for transmitting facsimile message signals, receiving apparatus responsive to said signals for recording the subject matter represented thereby and means for preventing unauthorized use of said transmitting apparatus comprising mechanism operative upon the insertion by a customer at said transmitting apparatus of a predetermined controlling object for delivering a controlling key to the customer, means accessible to said customer for inserting in the transmitting apparatus a message blank having inscribed thereon the subject matter to be transmitted, and means operable by said customer including mechanism controlled by said key for enabling the insertion of said inscribed message blank and conditioning said transmitting apparatus for the transmission of the subject matter inscribed on the blank to said receiving station.

12. A facsimile system including transmitting apparatus having scanning mechanism for transmitting facsimile message signals, receiving apparatus responsive to said signals for recording the subject matter represented thereby and means for preventing unauthorized use of said transmitting apparatus comprising means for containing a supply of message blanks each having a special controlling characteristic embodied therein, means including a motor for dispensing said blanks successively, mechanism operative upon the insertion by a customer at said transmitting apparatus of a predetermined controlling object for causing said means to deliver one of said blanks to the customer for inscription thereon of subject matter to be transmitted, and means accessible to said customer and utilizing said special controlling characteristic of the blank for conditioning said transmitting apparatus for the transmission of the subject matter inscribed thereon to said receiving station.

13. A facsimile system including transmitting apparatus having scanning mechanism for transmitting facsimile message signals, receiving apparatus responsive to said signals for recording the subject matter represented thereby and means for preventing unauthorized use of said transmitting apparatus comprising means containing a supply of message blanks and a supply of pencils, mechanism operative upon the insertion by a customer at said transmitting apparatus of a predetermined controlling object for delivering a blank and a pencil to the customer for inscription on the blank of subject matter to be transmitted, and mechanism for receiving said pencil and said blank and including means responsive to the insertion of said pencil by the customer for conditioning said transmitting apparatus for the transmission of the subject matter inscribed on the blank to said receiving station.

14. A facsimile system including transmitting apparatus having scanning mechanism for transmitting facsimile message signals, receiving apparatus responsive to said signals for recording the subject matter represented thereby and means for preventing unauthorized use of said transmitting apparatus comprising means for containing a supply of message blanks and a supply of pencils, mechanism operative upon the insertion by a customer at said transmitting apparatus of a predetermined controlling object for delivering a blank and a pencil to the customer

for inscription on the blank of subject matter to be transmitted, and mechanism for receiving said pencil and said blank and including means responsive to the successive insertion of these articles by the customer for conditioning said transmitting apparatus for the transmission of the subject matter inscribed on the blank to said receiving station.

15. A facsimile system including transmitting apparatus having scanning mechanism for transmitting facsimile message signals, receiving apparatus responsive to said signals for recording the subject matter represented thereby and means for preventing unauthorized use of said transmitting apparatus comprising mechanism operative upon the insertion of a predetermined controlling object for delivering a message blank having a special controlling characteristic embodied therein to the customer for inscription thereon of subject matter to be transmitted, means for receiving the inscribed blank and responsive to said special controlling characteristic of the blank when inserted by the customer for transmitting the subject matter inscribed thereon to said receiving station, a cost indicating display mechanism at said transmitting apparatus, means operable at the receiving apparatus for actuating said cost indicating mechanism after said message has been received by the receiving station, and coin receiving means at the transmitting apparatus and means associated therewith for notifying the receiving station when coins in the amount of the cost displayed have been deposited by the customer.

16. A facsimile system including transmitting apparatus having scanning mechanism for transmitting facsimile message signals, receiving apparatus responsive to said signals for recording the subject matter represented thereby and means for preventing unauthorized use of said transmitting apparatus comprising means for containing a supply of message blanks and a supply of pencils, mechanism operative upon the insertion by a customer at said transmitting apparatus of a predetermined controlling object for delivering a message blank and a pencil to the customer for inscription on the blank of subject matter to be transmitted, mechanism for receiving said pencil and mechanism including a normally closed chute for receiving the inscribed blank, means responsive to the insertion of said pencil by the customer for opening said chute to receive the inscribed blank, and means responsive to the successive insertion of these articles by the customer for conditioning said transmitting apparatus for the transmission of the subject matter inscribed on the blank to said receiving station.

17. A facsimile system including transmitting apparatus having scanning mechanism for transmitting facsimile message signals, receiving apparatus responsive to said signals for recording the subject matter represented thereby and means for preventing unauthorized use of said transmitting apparatus comprising means for containing a supply of message blanks and a supply of pencils each having a key on one end thereof, mechanism operative upon the insertion by a customer at said transmitting apparatus of a predetermined controlling object for delivering a message blank and a pencil to the customer for inscription on the blank of subject

matter to be transmitted, mechanism operable by the key on said pencil for initiating operation of the transmitting apparatus, mechanism for receiving said pencil and mechanism including a normally closed chute for receiving the inscribed blank, means responsive to the insertion of said pencil by the customer for opening said chute to receive a message blank, and means responsive to the successive insertion of these articles by the customer for conditioning said transmitting apparatus for the transmission of the subject matter inscribed on the blank to said receiving station.

18. A facsimile system including transmitting apparatus having scanning mechanism for transmitting facsimile message signals, receiving apparatus responsive to said signals for recording the subject matter represented thereby and means for preventing unauthorized use of said transmitting apparatus comprising means for containing a supply of message blanks and a supply of pencils each having a key on one end thereof, mechanism operative upon the insertion by a customer at said transmitting apparatus of a predetermined controlling object for delivering a message blank and a pencil to the customer for inscription on the blank of subject matter to be transmitted, mechanism for receiving said pencil and mechanism including a normally closed chute for receiving the inscribed blank, mechanism operable by the key on said pencil for initiating operation of the transmitting apparatus including means for indicating to the customer when to deposit the pencil, means responsive to the insertion of said pencil by the customer for opening said chute to receive the message blank, and means responsive to the successive insertion of these articles by the customer for conditioning said transmitting apparatus for the transmission of the subject matter inscribed on the blank to said receiving station.

19. A facsimile system including transmitting apparatus having scanning mechanism for transmitting facsimile message signals, receiving apparatus responsive to said signals for recording the subject matter represented thereby and means for preventing unauthorized use of said transmitting apparatus comprising means for containing a supply of message blanks and a supply of pencils each having a key on one end thereof, mechanism operative upon the insertion by a customer at said transmitting apparatus of a predetermined controlling object for delivering a message blank and a pencil to the customer for inscription on the blank of subject matter to be transmitted, mechanism for receiving said pencil and mechanism including a normally closed chute for receiving the inscribed blank, mechanism operable by the key on said pencil for initiating operation of the transmitting apparatus including means for indicating to the customer when to deposit the pencil, means responsive to the insertion of said pencil by the customer for opening said chute to receive the message blank including means for indicating to the customer when to insert the message blank, and means responsive to the successive insertion of these articles by the customer for conditioning said transmitting apparatus for the transmission of the subject matter inscribed on the blank to said receiving station.

GARVICE H. RIDINGS.