April 28, 1959 R. J. WISE 2,884,486

PHOTOCONDUCTIVE FACSIMILE TRANSMITTING APPARATUS

Filed Dec. 30, 1952 4 Sheets-Sheet 1

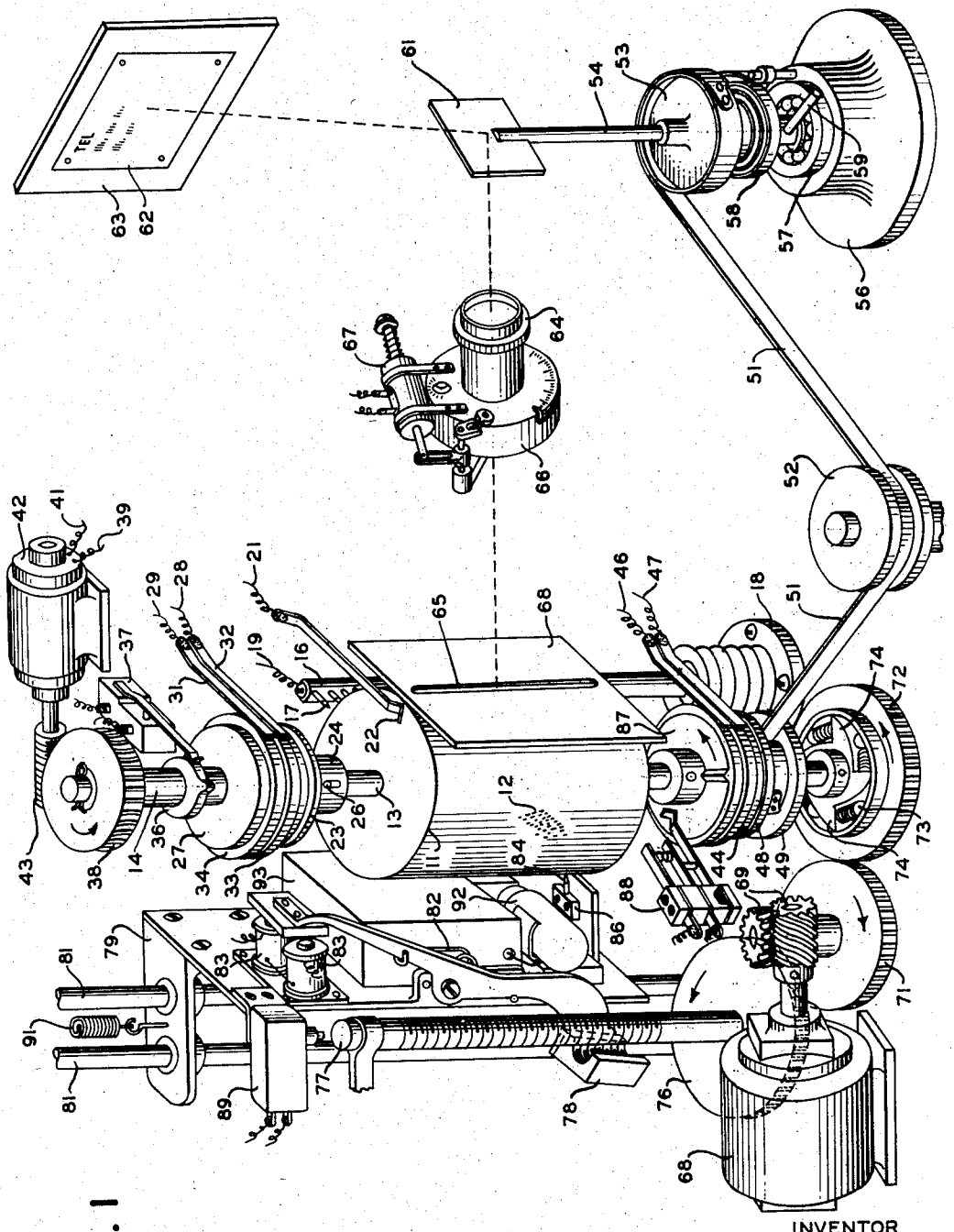

FIG. 1

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PHOTOCONDUCTIVE FACSIMILE TRANSMITTING APPARATUS

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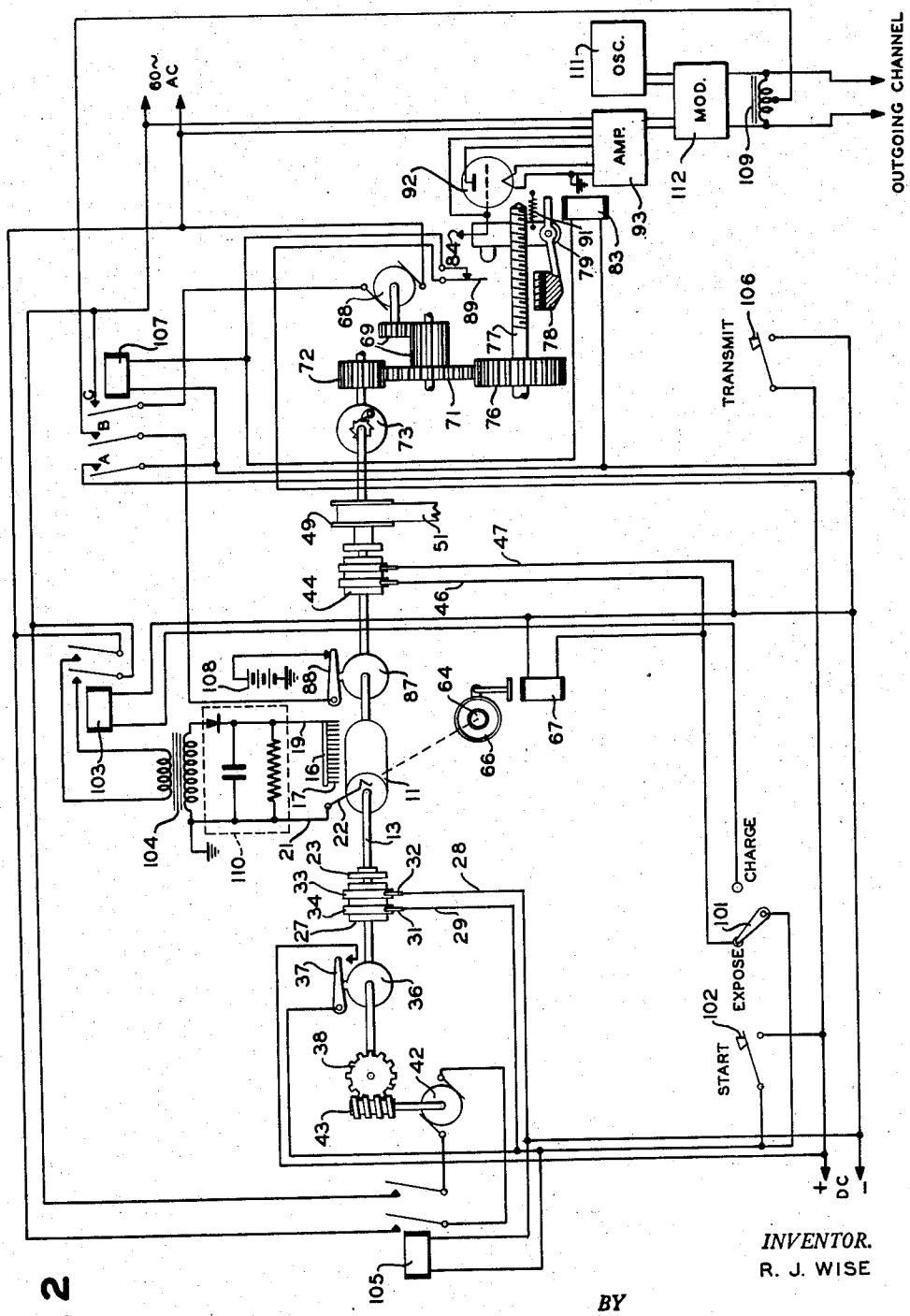

FIG. 2

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PHOTOCONDUCTIVE FACSIMILE TRANSMITTING APPARATUS

Filed Dec. 30, 1952 4 Sheets-Sheet 3

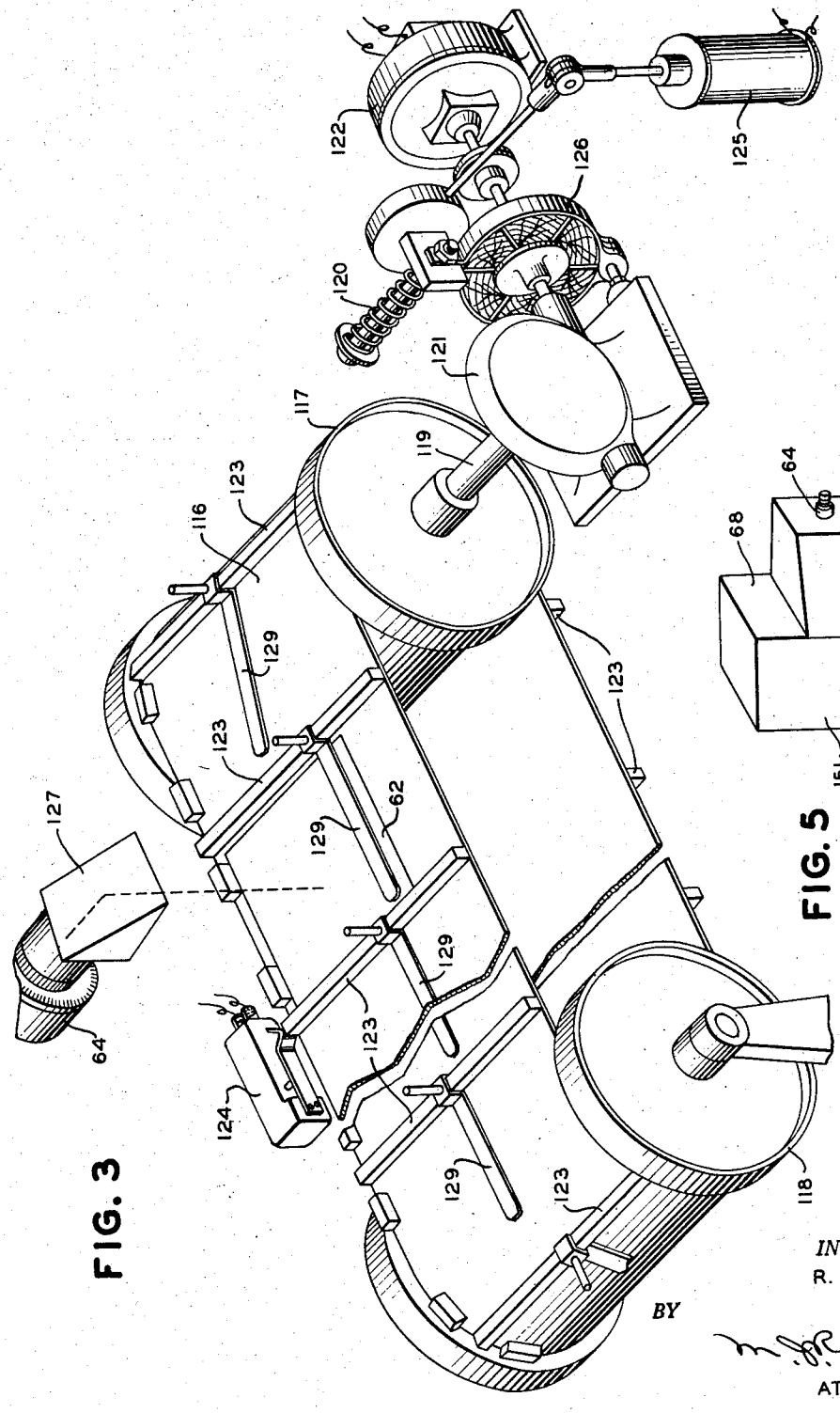

FIG. 3

FIG. 5

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PHOTOCONDUCTIVE FACSIMILE TRANSMITTING APPARATUS

Filed Dec. 30, 1952 4 Sheets-Sheet 4

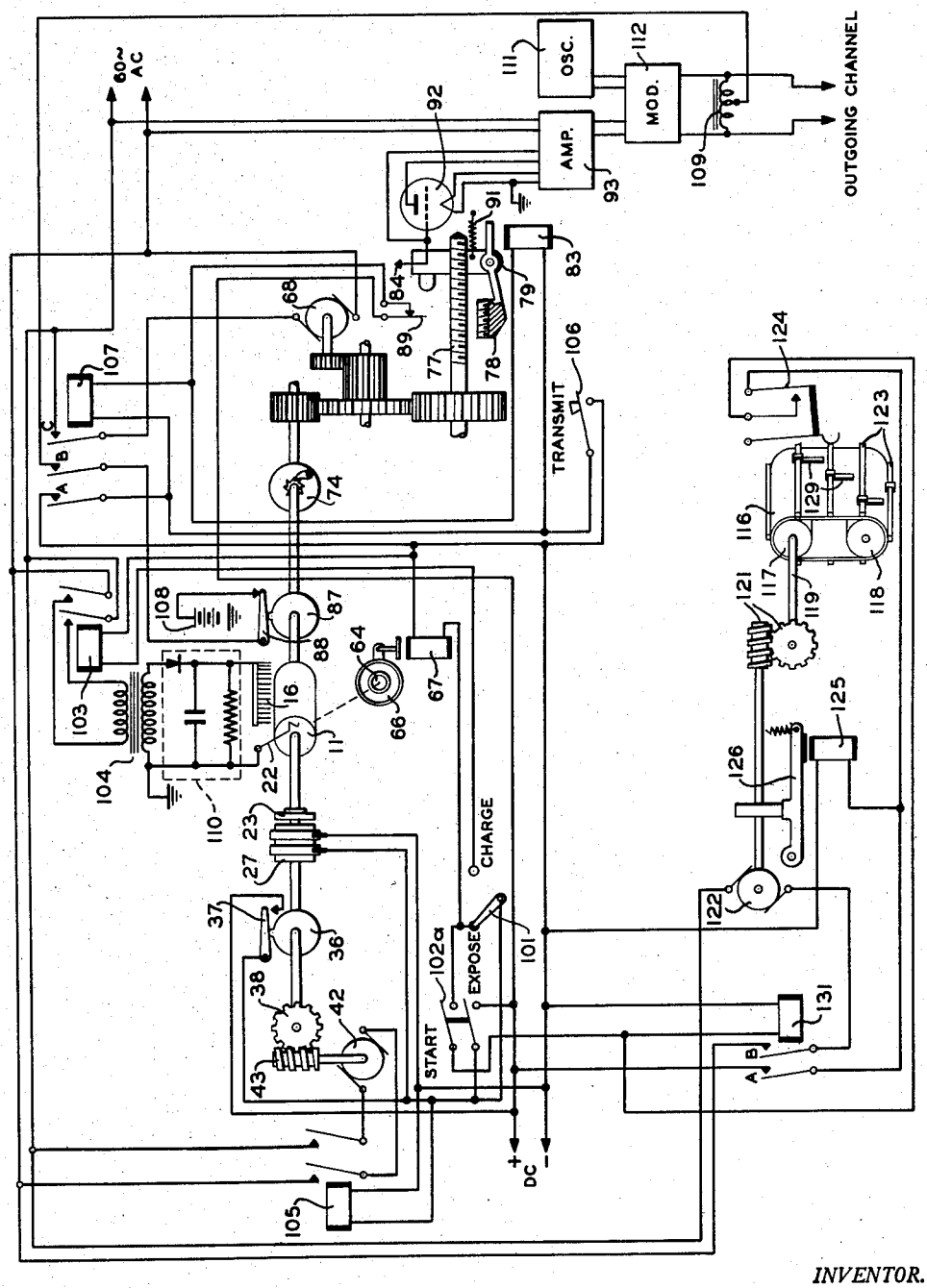

FIG. 4

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United States Patent Office 2,884,486 Patented Apr. 28, 1959

2,884,486

PHOTOCONDUCTIVE FACSIMILE TRANSMITTING APPARATUS

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Application December 30, 1952, Serial No. 328,612

15 Claims. (Cl. 178—7.1)

This invention relates to an improved device for providing a rapid and convenient means of accurately converting graphic or pictorial material into an electrical analog for storage and for transmission from such storage to a distant location.

Devices presently used for this purpose all require that the subject matter be transmitted by dividing it into a large number of elementary areas, according to some prearranged regular pattern, and performing successive photometric measurements or electric scanning of each such area, using the resulting brightness or electrical values to set at a corresponding level some convenient variable of the transmitted carrier, such as its voltage, frequency, phase, or the timing or other characteristic of a discontinuity therein.

In order for such a process to have practical value, however, it must be adapted to being received on a device which can produce light or dark areas on the reproducing surface corresponding to the variations of the incoming carrier, and, of equal importance, it must be able to locate these successive light and dark areas on the reproducing surface in exact correspondence with the location of those being transmitted.

It is this latter problem of synchronization which has led to the wide use of rotating drum transmitters and reproducers for facsimile systems, because in them it is necessary only to arrange for the transmitting and receiving drums to operate at the same speed, in order to ensure exact synchronism between corresponding elemental areas of the transmitted and received material.

This convenience, however, necessitates that the material to be transmitted be arranged on the surface of a drum so that it can be rotated at high speed. A method of doing this which is in wide current use is to wrap the paper message blank or other subject material around the drum and hold it in place with clips or a garter spring. This requires that the material be flexible enough to wrap around the drum, strong enough to withstand high speed rotation, very nearly the exact size of the drum, and have a minimum of surface irregularities. Moreover, an individual hand operation normally is required to place it in position on the machine, which must be done before each transmission can be started.

One of the objects of this invention is to provide a novel arrangement which overcomes these difficulties, by permitting the transmitted material to be of any size of contour, even a three-dimensional scene, without the necessity for physically applying it to a drum, thus avoiding the need for bending the sheet of material that carries it, or for rotating the resulting assembly. Since the subject material can be transmitted equally well from a flat position, it is well adapted to being fed automatically, as by the continuous or intermittent advancement of a belt or by an automatic feed, such as that used on a conventional letter press. An important advantage, moreover, lies in the fact that under such an arrangement a backlog of messages or other subject material can be supplied to the transmitting machine at any convenient

time, which time need bear no relation to the time at which the machine concludes its operation on any particular message. As a consequence of this, one machine operator can service a larger number of machines with greater ease, and with much less probability that any machine will remain idle despite the existence of a message waiting to be sent on it, as occasioned by the operator being engaged in servicing another machine at the time.

Another object of this invention is to accomplish the scanning operation on any type of subject matter without the use of a photoelectric cell.

A further object of the invention is to provide a simplified form of rotary scanner capable of transmitting information from flat subject matter such as stiff cards and the like.

Another object of the invention is to provide a means of storing scanned facsimile subject matter for subsequent transmission.

Other objects and advantages of the invention will be apparent from the following detailed description of an illustrative embodiment thereof, taken in conjunction with the accompanying drawings, in which:

Fig. 1 is an isometric view of a motorized storage scanner, and retransmitting assembly;

Fig. 2 is a schematic wiring diagram applicable to Fig. 1;

Fig. 3 is an isometric view of an automatic belt type easel usable with the scanning mechanism of Fig. 1;

Fig. 4 is a schematic wiring diagram applicable to the mechanism of Figs. 1 and 3;

Fig. 5 is a view of the lens and scanner mechanism of Fig. 1 enclosed in a lightproof housing.

Referring now to Fig. 1, numeral **11** designates a drum having a conductive surface, said surface being coated with photoconductive material **12**. The drum is carried on shaft **13** which is retained in upper and lower end bearings not shown in the figure. The term "photoconductive material" is employed to define any material which normally has a high insulating value sufficient to retain a substantial surface charge when not exposed to light, but which becomes sufficiently conductive when illuminated to selectively dissipate such charge in the illuminated areas. Materials of this class are anthracene, anthraquinone, sulphur, various mixtures thereof, and certain other substances, as disclosed by C. F. Carlson in Patent No. 2,297,691, issued October 6, 1942. By applying a charge of high voltage direct current electricity uniformly to the outer surface of such a layer contained on the conductive backing material of the drum, while it is in the dark or high resistance condition, and then directing thereon the real photic image of some desired subject material, for an appropriate time, the charge is differentially dissipated through the photoconductive layer in degree having a direct relation to the intensity of the incident light. This results in the desired conformal mapping of the said image in terms of electrical potential over the surface of the substance on the drum **11**. Electrode **16** constitutes an electrical charge sprayer comprising a multiplicity of relatively sharp discharge points **17** affixed thereto in proximity to but spaced from the drum **11**, supported on insulator **18** and energized as required through wire **19** with a high voltage direct potential with respect to grounding wire **21** which contacts drum **11** through the action of brush **22** sliding thereon. Such a high voltage direct potential can be obtained from any convenient and suitable source of familiar kind, such as a mains driven high voltage transformer equipped with a thermionic rectifier and a filter, a medium voltage transformer with voltage multiplying rectifier and filter, a so-called "RF power supply" employing a radio frequency or ultra-

sonic frequency oscillator, air core transformer, thermionic rectifier, and simplified filter, or simply by means of a static electricity generator of the Wimshurst or Van de Graff type.

Clutch plate **23**, having a slotted hub **24** engages a pin **26** driven into shaft **13**, so that the clutch plate is rotationally affixed thereto while being slidable longitudinally for engagement with the lower or driving surface of electromagnet **27** when the latter is energized. Said electromagnet is energized at predetermined times through wires **28** and **29** connected to brushes **31** and **32** bearing on the collector rings **33** and **34** and is affixed to quill **14**, as are the cam **36** whose single lobe operates to open switch **37** at a definite angular position thereof, and worm wheel **38**, through which the quill can be rotated by energizing wires **39** and **41** of low speed motor **42**, thus operating worm **43** which engages said worm wheel **38**. Quill **14** is thus rotatable by low speed motor **42** through the closing of a pair of contacts in one of the supply wires, here wire **39**, to said low speed motor and by simultaneously energizing clutch **27** as hereinafter described. By electrically connecting motor and clutch in parallel, and switch **37** in series with them, any starting of low speed motor **42** made by having external contacts shunt switch **37**, is maintained by the prompt closing of said switch, and continued for one revolution despite any removal of the shunt, at the end of which time, the shunt having been previously removed, the motor **42** stops. Momentary shunting of switch **37** thus causes low speed motor **42** to revolve drum **11** for one revolution, and then to disengage it from connection therewith. During this single revolution, the application of a high potential to electrode **16** results in the production of electrical charge in the sharp pointed conductors **17** which, in the absence of ambient light, as would occur in a darkened room, or preferably by enclosing the mechanical structure including the drum **11** in a light tight case, causes an induced electrical charge to be distributed uniformly over the surface of photoconductive layer **12** on the surface of drum **11**. This highly charged condition of the exterior surface of layer **12** persists because of the insulating condition of the layer, brought about by the absence of light.

After thus sensitizing the surface **12** of drum **11**, magnetic clutch **44** is energized through wires **46** and **47** to attract and engage movable clutch plate **48**, thus rotationally connecting pulley **49** to the shaft **13**. By again causing low speed motor **42** to turn drum **11** through one revolution, belt **51** is drawn around idler pulley **52** and wound up on pulley **49** to which its end is fastened. Wheel **53**, to which the other end of belt **51** is fastened, is turned thereby, as is the shaft **54** to which the wheel is fastened. Shaft **54** is rotatably mounted in bearing **57** secured in fixed base **56**, and is urged in the return direction by spring **58**, both to retain tension in belt **51**, and also to cause return to a fixed angular position determined by stop pin **59** upon disengagement of clutch **44**.

Rotation of shaft **54** causes rotation of front surfaced mirror **61** in step with drum **11**. This causes an image of the subject matter **62** mounted on easel **63**, as cast by lens **64** under control of shutter **66** operated by solenoid **67**, to sweep across the vertical slit **65** in diaphragm **68** at such a speed that each element of said image traversing the slit and impinging on drum **11** whereon it is focused, remains in step therewith.

By thus sweeping onto the charged surface of drum **11** an image composed of areas having differing intensity of light, the surface potentials of its different regions are changed; the highly charged parts untouched by light remaining so, and those exposed to the full intensity of illumination caused by bright areas on the subject material **61** being appreciably discharged due to the temporarily increased conductivity of photoconductive layer **12** brought about by the light incident thereon.

With a latent image of the subject material thus impressed on the surface **12** of drum **11** as areas of graduated electrical charge, clutches **27** and **44** are deenergized and high speed motor **68** energized to drive helical gears **69**, idler gear **71**, and also one way clutch member **74** which is pinned to shaft **13**, through the wedging action of bearing balls **73** against driving member **72**. Gear **76**, to which is affixed lead screw **77**, is also rotated by idler gear **71**, and at the same time half-nut **78** which is secured to the carriage **79** which slides freely on ways **81**, is held in engagement with lead screw **77** by the energized electromagnet coils **83**. Drum **11** is thus constrained to rotate, and carriage **89** to move parallel thereto, by the operation of high speed motor **68**. Stylus **84**, which is an electrical pickoff or charge detector in the form of a metal electrode supported on an insulating block **86** attached to the carriage, is thus carried across the face of the rotating drum **11** at a uniform rate. Single lobed cam **87**, which is pinned to shaft **13**, operates switch **88** to close its contacts once every revolution of the drum **11**, at a predetermined phase position in the cycle, thus providing means to produce a synchronizing impulse for transmission to a distant receiver. At the conclusion of the travel of carriage **79** along the ways **81**, the switch **89** fastened to the carriage strikes the end of lead screw **77**, and is operated by it to open the circuit leading to electromagnet coils **83**. This enables spring **82** to disengage half-nut **78** from engagement with lead screw **77**, and allows spring **91** to return the carriage to its original position.

During the advance of carriage **79**, the electrical signals picked up from the surface **12** of drum **11** by stylus **84** are applied by a vacuum-tube coupler **92** to an amplifier **93**, which is connected to further circuitry as later described.

In Fig. 2 is shown the electrical wiring arrangement of the elements set forth above, which provides for their cooperative action in an established sequence. Operation of the equipment is initiated by throwing the switch **101** to the "charge" position and momentarily depressing the starting key **102**. This completes the circuit to relay **105**, magnetic clutch **27** and relay **103**. Relay **105** controls low speed motor **42**, starting it and causing switch **37** to close, in parallel with the starting key, permitting the latter to be released without further immediate effect. Magnetic clutch **27** simultaneously engages clutch plate **23** to drive drum **11**, and relay **103** applies alternating mains voltage to transformer **104**, which, through conventional converter means **110**, applies a high direct potential between drum **11** and charge sprayer **16** during one revolution of the drum, as terminated by the ultimate reopening of switch **37** when operated by cam **36**, thus applying the uniform surface charge to the storage drum **11**.

With switch **101** thrown to the "expose" position, starting key **102** is again depressed to initiate another revolution of drum **11** as before, except that relay **103** controlling the high voltage supply is now deenergized, shutter magnet **67** is energized to open shutter **66** admitting the desired image to be impressed on the drum **11**, and clutch **44** is energized so that pulley **49** in winding up tape **51** causes the image to be swept across drum **11** in synchronism with the rotation thereof.

Upon the stopping of the drum at the completion of the above-described second or storage revolution, transmitting key **106** is depressed. This completes parallel circuits through limit switch **89** for half-nut magnet **85** and relay **107**. The latter pulls up and locks in on contact A. Contact C completes the circuit to high speed motor **68**, which drives lead screw **77** and, through overriding clutch **74**, drum **11**. Contact B applies power from battery **108** through synchronizing switch **88** to the center tap of inductor **109** for transmission of synchronizing pulses to a remote receiver. Electromagnet **83** engages half-nut **78** with lead screw **77**, causing advance-

ment of carriage **79** and thereby a scanning of the rotating drum **11** by stylus **84**. Limit switch **89** is opened by impingement at the conclusion of carriage travel in a predetermined amount, causing relay **107** and half-nut magnet **83** to release and causing spring **91** to return the carriage to its starting position. Electrical signals picked up by stylus **84** from the charged surface of drum **11** are coupled by vacuum tube **92** to amplifier **93** and together with signals derived from oscillator **111** are converted in modulator **112** to modulated continuous waves for transmission over a wire line to a remote receiver.

In Fig. 3 is illustrated another form of equipment for supplying to the sensitized drum **11** of Fig. 1 an image of the subject matter to be transmitted, it being understood that the mechanism of this figure may be substituted for the copy-holder and oscillating mirror mechanism and its belt drive of Fig. 1. In this construction a belt **116** of textile fabric or other flexible material passes over rolls **117** and **118** having flanged ends for the purpose of guiding and retaining the belt in position. Cleats **123** are secured to belt **116**, separated by a distance convenient for the retention of subject matter sheets **62** between them by means of slidable retaining clips **129**. Prism **127** is fixedly mounted in relation to lens **64** at an appropriate distance above subject matter **62**, and causes an image thereof to be projected into a plane tangent to the sensitized drum **11** of Fig. 1. Roll **117** is affixed to shaft **119** which is driven through reducing gear **121** by a motor **122** which operates synchronously with the low speed motor **42** previously described, to drive the belt **116**. Subject matter **62**, in thus traversing prism **127** at a fixed rate of travel with respect to drum **11** as predetermined by the ratio of reducing gear **121**, casts an image in a plane tangent to the surface of drum **11** opposite to the slit **65**, this image moving laterally across the slit at a speed equal to the surface speed of the drum. In consequence of this, the image is placed on the drum without distortion due to foreshortening. Switch **124** is actuated to open its contacts by the arrival of cleat **123** under its operating lever. As will next be described, this causes motor **122** and solenoid **125** to be deenergized, the latter causing brake **126** to be applied by spring **120** to stop shaft **119** immediately.

Fig. 4 is a schematic diagram of the electrical wiring used to operate the equipment shown and described under Fig. 3. It will be seen that except for the deletion of clutch **87** and belt **51** of Fig. 2, it comprises only the addition of control means thereto for use in connection with the belt **116**. Charging of the drum **11** is effected as previously described, by closing of starting key **102** with switch **101** in the "charge" position. Upon throwing switch **101** to the "expose" position and again momentarily depressing starting key **102***a*, the coil of relay **131** is energized together with the shutter magnet **67**. Relay **131** closes its contact A, releases brake **126** by energizing solenoid **125** and also closes its contact B to start motor **122**. Cleat **123** immediately moves beyond switch **124**, which then closes its contacts and holds relay **131** in the energized condition through the contacts A until arrival of the next such cleat under the operating lever of switch **124**, at which time said switch is opened thereby, and relay **131** is deenergized, opening contacts A and B to deenergize motor **122** and bring belt **116** to a stop with the cleat in exact register with the switch by applying brake **126**.

Fig. 5 illustrates a structure enclosing the scanner mechanism and especially the photosensitive drum **11** of Fig. 1 in a light tight housing in order to permit the use of the assembly under ordinary conditions of ambient light. It is seen that the housing **151** is terminated on the diaphragm **68** and that an additional housing **152** prevents stray light which does not pass through lens **64** from reaching the central portion of diaphragm **68**. Housings **151** and **152** may be combined into a single unitary assembly if desired. The housing structure shown, or its equivalent, has been deleted from Fig. 1 solely for the purpose of clarity of representation, and is to be considered a part thereof as if there shown.

It will be obvious that various modifications, alterations and elaborations of the devices shown in the drawings and described herein can be effected without departing from the spirit or the essential attributes of the invention as disclosed, and it is therefore intended that only such limitations be placed thereon as are specifically set forth in the appended claims.

What is claimed is:

1. A facsimile transmitter for sending subject matter, comprising a photoconductive storage member, means for uniformly charging said member to a predetermined potential, exposure means for subjecting said member to successive narrow but full member length linear elements of a light image of the subject matter to produce thereon a corresponding electrostatic charge image, and scanning mechanism including an electrical pickup device and means for scanning said member with said device to produce facsimile signals corresponding to the electrostatic charge on the elemental areas of said member.

2. A facsimile transmitter for sending subject matter, comprising a photoconductive storage member, means for uniformly charging said member to a predetermined potential, exposure means for subjecting said member to successive narrow but full member length linear elements of a light image of the subject matter to produce thereon a corresponding electrostatic charge image, and scanning mechanism including an electrical pickup device and means for scanning said member with said device to produce facsimile signals corresponding to the electrostatic charge on the elemental areas of said member wherein said photoconductive storage member comprises a rotatable drum having means for rotating the same in one cycle to produce said electrostatic charge image and in another cycle to impart the charge thereon to said electrical pickup device.

3. A facsimile transmitter for sending subject matter, comprising a photoconductive storage member, means for uniformly charging said member to a predetermined potential, exposure means for subjecting said member to successive narrow but full member length linear elements of a light image of the subject matter to produce thereon a corresponding electrostatic charge image, and scanning mechanism including an electrical pickup device and means for scanning said member with said device to produce facsimile signals corresponding to the electrostatic charge on the elemental areas of said member wherein said photoconductive storage member comprises a rotatable drum having means for rotating the same in one cycle to produce said electrostatic charge image and in another cycle to impart the charge thereon to said electrical pickup device and wherein said exposure means produces said electrostatic charge image on said drum in successive elemental line areas substantially coextensive with the linear elements of said drum.

4. A facsimile transmitter for sending subject matter, comprising a photoconductive storage member, means for uniformly charging said member to a predetermined potential, exposure means for subjecting said member to successive narrow but full member length linear elements of a light image of the subject matter to produce thereon a corresponding electrostatic charge image, and scanning mechanism including an electrical pickup device and means for scanning said member with said device to produce facsimile signals corresponding to the electrostatic charge on the elemental areas of said member wherein said photoconductive storage member comprises a rotatable drum having means for rotating the same in one cycle to produce said electrostatic charge image and in another cycle to impart the charge thereon to said electrical pickup device in which said exposure means includes a mask disposed closely adjacent to the surface of said drum in tangential relation thereto and having a dissecting aper-

ture extending substantially throughout said tangential portion, means for projecting a light image into the plane of said aperture, and means for moving said image past said aperture concurrently with the rotation of said drum and at a rate proportional to said rotation.

5. A facsimile transmitter for sending subject matter, comprising a photoconductive storage member, means for uniformly charging said member to a predetermined potential, exposure means for subjecting said member to successive narrow but full member length linear elements of a light image of the subject matter to produce thereon a corresponding electrostatic charge image, and scanning mechanism including an electrical pickup device and means for scanning said member with said device to produce facsimile signals corresponding to the electrostatic charge on the elemental areas of said member wherein said photoconductive storage member comprises a rotatable drum having means for rotating the same in one cycle to produce said electrostatic charge image and in another cycle to impart the charge thereon to said electrical pickup device in which said exposure means includes a dissecting aperture mask disposed adjacent to said drum, a projection system, a copyholder for supporting copy to be transmitted and means for producing relative movement between said projection system and the copy on said copyholder to advance the projected image of said copy across the dissecting aperture of said mask during said first mentioned cycle of rotation of said drum.

6. A facsimile transmitter for sending subject matter, comprising a photoconductive storage member, means for uniformly charging said member to a predetermined potential, exposure means for subjecting said member to successive narrow but full member length linear elements of a light image of the subject matter to produce thereon a corresponding electrostatic charge image, and scanning mechanism including an electrical pickup device and means for scanning said member with said device to produce facsimile signals corresponding to the electrostatic charge on the elemental areas of said member wherein said photoconductive storage member comprises a rotatable drum having means for rotating the same in one cycle to produce said electrostatic charge image and in another cycle to impart the charge thereon to said electrical pickup device in which said exposure means includes a dissecting aperture mask disposed adjacent to said drum, a lens system, a copyholder for supporting copy to be transmitted, means for reflecting an image of the copy on said copyholder to the said lens system and means for producing relative movement between said lens system and said reflected image to advance the projected image of said copy across the dissecting aperture of said mask during said first mentioned cycle of rotation of said drum.

7. A facsimile transmitter for sending subject matter, comprising a photoconductive storage member, means for uniformly charging said member to a predetermined potential, exposure means for subjecting said member to successive narrow but full member length linear elements of a light image of the subject matter to produce thereon a corresponding electrostatic charge image, and scanning mechanism including an electrical pickup device and means for scanning said member with said device to produce facsimile signals corresponding to the electrostatic charge on the elemental areas of said member wherein said photoconductive storage member comprises a rotatable drum having means for rotating the same in one cycle to produce said electrostatic charge image and in another cycle to impart the charge thereon to said electrical pickup device in which said exposure means includes a dissecting aperture mask disposed adjacent to said drum, a lens system, a copyholder for supporting copy to be transmitted, means for reflecting an image of the copy on said copyholder to said lens system and means for oscillating said reflecting means in coordinated relation to the rotation of said drum to project the reflected image of said copy across the dissecting aperture of said mask during the said first mentioned cycle of rotation of said drum.

8. A facsimile transmitter for sending subject matter, comprising a photoconductive storage member, means for uniformly charging said member to a predetermined potential, exposure means for subjecting said member to successive narrow but full member length linear elements of a light image of the subject matter to produce thereon a corresponding electrostatic charge image, and scanning mechanism including an electrical pickup device and means for scanning said member with said device to produce facsimile signals corresponding to the electrostatic charge on the elemental areas of said member wherein said photoconductive storage member comprises a rotatable drum having means for rotating the same in one cycle to produce said electrostatic charge image and in another cycle to impart the charge thereon to said electrical pickup device, in which said exposure means includes a dissecting aperture mask disposed adjacent to the said drum, a projection system, a copyholder for supporting copy to be transmitted, and means for moving said copyholder relative to said projection system in coordinated relation to the rotation of said drum to advance the projected image of said copy across the dissecting aperture of said mask during said first mentioned cycle of rotation of said drum.

9. A facsimile transmitter for sending subject matter, comprising a rotatable drum having a photoconductive surface layer, means for rotating said drum through first and second cycles of operation, means for uniformly electrostatically charging said drum to a predetermined potential during said first cycle, means for exposing said drum to successive narrow but full drum length linear elements of a light image of the subject matter during said second cycle, means for rotating said drum through a third cycle, and means to electrically scan said drum during said third cycle to produce facsimile signals corresponding to said light image.

10. A facsimile transmitter for sending subject matter, comprising a rotatable drum having a photoconductive surface layer, means for rotating said drum through first and second cycles of operation at a predetermined speed, means for uniformly electrostatically charging said drum to a predetermined potential during said first cycle, means for exposing said drum to successive narrow but full drum length linear elements of a light image of the subject matter during said second cycle, means for rotating said drum through a third cycle at a higher speed, and means to electrically scan said drum during said third cycle to produce facsimile signals corresponding to said light image.

11. A facsimile transmitter for sending subject matter, comprising a rotatable drum having a photoconductive surface layer, means for rotating said drum through first and second cycles of operation, means for uniformly electrostatically charging said drum to a predetermined potential during said first cycle, means for exposing said drum to successive narrow but full drum length linear elements of a light image of the subject matter during said second cycle, means for rotating said drum through a third cycle, means to electrically scan said drum during said third cycle to produce facsimile signals corresponding to said light image, and means for generating function signals during rotation of said drum in said third cycle.

12. A facsimile transmitter for sending subject matter, comprising a rotatable drum having a photoconductive surface layer, means for rotating said drum through successive cycles of operation, means for electrostatically charging the surface of said drum during a first said cycle of operation, drum masking means having a stationary linear aperture in the plane of a drum element for dissecting a light image, means to form a light image of subject matter in a plane tangent to said drum, light image deflecting means positioned to sweep said aperture at a rate proportioned to the speed of said drum

during a single revolution thereof whereby to distribute a subject matter light image on the surface of said drum and thereby to create a corresponding electrostatic charge means operatively interconnecting said light image deflecting means and said drum for causing said light image deflecting means so to sweep, and means to electrically scan said drum during a subsequent cycle of operation to produce image intelligence bearing facsimile signals.

13. A facsimile transmitter comprising a rotatable drum having a photoconductive surface capable of sustaining a distributed charge thereon, charging means therefor, a light mask fixed in a plane tangent to the drum and having a slit adjacent to the drum and extending entirely thereacross parallel to the axis thereof, a subject matter image producing lens fixedly disposed to form an image on said mask, a mirror opposite said mask, and rotatable about an axis parallel to said drum in step therewith to sweep an image from said lens across said mask during a single revolution of said drum means so to rotate said mirror, and means to scan the said drum to produce facsimile signals representative of said subject matter.

14. A facsimile transmitter comprising a rotatable drum having a photoconductive surface adapted to retain a distributed charge of electricity thereon, electrostatic means to charge said drum surface, a light mask fixedly mounted adjacent the side of said drum and slotted therealong throughout substantially the entire length of said drum, a copyholder movable oppositely to the drum and in step therewith, means so to move said copyholder a copy image forming lens fixedly mounted between said copyholder and said light mask to cast a copy image element on said drum, and drum scanning means to pick off from said drum facsimile signals representing a copy image.

15. A facsimile image storage system comprising a rotatable drum having a photoconductive surface for selectively retaining distributed charges thereon, a light mask fixedly mounted adjacent the side of the drum and slotted therealong, and means for sweeping an optical real image across the exposed surface of the drum in step with the rotation thereof to form a corresponding electrical charge image on the drum.

References Cited in the file of this patent

UNITED STATES PATENTS

Re. 21,417	Jenkins	Apr. 2, 1940
1,880,289	Sukumlyn	Oct. 4, 1932
1,979,722	Zworykin	Nov. 6, 1934
2,143,214	Selenzi	Jan. 10, 1939
2,169,840	Lewis	Aug. 15, 1939
2,301,199	Bruce	Nov. 10, 1942
2,330,682	Clothier et al.	Sept. 28, 1943
2,357,809	Carlson	Sept. 12, 1944
2,583,546	Carlson	Jan. 29, 1952
2,624,652	Carlson	Jan. 6, 1953