

April 28, 1959

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2,884,486

PHOTOCONDUCTIVE FACSIMILE TRANSMITTING APPARATUS

Filed Dec. 30, 1952

4 Sheets-Sheet 1

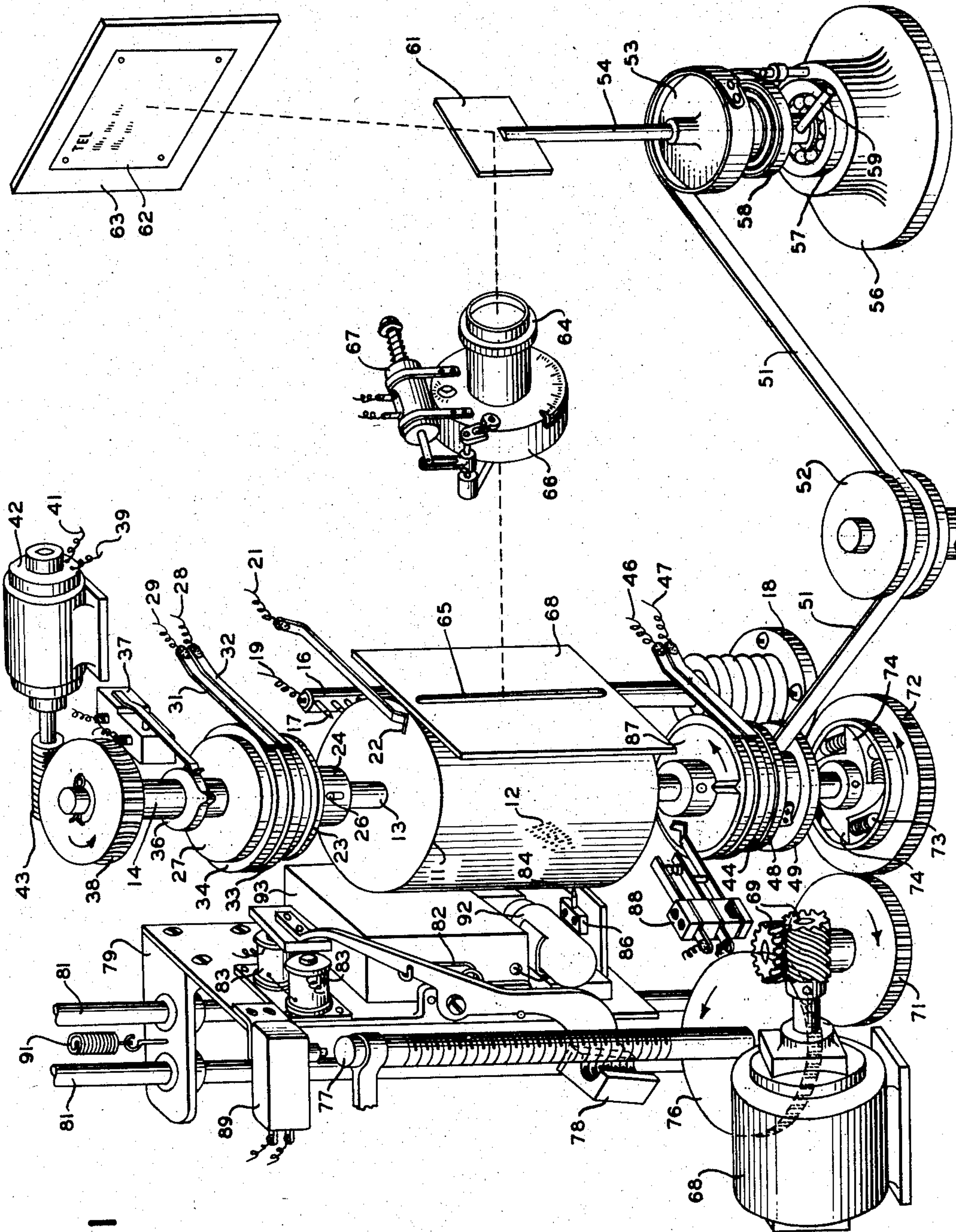


FIG. 1

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4 Sheets-Sheet 2

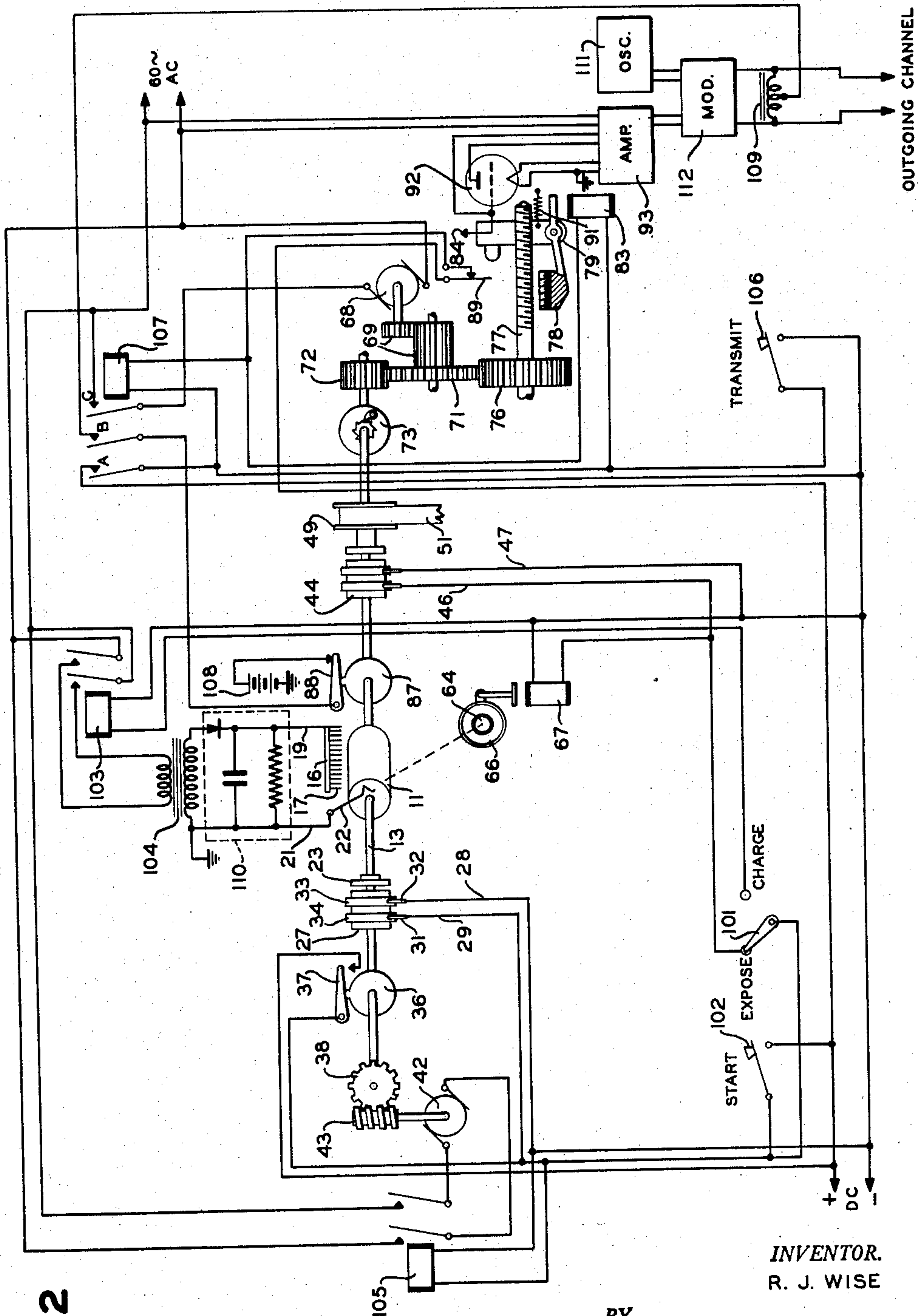


FIG. 2

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4 Sheets-Sheet 3

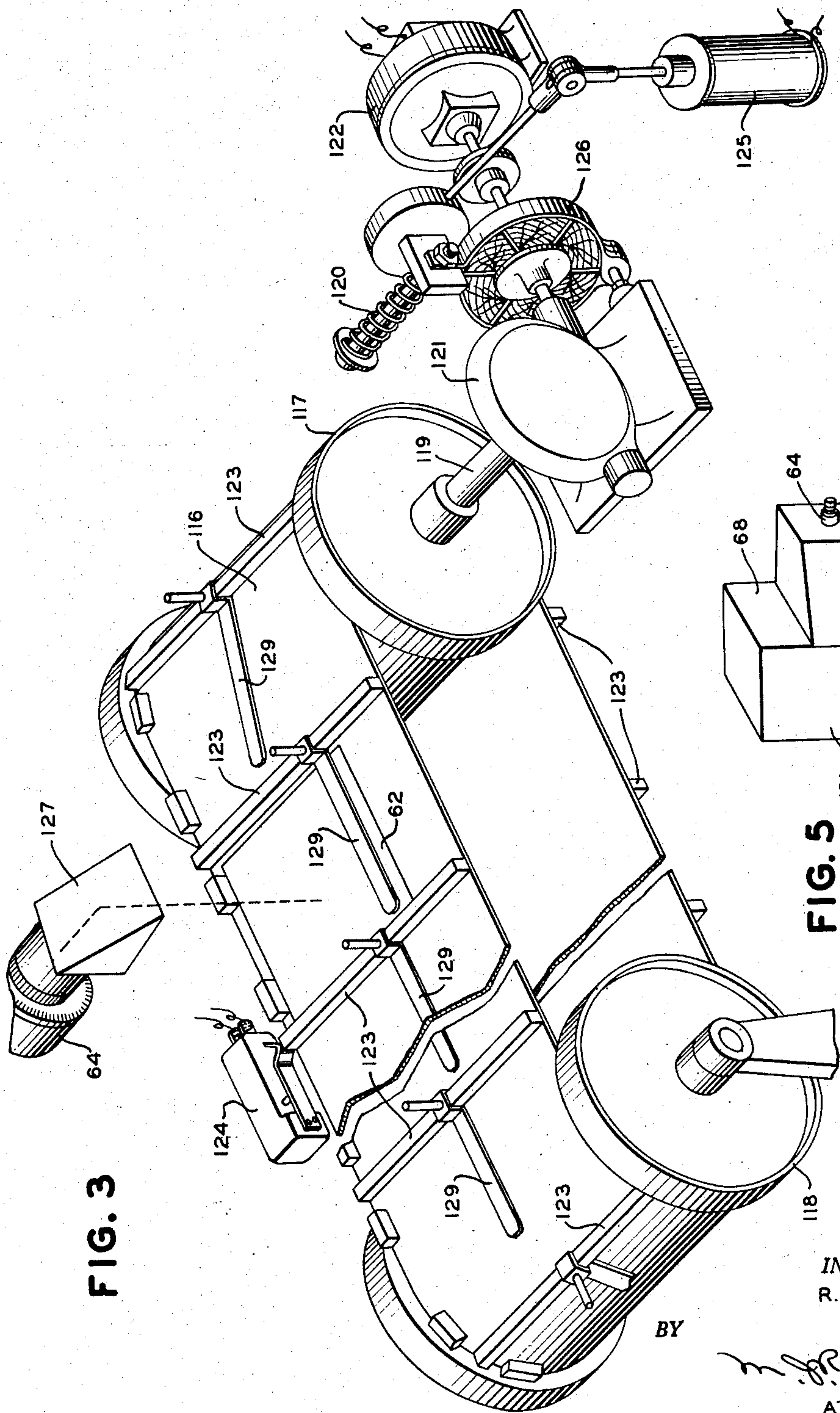


FIG. 3

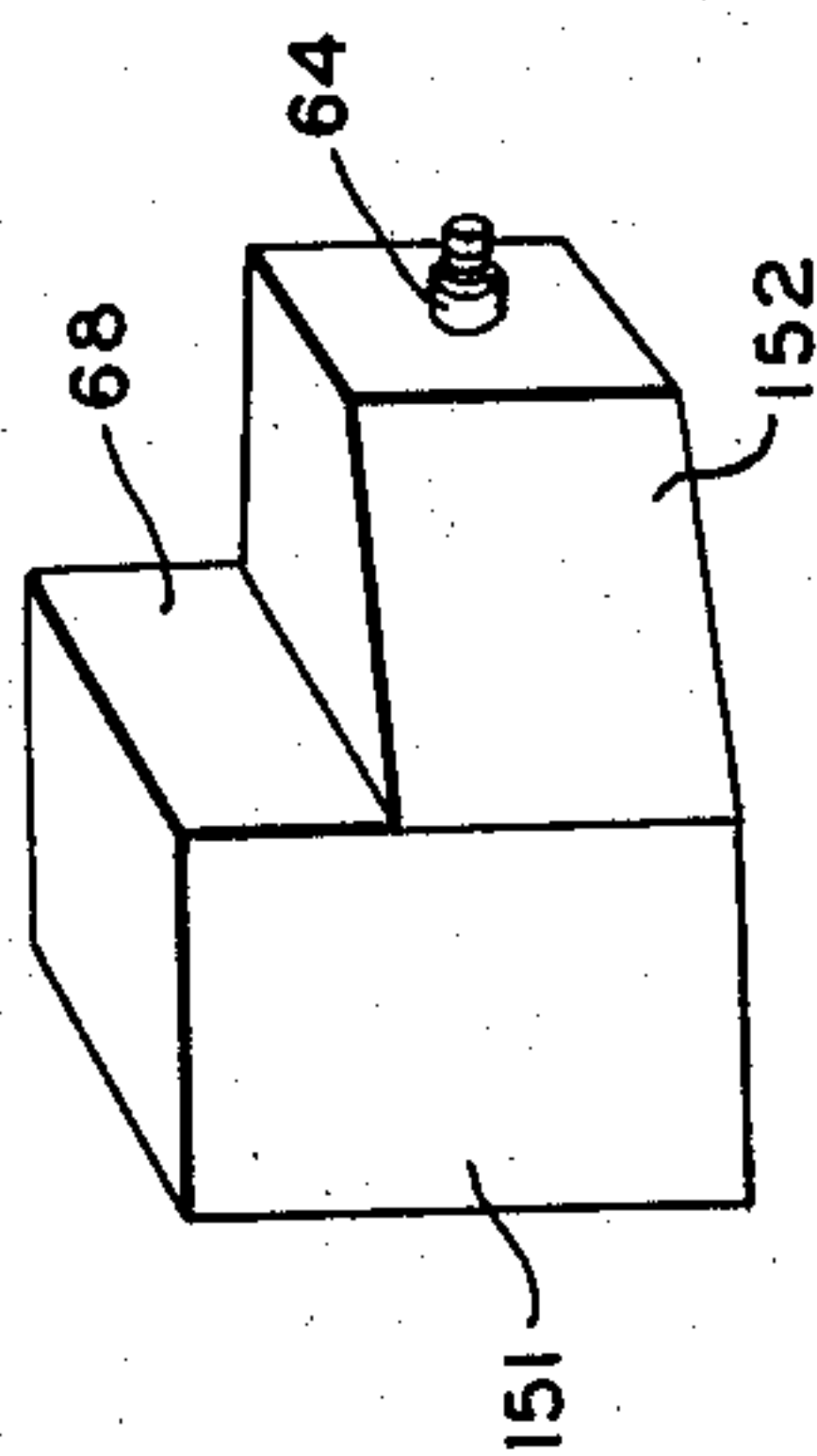


FIG. 5

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4 Sheets-Sheet 4

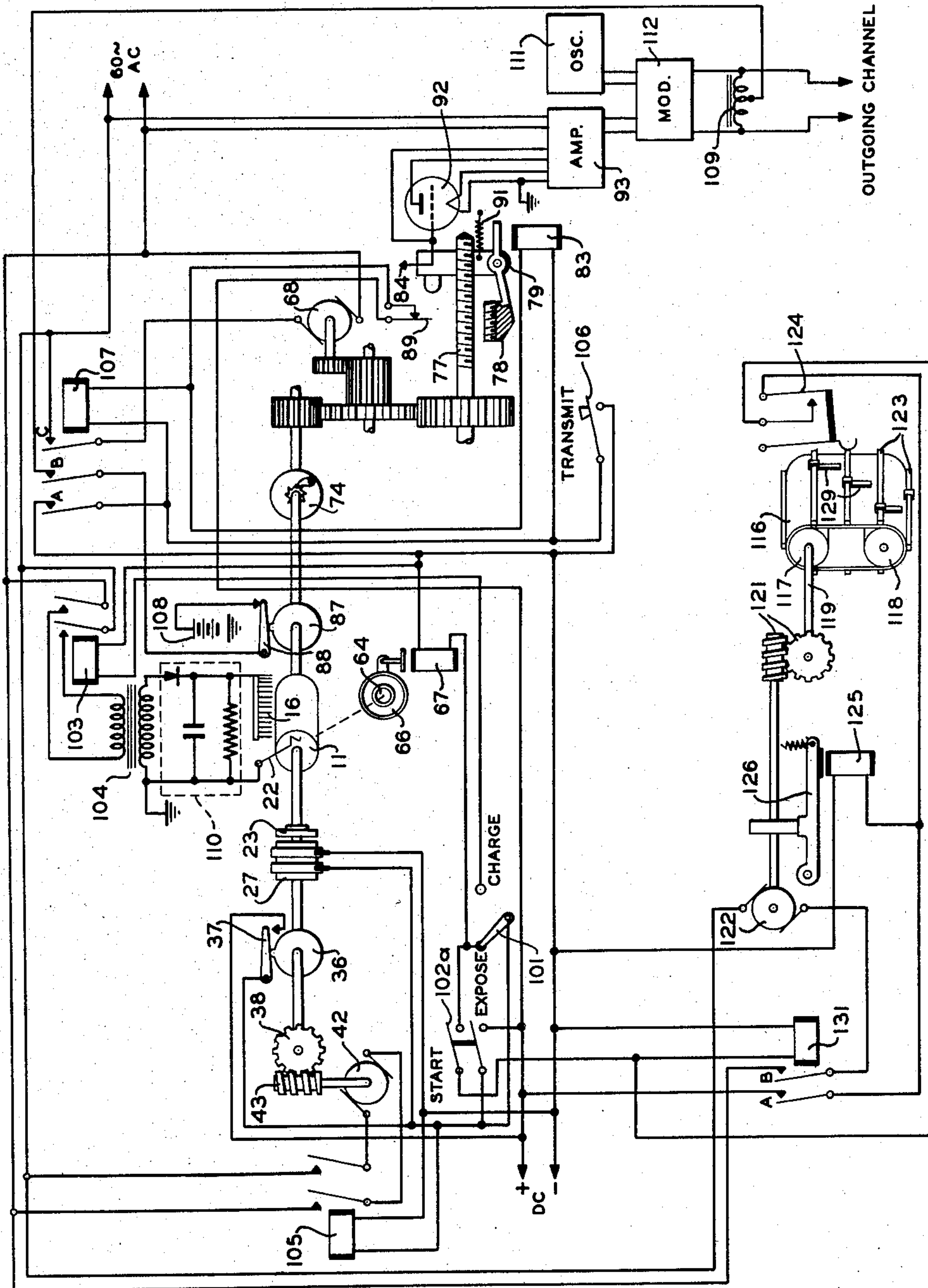


FIG. 4

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1

2,884,486

PHOTOCONDUCTIVE FACSIMILE TRANSMITTING APPARATUS

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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

2

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-

5

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 102a, 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

6

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

20	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
25	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