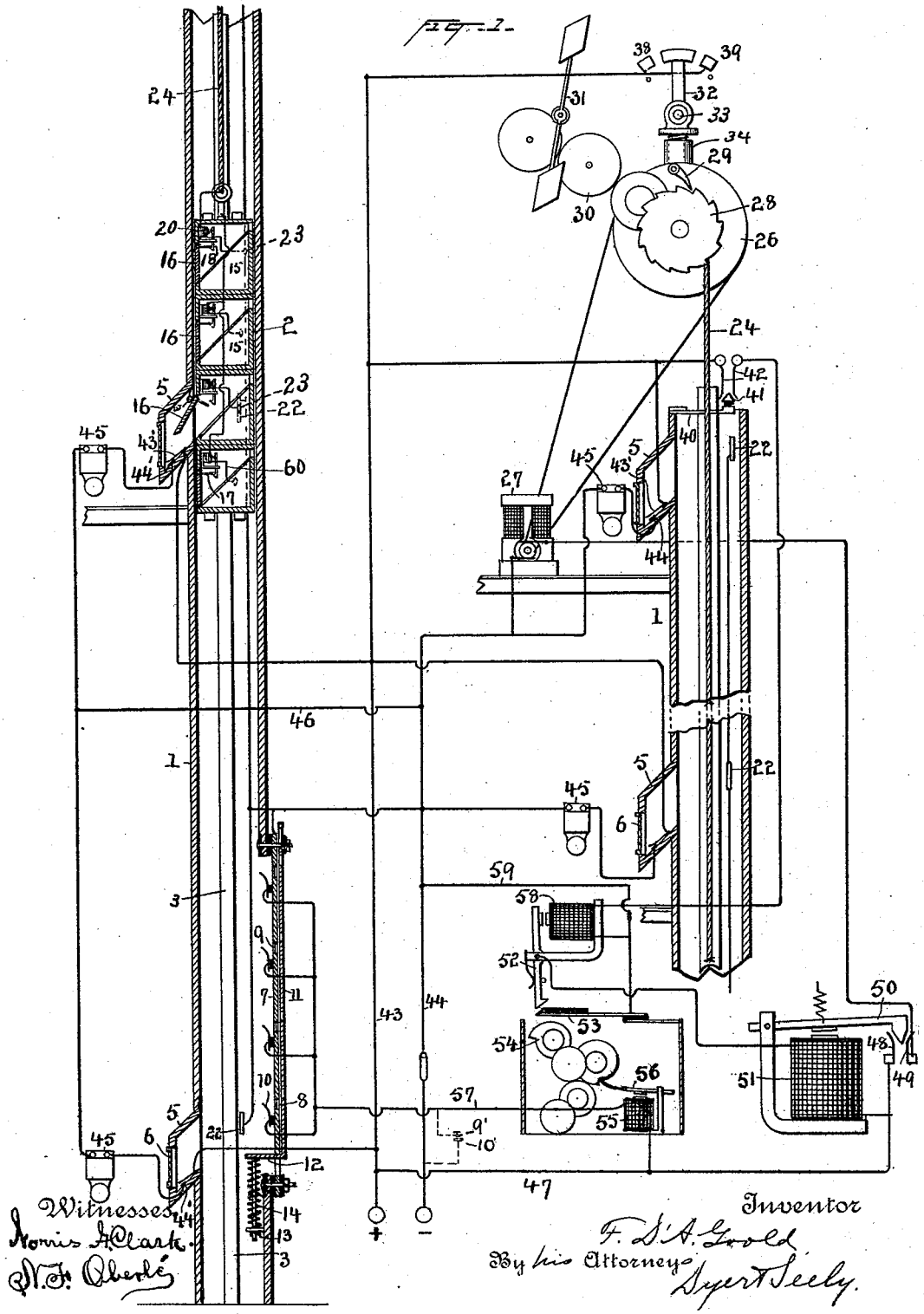
(No Model.) 5 Sheets—Sheet 1

F. D'A. GOOLD.

APPARATUS FOR DISTRIBUTING MAIL.

No. 490,607. Patented Jan. 24, 1893.



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F. D'A. GOOLD.

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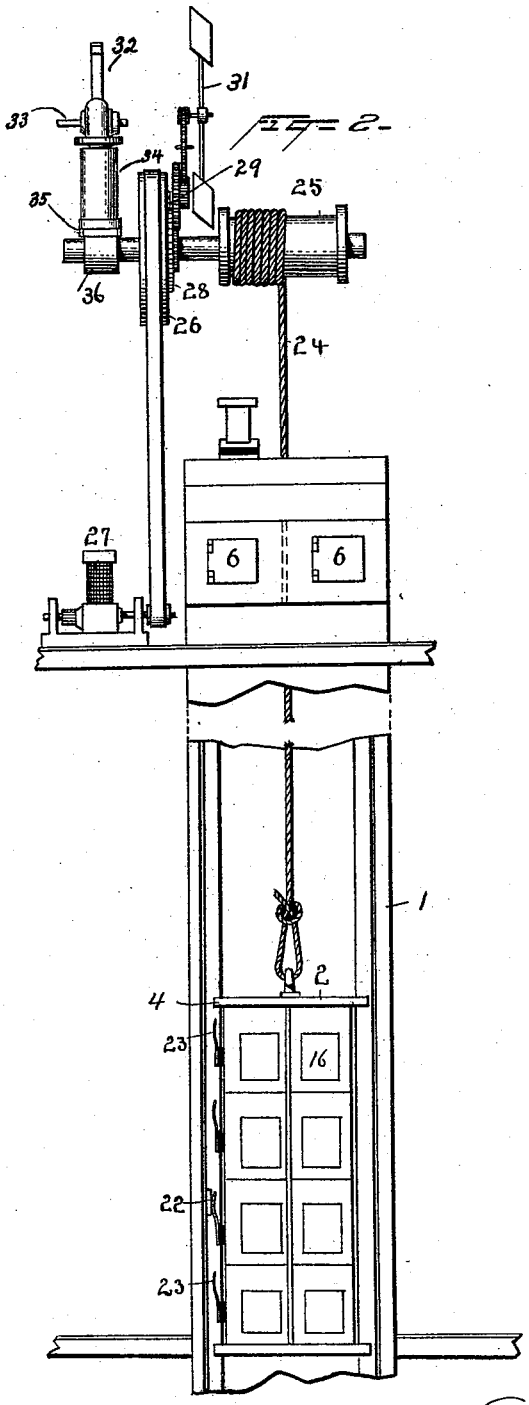

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(No Model.) 5 Sheets—Sheet 3.

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APPARATUS FOR DISTRIBUTING MAIL.

No. 490.607. Patented Jan. 24, 1893.

Fig. 3.

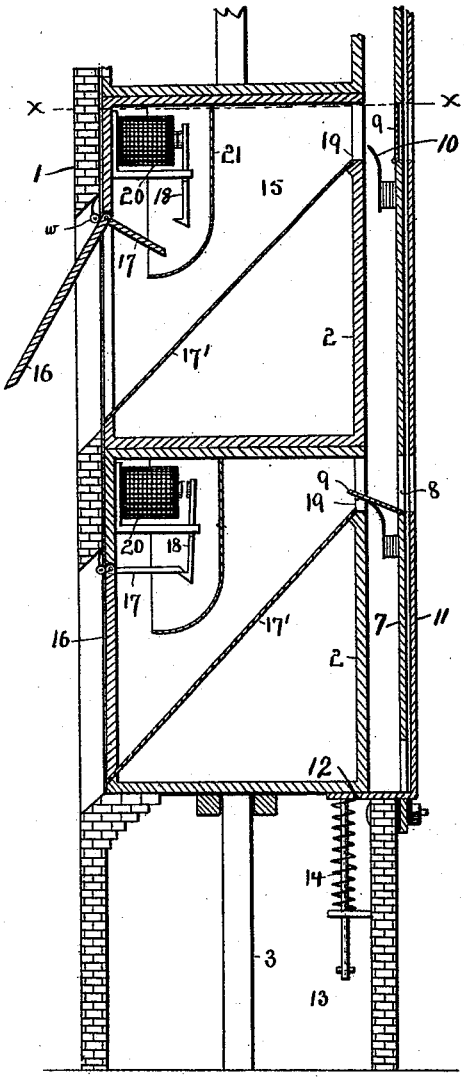

Fig. 4.

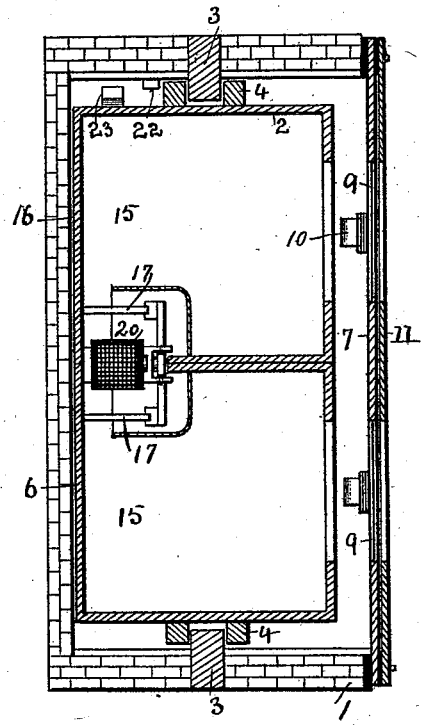

Fig. 5.

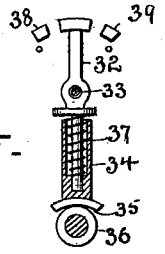

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Fig. 5.

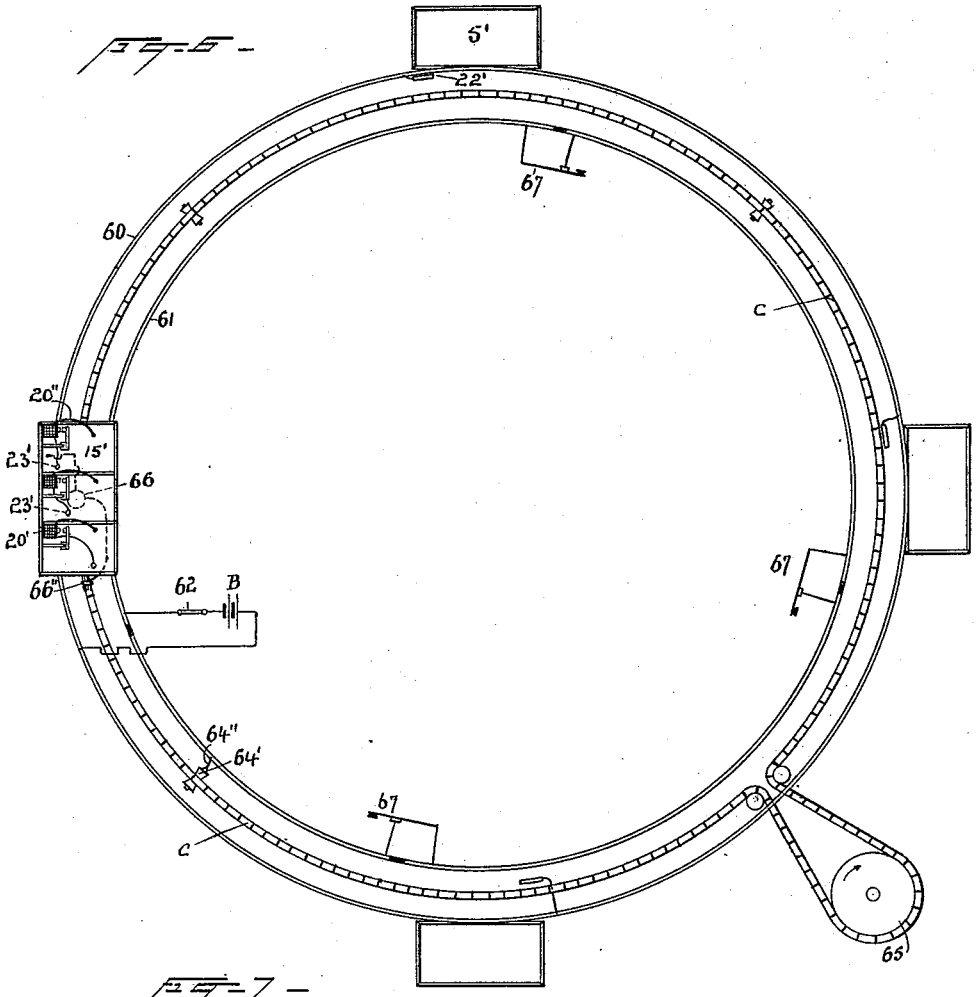


Fig. 7.

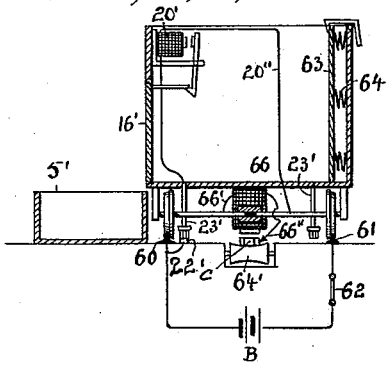
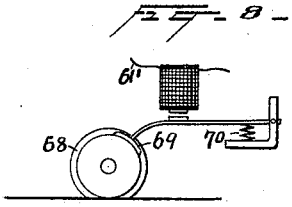


Fig. 8.



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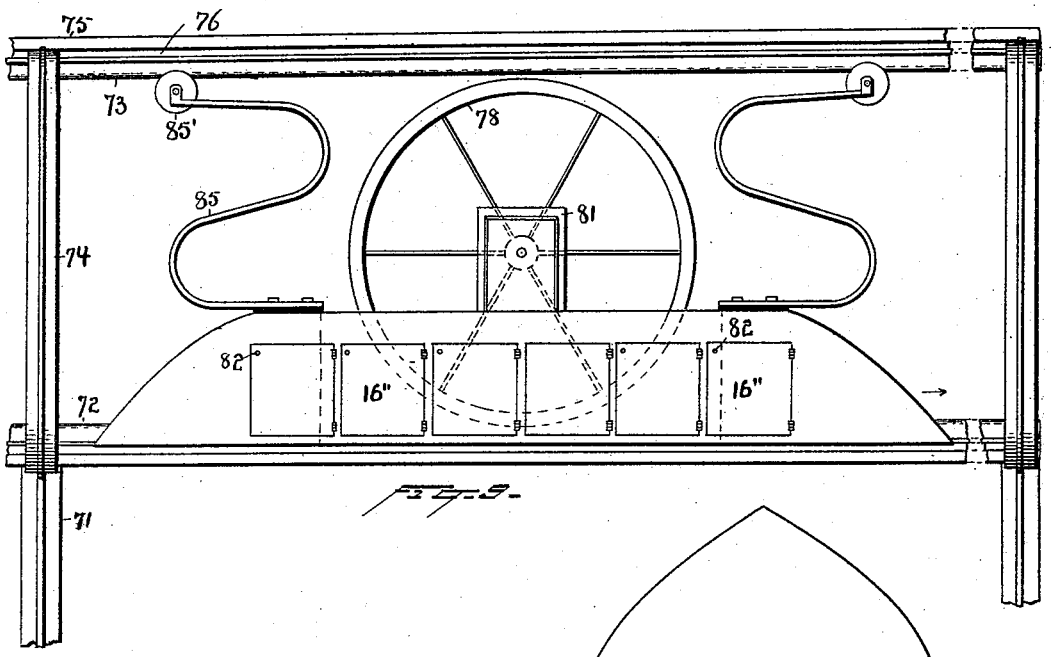


Fig. 9.

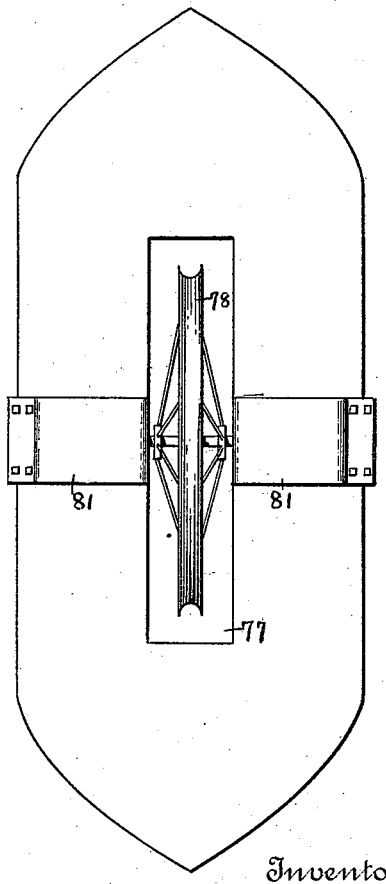
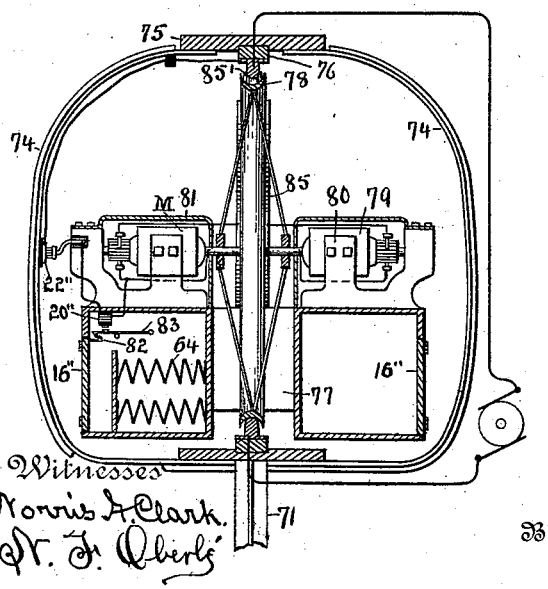


Fig. 11.

Fig. 10.



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UNITED STATES PATENT OFFICE.

FREDERICK D'A. GOOLD, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO JOSEPH HUTCHINSON, OF SAME PLACE.

APPARATUS FOR DISTRIBUTING MAIL.

SPECIFICATION forming part of Letters Patent No. 490,607, dated January 24, 1893.

Application filed May 6, 1892. Serial No. 432,050. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK D'A. GOOLD, a citizen of the United States, residing at New York city, county and State of New York, have invented a certain new and useful Improvement in Mail and Parcel Distribution, of which the following is a specification.

The present invention relates to apparatus for distributing letters, papers or other articles at several different points along a shaft, guide-way or track.

The main object of the invention is to provide a simple and practicable electrically controlled apparatus, for the purpose mentioned, which can be constructed and maintained at a reasonable cost and shall be reliable and efficient in operation.

The invention consists in the apparatus and in the several combinations described in the following specification and set forth in the claims.

The system and apparatus to be described are especially adapted for use in apartment houses and office buildings but may be used in any suitable situation.

In the accompanying drawings, Figure 1 is a general view, partially in section and partially diagrammatic, showing the preferred construction and arrangement of the parts of the system, and the circuit connections. On account of the length of the construction shown, the figure is divided into two sections placed side by side on Sheet 1, and in examining said figure it should be understood that the portion of the shaft, tube or guide-way at the right of the figure is really a continuation of the shaft, tube or guide-way shown at the left of the figure. Fig. 2 is a side view, at right angles to Fig. 1, of the hoisting devices at the top of the shaft, and of a section of the shaft containing the carriage, a part of the front wall of the shaft being broken away; Fig. 3 is an enlarged sectional view of the lower end of shaft and the lower end of the carriage; Fig. 4 is a plan view on line x—x of Fig. 3; Fig. 5 is a detail view of a circuit controller operated by a friction device to be described; Fig. 6 illustrates a modified system and apparatus; Fig. 7 is a cross-section through the track and carriage of this modified system; Fig. 8 is a view of a brake used on the carriage; Fig. 9 is a side view of a short section of track with a carriage thereon, both being of different form from those illustrated in the preceding figures; Fig. 10 is a cross-section through Fig. 9; and Fig. 11 is a plan view of the carriage.

In the drawings, 1 indicates the wall or frame-work of a shaft, tube or guide-way, preferably vertical, and extending from the lower to the upper floor of a building, and in which a carriage 2 is adapted to travel. Along the sides of the shaft are preferably placed guide-strips 3, on either side of which stand strips 4 carried by the carriage. At each floor of the building, or at each point of deposit for mail or other articles, are placed one or more delivery boxes or receptacles 5, into which the letters &c. are dropped from the carriage automatically. Each receptacle has a door 6, which may be opened by the authorized person. I prefer to place as many receptacles 5 side by side as there are apartments or offices on a single floor. In this system two such receptacles are shown, side by side, (see Fig. 2.) Near the lower end of the shaft or tube is a metal plate 7 forming a part of one wall of the shaft and having as many openings 8 as there are receptacles 5, these openings being normally closed by hinged metal valves 9, which are in electrical connection with the plate 7. Carried by said plate but insulated therefrom, and in position to be struck by the valves 9 when the latter are opened by forcing in a letter or other article, are springs 10. Outside of the plate 7 is a second plate 11 having holes corresponding in shape and arrangement to those in plate 7, and, in the normal position of the system, registering therewith. The outer plate is provided with an arm 12 extending through a slot in the inner plate and provided with a sliding rod 13 on which is a spiral spring 14 tending to raise the plate 11 to the position shown in Fig. 1.

The carriage referred to above is preferably provided with as many compartments or sections as there are points of delivery, that is, the same number as that of receptacles 5. The several compartments or sections 15 are in vertical rows, as shown in Fig. 1, and in horizontal rows as shown in Fig. 4. The number of compartments in each vertical row will

correspond with the number of the points of deposit, for example with the number of stories in a building in which the mail or parcels are to be distributed, and the number in each horizontal row will correspond with the number of apartments or offices to be accommodated on each floor, or, in other words, with the number of boxes 5 in each group. Each compartment of the carriage is provided with a hinged door or valve 16, having an arm 17 which is normally engaged by the catch or detent armature lever 18, the door being thereby held closed. Evidently it is not essential that the several doors in each horizontal row be controlled by the single detent, although this is preferred. Each compartment of the carriage is preferably provided with a partition 17′, extending from the lower end of the door to the bottom of the opening 19, through which the letters or parcels are inserted, which openings, when the carriage is in its lower position, as shown in Fig. 3, are in line with the openings 8 and the valves 9. It is not essential that the carriage be actually subdivided, but the letters or articles in the carriage must be subdivided so that at each delivery point only the desired letters or articles shall leave the carriage.

20 are magnets for operating armature levers 18. The door of the second compartment of the carriage, (Fig. 1,) is shown open, its magnet having been energized to release the arm 17.

21 are shields surrounding the magnets and armatures, so that articles inserted into the compartments will not interfere with said parts.

On one side or wall of the shaft or tube, adjacent to each point of delivery, is a contact strip 22, one for each magnet 20, the strips being arranged in different lines along the length of the shaft, so that a contact device which touches one will not touch the others. This arrangement is indicated in Fig. 1, where the lower contact strip 22 is immediately at one side of the guide-strip 3, while the other strips are successively farther away from the same. On the side of the carriage which moves along adjacent to this wall of the shaft are contact springs 23, one for each contact 22. The spring 23, on the lower row of compartments, is in line with the first or lower contact strip 22. The contact spring on the second horizontal row of compartments is in line with the second contact strip 22, and so on, for succeeding springs, although this order is not essential.

The carriage is supported by a conducting cable 24, which passes to and around the drum 25, on the shaft of which is a pulley 26 driven by any suitable motor, for example the electric motor 27. On the same shaft is a ratchet-wheel 28, in the teeth of which the pawl 29 is adapted to engage when the latter is carried toward the right by movement of the pulley 26.

30 is a train of wheels driven by the pulley shaft through the ratchet 28, and driving in turn the retarding fan or device 31.

32 is an arm of a circuit controller, pivoted at 33 and extending into the sleeve 34, having at its lower end a curved friction surface 35 which bears against a small pulley 36 on the pulley shaft.

37 is a light spring to produce necessary friction between said parts 35, 36. The arm 32, when the drum shaft turns in one direction, is carried against the contact 38, beyond which it cannot pass, and when the shaft rotates in the opposite direction, the arm is carried to block 39 and is there arrested.

At the upper end of the shaft is a spring or flexible arm 40 carrying a contact block 41 adapted to connect the two springs 42 when the former is raised.

The circuit connections preferred are as follows: +, — are the terminals of an electric generator or the wires of a supply circuit, and from them lead wires 43, 44, the former extending to the contact 39 and having a branch to one of the springs 42, and having branches also to each of the springs 43′ in the delivery boxes or receptacles 5. Below each spring is a contact 44′, from which wires lead to the bells 45, of which there are or may be as many as there are receptacles 5. The opposite terminals of the bells are connected by wires 46 to the negative wire of the circuit. The positive wire is also connected by wire 47 to a spring 48, normally separated from spring 49 but adapted to be connected by the armature lever 50 when the latter is drawn down by the magnet 51 of this magnetic circuit closer, the terminals of which magnet are connected to wire 47 and to the armature lever 52, the lower end of which has a catch adapted to hold up the insulated spring 53 when the latter is raised by the cam 54, and this takes place when the driving clock-work is released by the magnet 55 attracting its detent armature 56. The terminals of said magnet are connected to wire 47 and to wire 57, and this latter wire branches to the several springs 10. The insulated spring 53 is connected to one terminal of the magnet 58, the opposite terminal being connected to the second spring 42, and said spring 53 is connected by wire 59 to the negative side of the circuit. The several contact pieces 22 along the length of the shaft are also connected to the negative side of the circuit as also is the plate 7, this connection being shown as a wire leading from its upper end. The contact springs or brushes carried by the carriage are connected by wires 60 to the magnets 20, thence to the cable 24, to the arm 32, and, when the latter is in contact with block 39, to the positive side of the circuit.

The construction and circuit connections being as indicated above, the operation of the system would be as follows: Assuming that the carriage is at its lowest position in Fig. 1, the plate 11 will be moved down to its lower position, causing the openings therein to reg-

ister with the openings in plate 7, and leaving the system in such condition that letters or other articles can be placed into the particular compartment or compartments of the carriage corresponding to the point to which said letters or articles are to go. In this position the circuits are all open. When an article is inserted through an opening 8 its valve 9 will be turned on its hinges, as indicated in Fig. 3, making metallic contact with the corresponding spring 10. This closes the circuit of magnet 55, releasing the clock-work which drives the cam 54, causing the latter to turn slowly and to raise the spring 53, so that it will rest above the hook of armature 52. This movement requires sufficient time to allow insertion of other letters or articles in different compartments of the carriage, if it is desired to do so. When the spring 53 is raised as described, so that it makes contact with the lever 52, the circuit of magnet 51 is closed, thereby attracting its armature, connecting springs 48, 49, thereby completing the circuit of the motor 27 and causing it to turn in the direction to wind up the cable and raise the carriage. Immediately after the carriage starts, the arm 32 is moved onto contact 39, the plate 11 is moved up by the spring 14, making it impossible to insert articles until the carriage returns to its first position, and the brush on the lower section of the carriage makes contact with the first contact strip 22, closing the circuit of the door or valve controlling magnet 20 in said section, so that if there is any letter or other article on the inclined partition 17 and resting against the door it will be allowed to slide out into the first receptacle 5, or group of receptacles if there are articles in more than one of the compartments of the first horizontal section of the carriage. When said letter or article slides into the receptacle 5, its weight will press down spring 43′, completing the circuit to bell 45, which is placed in the apartment or office of the person who has access to the receptacle 5. As the carriage moves along the doors are automatically closed by action of the friction-wheels *w*, and when it reaches the second story the brush 17 on the second section of the carriage will make contact with the contact strip 22, thus closing the circuit through the magnet 20 in the second section and allowing the door or doors to open, as already described. The operation will be the same at the succeeding stories of the building, thus automatically distributing the mail or articles at the proper points and calling attention to the same by the alarm bells. Of course articles can be deposited at one point only in the same manner. When the carriage reaches the upper story, or the end of the shaft, it will strike the spring 40, raising it sufficiently to connect the springs 42, thus closing the circuit through magnet 58, causing it to attract its armature, releasing spring 53, opening the circuit of magnet 51, allowing its armature to be retracted, thereby opening the circuit of the motor and stopping further ascent of the carriage. The latter will then begin to descend by gravity, and as the drum 25 and pulley 26 are turned by the cable, the pawl 29 will engage with the ratchet-wheel and will cause the retarding fan or device 31 to rotate, causing the carriage to descend gradually. This movement can be made as slow or as rapid as desired. As the pulley turns in the direction indicated, the arm 32 will be turned on its pivot by the friction between pulley 36 and surface 35 until said arm is carried away from contact 39 and rests on block 38, where it is arrested, thus opening the circuit, so that the magnets 20 will not be energized when the springs 17 pass contact strips 22 during the downward movement of the carriage. By opening the motor circuit manually, as by the switch shown in the negative side of the circuit, the upward movement of the carriage can be stopped at any point below the top of the shaft if desired.

When the devices are arranged according to the preferred form above described, it will be seen that the entire operation is automatic; that is, a moment after a letter or article is inserted, the carriage automatically starts, delivers the letters or articles at the proper points, and, finally, returns to its first position. It is evidently not necessary that the carriage should start automatically. By omitting the springs 10, and the corresponding circuit connections, and placing a circuit-closer as indicated in dotted lines in Fig. 1 at 9′, 10′ in the circuit of magnet 55, the person depositing the letters or articles can close the same manually when he is ready to have the carriage start.

It will be evident that the form of motor employed for raising the carriage is immaterial; the expense for running the motor will be small, since it need only be used while the carriage is moving up the shaft. It is not necessary that the guide-way for the carriage should be an inclosed vertical shaft, although in apartment and office buildings it is preferable.

Instead of using a vertical shaft as above described, I may employ a horizontal guide-way or track. This is shown in Figs. 6 and 7, in which 60, 61 are two rails of a track, to which the poles of the generator B are connected, a switch 62 being included in the circuit, and on which track a carriage is adapted to move. The carriage used will preferably be divided into subdivisions 15′ as described in connection with Fig. 1. At several points along the track, which may be circular if desired, are delivery boxes 5′, corresponding to the receptacles 5 of Fig. 1. Adjacent to each of these boxes is a contact strip 22′, with which the brushes 23′ carried on the bottom of the carriage are adapted to make contact, there being one brush for each contact strip, said brush being so mounted that it will not make contact with the other strips 22′. The number of these brushes, as well as of the

strips 22′, corresponds to the number of subdivisions of the carriage, and each brush is connected to a separate detent controlling magnet 20′, and thence to the wire 20″ and to the other side of the circuit, as clearly shown in Fig. 7.

Instead of the means already described for giving articles a tendency to move out of the door 16 or 16′ of the carriage, namely, the inclined partition, I may employ other means; for example, in each subdivision may be placed a plate 63 having springs 64 tending to press it, and any articles in advance of it, forward. In the position shown these springs are compressed, the plate being held retracted by a catch.

Between the rails and supported at intervals on antifriction rollers 64′ is an iron chain, belt or cable, *c*, which is moved by being carried around the pulley 65 driven by any suitable power, not shown. On the under side of the carriage is a magnet 66, the pole or poles of which normally stand immediately over said magnetic belt or cable. The cable is electrically connected to the inner rail near the generator, as at 64″. The circuit of this magnet is from the outer rail to a wheel, to the divided axle, to wire 66′, to the magnet, to the brush 66″ which makes continuous connection with the cable, through said cable to the second rail, and thence to the other pole of the generator through circuit opening keys 67. This magnet being thus energized attracts the belt or cable with such power that the carriage will be moved along thereby. Adjacent to each delivery box one of the lines of rails is preferably divided, the ends being connected by normally closed circuit openers or keys 67.

In Fig. 8, 68 is one of the wheels of the carriage, or a pulley on one of the shafts, and against it bears a brake-shoe 69, being normally applied by the spring 70. Above the arm carrying the brake-shoe is a magnet, which may be the magnet 66 or any other suitable magnet, directly in the main circuit and adapted to attract this armature to remove the brake from the wheel.

With the arrangement just described, the carriage will continue to travel around the track until some person desires to use it, when he will open the main circuit by depressing a key 67 at the point where he desires to load articles into one or more of the compartments of the carriage. The opening of the circuit not only stops the particular carriage being loaded, but any others which may be on the same track, thereby preventing accident. When the carriage is loaded the key 67 is released, when the carriage at once starts. When it reaches the first contact strip 22′, the brush 23′, corresponding to one compartment, closes the circuit of the releasing magnet of said compartment, allowing the door 16′ to open and the inclosed article to be forced out by the springs 64, the catch having been moved to release the plate 63 when the article was placed in the compartment. The parts are so mounted that the door will open when said compartment is directly over the first delivery box, and the movement of the carriage is sufficiently slow so that articles will be deposited in the box. When the carriage reaches the second box 5′ the door of a second compartment will be opened, and so on in succession. The system can be permanently thrown out of use by opening the switch 62. As soon as the switch 62, or either of the switches 67, is moved to open the circuit, the brake-magnet is instantly de-energized and the brake applied, causing the carriage to stop at once.

The carriage shown in Fig. 6 has but one row of compartments, instead of several rows as in the carriage first described, but the number of compartments can, evidently, be increased as desired.

For high speed transmission and distribution of mail and articles over long distances, the apparatus shown in Figs. 9, 10, 11 may be employed.

71 are posts or columns, on which are supported rails 72, 73, both being preferably insulated, the upper rail being supported by curved arms 74, the upper ends of which are connected by longitudinal metal plates or girders 75 carrying the insulating girders 76. The arms 74, forming the supporting framework for the upper rail, may be at considerable distances apart, there being, say, fifty or thereabout to the mile. The carriage is preferably similar in shape to an inverted canoe, the bottom being flat and the upper surface being wedge-shaped, as shown in Figs. 9 and 11. At the center of the body is an opening or well 77, extending entirely through it, and in this opening is the large driving wheel 78, adapted to rest on the lower rail. On the shaft of this wheel are one or two electric motors M, say of about one horse power each when two are employed, the field-magnet 79 being supported by arms 80 projecting up from the body of the carriage. The shaft of the armature and wheel has end bearings supporting the body of the carriage, as shown. A shield 81 may be placed over each motor, to protect them from dust and water. The body of the carriage, along each side of the central opening 77, is sub-divided into several compartments or sections, which may or may not be separated by partitions, and each of which has a door 16″ hinged on the edge toward the front of the carriage. At the opposite edge of each door is a catch 82, adapted to be engaged by the detent armature 83, which is in position to be attracted by the magnet 20″ when the latter is energized. Within the compartments are springs 64 for pressing articles against the door and throwing the articles out when the door is unlocked. In this system, as in those above described, contact springs 22″ are arranged adjacent to the points where it is desired to deliver mail or articles, and the carriage carries a brush 23″ for each magnet 20″,

each brush being adapted to strike its own contact only.

The circuits may be as follows:—One terminal of the dynamo is connected to the lower rail, thence through the driving wheel and axle and in multiple arc through the motors to the springs 85, or either of them, said springs being insulated from the body of the carriage and having trolleys 85′ at their upper ends bearing on the upper rail. These devices not only serve as current collectors or contact devices, but are sufficiently stiff to steady the carriage and to maintain it in proper position, at the same time being adapted to yield when necessary. Thence the circuit passes to the upper rail and back to the dynamo.

The operation of this apparatus will be clear without detailed description. It will be evident that the motor and carriage can be stopped at any time by opening the main circuit of the dynamo by a suitable switch, and that at the end of the route, the carriage can be automatically brought to rest by running onto an insulated section of the track, or by any automatic circuit-opener. However great the speed of this carriage, there is little or no danger of its leaving the track, by reason of the low center of gravity of the body and by reason of the shape of said body, which is such that the action of the air tends to press it down onto the lower rail. When the circuit of any magnet 20″ is closed, the corresponding door will be forced open and the article in the compartment forced out by the springs 64 into a proper receptacle, as described in connection with the other figures. The door will then be immediately closed by the action of the air, or by any suitable means, and will be caught by the detent armature. The motors, being directly on the shaft of the driving wheel, act directly and with high efficiency. By reason of the elevated and protected arrangement of the conductors, high tension currents can be well employed. By the means described, very high speed can be attained with safety, and without interfering with the automatic operation of the devices for delivering the articles. If desired, a casing can be placed over the entire driving wheel and mechanism, in which case the small casings 81 would be unnecessary.

Many of the details of construction described in this and in the first systems can be varied or omitted without departing from the main features of the invention.

By arranging the circuit-closing devices and magnetic releasing devices as described, control of the apparatus is easily and perfectly secured.

What I claim is,

1. The combination, in an apparatus for distributing articles, of a guideway, a carriage movable along the same and adapted to contain articles separated into as many subdivisions as there are distribution points, means for retaining the articles in the carriage, and magnetic releasing devices brought into operation as the carriage moves along and constructed to allow the escape of the articles intended for one point only at each operation, substantially as described.

2. The combination, in an apparatus for distributing articles to several points, of a guideway, a carriage movable along the same, having several compartments or subdivisions, one for each delivery point, doors or valves held closed by detents for retaining the articles in their compartments, and magnets and armatures controlling said detent, the circuits of which magnets are automatically controlled by the moving carriage, for delivering the articles from the proper compartments when the carriage successively reaches the delivery points, substantially as described.

3. The combination, in an apparatus for distributing articles to several points, of a carriage movable along by the delivery points and having several subdivisions, one for each delivery point, means, such as doors or valves, held closed by detents, for retaining the articles in their subdivisions, and magnets and armatures for releasing the detent when the carriage successively reaches the delivery points, said magnets being in circuits controlled by the moving carriage, each circuit controller on the carriage being arranged to close the circuit of its own magnet only, substantially as described.

4. A movable carriage for distributing articles at several different delivery points and having several subdivisions, said subdivisions being arranged in several columns side by side, means for retaining articles in the several subdivisions, and a magnetic releasing device for each of said means, substantially as described.

5. The combination of a carriage adapted to contain articles separated into several subdivisions, means for retaining the articles in the carriage, and magnetic releasing devices brought into operation as the carriage moves along and constructed to allow the escape of a part only of said articles each time a magnetic device is operated, substantially as described.

6. The combination of a carriage having several subdivisions, a hoisting drum and cable, a motor connected to the drum to raise the carriage, means for opening the subdivisions automatically, a circuit controlling device near the end of movement of the carriage in a circuit which controls the motor, and means independent of the motor for controlling the return movement of the carriage, whereby the motor may be out of use while the carriage descends, substantially as described.

7. A movable carriage for distributing articles, having several subdvisions, means for retaining articles in the subdivisions, and magnetic releasing devices on the carriage,

brought into operation in a pre-determined order for releasing articles in the several subdivisions at desired points, substantially as described.

8. A carriage in which articles may be placed, a door therein, means giving articles in the carriage a tendency to move out of the door, a magnet and armature controlling said door, and a circuit controller for said magnet and operated by movement of the carriage, substantially as described.

9. The combination of a guide-way or track, a carriage movable along the same, a delivery box or point, automatic means for delivering articles from said carriage to said box or point an alarm circuit, a circuit-controller in said box or at said point operating to change the condition of the alarm circuit when an article is deposited in the box, and an alarm controlled by said circuit-controller, substantially as described.

This specification signed and witnessed this 2d day of May, 1892.

FREDK. D'A. GOOLD.

Witnesses:
CHARLES M. CATLIN,
GEORGE B. BUCHANAN.