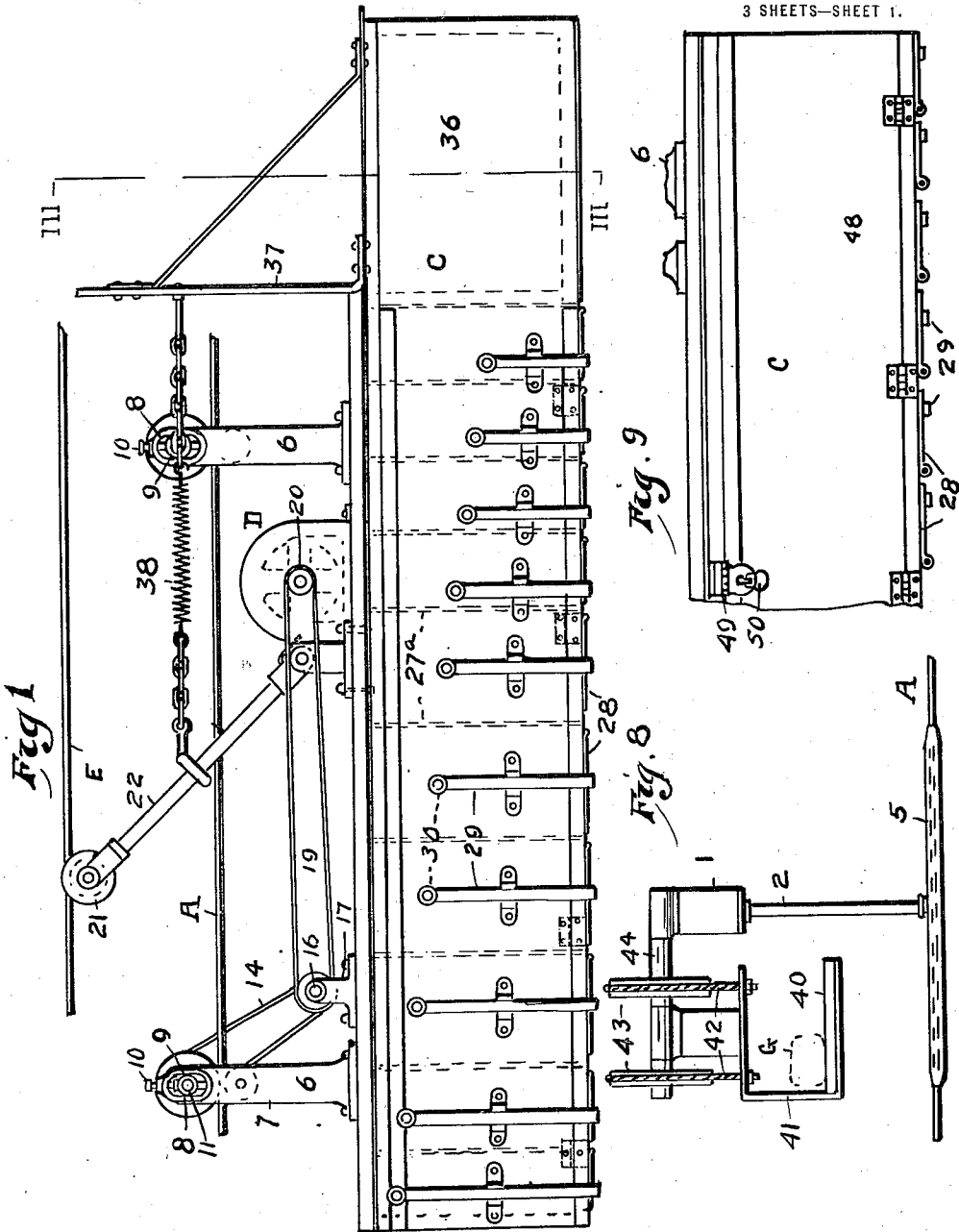


J. I. HOFFMAN.
 AUTOMATIC DELIVERY SYSTEM.
 APPLICATION FILED DEC. 21, 1920.

1,438,162.

Patented Dec. 5, 1922.

3 SHEETS—SHEET 1.



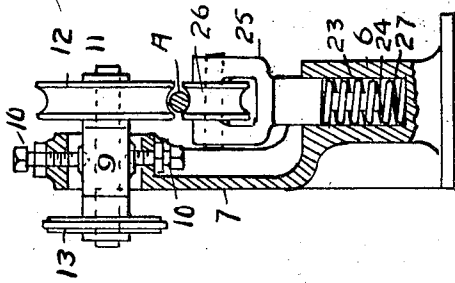
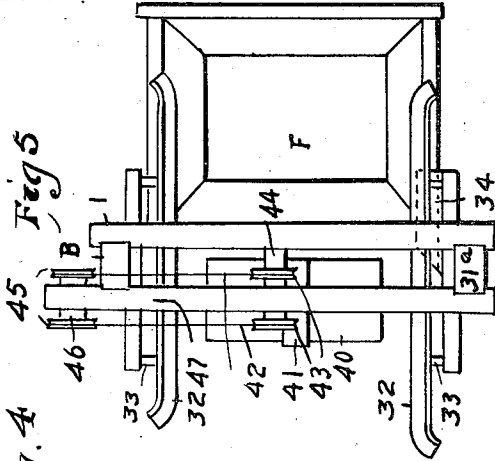
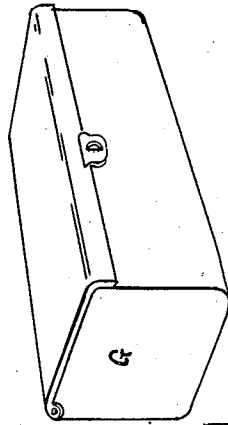
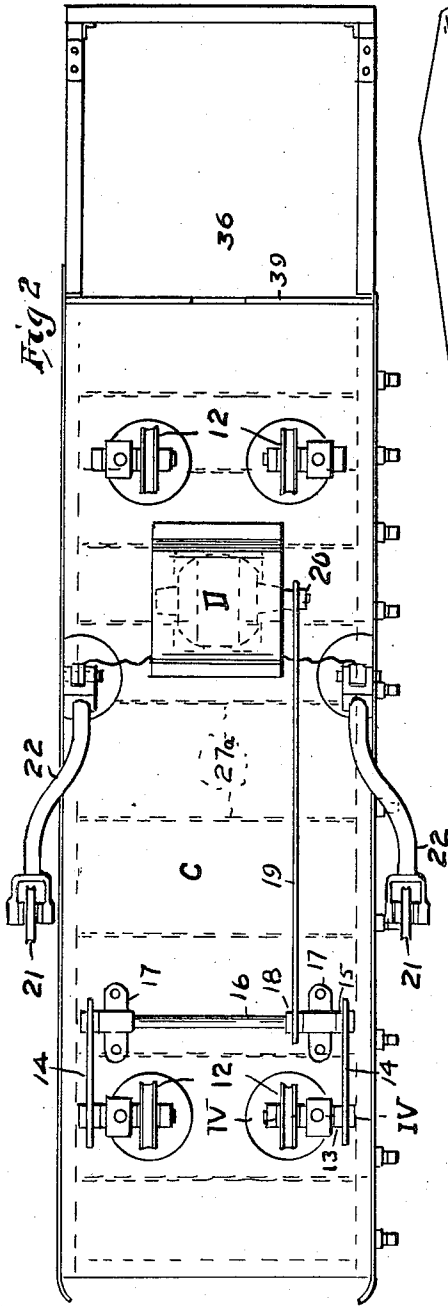
WITNESS
RFDilworth

INVENTOR
John I. Hoffman
 by *Edward A. Lawrence*
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3 SHEETS—SHEET 3.

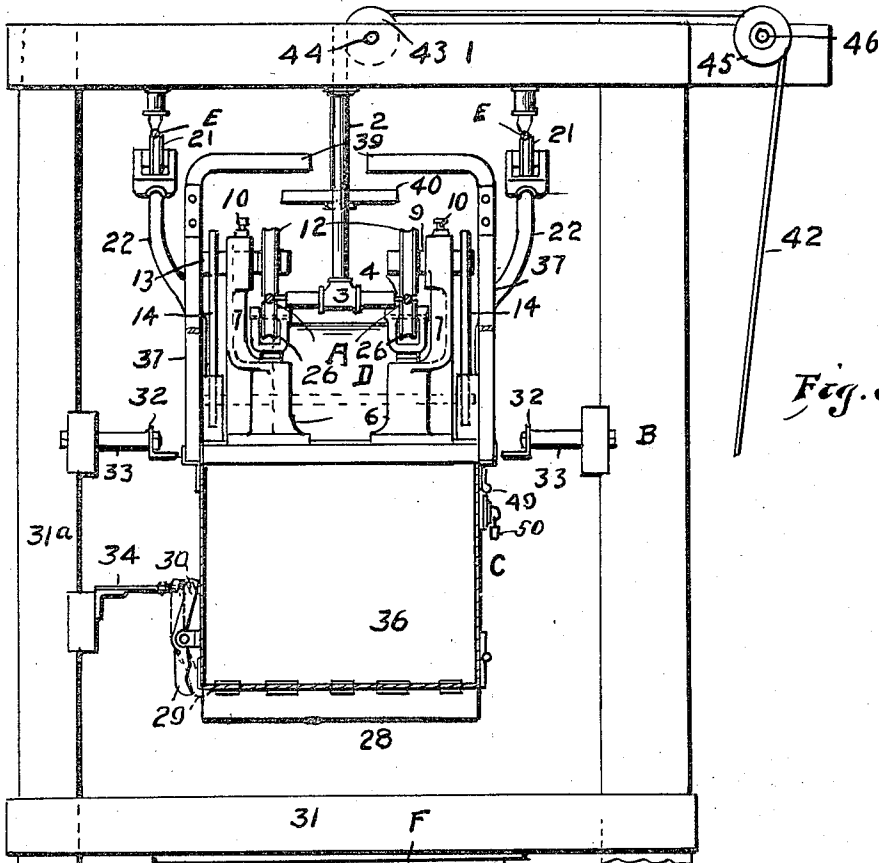


Fig. 3

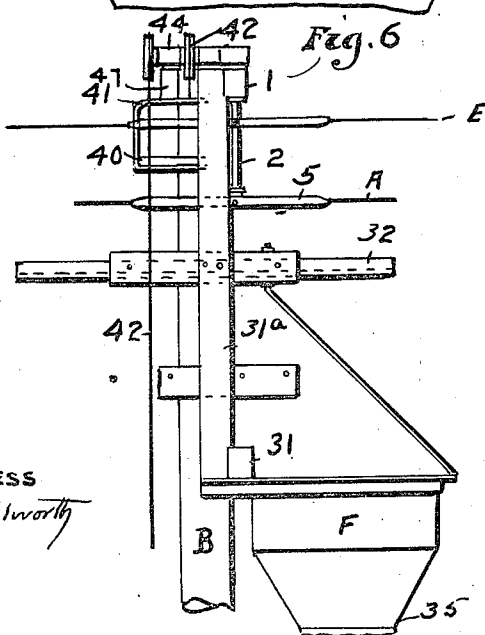


Fig. 6

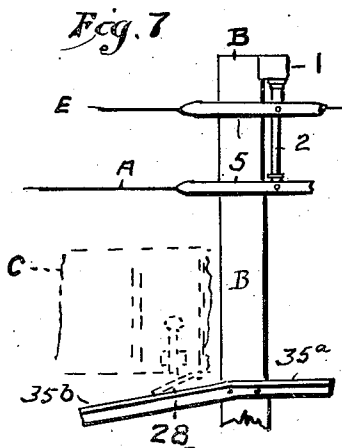


Fig. 7

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UNITED STATES PATENT OFFICE.

JOHN I. HOFFMAN, OF PITTSBURGH, PENNSYLVANIA.

AUTOMATIC DELIVERY SYSTEM.

Application filed December 21, 1920. Serial No. 432,254.

To all whom it may concern:

Be it known that I, JOHN I. HOFFMAN, a citizen of the United States, and residing in the city of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented or discovered new, useful, and Improved Automatic Delivery Systems, of which the following is a specification.

My invention consists in new and improved apparatus for the transportation, delivery and collection of packages and commodities, including mail matter such as first and other classes of mail, and parcel post.

The rapid increase in the use of the parcel post, especially by tradesmen in serving customers at a distance, and by farmers and the like in selling food stuffs at retail to the consumers, has rendered the present methods of delivery, by animal-drawn and motor vehicles, entirely inadequate, and the problem is becoming more serious as the parcel post increases in popularity.

The object which I have in view is the provision of an improved system of transportation, including automatic delivery and collection. Another object is the saving of time and expense of such service, and the multiplication of the capacity of the same.

With these and other objects in view, I have invented a new and improved automatic transportation, delivery and collection system which is of the following general character.

I provide an aerial railway along which one or more cars are driven, the cars being loaded at the station or terminus and started out on a continuous travel until the predetermined route has been traversed, automatic means being provided whereby at various points along the route the proper matter is discharged and waiting matter collected; so that when a car has completed its travel, its original load has been properly distributed and the matter collected en route is brought in.

The aerial railway may be provided with rigid rails, but I prefer to use a pair of properly supported cables for that purpose, owing to economy of erection and maintenance. If desired a monorail or single cable railway may be used, but I prefer the two cable system.

The car or cars are automatically driven

along the railway, preferably by means of electric motors mounted on the cars and supplied with current by conductors strung along the railway. If desired the current may be supplied from storage batteries carried by the cars, or internal combustion engines or stored power, such as compressed-air motors may be used. The cars may be drawn by means of a moving cable, but I prefer to make the same automotive.

To enable a car in its travel to make a plurality of deliveries, I divide it into compartments, each of said compartments being provided with drop or removable wall portions or bottoms which are automatically released at the respective proper points on the railway, to permit the contents of the compartment to be discharged, preferably into a chute leading to a mail box or other container. I provide selective means along the railway whereby the contents of the proper compartment are discharged when any individual delivery point is being passed. I also provide means whereby the bottom of the compartment is automatically closed after the corresponding delivery point is passed.

I also provide automatic means whereby the car picks up matter to be collected as it passes the various points on the line, said collection points being preferably the same as the delivery points.

I show novel form of track cable suspension, and also in car suspension wheel mechanism.

Other novel features of construction and arrangement of parts will appear from the following description.

In the accompanying drawings, which however are merely intended to illustrate a practical embodiment of the principles of my invention without limiting the scope of the latter to the construction shown, Fig. 1 is a side elevation of a car mounted on the aerial railway; Fig. 2 is a plan view of the car; Fig. 3 is a sectional view of the same taken along the line III—III in Fig. 1, the car being shown passing through one of the track frames, such as are provided at the various delivery points on the railway; Fig. 4 is an enlarged detail in section along the line IV—IV in Fig. 2, showing the method of suspending the car from the cables; Fig.

5 is a plan view showing a delivery point on the railway, the receiving hopper being shown; Fig. 6 is a side elevation of the same; Fig. 7 is a side elevation of the railway showing means for closing the drop bottom of a compartment after a delivery; Fig. 8 is a detail showing the collection shelf upon which matter to be collected is placed to be automatically taken up by the car; Fig. 9 is a side view of the car showing the loading door, and Fig. 10 is an enlarged perspective of the form of container which I provided in which the matter, to be either delivered or collected, is placed.

The following is a detailed description of the drawings.

A represents the railway tracks, shown as cables owing to their less original cost, and on account of convenience of erection and maintenance; although rails may be substituted.

Said cables are strung at a proper height from the ground to provide head room, and may be supported by poles or towers. In the drawings I show said cables supported in place from gallows beams 1 secured to posts B, said beams being provided with a depending pipe arm 2 having a T coupler at its lower end into which are screwed the short pipe sections 3 into the outer end of which latter are inserted, and secured as by crimping the end of the pipes, the lateral stems 4 of the sleeves 5 through which the cables A extend. The cables are thus supported at the proper intervals at the proper spaced relation.

C represents one of the cars provided near each end with upwardly extending posts 6 having angular bracket portions 7 whose upper ends are provided with vertically slotted, transverse openings 8 in which are mounted the bearing boxes 9 swiveled in place by means of screws 10 engaging threaded holes in the bracket and having their tapered ends engaging sockets in the boxes 9. 11 represents the axles journaled in said boxes and having their inner ends provided with grooved wheels 12 which run on the cables A and thus support the car. The rear axles 11 are provided with pulleys 13 which are operatively connected by the belts 14 with pulleys 15 on jack shaft 16 journaled transversely of the car in bearings 17. The shaft 16 is provided with a third pulley 18 which is connected by a belt 19 with a pulley 20 on the shaft of an electric motor, or other source of power, D mounted on top of the car. In the embodiment of the invention shown in the drawings, the motor is fed by a two wire system whose twin conductors E are strung along the under side of the gallows beams 1. Said wires are engaged from below by the trolley wheels 21, carried on trailing swiveled spring arms 22, and connected re-

spectively to the positive and negative sides of the motor D.

The posts 6 are provided with vertical sockets 23 in which are stepped the reduced stems 24 of the yoke members 25 in which are journaled the axles of the grooved compression wheels 26 which engage the cables A from beneath immediately below the wheels 12. Springs 27 are coiled about the stems 24 in the sockets 23, thereby spring pressing the wheels 26 against said cables to prevent the wheels 12 from jumping therefrom, and also providing traction for the wheels 12. The wheels 26 are depressed so as to enable the wheels 12 to run over the sleeves 5 without difficulty, the ends of said sleeves being preferably tapered down to the surface of the cable to prevent jarring or jumping as the wheels engage or leave the sleeves.

The cars C are preferably elongated, rectangular metal boxes divided transversely by the vertical partitions 27^a to form a plurality of compartments equal in number to the delivery points on the railway at which the car is intended to deliver matter. The bottoms of said compartments are formed by hinged doors 28 which drop down, when released, to discharge the contents of the compartments.

Said doors are held in their horizontal positions, as shown in Fig. 1, by means of spring latches 29 whose angular heads normally extend under the lower edge of the car and support the doors 28 from beneath. Said latches are spring pressed, as at 30, in their engaging position, but any one of the doors may be released by the retraction of its latch, as shown in Fig. 3 through an inwardly exerted pressure on the upper end of the latch.

At each delivery point on the line the railway is provided with an open frame through which the car passes. Thus in Figs. 3 and 5, I have shown said frame composed of the gallows beams 1 which are in pairs, one attached to each face of the post B. Below the same are a pair of similar horizontal beams 31; and the outer ends of the beams 1 and 31 are connected by a vertical post 31^a thus forming an open frame of sufficient internal dimensions to permit the free passage of the car C. To properly aline the car in passing through one of the frames, I prefer to provide opposed, horizontal guide rails 32, see Figs. 3 and 5 supported from the posts B and 31^a by brackets 33, and having outwardly curved or flared ends so that the car will pass between said rails and be prevented from material side swing while passing the delivery point.

Each delivery point is provided with a door opening member comprising a horizontally supported plate 34, see Figs. 3 and 5, having its front end bevelled, which plate

is intended to engage the upper end of the proper latch 29, and force the same inwardly to release the corresponding door; so that the latter drops and allows the contents of its compartment to fall down into the hopper F which is supported from the posts B and 31^a below and transversely of the trackway. The lower end of said hopper is connected by the chute 35 with a mail box or other container, not shown, on or near the ground and in easy reach.

The upper ends of the latches 29 are at different levels, as shown in Fig. 1, and the different door opening members 34 are also at varying levels to engage the proper latch, so that as the car passes a given delivery point, the door of the proper compartment is released but the other compartments are not disturbed.

The next post B beyond each delivery point is provided, as shown in Fig. 7 with a door closing plate 35^a mounted on said post and having an inclined forward portion 35^b, so as the car passes over said plate the open door is first raised and then snapped closed over the bevelled head of its latch.

Thus as the car reaches a delivery point, the door of the proper compartment is automatically opened and the contents of the compartment discharged into the waiting hopper, and as the car passes the next post B, the door is automatically closed. Thus, as, in turn, the delivery points are passed the contents of the proper compartments are discharged.

I also provide means whereby matter is automatically collected en route.

The same are shown as of the following construction.

The car is provided, preferably at the front with a bin or compartment 36, and at the rear thereof the car is provided with a pair of vertical standards 37, to which the trolley arms may be connected by means of resilient guys 38. The upper ends of the standards 37 are provided with inwardly extending, horizontal arms or sweeps 39 which, as the car travels pass over the top surfaces of the collection shelves 40 at various points on the line and sweep the contents of said shelves into the bin 36.

A collection shelf 40 is preferably provided at each delivery point on the line and is adapted to be lowered to permit matter to be placed therein and then to be raised into the path of the sweeps prior to the passage of the car.

I have shown the shelves each attached to the lower horizontal arm of a U-shape bracket 41 whose upper horizontal arm is attached to a pair of ropes 42 running over sheaves 43 journaled on a shaft 44 horizontally mounted on the gallows 1. Said ropes are led rearwardly over a second pair of sheaves

45 on a shaft 46 mounted on the rearward extension of one of the beams 1, and thence down to the ground.

47 is a depending stop to limit the upward movement of the shelf 40 so as to properly position the same.

I prefer to employ stout metal weather-proof boxes or containers, such as G in Fig. 10 in which matter to be delivered or collected is placed; said boxes being of proper size to fit loosely in the compartments of the car.

Thus, when a box is delivered at a point on the line, the recipient opens the box and removes the contents. If there is matter to be collected by the next car passing, he places the same in the box.

The shelf 40 is then lowered; the box is placed thereon, and the shelf is again raised into position.

If desired the latches may be alternated on either side of the car, thus having one-half of the latches on one side and one-half on the other side of the car. In like manner half of the stationary latch engaging plates would be on one side of the track and the other half on the other side of the track.

However by placing all of the latches on one side of the car, as shown in the drawings, I may provide a hinged door 48 in the wall of the other side of the car whereby access may be had to all of the compartments to load the same. The door may be held closed as by the catches 49 and a hasp and padlock 50 are provided.

It is evident that a car may be loaded at the starting point, such as the central post office, and the contents of the several compartments will be automatically delivered at the proper points, and the matter waiting on the collection shelves picked up and carried to the end of the line. By installing a belt line, on each complete trip deliveries and collections may be made along the route, the car being entirely unaccompanied and automatic in its action.

By making the car of relatively great height and alternating the latches on either side of the car a large number of compartments may be provided, and consequently the number of delivery points served by a car may be greatly increased.

If desired ordinary mail bags may be used instead of containers or boxes, the same being delivered and collected at central points for a number of patrons.

It is evident from the foregoing that the cost of collecting and delivering mail may be greatly reduced, as the rural mail carriers and their vehicles are not necessary.

Although, for the sake of clearness, I have minutely described the embodiment of the principles of my invention shown in the drawings, I do not wish to limit myself thereby, but claim broadly:—

1. In combination with a traveling car

provided with compartments, a drop wall for each of said compartments for the discharge of their contents, means for normally holding said walls in their closed position for the retention of said contents, means whereby the walls of said compartment are in turn automatically dropped at respective predetermined points along the path of said car, and means for the automatic closing of said walls after the discharge of the contents of said compartments.

2. In a delivery system of the character described, the combination with a moving car, of a drop bottom for the same, means carried by the car for holding said bottom in its closed position, means stationed adjacent to the path of the car and adapted to engage said first named means, as the car passes, to cause said first named means to release said bottom, and means in advance of said second named means in the direction of the travel of the car and adapted to engage said bottom to reclose the same.

3. In a delivery system of the character described, the combination with a moving car, of a drop bottom for said car, a latch adapted to hold said bottom in its closed position, means located along the path of the car and adapted to engage said latch and release said bottom, and means in advance of said first mentioned means in the direction of the travel of said car and adapted to engage said bottom to reclose the same.

4. In a delivery system of the character described, the combination with a moving car provided with compartments, a drop bottom for each of said compartments, a latch for each bottom adapted to hold the latter in its closed position, members mounted along the path of said car and each adapted to individually engage one of said latches to release the corresponding

drop bottom, and means whereby said bottom is automatically restored to its closed position after the car has passed said engaging member.

5. In a system of the character described, the combination with a moving car provided with a receiving compartment, of sweep means carried by said car, and a shelf mounted along the path of said car upon which matter to be collected is placed, said shelf having a flat upper surface to permit the sweep passing over the same as the car travels past the shelf, said matter being deposited from said shelf into said compartment by said sweep means.

6. In a system of the character described, the combination with a moving car provided with a receiving compartment, of sweep means carried by said car, and a shelf mounted along the path of said car upon which matter to be collected is placed, said shelf having a flat upper surface to permit the sweep passing over the same as the car travels past the shelf, said matter being deposited from said shelf into said compartment by said sweep means, and said shelf being adapted to be moved into and out of the path of said sweep means.

7. In a system of the character described, the combination with a moving car provided with a receiving space, of sweep means carried by said car, a shelf mounted along the path of said car and adapted to contain the matter to be collected by said car, said shelf having a flat upper surface to permit the sweep passing over the same as the car travels past the shelf, and means for elevating said shelf into the path of said sweep means whereby the latter deposits said matter in said receiving space as the car passes.

Signed at Pittsburgh, Pa., this 20th day of December, 1920.

JOHN I. HOFFMAN.