

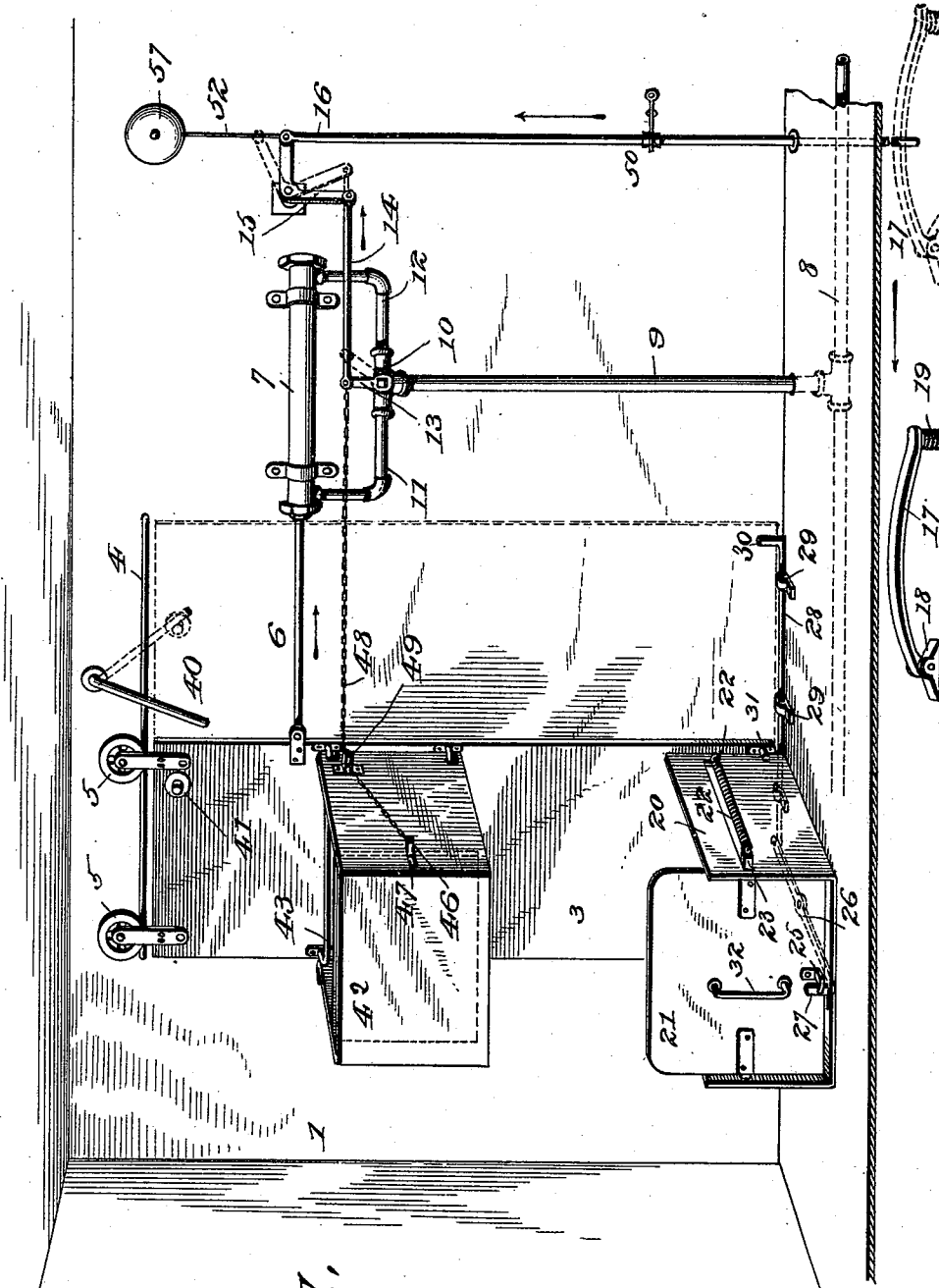
(No Model.)

2 Sheets—Sheet 1.

T. F. GROVE.
MAIL BAG CATCHER AND DELIVERER.

No. 541,482.

Patented June 25, 1895.



Witnesses
Alfred T. Gage

Fig. 1.

Inventor
Thomas F. Grove
by *R. E. Henderson*
att'y.

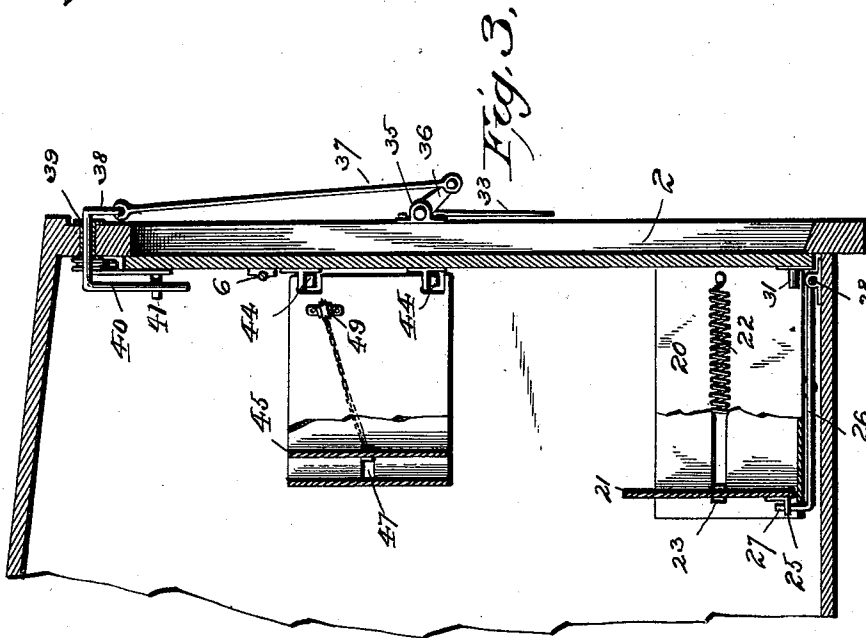
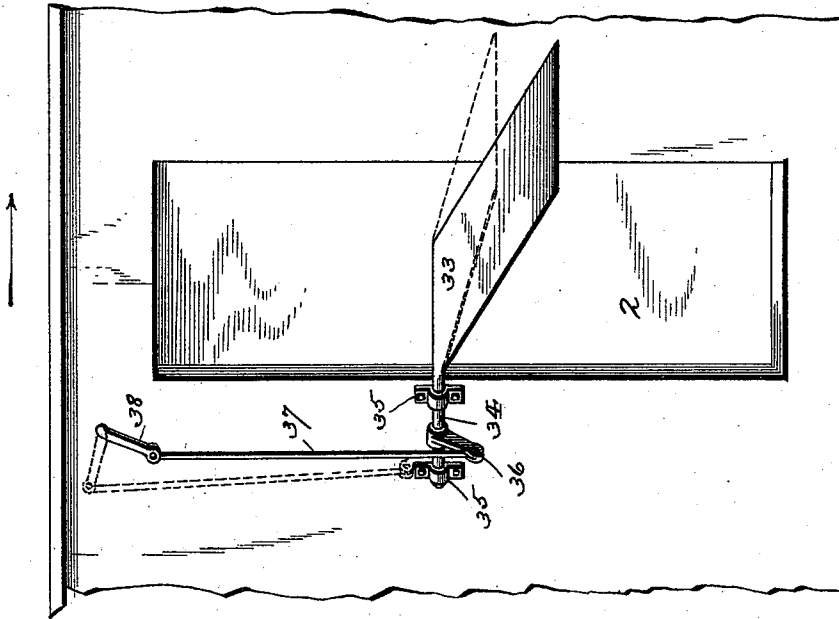
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2 Sheets—Sheet 2.

T. F. GROVE.
MAIL BAG CATCHER AND DELIVERER.

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Patented June 25, 1895.



Witnesses
Alfred S. Gage.

Fig. 2.

Inventor
Thomas F. Grove,
by *W. E. Henderson*
att'y.

UNITED STATES PATENT OFFICE.

THOMAS F. GROVE, OF HUMMELSTOWN, PENNSYLVANIA, ASSIGNOR, BY
MESNE ASSIGNMENTS, TO MARY J. GROVE, OF SAME PLACE.

MAIL-BAG CATCHER AND DELIVERER.

SPECIFICATION forming part of Letters Patent No. 541,482, dated June 25, 1895.

Application filed February 17, 1894. Serial No. 500,458. (No model.)

To all whom it may concern:

Be it known that I, THOMAS F. GROVE, a citizen of the United States, residing at Hummelstown, in the county of Dauphin and State of Pennsylvania, have invented certain new and useful Improvements in Mail-Bag Catchers and Deliverers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to a mail bag catcher and deliverer, and it has for its object to provide simple and efficient means for automatically catching mail bags at stations and for automatically delivering bags from the mail car to the station at which the bag is to be deposited.

To the accomplishment of the foregoing and such other objects as may hereinafter appear, the invention consists in the means and also in the combination of the parts hereinafter particularly described and then sought to be specifically defined by the claims, reference being had to the accompanying drawings forming a part hereof, in which—

Figure 1 is a side elevation of a portion of the inside of a car, showing in elevation and partly in perspective the operating parts of the invention. Fig. 2 is a vertical cross-section through Fig. 1; and Fig. 3, a side view of the outside of a car, showing the mail-bag-catching arm and the link or rod which connects it with a crank-lever operated from inside the car.

In the accompanying drawings the numeral 1 designates the car and 2 the door way therein. The sliding door 3 travels upon an overhead track 4 from which it is suspended by means of the overhead rollers 5. The door is opened and closed automatically. It is moved in both directions through the instrumentality of a piston rod 6 connected at one end to the door and having the piston head at its other end working in a piston cylinder 7 into which air is admitted from the train pipe 8 to act upon the piston head to reciprocate the door back and forth. The air is taken from the pipe 8

through a pipe 9 which has at its upper end a valve casing 10 containing a suitable valve of any well known construction that will admit the air alternately through the lateral pipes 11 and 12 extending from opposite ends of the valve casing and opening one into each end of the piston cylinder 7 on opposite faces of the piston head, a suitable exhaust being provided for the escape of the exhaust air from both ends of the piston cylinder in alternation.

The form of valve and exhaust to permit the operation stated is so well known in the art and involves only the skill of the mechanic to make application of the same that it is not necessary to illustrate in detail such well known features.

The valve in the casing 10 is provided with a stem 13 which when moved in one direction, say the direction illustrated by dotted lines in Fig. 1, will turn the valve so as to effect communication through one of its ports between the pipe 9 and the lateral pipe 11, thereby permitting the air to enter the piston cylinder at the end toward the door so as to move the piston head toward the other end of the cylinder and thereby cause the piston rod 6 to slide the door to its open position indicated by dotted lines in Fig. 1 of the drawings. To effect this movement of the valve I connect to the stem one end of a rod 14, the other end of that rod being connected to one end of a bell crank lever 15 which may be pivoted to the side wall of the car as indicated in Fig. 1. The other end of this bell-crank lever is connected to the upper end of a vertically moving rod 16 the lower portion of which extends through the bottom of the car as illustrated and terminates so as to come in contact with a projection located adjacent to the track rail. This projection, designated by the numeral 17, I construct of arch form as illustrated in Fig. 1, where it is illustrated as being an arched arm pivoted at one end to a suitable block 18 and having its other end resting upon a spring 19. The end of the vertically moving rod 16 lies far enough above the road bed as not to come in contact with obstructions along the road bed, and yet it projects far enough below the bottom of the car as to make contact with the

arched arms 17 wherever the same may be located. When the lower end of this rod strikes the arched arm it follows the arch of the arm, and is raised so as to throw the crank lever 15 in the position shown in dotted lines in Fig. 1, thus throwing the stem 13 of the multiple port valve into the position shown in dotted lines in said figure, thereby opening communication with the left hand end of the cylinder 7 so that air will enter the same from the pipes 9 and 11 and act upon the piston head to draw in the piston rod and slide the door into the position indicated by dotted lines in that figure. When the valve stem 13 is moved to the left of the position shown in full lines in Fig. 1 communication between the piston cylinder and the pipe 11 will be cut off and communication established between the cylinder and pipe 9 through pipe 12, so that the air will act on the opposite face of the piston head and thus drive the piston in the opposite direction and thereby close the door. This reverse movement of the valve may be effected in different ways, and, one of the ways will hereinafter particularly appear. When the valve stem 13 stands in its upright position communication is cut off between the pipe 9 and both ends of the piston cylinder.

The numeral 20 indicates a trough having its end next to the door 3 open and provided at the other end with a follower 21, the purpose of the trough being to receive the mail bag that is to be delivered from the car, and the purpose of the follower being to eject the bag when the door is opened. The follower is held in its normal position by a suitable catch which will be released automatically as the door slides open so that the follower may be impelled for the purpose of ejecting the mail bag, suitable automatic means being employed to move forward the follower as the door is opened so as to eject the bag. The means which I prefer to move forward the follower, consists of springs 22 attached at one end say to the sides of the trough 20 and at the other end to the studs or pintles 23 which project through and slide in grooves or ways 24 formed in the sides of the trough, said springs being distended when the follower is in its normal position shown in Fig. 1 of the drawings so that when the follower is released from its catch the spring will move it forward and thus cause it to eject the mail bag. A suitable means for holding the follower in its normal position and for releasing it at the proper time is a catch device consisting of a hook 25 secured to the back of the follower and a pivoted lever or hook 26, having an upturned end 27 with which the hook 25 will engage so as to hold the follower in its normal position. To one end of the lever 26 is attached the end of a rod 28, which may slide in suitable guides 29 placed parallel with the sides of the car adjacent to the door-way and formed with a hook 30 which is in the line of travel of a pin or stud 31 projecting from the lower corner of the door 3, so that when

the door is opened said stud or pin 31 will strike against the hook 30 and slide the rod 28 so as to turn the lever 26 and free its hooked end from the hook 25 on the follower, thus releasing the follower and allowing the spring 22 to move the follower so as to eject the mail bag. When the door is closed the handle 32 of the follower may be grasped so as to draw back the follower into its normal position and cause engagement with the hook 25 and hooked end of the lever 26 to hold the follower in position till another mail bag is ejected.

The mail bag catcher is an arm 33 which normally hangs parallel with the side of the car, as shown by full lines in Figs. 2 and 3 of the drawings. It is preferably of the form shown clearly in full lines in Fig. 3 of the drawings where it is represented as hanging parallel with the side of the car, the dotted lines in the same figure representing the arm in its raised position to catch the mail bag as it hangs from the crane usually employed at stations where the mail bag is to be taken into the car. This catcher 33 is provided with a shaft 34 which is journaled in brackets 35 secured to the side of the car, and is provided with a crank arm 36 to which the lower end of a rod 37 is connected, the upper end of said rod being connected to the crank arm 38 of a lever 39 which passes through the side of the car near its upper end adjacent to the door way, as illustrated clearly in Figs. 1 and 2 of the drawings. The inner end of the lever 39 is provided with a crank arm 40, which lies inside the car and in the line of travel of a pin or projection 41 extending from the inside of the door 3 near its upper end. As the door is opened, the pin or projection 41 comes into engagement with the crank arm 40 and swings the lever so that its outside crank arm 38 is lifted into the position shown by dotted lines in Fig. 3 of the drawings, thereby lifting the rod 37 and raising the mail bag catcher 33 into the position shown by dotted lines in Fig. 3 of the drawings. The door at this time being open, and the car moving in the direction indicated by the arrow in Fig. 3, the catcher 33 strikes the mail bag suspended from the crane and moves it from the crane, the shape of the catcher deflecting the bag and guiding it through the door way into the car.

For the purpose of receiving the mail bag as it is thrown into the car, I provide what I will for convenience term a shield 42 which as illustrated may have two sides and one closed end, the end next to the door way being open. This shield may be secured at one side in any suitable way to the side of the car to one side of the door way and sustained at its opposite side by engagement with rods 43 secured to the inside of the door and extending crosswise of the door, one side of the shield being connected to said rods for instance by hooks 44 formed in one edge of the shield so that they will hook over said rod and yet permit the rods to be moved with the door

as the latter is moved back and forth. These rods in the manner described assist in sustaining the shield, and are moved with the door so as to offer no obstruction to the delivery of the mail bag into the car through the door way. The shield serves to check the mail bag as it is thrown through the door way from the mail bag catcher and to cause it to be deposited on the floor of the car or in the trough beneath the shield. The shield is provided with a follower 45 which has pintles 46 projecting through slots 47 made in the side of the shield, and a cable or chain 48 which may pass around the shield 49 secured to the sides of the shield is connected at one end to one of the pintles 46 and at the other end to the valve stem 13, so that as the mail bag is thrown into the car and strikes the follower 45 it will move the latter backward and draw on the chain 48 so as to pull over the valve stem 13 and shift its valve so as to permit air from the pipe 9 to pass through the pipe 12 into the far end of the piston cylinder 7 and thus act upon the piston head to force out the piston rod 6 and thus cause the door to be automatically closed. As soon as the door is closed, the valve stem 13 and its valve will assume their normal position, indicated by the position of the valve stem in full lines in Fig. 1, and the air will be entirely cut off from the piston cylinder and pipe 9. The valve stem 13 may be drawn from its extreme left position to its upright position by any suitable means. A suitable means for the purpose is a spring metallic plate 50 attached to the side of the car and connected with the rod 16 so that when the rod 16 is lowered beyond its normal position by the chain 48 pulling on the valve stem 13, said spring arm 50 will have its tension increased and as soon as the pull on the chain 48 is released the recoil of the spring plate 50 will lift the rod 16 to its normal position, whereby the valve stem 13 and its valve will be moved into position to close the valve ports. This spring arm 50 will also serve to sustain the rod 16 in its normal position, and will further serve to assist gravity in restoring rod 16 to its normal position after it has been raised by contact of its lower end with the arched projection 17 in the act of opening the car door.

A gong 51 may be secured to the inside of the car and its clapper connected by an arm 52 with the rod 16 so that when the latter is raised by contact at its lower end with the arched projection 17 an alarm will be sounded and the postal clerk thus notified that the device is about to operate.

Instead of the particular form of spring 50 being employed, there may be used an ordinary coil spring connected with the rod so as to assist in sustaining said rod and to lift the same when thrown down below its normal position and yet have no influence upon said rod to throw it downward. This substitution of the coil spring for the spring plate is ob-

vious to the skilled in the art and not involving invention need not be illustrated.

The operation of the device is as follows: The mail bag to be delivered is placed in the trough 20. As the train approaches the station, the rod 16 strikes the arched projection 17 which lifts the rod to shift the valve to let the air into the piston cylinder to act on the piston head to pull open the car door. In the movement of the door its projection 41 strikes the arm 40 to throw up the mail bag catching arm 33 into the position shown in dotted lines in Fig. 3. In the same movement the projection 31 of the door strikes the end of the rod 38 so as to release the follower 21 of the trough. The door being now open, the spring 22 moves forward the follower 21 so as to eject the mail bag to the station. At the same time the mail bag catcher arm 33 strikes the mail bag, which is suspended from the crane at the station, and deflects the same through the doorway against the follower 45 of the shield 42. The movement of the follower 45 pulls the chain 48 to shift the valve stem 13 so as to cut off the air from the pipe 11 and admit it through pipe 12 into the other end of the piston cylinder to act on the piston head to force out the piston rod to slide the door into its closed position. The spring 50 then immediately acts on the rod 16 to move it to draw the valve stem 13 into its normal position, whereby the air is cut off from the piston cylinder and the parts are in position to act as before. The moment the projection 41 is moved away from the crank arm 40 in the closing of the door, the weight of the mail bag catcher arm 33 restores the crank arm 40 to its normal position. Indicated by full lines in Fig. 1 of the drawings. The follower 21 of the trough 20 can be drawn back in the trough by hand, or otherwise.

I have illustrated and described with particularity the construction of the parts which are believed to be the best form of the invention, but I do not mean to confine myself in all particulars to the details illustrated and described as alterations may be made therein without departing from the essential features of the invention.

Under the general arrangement described it will be observed that the device is automatic in its operation and that the air from the pipe is used both for opening and closing the door, and that the opening of the door automatically throws the mail bag catcher arm into position to catch the mail bag, and that at the same time the mail bag to be delivered from the car is automatically ejected from the car while the mail bag to be placed on the car is automatically thrown into the car, and further that as soon as the mail bag has been delivered from the car and the other mail bag is received into the car, the door is automatically closed.

It is obvious that steam from the steam pipe

may be used in place of air, as the construction illustrated admits of the use of either steam or air.

In practice, it is proposed to have the spring arm or lever 17 to lie normally about one inch, more or less, higher than the plane of the bottom of the cow catcher to the engine—that is, the portion between the two ends of the spring arm or lever will so lie, the ends of the arm or lever however being lower than the plane of the cow catcher, so that as the train moves along the cow catcher portion of the engine will pass over the end of the spring arm or lever and then bear upon the lever so as to depress the same, the spring of the arm or lever restoring the arm to its normal position as soon as the cow catcher has ceased to act on the same. This enables me to have the lower end of the vertically moving rod 16 so far above the road bed or the track rail that it will not come in contact with obstructions along the track that might accidentally operate the arm 16 which would be a very serious disadvantage as is apparent and which would be liable to occur if the end of the rod 16 were too close to the road bed or to the rail. The spring arm or lever 17, however, will stand normally high enough to contact with the lower end of the rod 16 so as to actuate the same at the proper time. If there should be any obstruction lying upon the road bed or adjacent to the track rails, the cow catcher would move the same to such an extent as to prevent the obstruction from actuating the rod 16 as the lower end of the same lies or stands higher than the plane of the bottom of the cow catcher, as stated, and will contact only with the arched or elevated spring arm 17 which will lie higher than the plane of the bottom of the cow catcher except at its ends. This construction also enables me to locate the rod 16 at any point within the outside dimensions of the car, which is an advantage for the reason that if it should lie outside of the dimensions of the car it would be liable to come in contact with obstructions lying outside thereof, which would be a serious objection. By the construction however which I have devised the rod 16 is so located that it will not come into engagement with the rails at switches or elsewhere nor with any other obstruction by which it might be accidentally operated.

Having described my invention and set forth its merits, what I claim is—

1. In a mail car, the combination with the door, of a piston cylinder, a piston therein having its rod connected with the door, and means for supplying a fluid or gas in alternation to opposite sides of the piston in the chamber for the purpose of opening and closing the door, substantially as and for the purposes described.

2. In a mail car, the combination, with its door, of a piston cylinder, a piston therein having its rod connected with the door, a pipe in communication with the cylinder on opposite

sides of its piston, a valve for controlling the admission of a gas or fluid in alternation to opposite sides of a piston from said pipe, and means for automatically shifting said valve for the admission of the gas or fluid to one portion of the piston cylinder and cutting it off from another portion, substantially as and for the purposes described.

3. In a mail car, the combination with the door, of a piston cylinder, a piston therein having its rod connected to the door, means for admitting a gas or fluid to the said cylinder on opposite sides of the piston in alternation to open and close the door, mechanism connected with said means and extending outside of the car to adapt it to be automatically operated from outside the car to actuate the means admitting the gas or fluid to the cylinder on one side the piston, and mechanism operated from inside the car for cutting-off the gas or fluid from one portion of the cylinder and admitting it to another portion for reciprocating the piston in the opposite direction, substantially as and for the purposes described.

4. In a mail car, the combination of the door, a mail bag catching arm, a mail bag ejector inside the car, and mechanism for automatically opening the door, projecting the mail bag catcher arm and ejecting the mail bag from the car and then closing the door, substantially as and for the purposes described.

5. In a mail car, the combination with the car door, of means for automatically opening and closing the door, means for supplying a gas or fluid to actuate said opening and closing means, a mail bag catching arm actuated by a member carried by the door, and a mail bag ejector, located within the car and thrown into operation by the movement of the door, substantially as and for the purposes described.

6. In a mail car, the combination with the car door, of means for automatically opening and closing the same, a mail bag catcher arm projected by the movement of the door and adapted to direct the mail bag into the car, and a shield located inside the car opposite the door, to stop the mail-bag when thrown into the car, substantially as and for the purposes described.

7. In a mail car, the combination with the mail bag catcher arm located outside the car adjacent to the door, of a lever lying partly inside the car and connected with said arm, and the door provided with a member adapted to actuate said lever as the door is opened to project the mail bag catcher arm, substantially as and for the purposes described.

8. In a mail car, the combination with the car door, of a follower located inside the car and adapted to eject the mail bag therefrom, means for moving said follower upon the opening of the door for ejecting the mail bag, and mechanism for holding said follower in its normal position, said mechanism being lo-

cated adjacent to the door to be actuated by the door for releasing the follower when it is to eject the mail bag, substantially as and for the purposes described.

5 9. In a mail car, the combination of the vertically swinging mail bag catcher 33, the lever lying partly inside the car and partly outside thereof, the rod connecting said lever with a part of the mail bag catcher arm, and the
10 door provided with a member to engage the portion of the lever lying on the inside of the car to project the mail bag catcher arm when the door is open, substantially as and for the purposes described.

15 10. In a mail car, the combination of the mail bag delivering trough located inside the car adjacent to the car door, the spring actuated follower for ejecting the mail bag from said trough, the lever mechanism for holding
20 said follower in its normal position and located adjacent to the door with a portion arranged to make contact with a part of the door in the movement of the door, and the door having a part to contact with said portion of the lever mechanism to release the
25 follower, substantially as and for the purposes described.

11. In a mail car, the combination with the door, of the piston cylinder having its piston
30 rod connected with the door, a valve for controlling the admission of a gas or fluid to said cylinder to actuate its piston to move the door, a shield located inside the car opposite the door, and a follower to said shield con-
35 nected with a valve admitting the gas or fluid to the piston cylinder for the purpose of shifting the valve by movement of said follower to admit the gas or fluid to the cylinder to close the door, substantially as and for the
40 purposes described.

12. In a mail car, the combination of the piston cylinder, a pipe for the transmission of a gas or fluid to said cylinder, a rod connected with the door and having its piston
45 working in said cylinder, a valve for admitting the gas or fluid to the cylinder on opposite sides of the piston in alternation, a rod actuated from outside the car and connecting with said valve to move it in one direction, a
50 shield located adjacent to the door to stop the mail bag as thrown into the car and provided with a follower connecting it with said valve to move it in one direction, a mail bag catcher arm actuated by a lever on the door as the
55 door is moved in one direction, and a mail bag ejector located inside the car and released for operation by the door as the latter is opened, the several parts operating substantially as and for the purposes described.

60 13. In a mail car, the combination with the door provided with the transverse rods, of the shield located inside the car and supported at one side from the side of the car and having its other side sustained by said rods on

the car door, substantially as and for the purposes described. 65

14. In a mail car, the combination of the door, the gas or fluid actuated rod connected with the door for opening and closing the same, the valve controlling the admission of
70 a gas or fluid to the cylinder, a piston attached to said rod, a rod extending outside of the car and connected with the valve that controls admission of the gas or fluid, and the arched projection located beneath the car and adapted
75 to have the lower end of the rod which projects through the car to contact therewith for lifting the rod substantially as and for the purposes described.

15. The combination with a mail car and its
80 door, of mechanism for automatically operating the door and having as a part thereof a rod or lever extending through the car and beneath the same at a point inside of the outside dimensions of the car, and a spring or
85 yielding arm or lever located between the rails of the road-bed and extending upward to a point where it will be first struck by the engine and depressed before acting on said downwardly projecting rod or lever, said arm or
90 lever having the capability of rising to contact with the lower end of said depending rod or lever after the engine has passed over it, substantially as and for the purposes described.

16. The combination, with the mail car and mechanism for automatically receiving and delivering mail from the car, of a rod or lever
95 extending through the car and beneath the same, and a spring or yielding arm or lever located between the rails of the road-bed and extending upward to a point where it will be first struck by a part of the engine and depressed before acting on said downwardly projecting rod or lever, said arm or lever having
105 the capability of rising to contact with the lower end of said depending rod or lever after the engine has passed over it, substantially as and for the purposes described.

17. The combination with a mail car, of
110 mechanism for automatically receiving and delivering mail from the car, a portion of said mechanism extending beneath the car at a point within the outside dimensions of the car, and a spring or yielding member located
115 between the rails of the road-bed and extending upward to a point where it will be first struck by a portion of the engine and depressed before acting on said extending portion of the mail receiving and delivering
120 mechanism, substantially as and for the purposes described.

In testimony whereof I affix my signature in presence of two witnesses.

THOS. F. GROVE.

Witnesses:

JOHN O. GROVE,
JAMES H. GROVE.