W. C. MILLER.

MAIL BAG CATCHING AND DELIVERING MECHANISM.

APPLICATION FILED JUNE 8, 1907.

923,872.

Patented June 8, 1909.

4 SHEETS—SHEET 1.

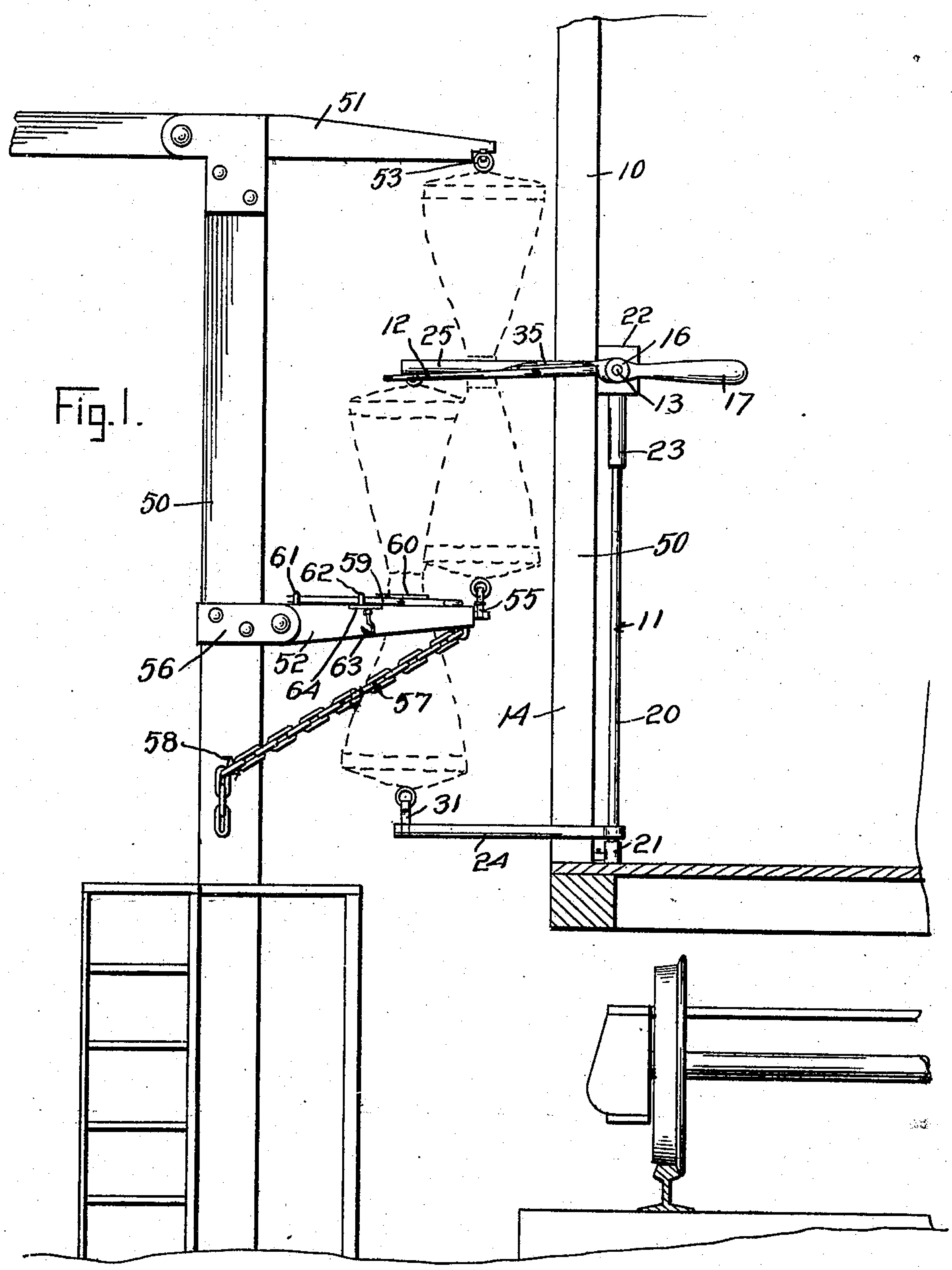

Fig. 1.

Witnesses

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4 SHEETS—SHEET 2.

Fig. 2.

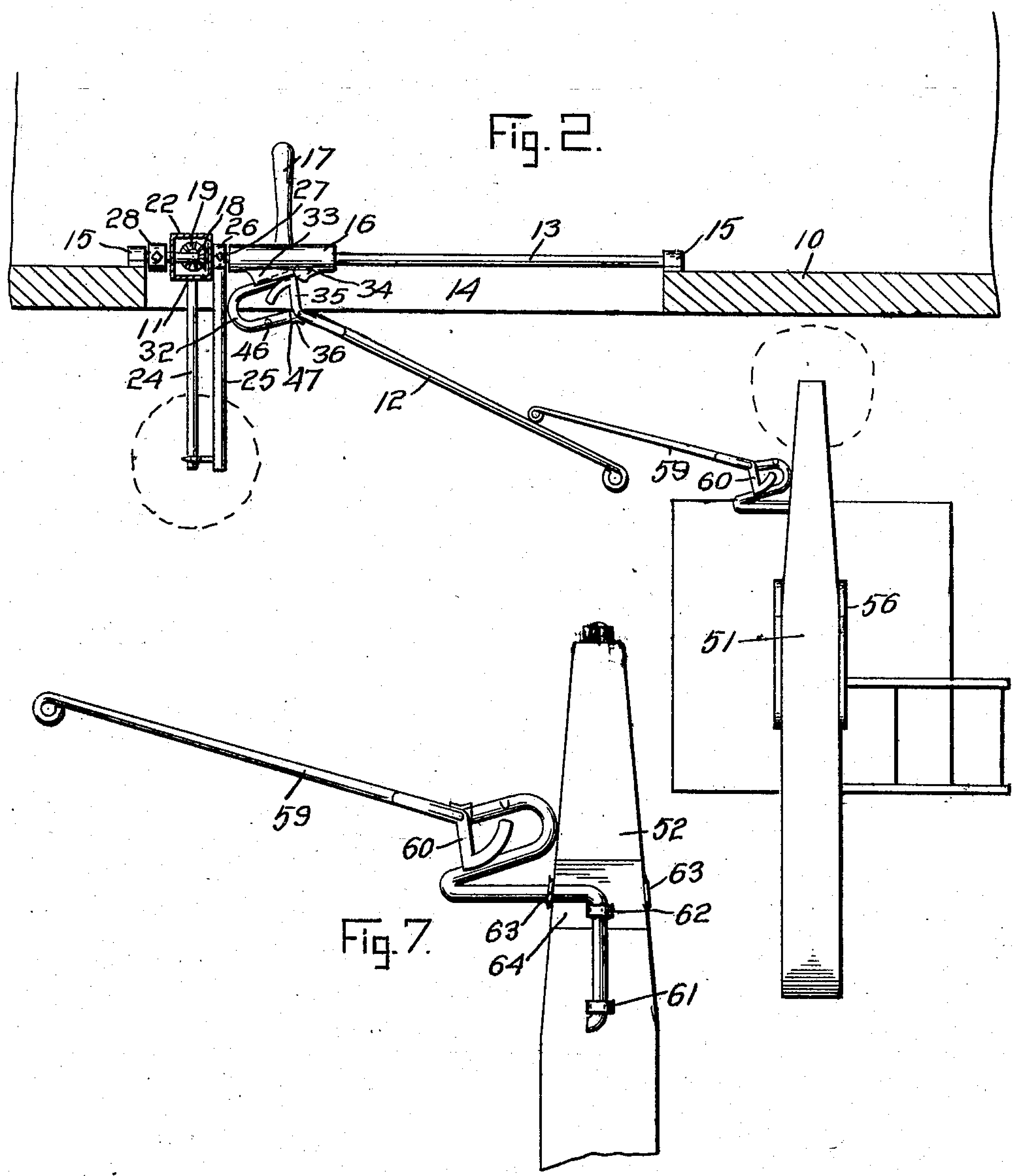

Fig. 7.

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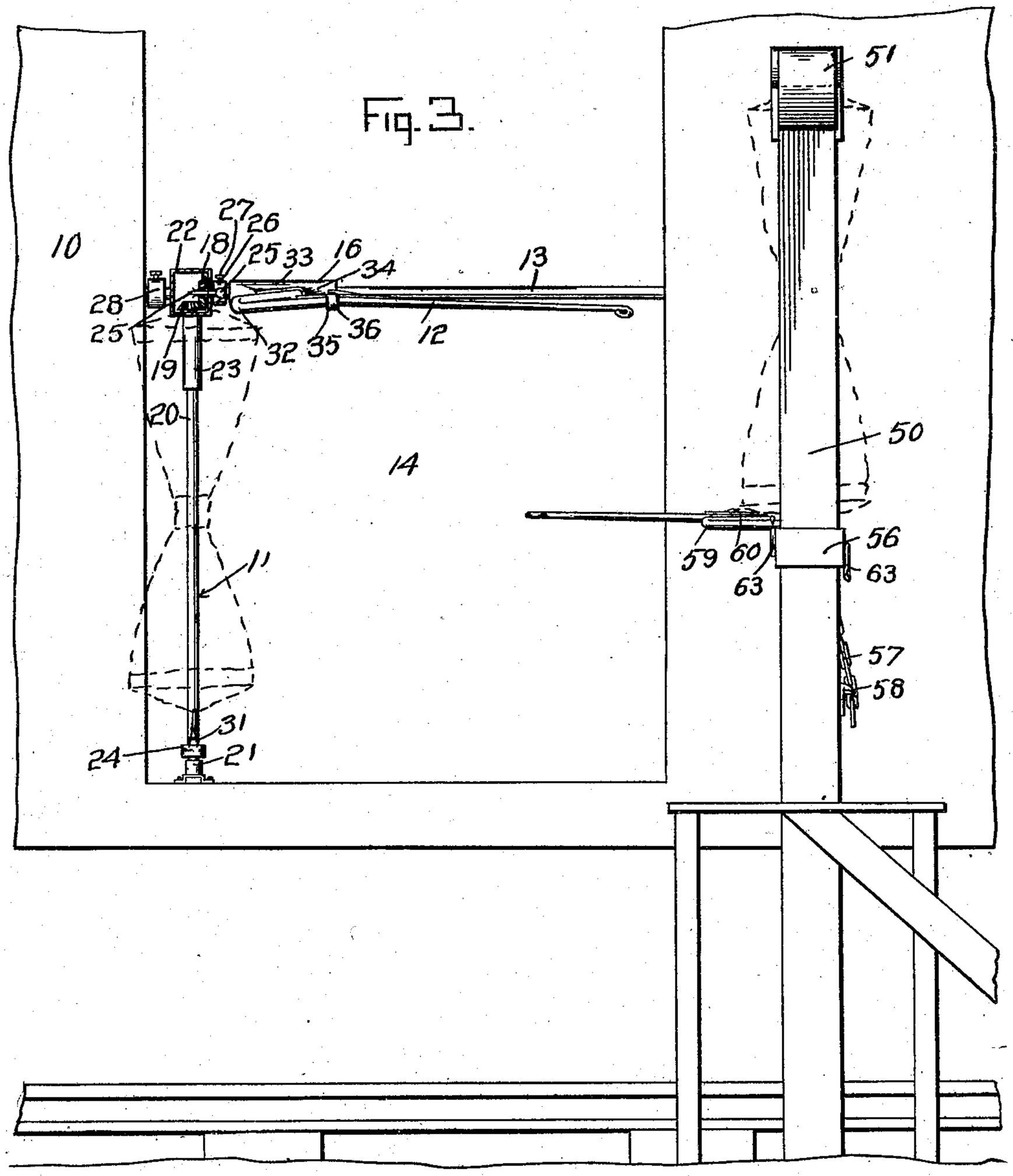
4 SHEETS—SHEET 3.

Fig. 3.



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4 SHEETS—SHEET 4.

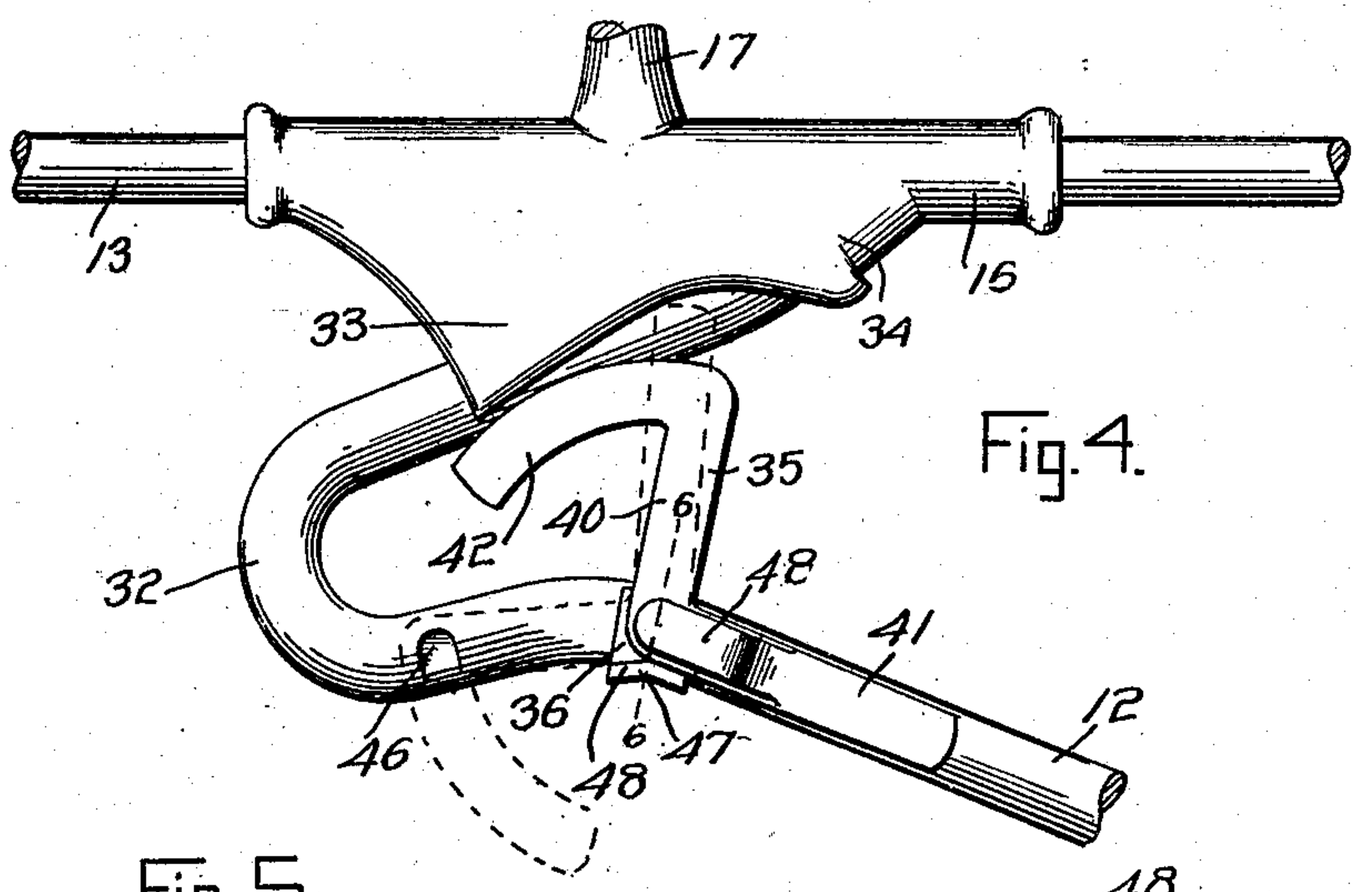

Fig. 4.

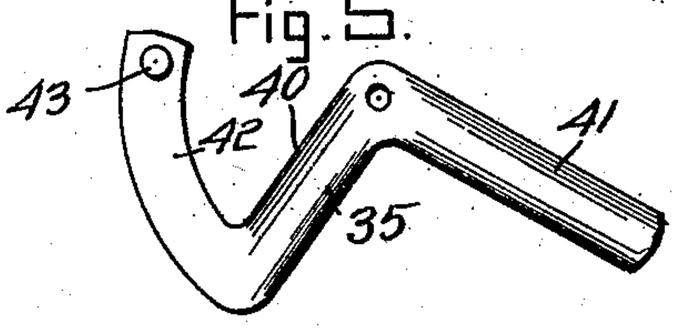

Fig. 5.

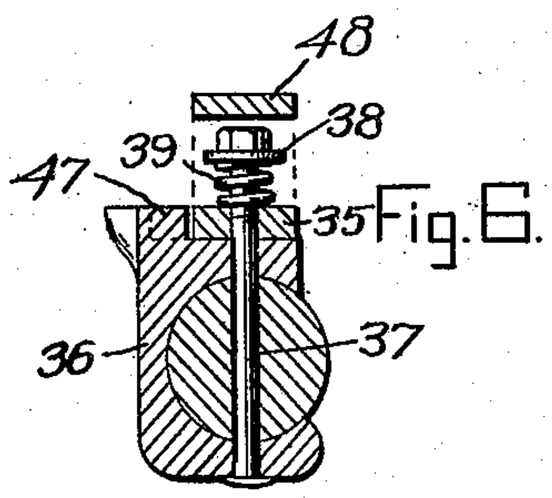

Fig. 6.

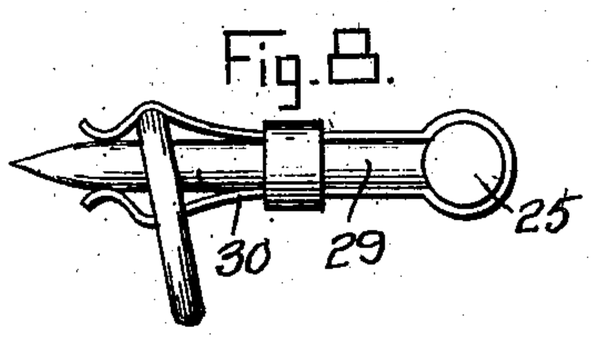

Fig. 8.

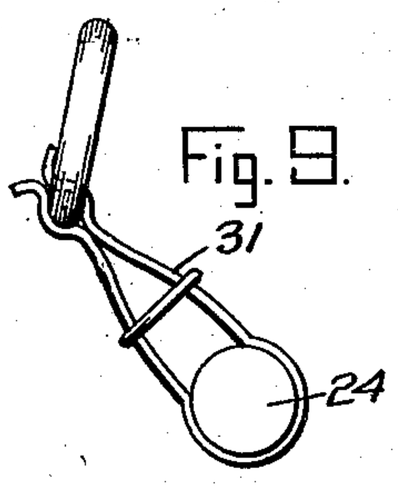

Fig. 9.

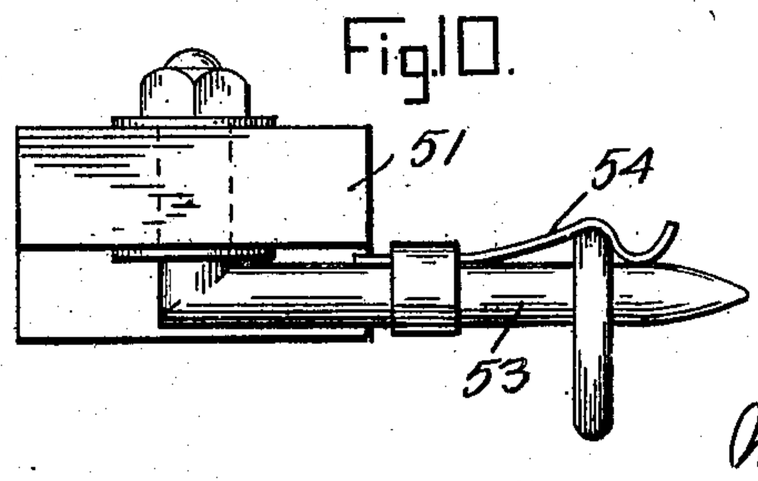

Fig. 10.

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UNITED STATES PATENT OFFICE.

WILLIAM C. MILLER, OF CHAMOIS, MISSOURI.

MAIL-BAG CATCHING AND DELIVERING MECHANISM.

No. 923,872. Specification of Letters Patent. Patented June 8, 1909.

Application filed June 8, 1907. Serial No. 377,964.

To all whom it may concern:

Be it known that I, WILLIAM C. MILLER, a citizen of the United States, residing at Chamois, in the county of Osage, State of Missouri, have invented certain new and useful Improvements in Mail-Bag Catching and Delivering Mechanisms; and I do hereby 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.

The present invention has relation to mail-bag catching and delivering mechanisms of that class which are employed where mail is received by and delivered from a moving train.

The invention aims, broadly speaking, to provide a simple and effective mechanism of the class above referred to of superior construction and arrangement of parts, by means of which mail-bags may be delivered and caught in a safe and convenient manner. Such mechanism, as is generally understood, comprises a member carried by the mail-car and including a receiving-arm and a bag-supporting crane, and a complementary device carried by a post located alongside of the track, the last-mentioned device coacting with the car-carried member, so that each catches one mail-bag while it delivers another. The present construction, however, differs from that ordinarily in use in that the receiving-arm and the crane of the car-carried member are attached to a single support, and are swung simultaneously into and out of operative position by a partial rotation of said support in one direction or the other, or, in other words, one object of the invention resides in the provision of a single means for simultaneously operating both the crane and the receiving arm.

A further object of the invention resides in the provision of a car-carried mechanism in which the simultaneously operated crane and receiving-arm lie wholly within the mail-car, when in operative position, to facilitate the attachment to and removal of the mail-bags.

The invention further includes the provision upon the delivery arms of both the car-carried member and the post of a safety device for holding the delivered mail-bag in place thereon until its removal by the mail-clerk, such device, in each instance, consisting of a spring-actuated angle-lever pivoted to the receiving-arm, the locking arm of the lever extending across the open mouth of the hook portion of the receiving arm, and being held in positive engagement therewith through the action of the spring, when the bag is in place upon the receiving arm.

A still further improvement consists in the provision of a car-crane comprising a rotatably-mounted vertical member, a horizontal member connected to the lower end of the vertical member, and a second vertical member connected to the member which supports the first-mentioned vertical member, whereby a partial rotation of the supporting member will cause the first-named vertical member to rotate on its longitudinal axis and swing the member connected thereto outwardly from the car in a horizontal plane, and will, at the same time, swing the second vertical member outwardly and upwardly from the car, thus bringing the mail-bag, which is connected to the two last-mentioned members, into position to be removed therefrom by the receiving-arm of the post.

The construction of the clips which are secured to the arms of the car and post cranes and with which the rings of the mail-bags are engaged, forms a still further improvement contemplated by the present invention.

With the above and other ends in view, the invention consists in the construction, combination, and arrangement of parts, all as hereinafter fully described, specifically claimed, and illustrated in the accompanying drawings, in which like parts are designated by corresponding reference numerals in the several views.

Of the said drawings—Figure 1 is an end elevation of the mechanism forming the subject of the present invention, the car being shown in transverse section, the several parts of such mechanism being in their operative position. Fig. 2 is a top plan view of Fig. 1. Fig. 3 is a side elevation of Fig. 1. Fig. 4 is an enlarged detail view of the receiving-arm of the car-carried mechanism, the view showing both positions of the locking-lever, and also a portion of the operating sleeve which is carried by the supporting member and embraces the receiving-arm. Fig. 5 is a bottom plan view of one of the locking levers. Fig. 6 is a transverse vertical section taken on the line 6—6 of Fig. 4. Fig. 7 is a top plan view of the lower arm of the post crane. Figs.

8, 9, and 10 are enlarged detail views of the clips carried by the upper and lower arms of the car-crane and the upper arm of the post crane, respectively.

The several mail-bags are shown in dotted lines in Figs. 1, 2, and 3.

In the following detailed description, reference will be had first to the car-carried mechanism, which includes the more important features of the invention. This mechanism, which, in its inoperative position, is disposed entirely within the body of the mail-car 10, comprises primarily, a bag-supporting crane 11 and a bag-receiving arm 12, which latter is in the nature of an integral lateral extension of a horizontal supporting rod 13 which is disposed transversely across the door opening 14 of the car and has its opposite ends journaled in bearings 15 secured to the inner face of the car wall. The rod 13 is rotatably mounted in its bearings, such movement being effected by a sleeve 16 keyed or otherwise secured thereto, and provided with an operating handle 17. Toward one end, the supporting rod carries a bevel-gear 18, which meshes with a similar gear 19 fast on the upper end of a vertical shaft 20, the lower end of which fits in a bearing shoe 21 adapted for engagement in a slip pocket secured to the car floor. The gears 19 and 18 are inclosed by a cage 22 which terminates in a sleeve 23 through which the shaft 20 loosely passes, said cage being further provided with alining openings to admit the rod 13. The shaft 20, toward its lower end carries an arm 24 arranged at right-angles thereto, and forming the lower arm of the crane 11. This arm may be formed integral with the shaft 20, or may be independently formed and secured at its inner end to the shaft in any desired manner, it being only essential that such arm be capable of a swinging movement in a horizontal plane, when said shaft is rotated.

The upper arm of the crane is formed by a vertical arm 25 which is disposed parallel with shaft 20 and, in consequence, lies in a plane at right-angles to that in which the lower crane arm 24 moves. The arm 25 is provided at its upper end with a collar 26, through which the rod 13 passes, said collar carrying a set-screw 27 by means of which said rod and arm are fastened together. The collar above referred to is disposed between one end of the sleeve 16 and the adjacent face of the gear-cage 22. The supporting rod 13 is further provided with a second collar 28 which is disposed between the opposite face of the gear-cage and the adjacent bearing 15.

The upper crane arm 25 is provided at its free end with a laterally-projecting finger 29, which extends toward the rear end of the car and carries a U-shaped spring-clip 30, the arms of which are held against the opposite sides of said finger by a slip-ring, the free ends of the spring arms being slightly bowed, as shown in Fig. 8. The free end of the lower crane arm 24 is likewise provided with a spring-clip 31 somewhat similar in shape to the clip 30 and carrying a slip-ring. These clips are adapted to be engaged with the usual rings secured to the upper and lower ends of a mail-bag; the upper bag ring, however, is held between one of the arms of the clip 30 and the finger 29, while the lower ring of the bag is engaged by both arms of the clip 31.

The mail-receiving arm 12, as shown in Fig. 4, is set at an angle of about 35° to the supporting rod 13, and terminates at its inner end in a bend forming a U-shaped hook 32, which extends downwardly toward the rear end of the car, the open mouth of the hook facing the front end thereof. Owing to such angular disposition of the body portion of the arm, it will be apparent that a mail-bag removed thereby from the post crane will not be received directly in the hook portion 32, but will strike the inclined body portion of the arm and slide therealong into the hook, so that the force of the blow will be gradually decreased. The sleeve 16 which is carried by the rod 13, is provided with an integral flange 33, which extends partly across the inner arm of the hook 32 and terminates in a preferred shoulder 34, through which said arm passes adjacent the point at which it meets the rod 13. In this connection, it may be stated that the arm 12 may, if desired, be formed separately from the rod 13 and connected rigidly thereto at its inner end.

The mouth of the hook portion 32 is closed by an angle-lever 35, which is loosely pivoted at its apex to the plane upper face of a collar 36, which is carried by the arm 12, the pivot bolt 37 passing through said collar and arm, as shown in Fig. 6. The upper end of the bolt 37 carries a washer 38 against the under face of which bears one end of an expansible coil-spring 39, which likewise embraces the bolt and bears at its lower end against the angle-lever, whereby the latter is held yieldingly against the upper face of the collar. This lever, as shown in Fig. 5, includes a short arm 40, which extends across the open mouth of the hook 32, in its normal position, and a long arm 41, which normally extends along the upper face of the body portion of the arm 12, having its under face slightly concaved to enable it to fit snugly thereagainst. The arm 40 is further provided with an integral rearwardly-extending arcuate arm 42, which is formed on the free end thereof and carries a rivet or spur 43, the lower end of which extends slightly below the lower face of said arcuate arm. When, therefore, the lever is in the position which it occupies when a mail-bag has been removed

by the arm 12 and is in place within the hook 32, the spur 43 will engage in a notch 46 formed in the outer hook arm.

It will be apparent from the foregoing, therefore, that when the short arm 40 strikes a mail-bag carried by the post crane, the angle-lever will be swung on its pivot by the force of the blow until the above-described engagement of the spur 43 in the notch 46, such engagement taking place automatically through the tension of the spring 39. The mail-bag will thus be locked in the hook 32 and its displacement therefrom is impossible until the mail-clerk lifts the end of the arcuate arm 42, releasing the studs from engagement in the notches; the mail-bag can then be drawn forward from the hook, thus swinging the lever back into its normal position.

In order to prevent a complete revolution of the angle-lever upon its pivot, in the event of the studs failing to become engaged in their respective notches, the collar 36 is preferably provided with an upstanding shoulder 47, against which the arm 40 will strike, if the stud 43 passes the notch 46. It has been found desirable, moreover, to provide the arm 41 with an upwardly-inclined, longitudinal flange 48, which extends over the top of the bolt 37 and over the washer 38 carried thereon, thus avoiding any injury to a mail-bag from contact with the bolt end during its passage into the hook 32.

The operation of the mechanism above described may be briefly stated as follows: Shortly before reaching the station at which the transfer of the mail-bags is to be effected, the mail-clerk within the car attaches the bag, by means of its rings, to the clips 30 and 31; the car door is then slid back, and the clerk then swings the operating handle 17 downward. This movement rotates the shaft 13, swings upward the receiving-arm 12 and the upper crane arm 25, and causes the rotation of the shaft 20, through the medium of the intermeshing gears 18 and 19, the rotation of said shaft causing the lower crane arm 24 to swing outwardly, in a horizontal plane, from the interior of the car, thus raising the mail-bag in its proper position, the above described movement of the several arms being effected by a single movement of the handle 17.

The mechanism complementary to that above described consists of a post 50 erected by the side of the tracks in the usual manner and provided with a movable upper arm 51 and a movable lower arm 52, extending outwardly therefrom at right-angles, toward the tracks, the said post and arms comprising what may be termed the post crane.

The arm 51, as shown in Fig. 10, is provided with a laterally projecting finger 53 carrying a spring-clip 54 adapted to engage the upper ring of a mail-bag, while its lower ring is engaged by a spring-clip 55, which is disposed at the free end of the arm 52 and is identical in construction with the clip 31 already described. The lower crane arm 52 is pivotally mounted, at its inner end between the members of a U-shaped strap 56, which is bolted to the post 50; at its opposite end, this arm is connected to the upper end of a chain 57 whose lower end is removably engaged with a catch 58 which is likewise bolted to the post. Owing to the provision of the chain, it will be obvious that a mail-bag supported by the crane arms will be held the proper distance from the post, as the arm 52 will be prevented from moving out of line with the strap above referred to by said chain. Upon the upper face of the lower crane arm is mounted a receiving-arm 59, which is practically identical in construction with the receiving-arm 12 and is likewise provided with an angular locking lever 60, which corresponds in every way to the lever 35 and is attached and operated in a similar manner. The receiving-arm 59, however, is so mounted upon the crane arm 52 as to be capable of semi-rotation, in order to adapt it for operation on either side of the crane arm, according as the mail-car approaches from one direction or the other. To this end, the body portion of the said arm 59 extends loosely through a pair of eye-bolts 61 and 62 which pass vertically through the crane arm 52, the shoulders formed by the laterally bent portions of the receiving arm preventing any endwise movement thereof. The crane arm 52 is further provided upon each of its side faces with a catch 63, one or the other of which is adapted to be engaged with the receiving arm according as the operative portion of the latter extends to one side or the other of the crane arm. If desired, a wear-plate 64 may be fixed to the upper face of the crane arm, the front eye-bolt 62 passing through said plate, as shown in Fig. 7.

The disposition of the various arms of the post and car cranes with respect to each other is such that the upper and lower arms of the latter travel below the corresponding arms of the former a distance equal to half the height of a mail-bag in its extended condition, or, in other words, the receiving-arm of the car-carried mechanism, which, in its operative position lies approximately in the same horizontal plane as the upper arm of the car crane, will strike the constricted central portion of the mail bag suspended from the arms of the post crane, while the receiving arm of the latter, which is disposed upon the upper face of the lower crane arm, is adapted to contact with the constricted central portion of the bag carried by the car crane. The receiving arms of both mechanisms are, therefore, so positioned that each removes the mail-bag from the crane arms of the opposite mechanism. Immediately upon such removal, the lower crane arm of each mechan-

ism will swing downwardly, thus, in the case of the car mechanism, drawing the bag into the interior of the car, and in the case of the post mechanism, swinging the bag away from the tracks out of danger from chance blows from the crane arm of any mail-cars which may subsequently pass by. It will be likewise apparent that the provision of the safety device upon the post receiving-arm positively holds the bag in place within the hook portion of the latter, and prevents displacement of the bag therefrom until removed by the mail-clerk at the station. The possibility of a bag becoming disengaged and rolling onto the tracks is therefore completely obviated. The downward movement of the car arm 12 and of the post arm 52 is, in both instances due to the weight of the mail-bag engaged therewith, such movement of the car arm rotating the shaft 13 in a direction opposite to that first described, and in consequence, swinging the arm 25 downwardly and the arm 24 inwardly, into the interior of the car, when the bag can be removed by the mail-clerk.

The construction of both mechanisms, and the operation and functions of their component parts are thought to be sufficiently clear from the foregoing, and further description is accordingly deemed unnecessary. Attention, however, is directed to the fact that the crane arms and receiving arm of the car mechanism are attached to a single support, are swung simultaneously into and out of operative position by a single movement of such support, and, in inoperative position, lie wholly within the interior of the car, and that the mail-bag, when in place upon the receiving arm of either mechanism is positively locked thereon by the safety lever. It will likewise be understood that the main features of the car-carried mechanism may be adapted for use upon the post, in which instance the latter will be provided with a horizontal shaft rotatably mounted thereon and connected with a crane and receiving arm identical in construction with such parts of the car mechanism, so that the crane arms and the receiving arm may be simultaneously moved into and out of operative position according as the shaft is rotated in one direction or the other by the sleeve handle.

Modifications and changes may obviously be made within the scope of the appended claims, as the invention is not intended to be limited to the exact details of construction shown and described.

What is claimed, is—

1. In an apparatus of the character described, a bag-supporting crane and a bag-receiving arm movably connected to a common rotatable support, said crane including independently movable bag-engaging arms, and a single means for rotating said support in one direction or the other, for simultaneously moving all of said arms into and out of operative position.

2. In an apparatus of the character described, a bag-supporting crane, and a bag-receiving arm movably connected to a common horizontally-disposed rotatable support, said crane including independently movable bag-engaging arms, and a single means for rotating said support in one direction or the other, for simultaneously moving all of said arms into and out of operative position.

3. In an apparatus of the character described, a bag-supporting crane and a bag-receiving arm movably connected to a common support, said crane comprising a horizontally-movable arm and a vertically-movable arm, and a single means for simultaneously moving all of said arms into and out of operative position.

4. In an apparatus of the character described, a bag-supporting crane and a bag-receiving arm movably connected to a common support, said crane comprising a vertically-movable arm and a horizontally-movable arm, and a single means for simultaneously moving all of said arms into and out of operative position.

5. A mail-bag receiving and delivery mechanism secured to a car and comprising a bag-supporting crane and a bag-receiving arm connected to a common support, and a single means for simultaneously moving said crane and arm into and out of operative position, said crane and arm in inoperative position lying entirely within the interior of the car.

6. A mail-bag receiving and delivery mechanism secured to a car and comprising a bag-supporting crane and a bag-receiving arm connected to a common horizontally disposed movable support, and a single means for moving said support in one direction or the other to project said crane and arm outwardly from the car simultaneously into operative position, and to retract the same simultaneously into inoperative position within the car.

7. A mail-bag receiving and delivery mechanism secured to a car and comprising a bag-supporting crane and a bag-receiving arm connected to a common horizontally disposed rotatable support, and a single means for rotating said support in one direction to project said crane and arm simultaneously outward from the car into operative position and in the opposite direction to withdraw said crane and arm simultaneously into inoperative position within the interior of the car.

8. A mail-bag receiving and delivery mechanism secured to a car and comprising a bag-supporting crane and a bag-receiving arm connected to a common rotatable support, said crane comprising a horizontally movable arm and a vertically movable arm, and a single means for rotating said support in one di-

rection to project said crane and arm simultaneously outward from the car into operative position, and in the opposite direction to withdraw said crane and arm simultaneously into inoperative position within the interior of the car.

9. In an apparatus of the character described, a bag-supporting crane and a bag-receiving arm connected to a common horizontally-disposed rotatable support, said crane comprising a horizontally movable arm and a vertically movable arm, a single means for rotating said support in one direction or the other for moving said crane and arm simultaneously into and out of operative position, and means carried by said arm for positively locking a bag received upon said arm in place thereon.

10. A mail-bag receiving and delivery mechanism secured to a car and comprising a bag-supporting crane and a bag-receiving arm connected to a common movable support, said crane comprising a horizontally movable arm and a vertically movable arm, a single means for projecting said crane and arm outwardly from the car simultaneously into operative position, and for retracting the same simultaneously into inoperative position within the car, and means carried by said arm for positively locking a bag received upon said arm in place thereon.

11. A mail-bag receiving and delivery mechanism secured to a car and comprising a bag-supporting crane and a bag-receiving arm connected to a common rotatable support stationary relative to the car, a single means for rotating said support in one direction to project said crane and arm simultaneously outward from the car into operative position and in the opposite direction to withdraw said crane and arm simultaneously into inoperative position within the interior of the car, and means carried by said arm for positively locking a bag received upon said arm in place thereon.

12. In an apparatus of the character described, a horizontally-disposed rotatable member, a pair of vertically movable arms carried by said member, a gear secured to said member, a vertical shaft provided with a gear in mesh with said first-mentioned gear, a laterally-projecting arm secured to said shaft and rotatable therewith, and means for rotating said member in one direction or the other, to move all of said arms simultaneously into and out of operative position.

13. In an apparatus of the character described, a bag-receiving arm, an angle lever pivoted thereto and movable thereon into and out of operative position to lock a bag received by said arm in place thereon, and means extending over the upper end of the pivot to prevent the bag from contacting therewith.

14. In an apparatus of the character described, a bag-receiving arm, an angle lever pivoted thereto and movable thereon into and out of position to lock a bag received by said arm in place thereon, and means extending over the upper end of the pivot to prevent the bag from contacting therewith, said means being carried by the lever.

15. In an apparatus of the character described, a bag-receiving arm, an angle lever pivoted thereto and movable thereon into and out of position to lock a bag received by said arm in place thereon, yielding means carried by the pivot and bearing against said lever, and means carried by said lever and extending over said first-mentioned means.

16. In an apparatus of the character described, a bag receiving arm, an angle lever pivoted thereto and movable thereon into and out of position to lock a bag received by said arm in place thereon, a spring carried by the pivot at its upper end and adapted to bear upon said lever to press the same yieldingly against said arm, and a shoulder formed on one arm of said lever and extending over said spring.

17. In an apparatus of the character described, a bag-receiving arm provided with a notch, and an angle-lever pivoted to said arm and movable thereon into and out of operative position to lock a bag received upon said arm in place thereon, said lever having a stud adapted for engagement in said notch when said lever is in its operative position.

18. In an apparatus of the character described, a bag-receiving arm provided with a notch, an angle lever pivoted to said arm and movable thereon into and out of operative position to lock a bag received upon said arm in place thereon, a stud formed upon one arm of said lever, and a spring carried by the upper end of the pivot and adapted to bear upon said lever, to force said stud into said notch when the lever is in its operative position.

19. In an apparatus of the character described, a bag-receiving arm provided with a notch, an angle lever pivoted to said arm and movable thereon into and out of operative position to lock a bag received upon said arm in place thereon, a stud formed upon one arm of said lever, a spring carried by the upper end of the pivot and adapted to bear upon said lever, to force said stud into said notch when the lever is in its operative position, and a shoulder formed upon one arm of the lever and extending over the upper end of the pivot, to prevent the bag from contacting therewith.

20. In an apparatus of the character described, a bag-receiving arm provided with a notch, and a spring-pressed angle lever pivoted to said arm and movable thereon into and out of operative position to lock a bag

received upon said arm in place thereon, said lever having a stud upon one end adapted for engagement in said notch when said lever is in its operative position.

21. In an apparatus of the character described, a bag-receiving arm and an angle lever pivoted thereto and movable into and out of position to lock a bag received by said arm in place thereon, one arm of said lever having a shoulder extending over the upper end of the pivot.

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

WILLIAM C. MILLER.

Witnesses:
N. P. GASPER,
F. W. STEPPILMAN.