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AUTOMATIC EXCHANGER FOR MAIL

Filed Jan. 20, 1930

2 Sheets-Sheet 1

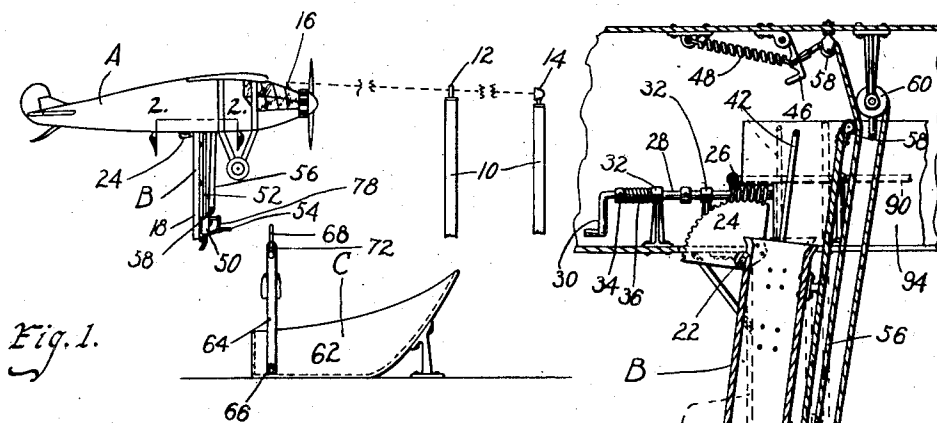


Fig. 1.

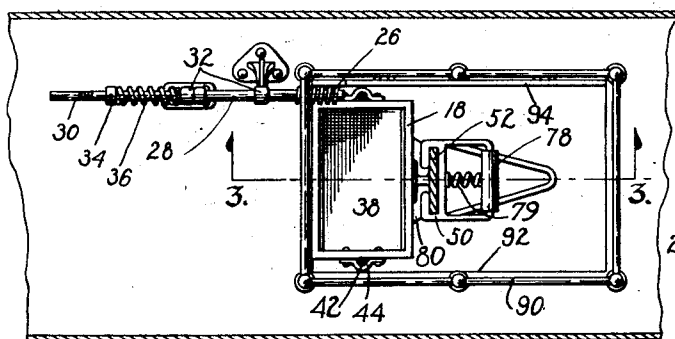


Fig. 2.

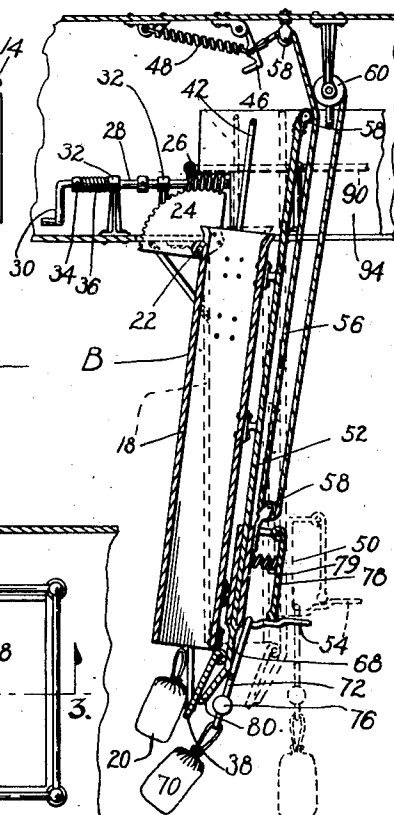


Fig. 3.

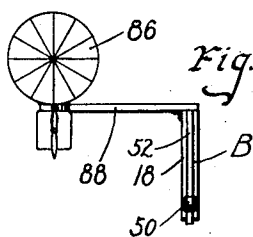


Fig. 9.

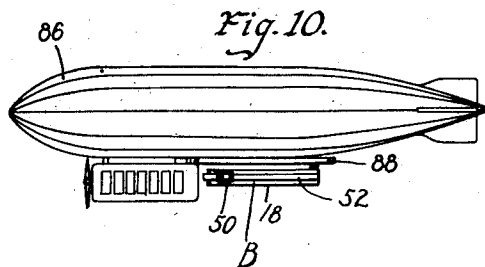


Fig. 10.

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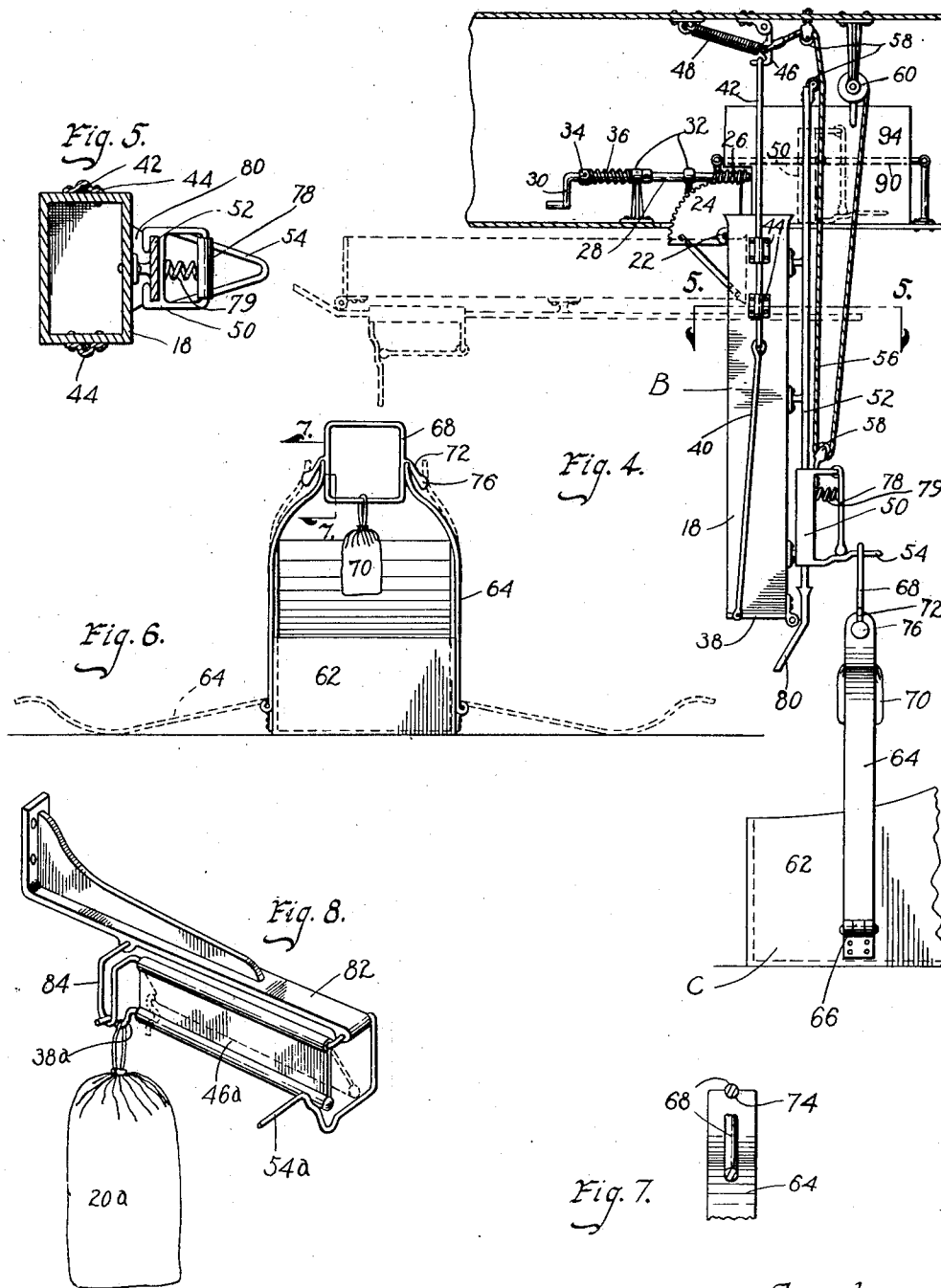
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AUTOMATIC EXCHANGER FOR MAIL

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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AUTOMATIC EXCHANGER FOR MAIL

Application filed January 20, 1930. Serial No. 422,084

The object of this invention is to provide an automatic exchanger for mail which is simple, durable, and comparatively inexpensive to manufacture.

5 A further object of my invention is to provide an automatic exchanger for mail and the like, consisting of a stationary mail support and a movable mail support, the movable mail support being mounted on a vehicle such as a train, bus or airplane, and having means to support mail to be delivered, and means for picking up mail from the stationary mail support.

15 A further object is to provide a movable mail support consisting of a pivoted chute adapted to be secured to an airplane fuselage so that it can be drawn up to a position adjacent thereto or extended to a position for delivering and picking up mail and the like.

20 Still a further object is to provide a means for accurately guiding the vehicle so as to insure proper coaction between the mail support thereon and the stationary mail support.

25 With these and other objects in view my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

35 Figure 1 is a side elevation of my automatic exchanger for mail illustrating the movable mail support on an airplane and showing the means for accurately guiding the plane when exchanging mail.

Figure 2 is a sectional view on the line 2—2 of Figure 1, illustrating the movable mail support in plan elevation.

40 Figure 3 is a sectional view on the line 3—3 of Figure 2 showing the movable mail support picking up and delivering mail.

45 Figure 4 is a sectional view somewhat similar to Figure 3 showing the movable mail support in side elevation and also a portion of the stationary mail support, and illustrating the two coacting with each other for picking up and delivering mail.

50 Figure 5 is a sectional view on the line 5—5 of Figure 4.

Figure 6 is an end elevation of the stationary mail support.

Figure 7 is a detailed sectional view on the line 7—7 of Figure 6.

Figure 8 is a perspective view of a modified form of mail exchanger. 55

Figure 9 is a front end elevation of the exchanger mounted on a dirigible; and

Figure 10 is a side elevation of Figure 9.

60 On the accompanying drawings I have used the reference character A to indicate generally an airplane. The airplane A carries the movable mail support B while the stationary mail support is indicated at C. For accurately guiding the airplane A a pair of posts 10, one surmounted with an eye member 12 and the other with a spot light 14 can be located at some distance ahead of the stationary mail support C. On the airplane A an eye member 16 is provided through which the pilot 70 of the plane can sight for aligning the spot light 14 through the eye member 12, whereupon he knows that his plane is in proper position for the movable mail support to coact with the stationary mail support for the exchange of mail. 75

The movable mail support B consists of a chute 18 adapted to contain one or more mail bags 20. The chute 18 is pivotally mounted on a shaft 22 secured to the airplane A so that swinging movement thereof is possible. The chute 18 may assume a landing position adjacent the airplane A as shown in dotted lines in Figure 4 or an extended position for exchanging mail as shown in full lines in this figure and in Figures 1 and 3. 85

90 For swinging the chute 18 a suitable means may be provided such as a worm gear sector 24 and a worm 26. The sector 24 is secured to the chute 18, while the worm 26 is secured to a crank shaft 28. A handle 30 is mounted on the shaft 28. The shaft 28 is supported in bearings 32 and is provided with a collar 34. A shock absorber spring 36 is interposed between the collar 34 and one of the bearings 32. The shock absorber spring 36 allows the chute 18 to swing from the position shown in Figure 4 to the position 95

shown in Figure 3 upon receiving mail from the stationary mail support C.

A trap door 38 is provided for the bottom of the chute 18 and is normally held closed by links 40 connected with an inverted U shaped rod 42. The rod 42 is slidably mounted in bearings 44 mounted on the sides of the chute 18, and the cross bar thereof is normally adapted to rest on a catch 46. The spring 48 holds the catch 46 in coaction with the cross bar of the rod 42.

Mail pick up means consisting of a carriage 50 is provided for the movable mail support B. The carriage 50 slidably contacts with a guide plate 52, as best shown in Figure 5 of the drawings. The carriage 50 is provided with a pick up hook 54 and is normally supported by a rope 56. One end of the rope 56 is connected with the catch 46 and extends over pulleys 58 and has its other end secured to a winding drum 60. The winding drum 60 may be manipulated for raising the carriage 50 to the dotted line position shown in Figure 4.

The stationary mail support consists of a reception trough 62 which is usually suitably supported on a raised platform or on top of a building. A pair of resilient arms 64 are hinged as at 66 to the sides of the reception trough 62. As shown in Figure 6, the arms 64 may assume a supine dotted position or may be raised to an upright position for coaction with an eye member 68. Mail bags 70 to be picked up by the airplane A are tied or otherwise secured to the eye member 68 and any desired number of them can be attached thereto. The eye member 68 is provided with a pair of hook elements 72 seated in notches 74 in the upper ends of the arms 64. The hooks 72 are counterweighted by counterweights 76. The resiliency of the arms 64 normally causes them to assume an upright position as illustrated in dotted lines in Figure 6, while the hook elements 72 of the eye member 68 pull them inwardly to the full line position illustrated.

Practical operation

In the operation of my device, the chute 18 normally assumes the dotted line position shown in Figure 4 to which position it may be moved by manipulating the crank 30. When it is desired to exchange mail relative to the stationary mail support C, mail bags 20 to be dropped in the receptacle 62 are dropped into the chute 18 which is of sufficient capacity to hold several mail bags 20. The trap door 38, of course, is first closed and hooked in closed position with the latch member 64.

The mail bags 70 to be picked up are secured to the eye member 68 and the eye member supported on the resilient arms 64. The pilot when approaching the stationary mail support C aligns his airplane with the

sight members 12 and 14 so as to insure that the pick up hook 54 will enter the eye 68. Upon the pick up hook 54 entering the eye, the eye will be received on the hook member as shown in Figure 3. The shock of receiving the eye member 68 and the mail bags thereon is absorbed by the spring 36, which is shown in compressed position in Figure 3. A pivoted gate 78 (normally urged outwardly by a spring 79) swings inwardly to allow the eye member 68 to engage on the hook 54 and then swings outwardly again to prevent accidental bouncing of the eye member from the hook.

The weight of the eye member and mail bags 70 will cause the carriage 50 to lower against the action of the spring 48 which releases the latch 46 from the cross bar of the rod 42 and allows the trap door 38 to open and drop the mail bags 20 into the receptacle C. As soon as this has occurred, the pilot of the airplane can steer upward or sidewise to miss the posts 10.

As soon as the eye member 68 has been transferred to the pick up hook 54, the arms 64 will swing outwardly and downwardly out of the way. It will be noted that the hook member 54 is shaped like an arrow head so that if there is a slight variation between the path of the hook member and the center of the eye 68, the hook member can still pick up the eye member. In the event of missing the eye member 68 with the pick up hook 54 or by hitting it with a guard 80 formed on the lower end of the guide plate 52, the eye member will be knocked from the arms 64 and can then be replaced for the airplane to return and make another attempt to exchange mail.

In Figure 8 I have shown a modified form of construction consisting of a bracket 82 supporting a pick up hook 54a and a pivoted latch plate 46a. A supporting hook 38a is pivotally mounted on the latch plate 46a and normally rests in a loop member 84, in which position it supports the mail bag 20a to be delivered. Upon a mail bag being picked up on the hook 54a, the latch plate 46a swings to the dotted line position and allows the bag 20a to drop off the hook 38a. This type of device is especially adapted for attachment to the sides of trains and busses. Channel tracks could be provided for a bus to insure proper alignment of the pick up hook 54a with an eye similar to the eye 68 or with the rope of the mail bag which could be supported in a suitably extended position.

In Figures 9 and 10 I have illustrated a modified form of mail exchanger for dirigibles 86. A swinging arm 88 is provided to which the mail support B is hingedly connected. In Figure 9 the arm 88 is swung to a side extending position so that the mail support B does not extend downwardly from the cabin of the dirigible. In Figure 10 the arm 88 has been swung to position parallel with the dirigible and mail support B raised to

position where it does not interfere with landing.

In connection with trains or busses a trap door could be provided in the bottom of such vehicles for the discharge of mail therefrom, such trap door being operated on the same principle as the one shown in Figures 3 and 4.

My device can be used for any number of mail bags and is not limited to the exchange of mail but can also be used for parcels.

For the protection of operators within the airplane A it is desirable to provide a railing 90 around an opening 92 in the bottom of the airplane through which the chute 18 extends. When the chute is moved to the dotted line position shown in Figure 4, a door 94 may be closed over the opening 92.

Some changes may be made in the construction and arrangement of the parts of my device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. In an automatic exchanger for mail and the like, a stationary mail support and a movable mail support, said movable mail support including a chute and a mail pick up means provided with mechanism for releasing mail from said chute upon the pick up means receiving mail from the stationary mail support.

2. In an automatic exchanger for mail and the like, a stationary mail support and a movable mail support, said movable mail support including a receptacle, a trap door on the bottom thereof and a mail pick up means, said mail pick up means comprising a pick up hook and a release member for said trap door, said release member being actuated by said pick up hook upon receiving mail from the stationary support.

3. In an automatic exchanger for mail and the like, a stationary mail support, a movable mail support adapted to be attached to a vehicle, said movable mail support comprising a chute having a trap door, a pick up hook movably mounted relative to said chute and an operative connection between said hook and said trap door for opening the trap door upon movement of the hook caused by receiving mail thereon from the stationary mail support.

4. In an automatic exchanger for mail and the like, a stationary mail support, a movable mail support adapted to be attached to a vehicle, said movable mail support comprising a chute having a trap door, a pick up hook movably mounted relative to said chute and an operative connection between said hook and said trap door for opening the trap door upon movement of the hook caused by

receiving mail thereon from the stationary mail support, said operative connection comprising a catch for the trap door and means of connection between said catch and said hook for moving the former upon movement of the latter.

5. In an automatic exchanger for mail and the like, a stationary mail support, a movable mail support adapted to be attached to a vehicle, said movable mail support comprising a chute having a trap door, a pick up hook movably mounted relative to said chute, an operative connection between said hook and said trap door for opening the trap door upon movement of the hook caused by receiving mail thereon from the stationary mail support, said chute being pivotally mounted relative to said vehicle and resilient means to allow the chute to swing upon said hook receiving mail from the stationary mail support and thus absorb the shock of such reception.

6. In an automatic exchanger for mail and the like, a stationary mail support, a movable mail support adapted to be attached to a vehicle, said movable mail support comprising a chute having a trap door, a pick up hook movably mounted relative to said chute, an operative connection between said hook and said trap door for opening the trap door upon movement of the hook caused by receiving mail thereon from the stationary mail support, and means for moving said pick up hook relative to the chute to a position convenient for removing the mail therefrom.

7. In an automatic exchanger for mail and the like, a stationary mail support, a movable mail support adapted to be attached to a vehicle, said movable mail support comprising a chute having a trap door, a pick up hook movably mounted relative to said chute, an operative connection between said hook and said trap door for opening the trap door upon movement of the hook caused by receiving mail thereon from the stationary mail support, said chute being pivotally mounted relative to said vehicle, and means for selectively swinging the chute to a position adjacent the vehicle or to a position extended therefrom.

8. In an automatic exchanger for mail and the like, a stationary mail support, including a pair of arms capable of movement away from each other, an eye member supported thereon which retains them in a predetermined position, a movable mail support, said movable mail support including a mail pick up means adapted to coast with said eye member and remove it from said arm and provided with mechanism for releasing mail from the movable mail support upon the pick up means coasting with said eye member.

9. In an automatic exchanger for mail

and the like, a stationary mail support, including a pair of arms hinged at their lower ends and constrained toward pivotal movement away from each other, an eye member supported on said arms and retaining them in a predetermined position, a movable mail support, said movable mail support including a mail pick up means adapted to coact with said eye member and remove it from said arms, said eye member being provided with mechanism for releasing mail from the movable mail support upon the pick up means coacting therewith.

10. In an automatic exchanger for mail and the like, a stationary mail support and a movable mail support, said movable mail support including a mail pick up means provided with mechanism for releasing mail from the movable mail support, said stationary mail support including a pair of resilient arms each pivotally supported at one end, an eye member adapted to coact with said pick up means having means coacting with the free ends of said arms and being supported thereby, the resiliency of said arms contributing to retain the eye member thereon and causing the arms to assume a supine position upon the eye member being removed therefrom by the pick up means.

Des Moines, Iowa, January 10, 1930.
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