P. M. HUSSEY AND C. E. IRVINE.

BOMB DROPPING MACHINE.

APPLICATION FILED DEC. 13, 1918.

1,305,214.

Patented May 27, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

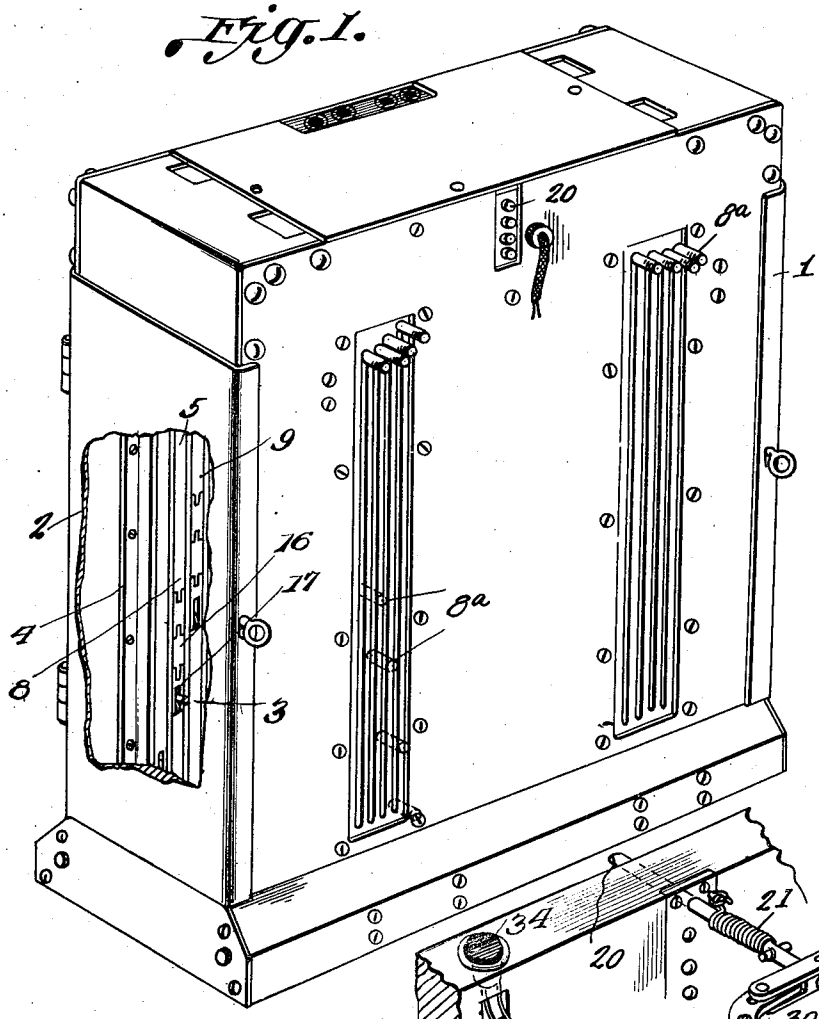
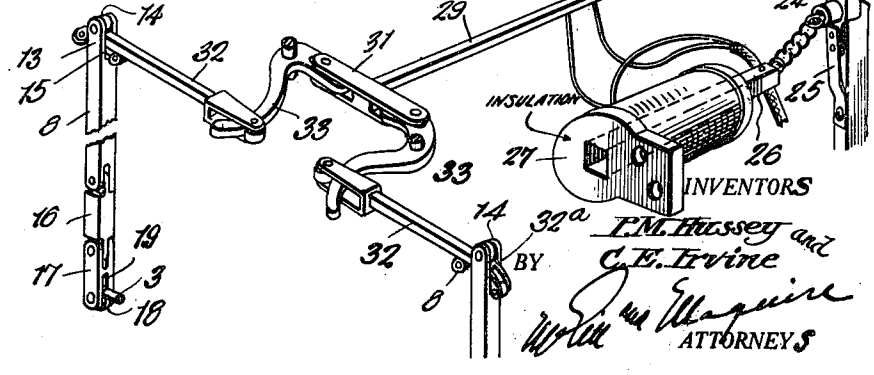


Fig. 2.



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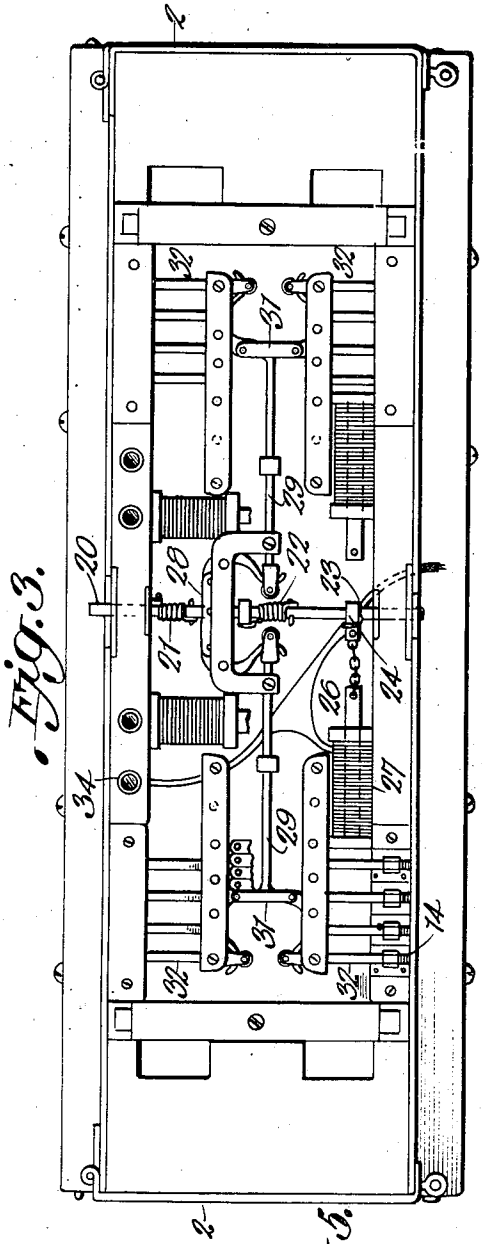


Fig. 3.

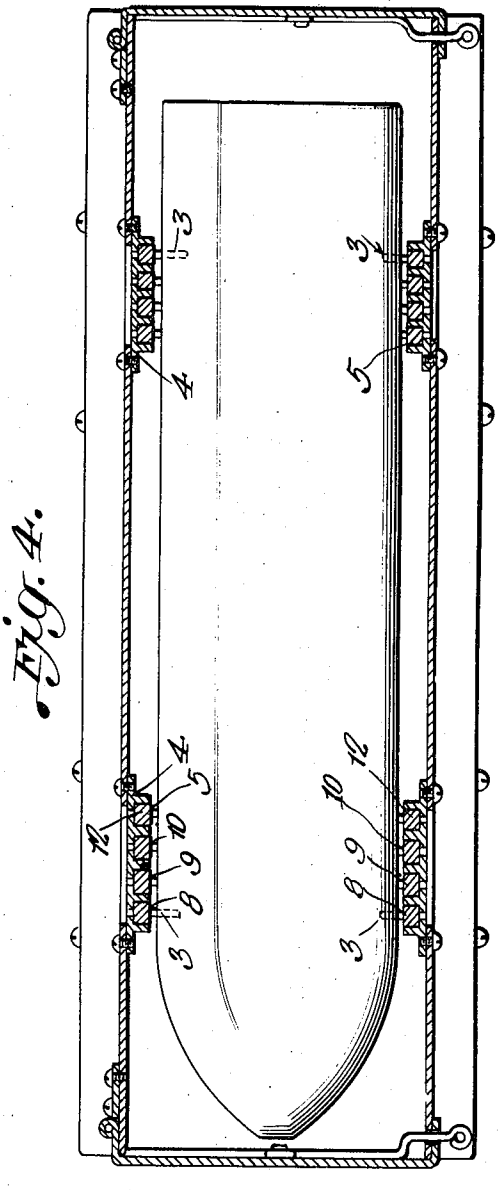


Fig. 4.

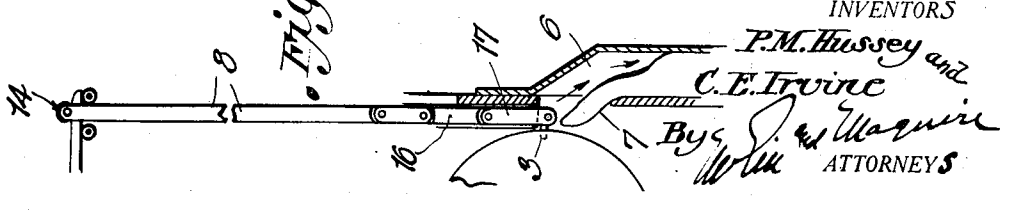


Fig. 5.

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UNITED STATES PATENT OFFICE.

PERCIVAL M. HUSSEY AND CATHERINE E. IRVINE, OF WINNIPEG, MANITOBA, CANADA.

BOMB-DROPPING MACHINE.

1,305,214. Specification of Letters Patent. Patented May 27, 1919.

Application filed December 13, 1918. Serial No. 266,551.

To all whom it may concern:

Be it known that we, PERCIVAL M. HUSSEY and CATHERINE E. IRVINE, of Winnipeg, Canada, have invented certain new and useful Improvements in Bomb-Dropping Machines; and we 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.

Our invention is primarily adapted for use on aeroplanes and balloons and constitutes a receptacle in which the bombs are stored and means for successively or simultaneously dropping the bombs. It is available as well for distributing mail or other matter when the object is to release and drop the several packages separately or at once.

In the accompanying drawings, Figure 1 is a perspective of the apparatus. Fig. 2 is a detail of one of the bomb holding and releasing mechanisms. Fig. 3 is a top view with the casing cover removed showing all of the holding and releasing mechanisms. Fig. 4 is a horizontal section through the casing. Fig. 5 is a detail.

Casing 1 has its lower end open to permit release of the bombs. At each end it is equipped with doors 2 to facilitate storage of the bombs. The casing may be of any general shape desired although the rectangular formation illustrated is best adapted for bombs. As illustrated in Fig. 4 each bomb is equipped with two pairs of stub shafts 3 projecting laterally from the sides of the body or shell. The apparatus illustrated is, for convenience, arranged to carry four bombs.

Vertically disposed on the inner side walls of the casing are four series of guides preferably made of channeled plates 4 providing grooves 5. These series and their complementary parts are alike so that a description of one will suffice. At the lower ends of the grooves 5 is a pocket 6 (Fig. 5) from the inner wall of which five deflector bars 7 project, the bars being so disposed that the spaces between them are in line with the grooves. Runners 8, 9, 10, 12 are movable in the grooves 5. They are of different lengths. Runner 8 is the longest, and their lengths decrease in the order in which they are recited. The runners are provided with handles 8^a extending through slots in casing 1. These permit of ready manipulation of the runners and keep them in their grooves.

The corresponding runners in the four series of plates 4 constitute the support for one bomb. Each runner has its upper end forked as at 13 and a roller 14 journaled in the extremities, leaving a hole 15 beneath the roller. This upper end is for engagement by the holding and releasing mechanism under control of the operator. At its lower end the runner is preferably provided with two pivoted links 16, 17 and the lower, 17, is forked to receive a roller 18 and provide a hole 19 in which a stub shaft 3 of the bomb is seated. When a bomb is fixed to its four corresponding runners it is elevated until the runners are engaged by the holding and releasing mechanism, the links 17 hanging vertically as the runners move through their grooves. The handles 8^a are then in their full line positions. When the runners are released and drop with the bomb by gravity they will continue to hold the bomb until the lower ends of links 17 contact with deflector bars 7, causing the links to turn into pockets 6 and allowing the stub shafts 3 to withdraw from holes 19 and permitting the bomb to drop. The spaces between bars 7 are sufficient to permit the stub shafts to pass through them but not the links 17.

It will be apparent from the foregoing that the first bomb installed is attached to the four shortest runners 12 and that these are elevated and locked. The second bomb is carried by the series of runners 10, the third by series 9 and the last by 8. The bombs are dropped in the reverse order.

We provide electrically actuated devices for holding and releasing the runners and their bombs or other packages. We shall first describe the parts affecting the runners 8. Mounted transversely of the casing 1 at its top and projecting through one of the side walls is a hand operated push rod 20. A spring 21 is coiled upon and secured to the rod and to the casing thus tending to hold the rod projected. A second spring 22 may also be attached to the rod and to a post mounted in the casing. The rod is formed with a notch 23 adapted, when the rod is pushed inward against its spring tension, to be engaged by a latch 24 mounted on a spring arm 25 tending to hold the rod pushed in and under tension. This latch is attached to the armature 26 of an electromagnet 27. A bar 28 is fixed trans-

versely on the rod 20 and its ends are connected with arms 29 by bell crank levers 30. Thus the movement of rod 20 imparts movement in right angular directions to the arms 29. These arms effect the locking and releasing of the runners. They carry fixed transverse bars 31 connected with locking levers 32 by bell cranks 33. These locking levers which are beveled at their ends as 32ª are adapted to project into grooves 5 and through holes 15 of the runners. This is the position when a set of runners 8 and their bombs are elevated and the bar 20 pushed in. A push button 34 controls the circuit from a battery to the magnet 27. When it is desired to release the bomb held by runners 8 this push button is operated to energize the magnet and retract its armature 26. This withdraws latch 24 from notch 23 and allows rod 20 to move outward under its spring tension, thus moving arms 29 and levers 32 to release the bomb. Independently of the spring action, and even if springs 21 and 22 were omitted, the weight of the bomb pulling on the beveled ends of the levers 32 will force the levers inwardly and disengage them from the runners 8.

The elements described for holding and releasing the runners 8 are repeated for each of the other three sets of runners 9, 10 and 12, each set having its respective push rod, latch, arms, locking levers, magnet and push button. As they operate independently, further description of each is unnecessary.

We claim as our invention:

1. The combination with a bomb having stub shafts, of a casing to contain said bomb, runners vertically movable in said casing and having means for engaging said shafts, means for holding said runners elevated in said casing, means for releasing said runners, and means for disengaging said shafts from said runners.

2. The combination with a bomb having stub shafts, of a casing to contain said bomb, runners vertically movable in said casing and having perforated links at their lower ends adapted to receive said shafts, means for holding said runners elevated in said casing, means for releasing said runners, and deflector bars in the path of movement of said runners for disengaging said links from said shafts.

3. The combination with a bomb having stub shafts, of a casing to contain said bomb, vertical guiding grooves in the walls of said casing, pockets beneath said grooves, deflector bars adjacent said pockets, the spaces between said bars being in line with said grooves, runners movable in said grooves, perforated links carried by said runners and adapted to receive said shafts, and means for holding said runners elevated and effecting their release.

4. The combination with a plurality of vertically movable runners adapted to engage and hold a bomb, of a spring-held push rod, a latch for holding said rod against its spring tension, an electro-magnet, a connection between the armature of said magnet and said latch, means for energizing said magnet, and locking levers for engaging said runners and movable with said rod.

5. The combination with a plurality of runners adapted to engage and hold a package to be dropped from aerial craft, of a spring-held push rod having a notch, a latch adapted to engage said notch and hold the rod against its spring tension, arms actuated by said rod, locking levers actuated by said arms and adapted to engage said runners, an electro-magnet, a connection between the armature of said magnet and said latch, and means for energizing said magnet.

In testimony whereof we have signed this specification.

PERCIVAL M. HUSSEY.
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