J. F. MEIGS & R. P. STOUT.

AMMUNITION HOISTING CAR.

APPLICATION FILED OCT. 11, 1909.

1,105,813.

Patented Aug. 4, 1914.

4 SHEETS—SHEET 1.

Fig. 1.

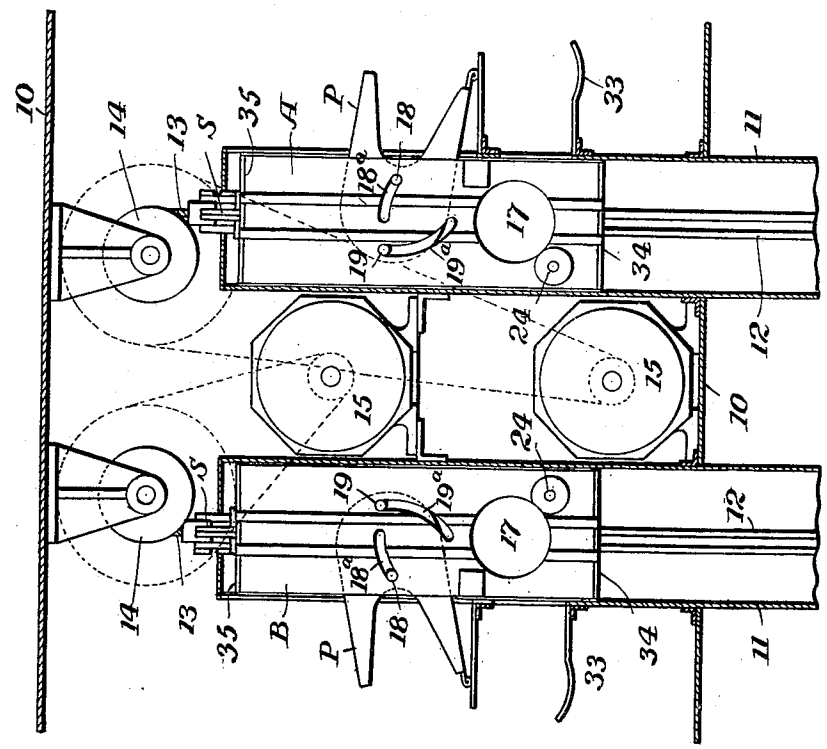
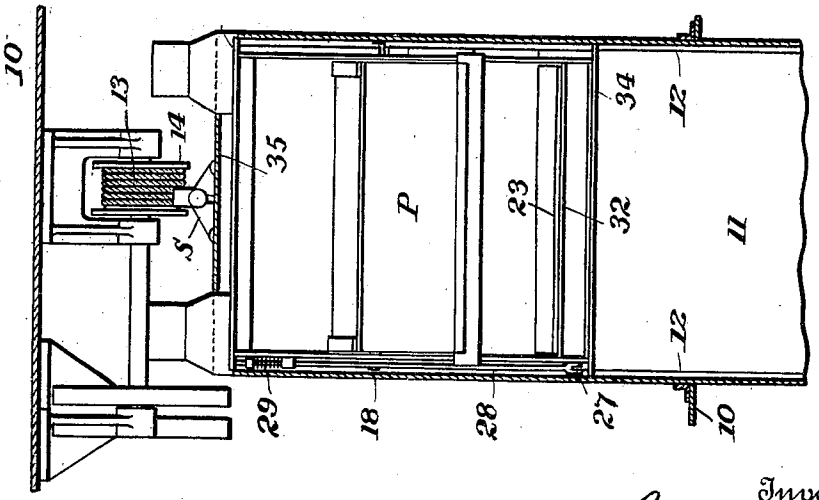


Fig. 2.



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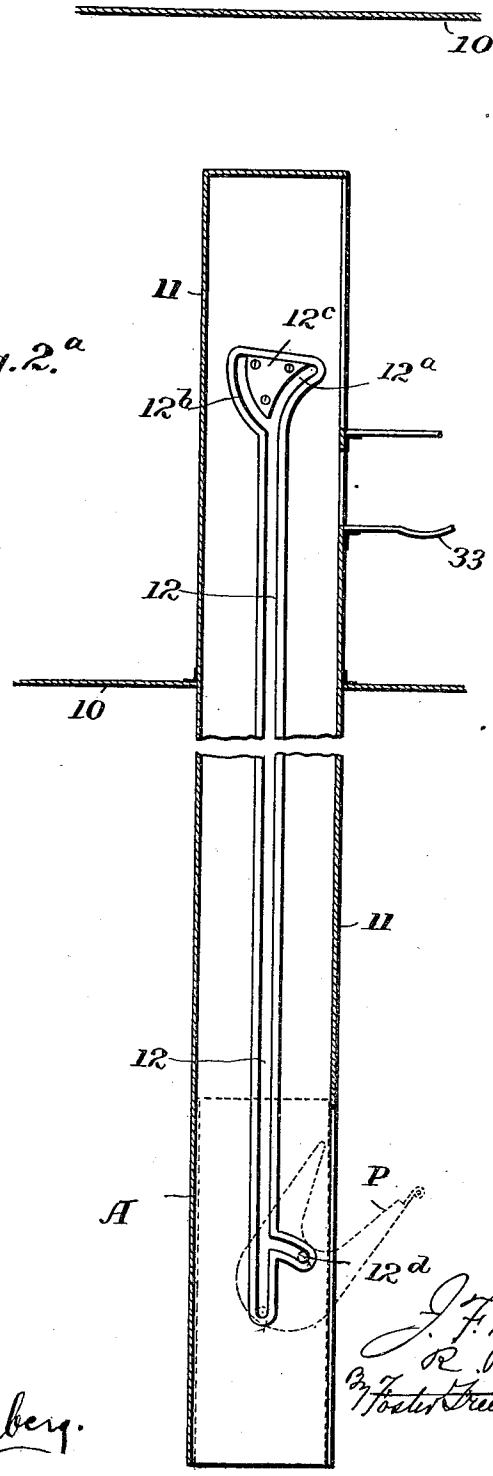
4 SHEETS—SHEET 2.

Fig. 2.ª



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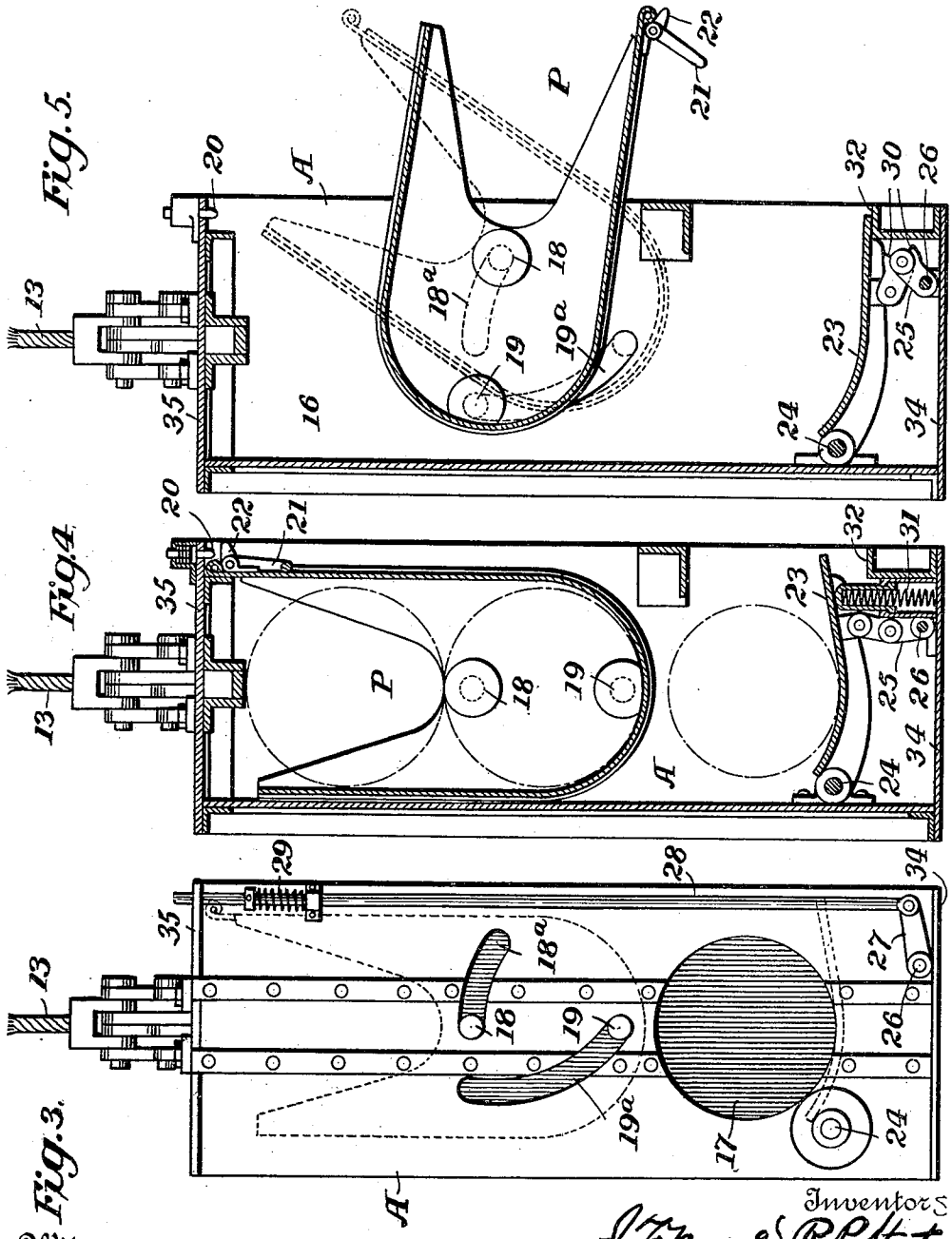
4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

Fig. 6.

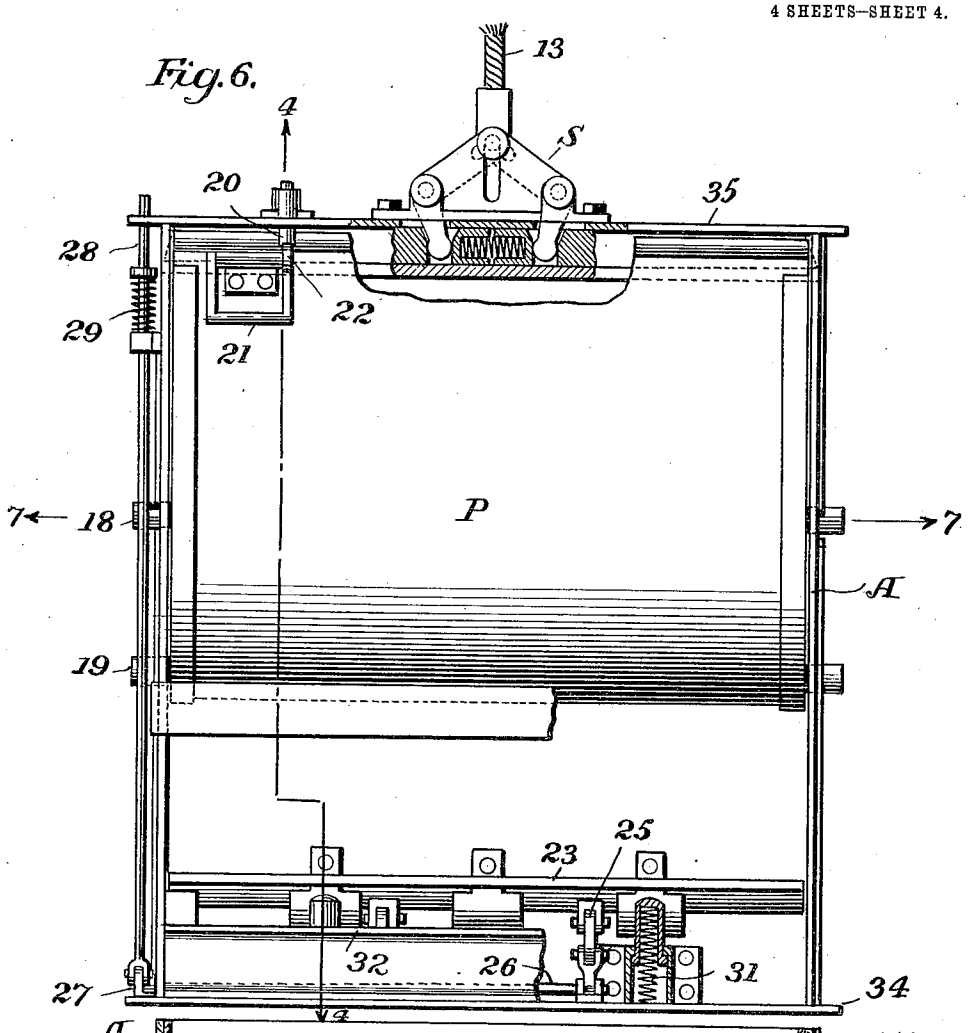
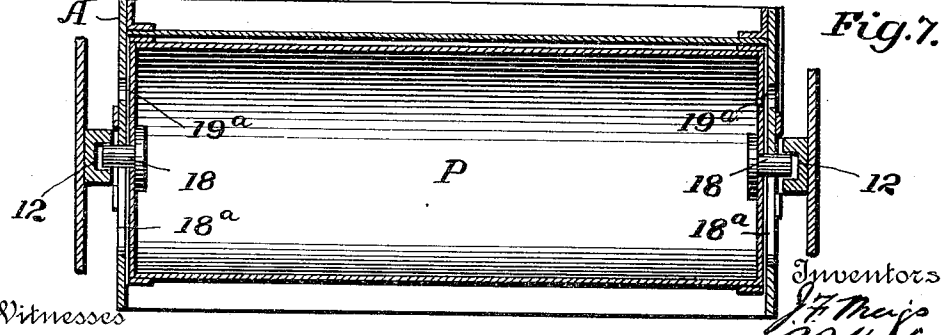


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN F. MEIGS AND ROBERT P. STOUT, OF SOUTH BETHLEHEM, PENNSYLVANIA, ASSIGNORS TO BETHLEHEM STEEL COMPANY, OF SOUTH BETHLEHEM, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

AMMUNITION-HOISTING CAR.

1,105,813. Specification of Letters Patent. Patented Aug. 4, 1914.

Application filed October 11, 1909. Serial No. 522,197.

To all whom it may concern:

Be it known that we, JOHN F. MEIGS and ROBERT P. STOUT, citizens of the United States, and residents of South Bethlehem, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in Ammunition-Hoisting Cars, of which the following is a specification.

This invention relates to improvements in ammunition hoisting mechanism and more particularly to an improved hoisting car which is adapted to fully inclose the powder charge while the same is being elevated and which has certain automatic features in connection with the unloading of the charge at the upper station of the hoist.

The invention will be described in detail in the following specification, in connection with the accompanying drawings, in which—

Figure 1 is a view of the upper station of a double ammunition hoist showing two cars in end elevation and showing the casings or wells in which the cars run in section; Fig. 2 is a side view of one of the cars shown in Fig. 1, the casing or well being shown in section; Fig. 2ª is a detail of one of the guides for the cars; Fig. 3 is an enlarged end view of one of the cars; Fig. 4 is a sectional view taken on the line 4—4 of Fig. 6; Fig. 5 is a sectional view of the car showing the trays in unloading position; Fig. 6 is an enlarged side view of the car; and Fig. 7 is a section on the line 7—7 of Fig. 6.

Referring to the drawings, 10 indicates the housing surrounding the upper part of the hoist, which housing may, for instance, be the lower part of a turret in which the elevating apparatus is supported. Within and supported by the casing 10 are the hoist wells or casings 11 which are provided with grooved guide rails 12 which serve to guide the cars centrally in the wells. In Fig. 1 two cars A, B are shown, opening respectively to the right and left and they are carried and moved by ropes 13 winding on suitable drums 14, which are driven by suitable means, such as the electric motors 15. A description of one of the cars will answer for both.

Referring to Figs. 3 to 7 inclusive, the car A consists of a rectangular casing 16 open at one side and provided with at least one end opening 17 through which the projectile can be thrust in loading the car. Each car is preferably provided with a safety device S, which may be of any suitable type. This device need not be described in detail as it forms no part of the present invention. Its object, as is well understood, is to prevent the car from dropping in case the hoisting rope or its operating machinery should break.

In the upper portion of the car there is a powder receptacle P which is U-shape in cross section and adapted to receive one or more parcels of powder, two being indicated by dotted circles in Fig. 4. The front side of the receptacle P is sufficiently high to close the receptacle against the entrance of sparks or flame when it is in the hoisting position, while the rear wall of the receptacle is lower to permit the receptacle to tip downward into the position shown in Fig. 5, for discharging purposes. The powder receptacle is provided with two pins or studs 18, 19 at each end and the casing of the car is provided with slots 18ª, 19ª in which these pins move, respectively, when the powder receptacle is tilted. During the hoisting operation the pins 18, 19 run in the vertical guide grooves 12 as shown in Fig. 7. As the car approaches the upper station, the upper stud or pin 18 runs into a laterally curved extension 12ª of the guide groove 12, which throws the powder receptacle out into the position shown in dotted lines in Fig. 5, the slots 18ª permitting the receptacle to tilt into this position. During this movement the receptacle turns about the pins 19, which are held in the grooves 12. After the receptacle has assumed the position shown in dotted lines in Fig. 5, it tends to tip farther, the center of gravity of the loaded receptacle being above the pins 18. The guide grooves 12 have other laterally-curved extensions 12ᵇ, Fig. 2ª, to permit the pins 19 to swing laterally, and the receptacle pivots upon the pins 18 and swings automatically into the position shown in full lines in Fig. 5, in which position the powder charge is automatically delivered from the receptacle onto any suitable support.

After the powder is discharged the receptacle P will resume automatically the

dotted position, Fig. 5, the center of gravity of the empty receptacle being to the left of or below the pin 18, and if the car be then lowered it will be automatically returned to closed position by the grooves 12^a. By removing the block 12^c between the curbed grooves 12^a, 12^b the receptacle is freed from the guides and may be tilted freely by hand. At the lower end of the guides 12 are suitable openings or branch grooves 12^d to permit the receptacle to assume a loading position similar to that shown in dotted lines in Fig. 5. The car is preferably retained in the closed position by a spring latch 20 and the upper edge of the receptacle is round so that it will pass the spring latch automatically when pressure is applied in either opening or closing. For convenience in opening the powder receptacle when empty, a pivoted handle 21 is provided which has an arm 22 adapted to lift the latch 20. By grasping the handle 21 the latch may be raised and the powder receptacle simultaneously pulled out into open position.

The projectile, which is indicated by a broken circle in Fig. 4, is supported upon a tray 23 which is slightly concave and which is pivotally attached at 24 to the rear wall of the car. The tray is normally supported by pairs of toggle links 25, the upper links being pivoted to the tray 23, while the lower links are fixed on a rock shaft 26. The shaft 26 has an arm 27 to which is connected a rod 28 extending slightly above the top of the car and normally held in its upper position by a spring 29 (Fig. 3). The spring 29 tends to hold the toggle 25 in its normal or sustaining position, as shown in Fig. 4, in which the middle pivots of the links are slightly in the rear of the upper and lower pivots, thus preventing any possibility of accidental collapse of the toggles. The links are provided with shoulders 30 which abut when they are in the sustaining position and prevent the links from moving backwardly under the stress of the load on the tray. A suitable spring 31, Fig. 4, constantly presses up on the tray 23 and assists in raising it to its normal position. When the car reaches its upper station, the upper end of the lever 28 strikes a fixed abutment and the shaft 26 is rocked sufficiently to "break" the toggles 25 and permit the tray 23 to descend under the weight of the projectile, which is sufficient to compress the springs 29 and 31. The tray 23 drops until its forward edge rests upon a support 32 and the projectile rolls off automatically onto a shelf or other suitable support 33. When the tray is relieved of the weight of the projectile and the car lowered the springs return the tray to its upper position and it is supported in that position by the toggles, as heretofore described.

The bottom 34 of each car is made to fit the well 11 quite closely and the car is of such depth that the bottom does not reach the discharge opening in the well when the car is in its upper position. The well is thus closed to prevent fire from being communicated from the turret through the well 11 to the ammunition room below. Likewise, the top plate 35 of each car is made to fit the well closely and serves to prevent fire from passing to the ammunition room when the car is below the discharge openings. The lower opening in each well, through which the ammunition is loaded onto the car is below the top plate 35 when the car is in its lowest position, and hence the top plate serves to prevent any communication between the ammunition room and the well, or the turret above the well, while the car is being loaded.

It will be evident that the details of construction of our invention may be variously modified without departing from the spirit and scope thereof and hence we do not desire to limit ourselves to the precise apparatus herein shown and described.

What we claim and desire to secure by Letters-Patent is:

1. In an ammunition hoist, the combination with a track or guideway, of a car, a normally closed tilting powder receptacle on the car, and means on the powder receptacle for engaging the track or guideway, the upper part of said track or guideway being constructed to tilt and open the powder receptacle to discharge the powder therefrom.

2. In an ammunition hoist, the combination with a hoisting car, of a tilting powder receptacle thereon, means for closing said receptacle when in its normal position on the car to wholly inclose the powder, and means for tilting the receptacle arranged to open the same and discharge the powder therefrom.

3. In an ammunition hoist, the combination with a car or casing, of a powder receptacle normally mounted therein and having pivot pins extending through slots in the wall of the car or casing, a track or guideway adapted to engage said pivot pins and tilt the receptacle from normal position, and means for closing the receptacle when in normal position.

4. In an ammunition hoist, the combination with a car or casing, of a powder receptacle pivotally mounted in said car or casing, means for closing the receptacle when in one of its positions, a track or guideway, and means connected with the track or guideway for automatically moving the receptacle to and from closed position, to close and open the same.

5. In an ammunition hoist, the combination with a car or casing, of a powder re-

ceptacle pivotally mounted in said car or casing and provided with two pivotal centers, said car being adapted to swing successively about said pivotal centers for the purpose set forth.

6. In an ammunition hoist, the combination with a car or casing, of a powder receptacle pivotally mounted in said car or casing and provided with two pivotal centers, said car being adapted to swing successively about said pivotal centers for the purpose set forth, one of said centers being above the center of gravity of the receptacle when the latter is empty.

7. In an ammunition hoist, the combination with a track or guideway, of a car adapted to run thereon and having curved slots in its walls, a powder receptacle pivotally mounted within the car and having two pins or projections at each end extending through said curved slots, means on the car normally closing the receptacle, the track being adapted to engage said pins or projections to move said powder receptacle from and to its closing means.

8. In an ammunition hoist, the combination with a car or casing, of a powder receptacle movably mounted in the car or casing, a part in said car or casing adapted to close said receptacle in one position thereof, and means at one station of the hoist for moving said receptacle to open the same as the car approaches its upper station.

9. In an ammunition hoist, the combination with a car or casing, of a powder receptacle movably mounted in the car or casing, a part in said car or casing adapted to close said receptacle in one position thereof, and means at one station of the hoist for tilting said receptacle away from its closing means to open the receptacle and discharge its contents.

10. In an ammunition hoist, the combination with a car, of an ammunition tray pivotally mounted within the car, a spring tending normally to raise the tray to its upper position, toggle links arranged to sustain the tray in its upper position, a second spring adapted to normally hold the toggle links in their sustaining position, and means for automatically breaking the toggle to permit the tray to drop under the weight of the projectile whereby the projectile is automatically unloaded.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN F. MEIGS.
ROBERT P. STOUT.

Witnesses:
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FRANK I. GRIM.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."