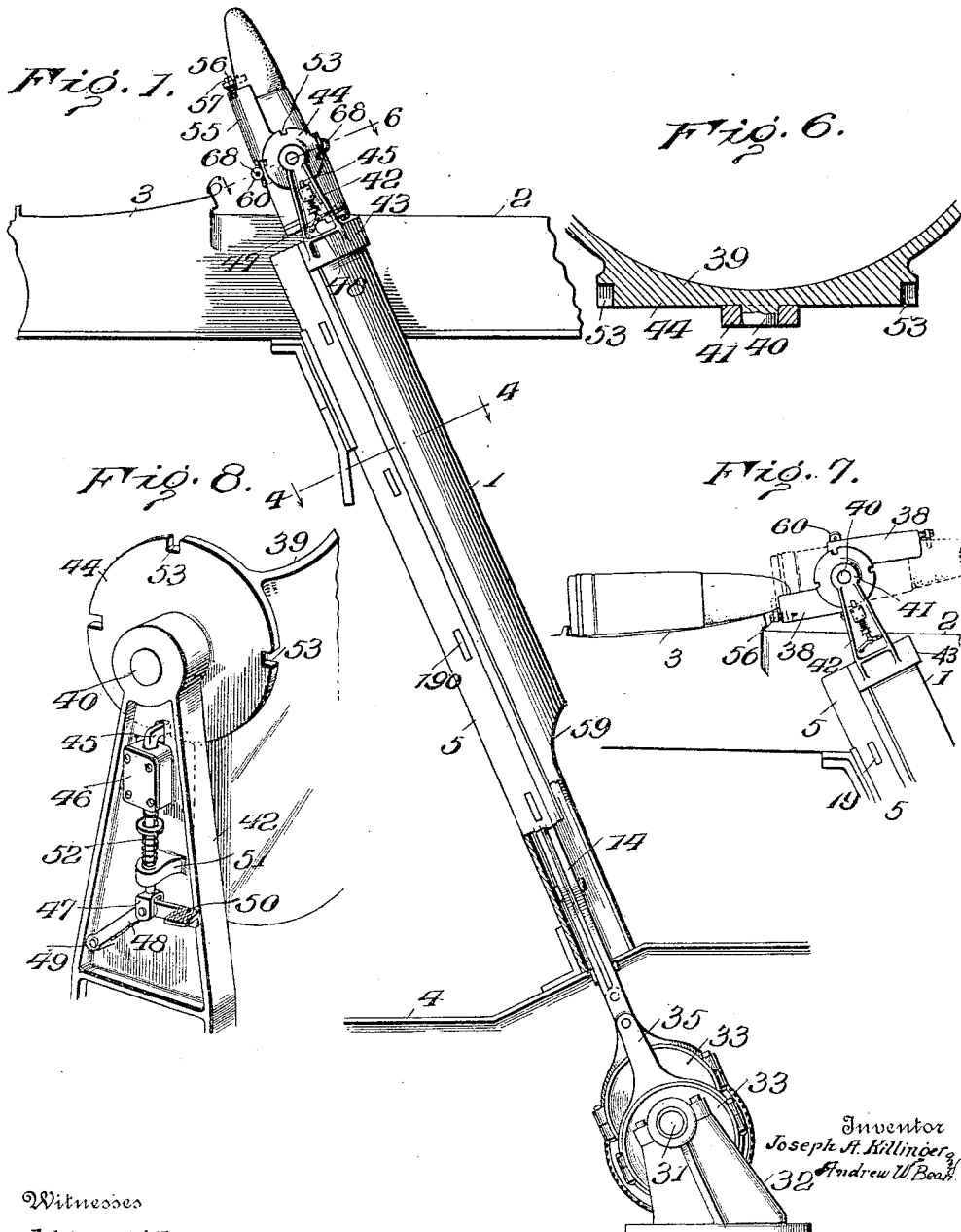


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 AMMUNITION HOIST.
 APPLICATION FILED JAN. 21, 1915.

1,204,360.

Patented Nov. 7, 1916.
 3 SHEETS—SHEET 1.



Witnesses

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By

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Fig. 3.

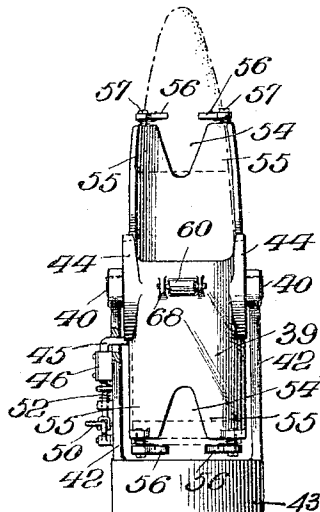
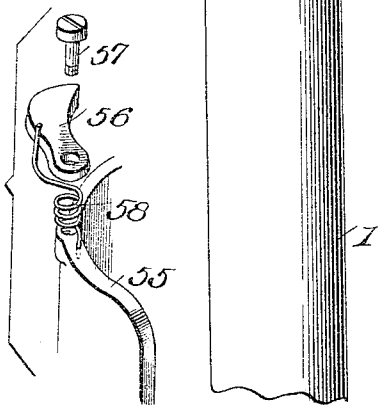
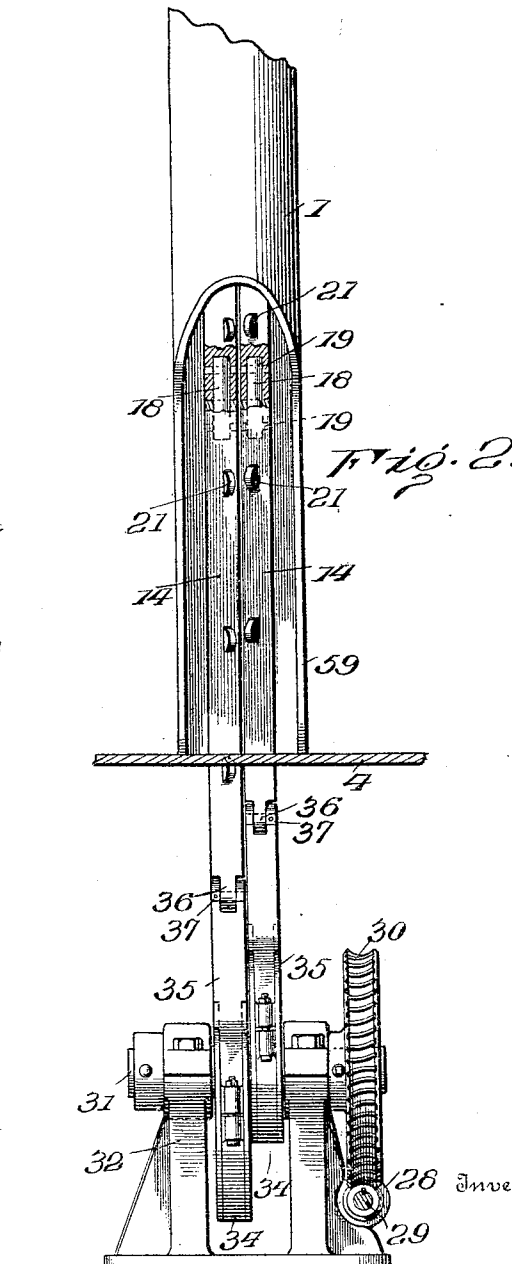


Fig. 9.



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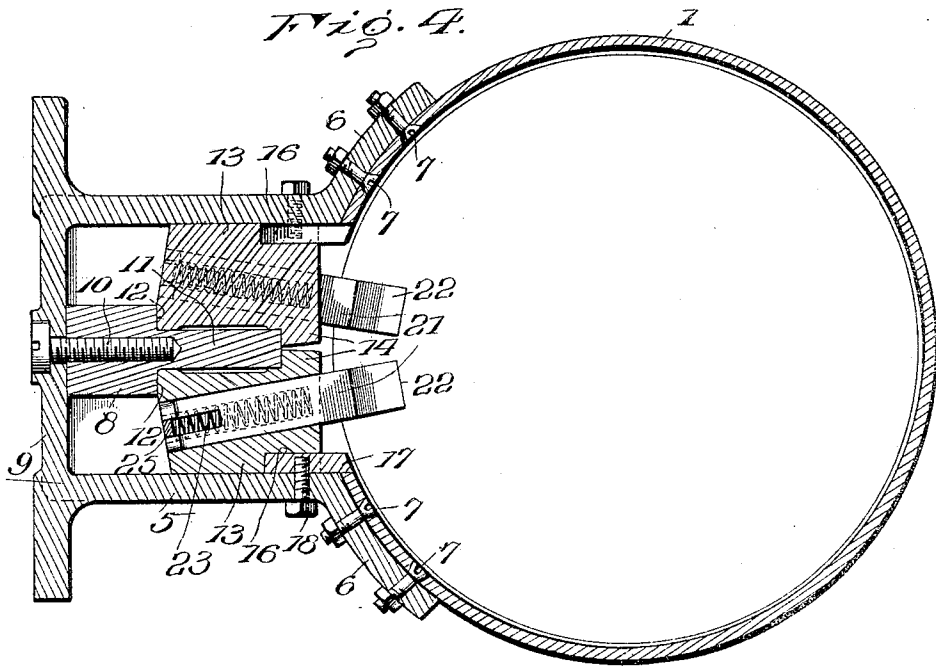
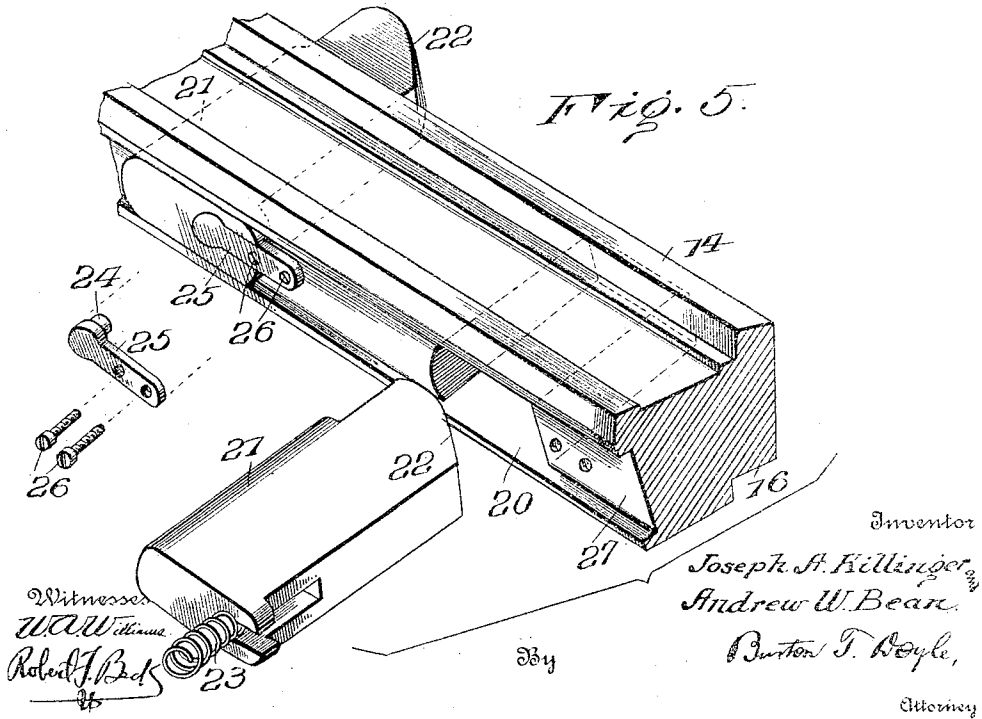
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UNITED STATES PATENT OFFICE.

JOSEPH A. KILLINGER AND ANDREW W. BEAN, OF WASHINGTON, DISTRICT OF COLUMBIA.

AMMUNITION-HOIST.

1,204,360.

Specification of Letters Patent.

Patented Nov. 7, 1916.

Application filed January 21, 1915. Serial No. 3,538.

To all whom it may concern:

Be it known that we, JOSEPH A. KILLINGER and ANDREW W. BEAN, citizens of the United States, residing at the city of Washington, in the District of Columbia, have invented certain new and useful Improvements in Ammunition-Hoists, of which the following is a specification.

This invention relates generally to ammunition hoists, and more particularly to one adapted for use on warships for elevating heavy projectiles from the hold or magazine to a point that such shells may be projected into the breech of the gun.

The object of the invention is to provide a simple and thoroughly effective mechanism for elevating heavy shells, the construction of the mechanism being such that the shell is taken up automatically when it is fed to the hoist, and is delivered automatically when it reaches the upper end of the shaft, whereby personal service, other than to supply the shells to the lower end of the hoist is dispensed with, and the elevation of the shells is accomplished in a positive and certain manner.

A further object is to provide, in conjunction with a hoisting mechanism, a novel form of double-acting shell cradle arranged for operating in such manner that when the shell is deposited within the cradle, by the manipulation of simple mechanism, the shell will be disposed upon a suitable run-way located opposite the gun, whence, by the ordinary loading mechanism, it is forced into the breech of the gun.

With the above and other objects in view, as will appear as the nature of the invention is better understood, the same consists generally stated, in an ammunition hoist embodying a shell guide and a pair of parallel disposed reciprocatory bars, each provided with spring-actuated shell-engaging means for moving the shell in a step-by-step manner from the magazine to the cradle, the operation of the bars being such that there will be practically a continuous motion or movement on the part of the shell, simulating very closely the operation of the ordinary ammunition hoist in use.

The invention consists further in the various novel details of construction of an ammunition hoist as will be hereinafter fully described and claimed.

In the accompanying drawings forming a

part of this specification and in which like characters of reference indicate corresponding parts: Figure 1 is a view in side elevation, partly in section, of an ammunition hoist constructed in accordance with the present invention. Fig. 2 is a front elevation, partly in section and partly broken away of the hoist. Fig. 3 is a rear elevation of a portion of the hoist, showing more particularly the arrangement of a portion of the cradle. Fig. 4 is a transverse sectional view, on an enlarged scale, taken on the line 4-4 of Fig. 1. Fig. 5 is a fragmentary detail view in perspective, partly in section, of a portion of one of the elevating bars, showing the manner in which the shell engaging dogs are combined with the bar. Fig. 6 is a transverse sectional view, on an enlarged scale, taken on the line 4-4, Fig. 1. Fig. 7 is a fragmentary detail view showing the position occupied by the cradle when discharging a shell upon the run-way. Fig. 8 is a fragmentary detail view in perspective showing the mechanism for releasing the cradle to permit discharge of a shell upon the run-way. Fig. 9 is a detail perspective view of one of the retaining dogs.

Referring to the drawings, 1 designates generally, the shell guide, the upper end of which is suitably bolted or secured to a deck beam 2, that will be located within the turret, and one end of which is shaped to provide a run-way 3 to receive a shell from the cradle presently to be described. The lower end of the shell guide is secured in any suitable manner to the lower deck 4, and is located adjacent to the magazine, so that rapid handling of the shells in positioning them within the hoist may be secured.

The shell guide, as shown in Fig. 4, is a split tube, and is secured to a channel-shaped support 5 provided with curved extensions 6 to which the shell guide is secured by bolts 7. Secured centrally and longitudinally to the support is a flange or rib 8 which is held secured to the base 9 of the support by bolts or screws 10. Projecting from the upper surface of the rib is a guide 11, which as shown in the figure referred to, is of a considerably less width than the rib, providing thereby two shoulders 12 upon which are adapted to rest the inner under edges of a pair of elevating bars 13 which are arranged to reciprocate upon the shoulders 12 which in effect con-

stitute guide-ways. The upper inner or opposed faces of the elevating bars are provided with inwardly projecting shoulders 14 that are designed to bear upon the upper face of the guide 11, and be supported thereby, in conjunction with the guide-ways 12 when the elevating bars are reciprocated by mechanism presently to be described. The outer faces of the elevating bars are provided with longitudinal channels 16 that are designed to engage plates 17 that are bolted to the inner opposed faces of the support 5 by bolts 18, these plates serving as lateral guides for the elevating bars.

The elevating bars are preferably constructed in sections, and these sections, as shown in Fig. 2, are connected by pins 18 that are seated in sockets in the opposed ends of the bar sections, and are held connected by cross pins 19, and in order to permit removal of the pins for the purpose of detaching the sections of the bars, the sides of the support 5 are provided with longitudinal slots or openings 190 through which a suitable tool may be inserted for the purpose of detaching the pins.

At spaced intervals in each of the bars are arranged transverse slots 20 in which are disposed dogs 21, each dog being provided with a beveled nose 22. In order to cause the dogs to project beyond the upper face of the elevating bars, a coiled spring 23 (Fig. 5) is combined with each of the dogs and is disposed within a socket in the under face thereof, and engages at its outer end with a boss 24 carried by a plate 25 that is secured to the under face of the elevating bar by screws 26, the plate 25 being seated in and disposed flush with the under face of the dog, and lying within the plane of the under face of the bar by providing the latter with a longitudinal channel 27, so that there will be no interference in the reciprocatory movements between the elevating bars and their guide-ways.

Means for reciprocating the bars comprises a worm 28 that is mounted upon a shaft 29 driven by a suitable motor (not shown). This worm meshes with a worm wheel 30 carried by a shaft 31 mounted in suitable bearings carried by a pedestal 32 disposed in the hold of the vessel. This shaft carries two eccentrics 33 having straps 34, the upper ends of the straps being provided with extensions 35 having their upper ends bifurcated to receive the lower reduced ends 36 of the elevating bars, the bars being held within the bifurcations by pins 37.

It will be noted by reference to Fig. 2, that the dogs are not in transverse alignment, but are arranged in break joint order, the object of this arrangement being to cause one dog to take hold or contact with the lower end of a shell, the instant that

the other dog is released therefrom, this action being secured by the reciprocatory motion of the elevating bars resulting from the rotations of the eccentrics. Thus, it will be seen that the progression of the shell from the lower end of the shell guide 1 to its upper end will be practically continuous, and will be absolutely certain and positive in its operation. Owing to the beveled faces 22 of the dogs, the latter will be caused easily to slip from contact with the shell to permit taking of a fresh hold beneath the lower end thereof. In other words, the cams operate simultaneously to reciprocate the bars in opposite directions and alternately in the same direction, so that a positive elevation of a shell will be secured.

As a means of further and specific improvement, there is combined with the shell guide a shell cradle, which constitutes a very essential feature of the invention, inasmuch as it eliminates any manual handling of the shell. This cradle, as shown in Fig. 7, consists of two oppositely disposed semi-circular shell rests 38 that are integral with a tubular body 39, from each side of which project trunnions 40 that are journaled in bearings 41 carried by pedestals 42 formed integral with or secured to a collar 43 preferably threaded on the upper end of the shell guide although it may be otherwise secured thereto. The body on one side is provided with a notched disk 44 that is designed to be engaged by a latch 45 slidably mounted in a guide 46 carried by one of the pedestals, the lower end of the latch being provided with a bifurcated head 47 that is pivoted to a foot lever 48 pivoted at 49 to the pedestal, and provided at its free end with a pedal 50.

The shank on the latch projects through a boss 51 carried by the pedestal and mounted on the shank below the guide 46 and supported on the boss 51 is a coil spring 52. On the shank below the guide 46 is a flange against which the upper end of the spring bears, the tension of the spring being to normally force the nose of the latch into engagement with one of the notches 53 in the disk 44.

As shown in Fig. 3, the ends of the cradle are provided with triangular recesses 54 defining thereby at each end of the cradle two arms 55, and upon the outer end of each of these arms is mounted a spring-pressed retaining dog 56, which engages the shell, said dogs preventing the shell from dropping downwardly after having been once projected within the cradle and prior to the same being tilted to discharge the shell upon the run-way. This arrangement of retaining dogs while thoroughly efficient for the purpose designed, may be constructed differently from that shown, but as indicated in Fig. 9, comprises the dog 56 which is held

assembled by a screw 57, with the end of the arm 55, and is held normally projected in the path of the shell by a coiled spring 58, one end of which is seated in a recess or 5 socket in the arm, and the other end of which bears against the outer face of the dog, the inner face of the dog being curved to conform to the contour of the shell, and thus obviate the presentation of an obstruction when the shell is being forced into the 10 cradle.

As clearly shown in Figs. 1 and 2, the lower end of the shell guide or tube is provided with a cut-away portion 59 which will 15 be somewhat longer than the length of the shell and is provided for the purpose of furnishing an entrance mouth to permit positioning of a shell within the guide or tube.

While not essential, the deck or support 4 20 of the shell guide is shown as inclined at that point upon which the guide rests, but if preferred, the part 4 may be level, and the lower end of the guide inclined, and still be within the scope of the invention.

In the operation of the apparatus, the eccentrics 33 being in motion, and the elevating bars alternately reciprocated by the action thereof, a shell is placed within the lower end of the guide and immediately, one 30 of the dogs of one of the elevating bars will engage with the lower end of the shell and elevate it to the limit of the eccentric that actuates the bar of the engaging dog. At the instant that this eccentric starts to recede, the adjacent dog of the next elevating 35 bar passes beneath the lower end of the shell so that the latter is rapidly and in a step-by-step manner, elevated to the cradle.

It is to be understood of course, that the 40 bars are of sufficient length to project the shell within the cradle, thus to permit of the dogs 56 passing beneath the lower end of the shell, as shown in Fig. 3, and thus retain it against backward movement relative to the 45 cradle. The attendant now presses upon the pedal 50 and turns the dog 45 out of engagement with the notch 53 with which it is engaged, whereupon the cradle will be free to be tilted and thus discharge the shell upon 50 the run-way, and bring the other section or

rest of the cradle in position to engage with the next succeeding teeth.

In order to facilitate the passage of a shell from the elevating bars onto the cradle, the latter is provided on its outside with 55 rollers 60 which project through openings in the cradle body and within the same a sufficient distance to serve as anti-friction surfaces for shell movement.

The operation of the apparatus is exceedingly 60 simple, but will be positive and effective in securing the objects sought, and owing to the simplicity of the arrangement of parts, will eliminate danger of accident.

What is claimed as new is:—

1. The combination with a shell guide including shell elevating means, of a tiltable 65 cradle embodying reversely disposed shell rests, automatic operating means for locking the cradle at the limit of its throw, and 70 means for releasing the locking mechanism.

2. In combination, a shell guide, brackets extending upwardly therefrom, a tilting shell cradle pivoted between the brackets, 75 said cradle comprising oppositely extending shell rests disposed on opposite sides of the pivotal connection, means at the ends of the shell rests for engaging a shell to hold same in the cradle, and means for locking the 80 cradle in alinement with the shell guide or in its tilted position.

3. In combination, a shell guide, brackets extending upwardly therefrom, a tilting shell cradle pivoted between the brackets, 85 said cradle comprising oppositely extending shell rests disposed on opposite sides of the pivotal connection, means at the ends of the shell rests for engaging a shell to hold same in the cradle, a notched disk on the cradle, and a spring actuated lock to engage the 90 notches in the disk to hold the cradle in alinement with the shell guide or in tilted position.

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

JOSEPH A. KILLINGER.

ANDREW W. BEAN.

Witnesses:

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M. E. BOTELER.