

Sept. 22, 1925.

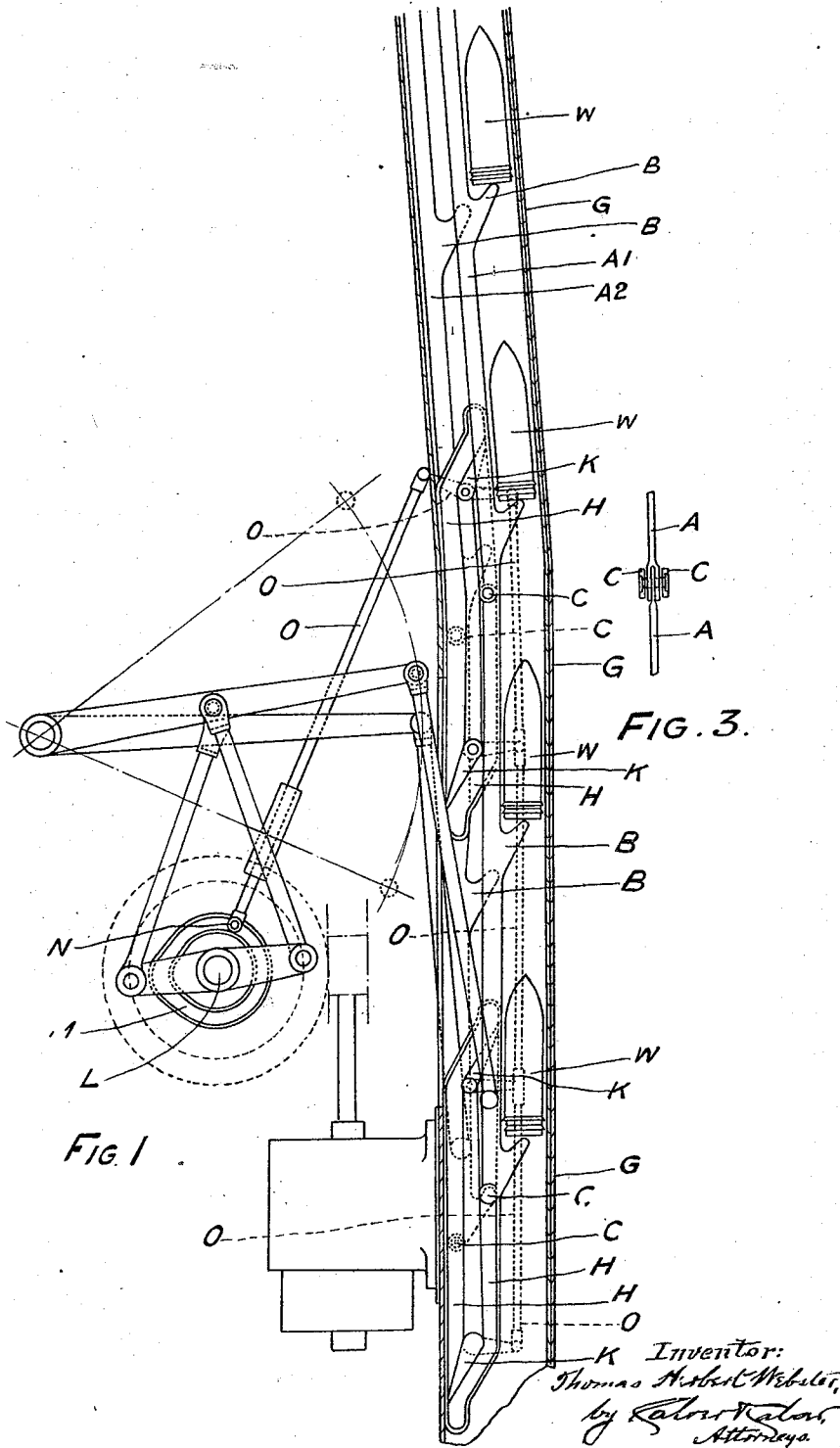
1,554,830

T. H. WEBSTER

AMMUNITION HOIST

Filed June 15, 1925

2 Sheets-Sheet 1



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FIG. 4.

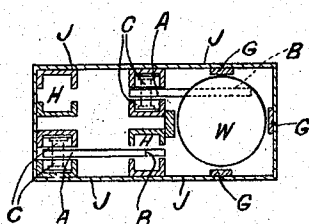
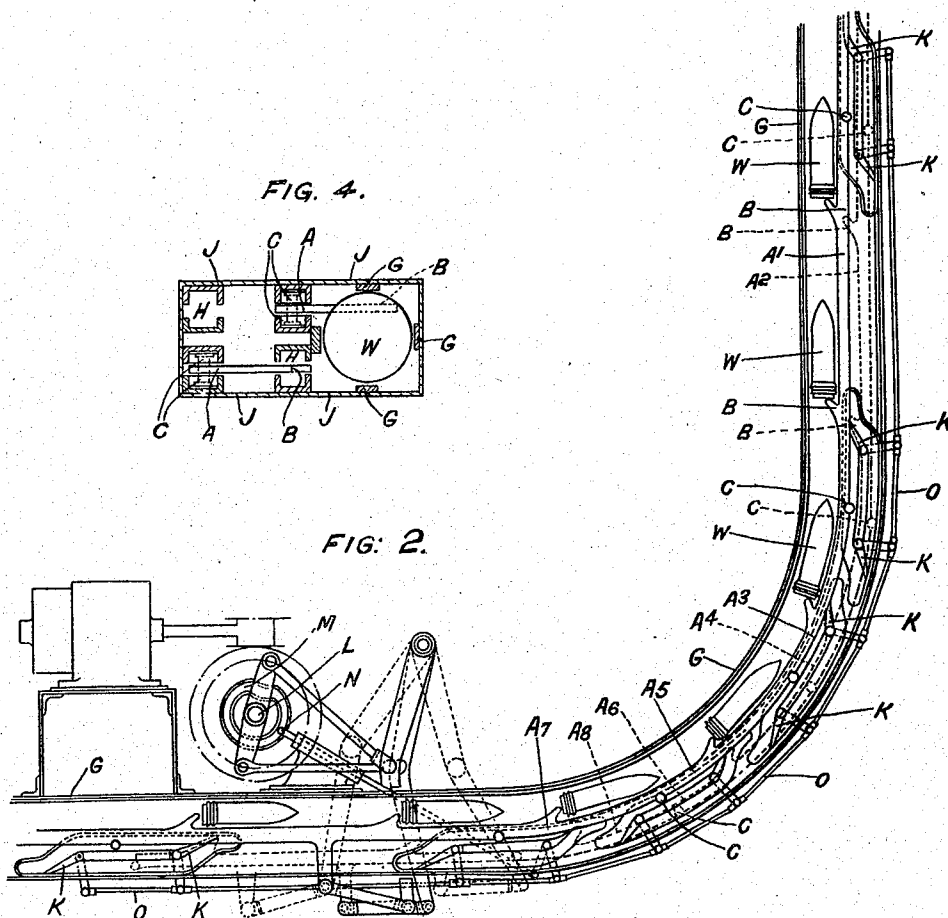


FIG. 2.



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UNITED STATES PATENT OFFICE.

THOMAS HERBERT WEBSTER, OF LONDON, ENGLAND.

AMMUNITION HOIST.

Application filed June 15, 1925. Serial No. 37,242.

To all whom it may concern:

Be it known that I, THOMAS HERBERT WEBSTER, a British subject, and a resident of London, England, have invented certain new and useful Improvements in Ammunition Hoists, of which the following is the specification.

This invention relates to the mechanism of hoists or transporters in which the body or bodies hoisted or transported is or are moved by successive impulses or pushes along a guideway which follows the desired path of the body or bodies from one point to another, such for example, as the hoist for gun ammunition from its place of stowage in a ship to the point at which it is loaded into the gun, the mechanism being of that type in which a plurality of pawl-carrying rods are moved asynchronously so that the pawls engage the body or bodies and advance it or them step-by-step.

The invention provides an improved mechanism of this type which, whether vertical, horizontal, inclined or curved, is capable of moving the body or bodies in either direction as may be desired.

In a mechanism according to the invention, the rods are not only adapted to be reciprocated but are also movable laterally—that is to say, at right angles to the direction of their reciprocation—and, unlike constructions having pivoted pawls, bear rigid fingers or equivalents adapted to engage at one or both ends the bodies to be moved. The rods may be reciprocated by any convenient means, their lateral movement during reciprocation being attained by the engagement of followers on the rods with cam-tracks or the equivalent.

Two embodiments of the invention are illustrated in the accompanying drawings in which Figs. 1 and 2, are respectively sectional elevations of part of a vertical hoist and part of a curved hoist, and Figs. 3 and 4 views of details thereof.

According to the invention the mechanism which gives the required impulses or pushes to the body or bodies comprises two rods which may be, each, continuous such as A^1 and A^2 , Fig. 1, in a straight or slightly bent hoist or transporter or may, each be made up of a series of elongated links such as A^3 to A^8 Fig. 2 in a curved hoist or transporter; the rods are approximately the same length as the guideway G, G, G, Figs. 1 and

2, and are parallel or approximately parallel to its axis but outside and at a suitable distance from it.

Each rod has integral projections or fingers B, B, B projecting towards the guideway and of such length that when each rod is in a position as hereinafter described its projections or fingers extend between the guides to approximately the axis of the guideway and can thus engage behind the body or bodies W to be moved therealong, the pitch of the projections or fingers being more than the length of the body or bodies.

Each rod, or in a curved hoist or transporter each link comprised in the rod, has at its extremities a pair of followers in the form of rollers C, C, C, Fig. 4, mounted on an axis at right angles to the rod, a roller on each side of the rod.

The rollers of each rod track grooves or channels H, Figs. 1 and 4, formed on plates J, the plane of which is parallel to the plane containing the axis of the guideway and a line midway between the two rods; the grooves for each rod are so disposed that over the major portion of their length they are parallel to the axis of the guideway and to one another and at a distance apart equal to the required protrusion within the guideway of the projections or fingers on the rod; the length of these parallel portions is approximately three fourths of the pitch between the projections or fingers on the rods. The grooves converge to and merge into one another in such manner that from the point occupied by the rollers at the commencement of the impulsive or pushing stroke of the rod the outer of the two grooves runs obliquely towards the axis of the guideway, while from the point occupied by the rollers at the commencement of the reverse stroke the inner groove runs obliquely away from the axis of the guideway.

At the meeting points of the grooves are placed switches K whereby the rollers on each rod may be deflected by operation of the switch from one groove into the other, thus giving the rod a movement displacing it laterally towards or away from the axis of the guideway such distance as places the projections or fingers of the rod between the guides of the guideway or removes them from that position.

Each rod is reciprocated in the direction

of the axis of the guideway a distance equal to the length of the groove by any well known means (such as the connecting rods shown) of producing reciprocating movement from the continuous rotation of a shaft L and so arranged that the phase of the reciprocating motion of each rod differs by approximately 180 degrees from that of the other, thus causing the two rods A¹, A² to move in opposite directions.

Mounted on the same shaft as that producing the movement of the rods is a cam M, Figs. 1 and 2, which, by means of a roller N and a system of rods O and levers operates the switches at the required moment in the duration of the movement of the rods so that the rollers C on the rods are deflected from one groove to the other and produce the lateral displacement of the rods as before described.

In this manner the rods as they reciprocate alternately move one stroke in the direction of the way of the desired movement of the body or bodies during which their projections or fingers are engaged with it or them, and one stroke in the reverse direction during which the projections or fingers are disengaged or vice versa.

The position of the projections or fingers on either rod is such that when one rod has completed its stroke in either direction and the lateral movement commences the projections or fingers of the other rod commence their lateral movement in the opposite direction so that if the former commence to be disengaged from the body or bodies the latter simultaneously commence to engage it or them or vice versa, such action precluding the possibility of the body or bodies slipping back or falling in the guideway.

It will be observed that when the hoist is vertical or inclined mere reversal of the driving mechanism causes it to reverse the direction of its action—that is to lower bodies under the action of gravity instead of raise them.

What I claim is:—

1. In a mechanism of the character desired, a plurality of rods mounted for endwise reciprocatory and bodily lateral movement and having integral fingers engageable with the bodies to be moved, and means for imparting out-of-time movements to the several rods.

2. In a mechanism of the character desired, a plurality of rods having projecting fingers and followers, cam tracks for each rod, engaged by said followers, said tracks being mainly parallel with the longitudinal direction of the respective rod and merging into one another at spaced points, means for imparting to the rods reciprocatory movements differing in phase from one another

and means for transferring the followers from one track to another.

3. In a mechanism of the character desired, a plurality of rods each having rigid projecting fingers and provided with cam followers, cam tracks for each rod engaged by said followers, said tracks being mainly parallel with the longitudinal direction of the respective rods and merging into one another at each end, switches for transferring the followers from one track to another, means for imparting out-of-time reciprocatory movements to the rods, and means for operating said switches.

4. In an ammunition hoist, in combination with a guideway for the bodies to be moved, a plurality of rods extending parallel to said guideway, said rods formed with integral projections engageable with said bodies, means for imparting out-of-time endwise reciprocatory movements to said rods in a direction generally parallel to the axis of said guideway and for simultaneously moving said rods bodily laterally at the beginning and finishing ends of said endwise movements to bring the projections into and out of the paths of the bodies.

5. In an ammunition hoist, in combination with a guideway for the bodies to be moved, a pair of rods extending parallel to the axis of said guideway, said rods formed with projections engageable with said bodies, followers on said rods, cam tracks extending alongside said rods and engaged by said followers, there being a pair of tracks for each rod, one track of said pair being nearer said axis than the other, the tracks of each pair merging into one another at the ends, means for imparting out-of-time endwise reciprocatory movements to said rods, and means for transferring each follower from one track to another track of the pair.

6. In an ammunition hoist, in combination with a guideway for the bodies to be moved, a pair of rods extending parallel to the axis of said guideway, said rods formed with projections engageable with said bodies, followers on said rods, cam tracks alongside said rods and engaged by said followers, there being a pair of tracks for each rod, one track of said pair being nearer said axis than the other, the tracks of each pair merging into one another at the ends, means for imparting out of time endwise reciprocatory movements to said rods, switches between the tracks, and means for operating the switches to transfer each follower from one track to the other track of the pair on arrival of said follower at the end of a track.

In testimony whereof I have signed my name to this specification.

THOMAS HERBERT WEBSTER.