No. 878,226. PATENTED FEB. 4, 1908.

E. Y. MOORE.

HOIST.

APPLICATION FILED JULY 10, 1906.

3 SHEETS—SHEET 1.

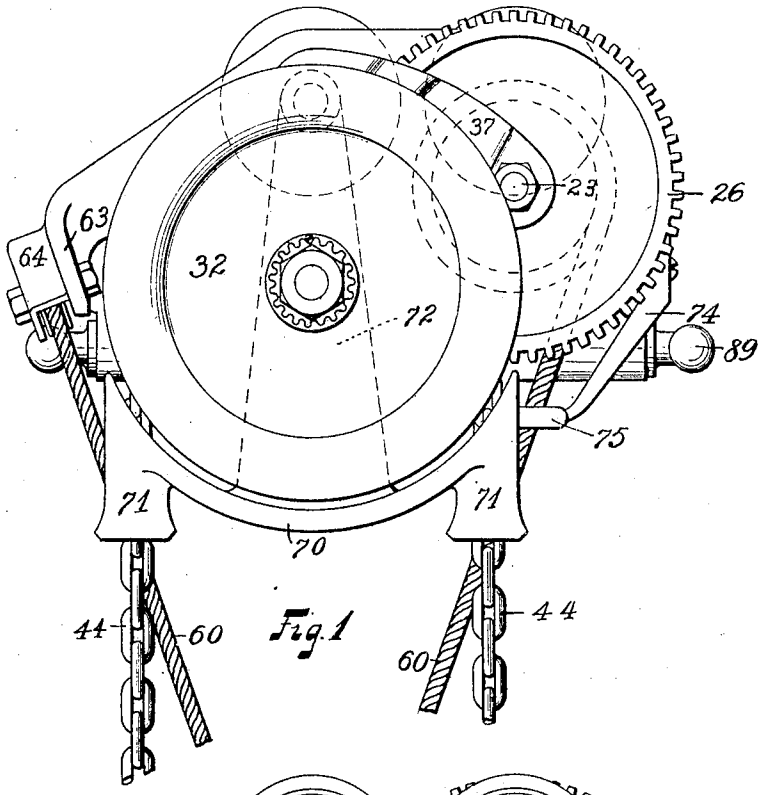


Fig. 1

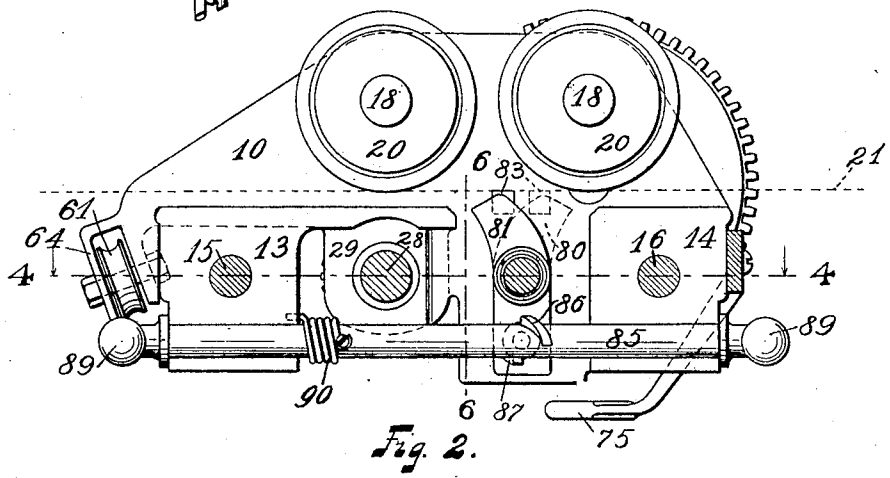


Fig. 2.

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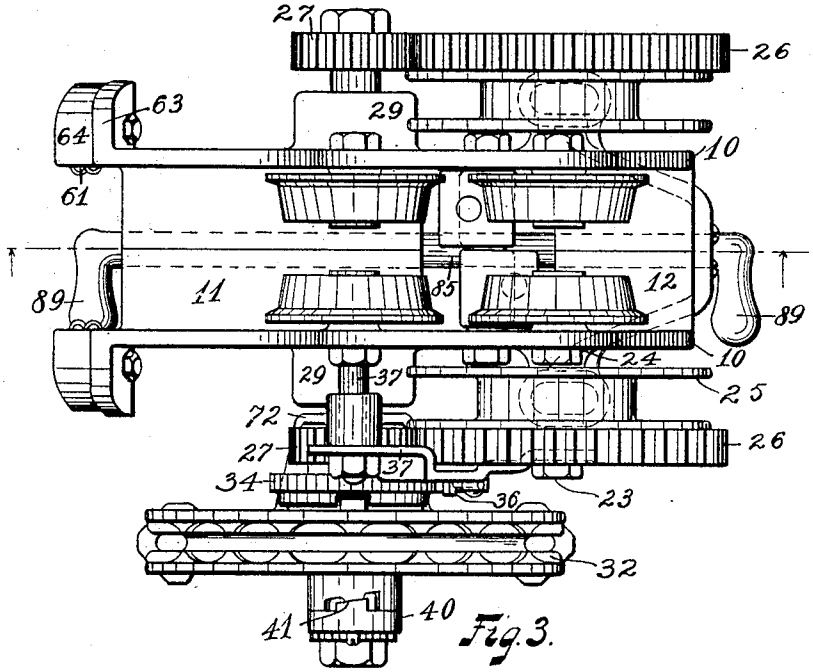


Fig. 3.

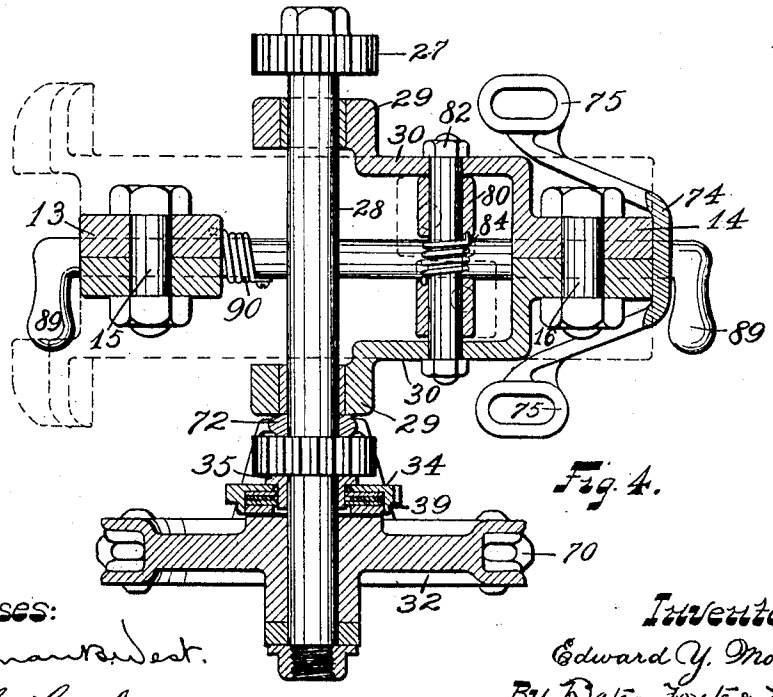


Fig. 4.

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3 SHEETS—SHEET 3.

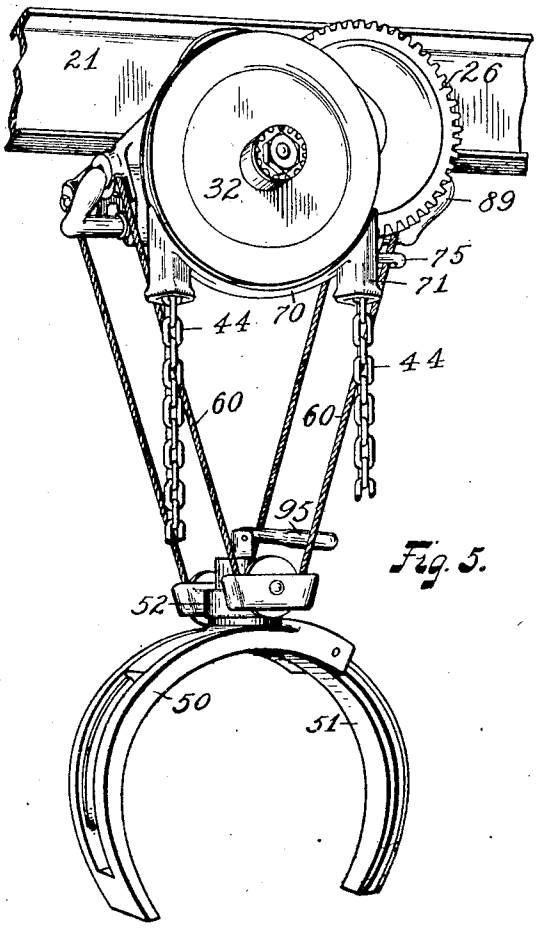
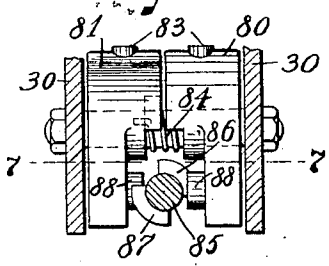


Fig. 5.

Fig. 6.



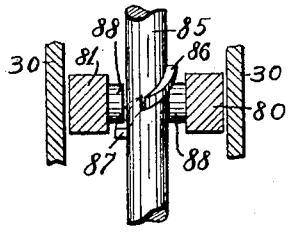


Fig. 7.

Fig. 8.

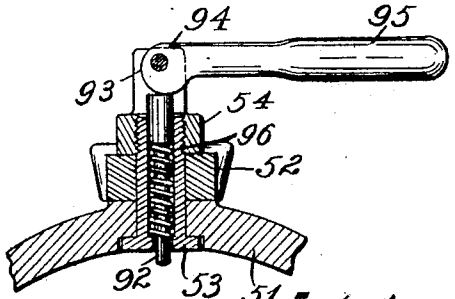
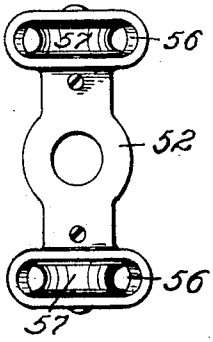


Fig. 9.



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EDWARD Y. MOORE, OF CLEVELAND, OHIO.

HOIST.

No. 878,226. Specification of Letters Patent. Patented Feb. 4, 1908.

Application filed July 10, 1906. Serial No. 325,447.

To all whom it may concern:

Be it known that I, EDWARD Y. MOORE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Hoists, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of this invention is to furnish a simple and efficient hoist adapted to be shifted along a supporting beam, and having effective means for preventing undue swinging of the load.

The invention is well adapted for an ammunition or gun hoist on ship board, where steadiness, compactness and small head-room are important.

The various features of the invention will more fully appear from the description hereinafter given of the embodiment shown in the drawings.

Figure 1 is a side elevation of the supporting and elevating portion of the hoist; Fig. 2 is a vertical central section of the same; Fig. 3 is a plan; Fig. 4 is a horizontal section substantially on the line 4—4 of Fig. 2; Fig. 5 is a perspective view of the hoist complete; Fig. 6 is a vertical cross section on the line 6—6 of Fig. 2, looking to the right; Fig. 7 is a detail in horizontal section on the line 7—7 of Fig. 6; Fig. 8 is a vertical section through the load-grasping portion of the hoist, and Fig. 9 is a plan of the swivel bar supporting such portion.

In the embodiment shown in the drawings, the hoist frame is equipped with a suitable lock adapted to clamp it at any desired point to its support. This lock is the subject matter of my divisional application Serial No. 389042 filed Aug. 17, 1907, and is there claimed.

As shown in the drawings, the frame of the hoist comprises two corresponding integral castings, each including a side plate 10, two horizontal inwardly extending plates 11 and 12 and lugs 13 and 14 extending downwardly from the plates 11 and 12 respectively. Through these downward lugs extend bolts 15 and 16 which secure the frame members together. Mounted on studs 18 carried by the plates 10 are the supporting wheels 20, which are arranged to ride on the lower flange of an I-beam, as shown at 21 in Fig. 5. The horizontal members 11 and 12 of the frame lie beneath this I-beam.

Mounted on studs 23 extending outwardly from bosses 24 on the outer side of the plates 10 are the elevating wheels 25. There are two of these wheels, one on each side of the frame. Each wheel has formed integral with it, on its outer side, gear wheels 26. These gear wheels mesh with pinions 27 on the main driving shaft 28 which is journaled in lugs 29 extending downwardly from the frame members 10 and longitudinally from downward extensions 30 of those frame members.

The above described arrangement of supporting wheels, elevating wheels and driving shaft is claimed in my prior patent No. 811,077 issued January 30, 1906.

Mounted on the main driving shaft 28 is a hand chain wheel 32 for rotating this shaft. As shown, this hand chain wheel is not rigidly fastened to the driving shaft but loose enough to allow it to control a friction brake to make the hoist selfsupporting. The construction may be similar to that described and claimed in my Patent No 794,997 issued July 18, 1905. As shown, it comprises a cup like member 34 loose upon a collar 35 which is rigid on the shaft. This cup like member has ratchet teeth adapted to be engaged by a pawl 36, which is shown as carried by a plate 37 secured to one of the studs 23 and to a prolongation 37 of one of the studs 18. Within the cup 34 are a series of disks 39, alternating ones of which are connected with the collar 35, the intermediate disk or disks being connected with the cup. Rigid on the shaft is a collar 40 having an inclined projection 41 against which a corresponding incline on the hub of the hand wheel is adapted to bear.

When the hand wheel is turned in a direction to lift the load, it is forced inward by the incline 41 and thus binding the disks and locks the hand wheel and cup 34 to the collar 35 and the driving shaft. These parts, therefore, all rotate together, raising the load. When the raising rotation of the hand wheel ceases, the load tending to run down holds the brake set, and the pawl 36 prevents the cup rotating in the opposite direction, so that the load is held at whatever point it may be. To lower the load the hand wheel is turned in the reverse direction, releasing the brake and allowing the load to descend, the hand wheel during the descent being always kept in advance of the load by means of the hand chain 44.

Suitable load grasping members are provided. As shown, these members comprise

a telescoping grapple consisting of a bifurcated arc-shaped member 50 and an intermediate arc-shaped member 51 which members have tongues and grooves on their edges. A supporting bar 52 is swiveled to the arm 51, the swiveling as shown, being accomplished by a pin 53 having a head on the underside of the arm 51 and having a nut 54 above the bar 52. This arrangement of grapple is, broadly considered, shown and claimed in my Patent No. 814,388 issued March 6, 1906. The particular construction, however, as hereinafter described, constitutes a portion of the present invention.

The swivel bar 52 of the grapple is formed near its ends with enlargements having vertical recesses 56. In these recesses are journaled the sheaves 57. The elevating cable 60 passes at substantially its mid point over a pair of equalizing sheaves 61 mounted on diagonal axes in inclined lugs 63 on the end of the plates 10, and extensions 64 of such lugs, so arranged as to form pockets to receive these sheaves. From the sheaves 61 the two reaches of the cable 60 extend downward diagonally at approximately right angles to the axis of the sheaves and pass beneath two pulleys 57. Then these two reaches pass upward onto the outer sides of the two elevating wheels 25, the ends of the cables being anchored to these elevating wheels. The elevating wheels rotate in unison and the two ends of the cables are thus wound in simultaneously. The sheaves 61, however, are provided to allow equalizing should one cable, by riding on top of a previously laid portion thereof, wind in faster than the other.

By having the elevating cable pass diagonally inward from two points to the point of support of the load, the swinging of the load is very much reduced, for each diagonal reach of the cable gives the load a tendency to move diagonally downward to a point beneath the support of such reach, and these two forces, having components in opposite directions, tend to hold the load in a plane midway between the cable supports and prevent swinging of the load. This is an important point and one of the features of this invention. On ship-board the rolling of the vessel gives the load a constant tendency to swing back and forth, and with vertical cables or chains it is difficult to prevent such swinging, for before the load is brought to rest, the rocking of the vessel again sets it in motion. With my invention as the vessel rocks, the cable plays loosely through the sheaves 57 but the load remains substantially in place.

Suitable guards are provided for the hand chain and the elevating cable. As shown, the guard for the hand chain comprises an arc-shaped member 70 having two sleeves 71 around the hand chain and supported by an arm 72 which is journaled on the shaft 28 and is held against displacement by being secured at its upper end on the stud 37. The guard for the elevating cable comprises the member 74 secured to the lugs 14 and having arms passing diagonally downwardly and outwardly and being provided with sleeves or rings 75 which loosely receive the cable.

To lock the hoist in desired position on the I-beam, I may provide the mechanism shown, which, as stated, is covered in my divisional application referred to. This mechanism includes a pair of dogs 80 and 81 journaled on the shaft 82, carried by the frame members 30. These dogs are provided near their upper ends with hardened steel plugs 83 which are adapted to bear against the under surface of the I-beam. A spring 84 surrounds the shaft 82 and gives the dogs a tendency to move so that their upper ends approach each other and thus cause the plugs to bite against the I-beam, and this biting becomes harder the more the hoist tends to move. The result is that the hoist is normally locked to the I-beam against movement in either direction.

To release the dogs 80 and 81, the mechanism referred to provides a shaft 85 which extends longitudinally beneath the I-beam, being mounted in the lugs 13 and 14. This shaft carries a pair of cams 86 and 87 which are adapted to bear against rollers 88 on the dogs 80 and 81 respectively. Handles 89 on the ends of the shaft 85 form means for rocking it, and when so rocked, the cams engage the rollers and swing the dogs so that the plugs 83 pass away from and out of contact with the I-beam, allowing the hoist to be shifted, as desired. A spring 90, surrounding the rock shaft 85 and secured to it at one end and the other end to one of the lugs 13, normally holds the rock shaft in idle position, thus allowing the spring 84 to cause the dogs to bite the I-beam. When either handle 89 is turned downwardly, against the action of the spring 90, the dogs release the I-beam and the hoist may be shifted. These handles form also convenient means for shifting the hoist. After shifting, upon release of the handle 89, the spring 90 restores the shaft 85 and releases the dogs, which automatically assume locking position.

To lock the load in its grasping members, preventing it shifting lengthwise thereof, I provide a plunger 92 seating in a bore in the swivel pin 53. The nut 54 has a pair of ears 93 rising from it and between these ears is mounted a cam 94 having a lever 95. The cam bears on the upper end of the plunger 92. Surrounding the plunger and compressed between a head thereon and a seat near the lower end of the swivel pin is a coil spring 96 tending to keep the plunger elevated. If the lever 95 is turned backward out of the way the spring 96 keeps the plunger 92 from

being in the path of the shell or gun to be grasped. When, however, the arms 50 and 51 have been passed around such object, the lever 95 is drawn over, forcing the plunger down onto the load, thus effectively holding it in the arms.

I claim:

1. The combination of a hoist frame, supporting wheels carried thereby and adapted to ride on the lower flange of an overhead trackway, a pair of elevating wheels on opposite sides of said frame, gears in rigid connection with said elevating wheels, a shaft extending crosswise of the frame and adapted to stand beneath such trackway, pinions on said shaft engaging such gears, a flexible raising member secured to said elevating wheels and depending in a pair of loops beneath said shaft and onto the opposite side thereof, and an equalizing sheave carried by the hoist frame, the loops of the flexible member joining over the equalizing sheave.

2. The combination, in a hoist, of a frame having upwardly projecting sides, supporting wheels carried on the inner faces of the frame sides, elevating wheels carried on the outer faces of such sides, a driving shaft extending crosswise beneath the side portions of the frame, gearing connecting said shaft with the elevating wheels, a pair of equalizing sheaves carried by the frame on the opposite side of the shaft from the elevating wheels, and a flexible raising member passing intermediately over said sheaves and depending in a pair of loops, the other ends of which are mounted on said elevating wheels.

3. The combination of a grapple, a bar swiveled thereto, a pair of sheaves carried by said bar, a hoist frame, supporting wheels carried thereby, elevating wheels carried thereby, an equalizing member carried by said frame, and a flexible elevating member bent intermediately over said equalizing member and passing diagonally downward between the sheaves in the swiveled bar and diagonally upward to the elevating wheels.

4. In a hoist, the combination with a frame, of a main shaft journaled therein, a pair of elevating wheels geared with said shaft, an equalizing sheave carried by the hoist frame, and a flexible elevating member passing over the equalizing sheave and downward and upward in a pair of loops, the ends of said flexible member running onto the far sides of the elevating wheels.

5. In a hoist, the combination of a frame, a driving shaft carried thereby, an elevating wheel on one side of the shaft geared with it, a flexible raising member running off of the elevating wheel on the side opposite the driving shaft, said member passing diagonally downward and then upward in a loop beneath the driving shaft, said flexible member being supported by the hoist frame on the side of said shaft opposite the elevating wheel.

6. The combination of a hoist frame, a driving shaft mounted therein, a pair of pinions on said shaft, a pair of elevating wheels on opposite sides of the hoist frame, said elevating wheels having gears meshing with the pinions, an equalizing sheave carried by the hoist frame, and a cable bent over said equalizing sheave and passing diagonally downward then upward in a loop beneath the driving shaft, the ends of said cable passing onto the outer side of the elevating wheels and being anchored thereto.

7. The combination of a hoist adapted to travel and comprising an elevating mechanism and a pair of flexible members depending in two loops parallel with each other, each loop having its two reaches flaring upwardly, and a supporting bar having sheaves riding in such loops.

8. In a hoist, the combination of a frame, supporting wheels and a pair of equalizing sheaves, a load-supporting structure having a pair of sheaves side by side, and a flexible elevating cable passing intermediately over the two equalizing sheaves and depending parallel with each other and diagonally beneath the sheaves of the load-supporting structure and then extending diagonally upward in parallelism to the elevating wheels.

9. The combination of an I-beam, a hoist frame extending beneath the I-beam and onto opposite sides thereof and carrying supporting wheels riding on the lower flange of the I-beam, elevating wheels carried by the hoist frame on the opposite sides of the I-beam, a load-supporting member, and flexible raising mechanism depending in a pair of loops from the two elevating wheels, and intermediately supported by the hoist frame, said loops extending diagonally inward to the load-supporting structure.

10. The combination of a supporting beam, a hoist adapted to travel thereon and having a pair of elevating wheels on opposite sides of said beam, and a flexible member passing in a pair of loops from the elevating wheels diagonally downward and thence diagonally upward, and a load-supporting structure carried by said loops.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

EDWARD Y. MOORE.

Witnesses:
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J. B. HULL.