

No. 765,672.

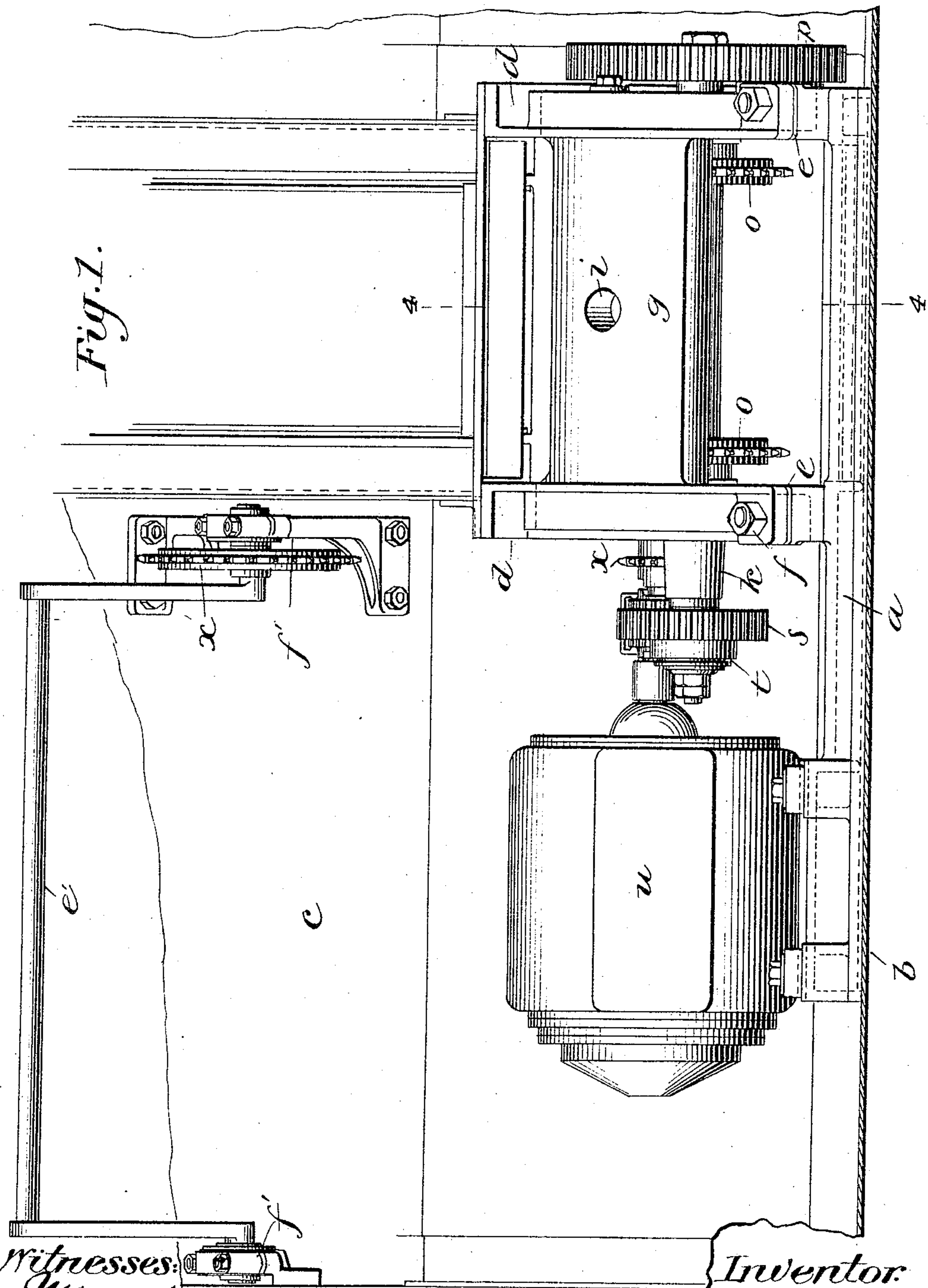
PATENTED JULY 26, 1904.

J. F. METTEN.  
AMMUNITION HOIST.

APPLICATION FILED FEB. 19, 1904.

NO MODEL.

5 SHEETS—SHEET 1.



Witnesses:  
*J. M. [Signature]*  
*J. E. Hutchinson*

Inventor:  
*John F. Metten*  
By his attys  
*Daniel Goldborough*

No. 765,672.

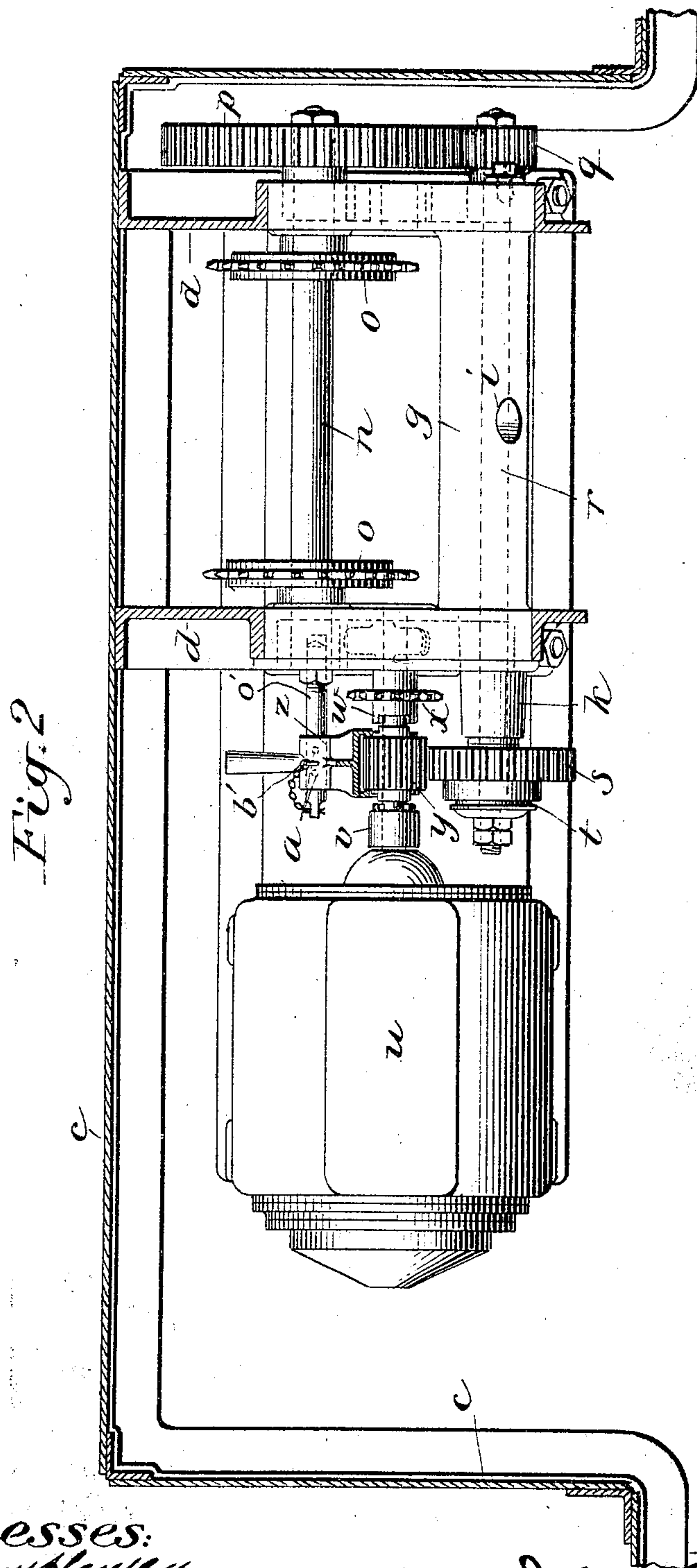
PATENTED JULY 26, 1904.

J. F. METTEN.  
AMMUNITION HOIST.

APPLICATION FILED FEB. 19, 1904.

NO MODEL.

5 SHEETS--SHEET 2.



Witnesses:  
M. W. H. H. H.  
J. E. Hutchinson Jr.

Inventor:  
John F. Mitten  
By his attys.  
Pennie & Goldsborough

No. 765,672.

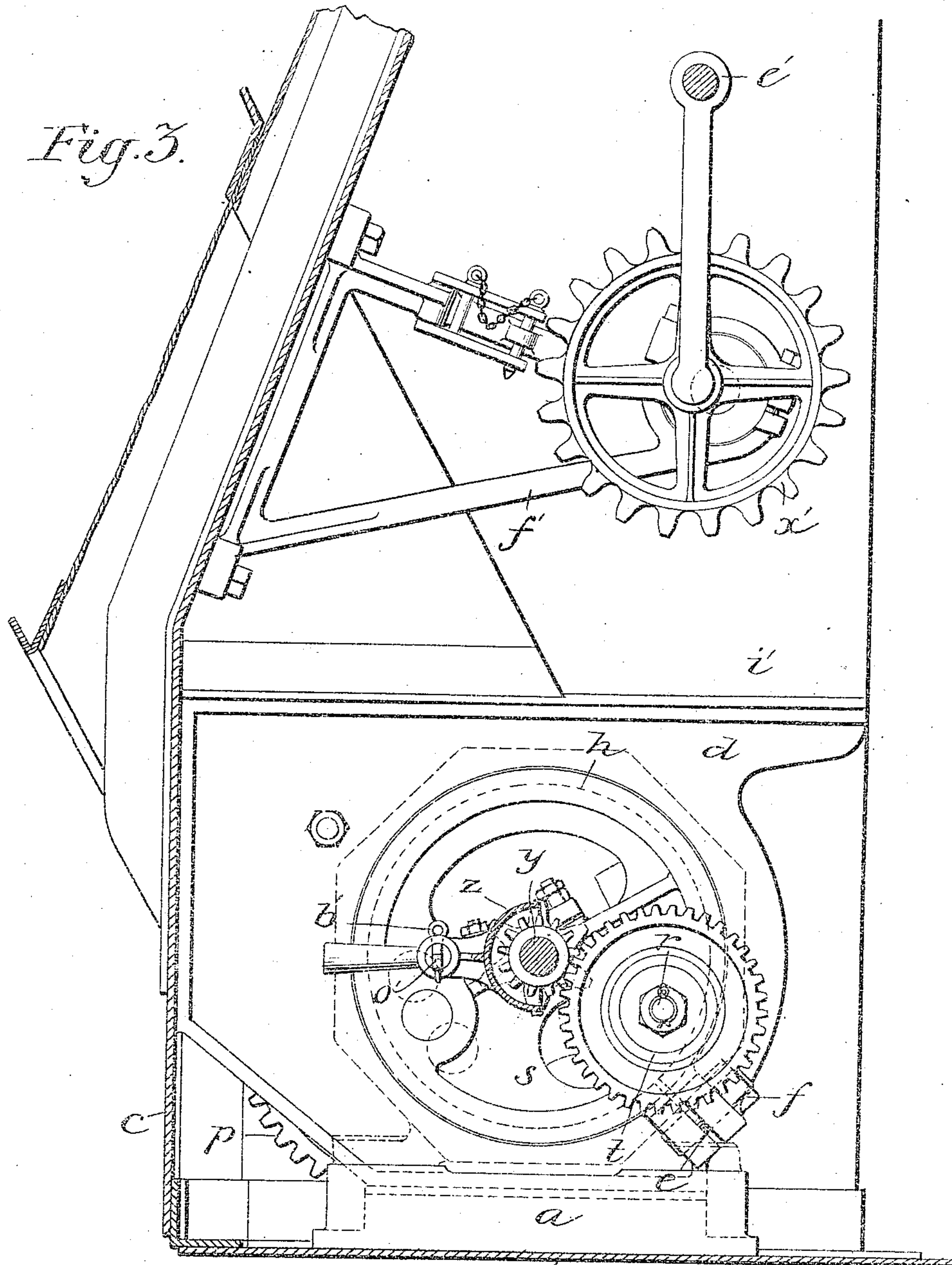
PATENTED JULY 26, 1904.

J. F. METTEN.  
AMMUNITION HOIST.

APPLICATION FILED FEB. 19, 1904.

NO MODEL.

5 SHEETS—SHEET 3.



Witnesses:  
*J. M. H. H. H.*  
*J. E. Hutchinson*

*6*  
Inventor:  
*John F. Metten*  
By his attys.  
*Ernie T. Goessens*



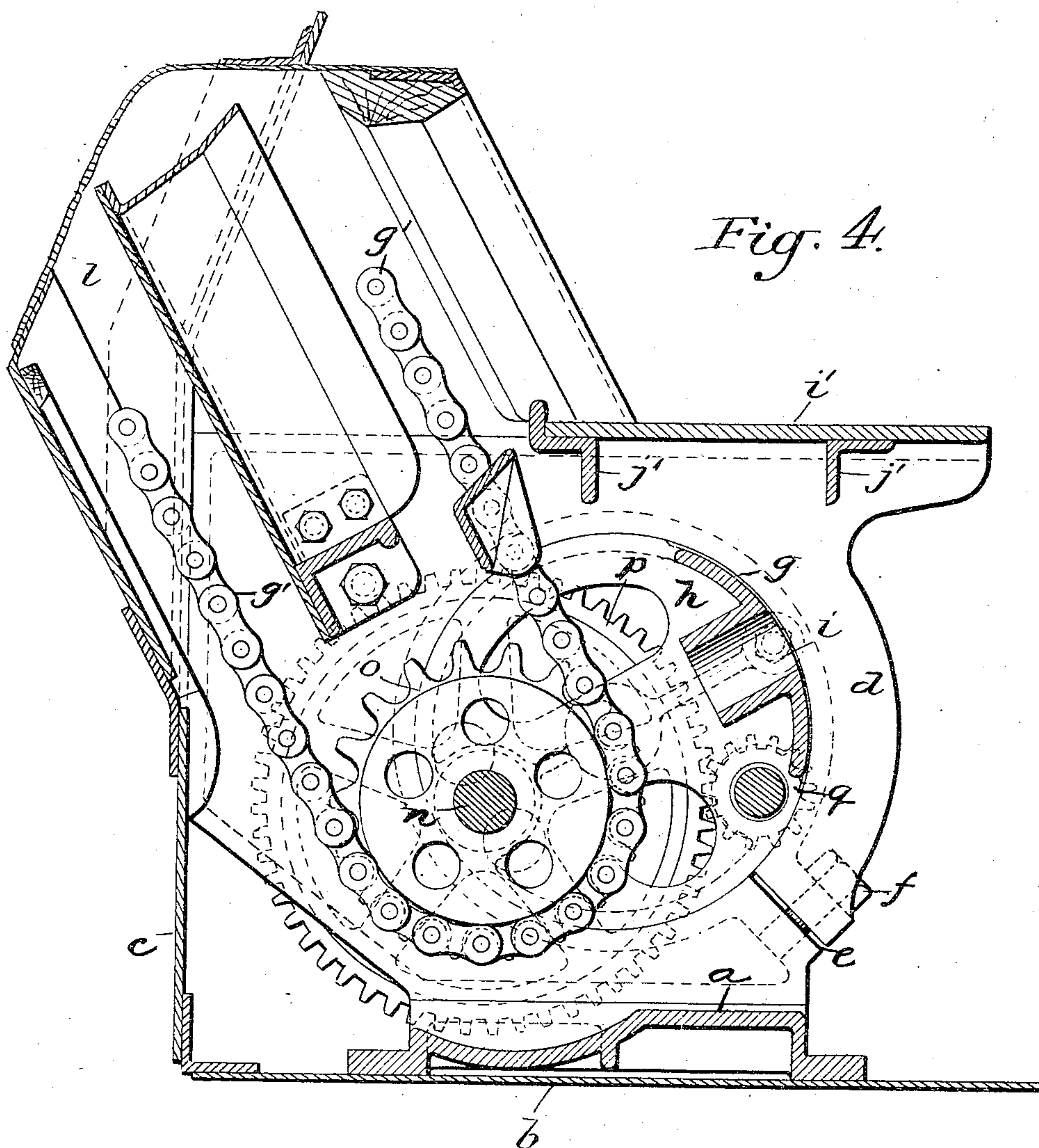
No. 765,672.

PATENTED JULY 26, 1904.

J. F. METTEN.  
AMMUNITION HOIST.  
APPLICATION FILED FEB. 19, 1904.

NO MODEL.

5 SHEETS—SHEET 4.



Witnesses:  
*Wm. H. H. H.*  
*J. E. Hutchinson Jr.*

Inventor:  
*John F. Metten*  
By his attys.  
*Pennie Goodborough*

No. 765,672.

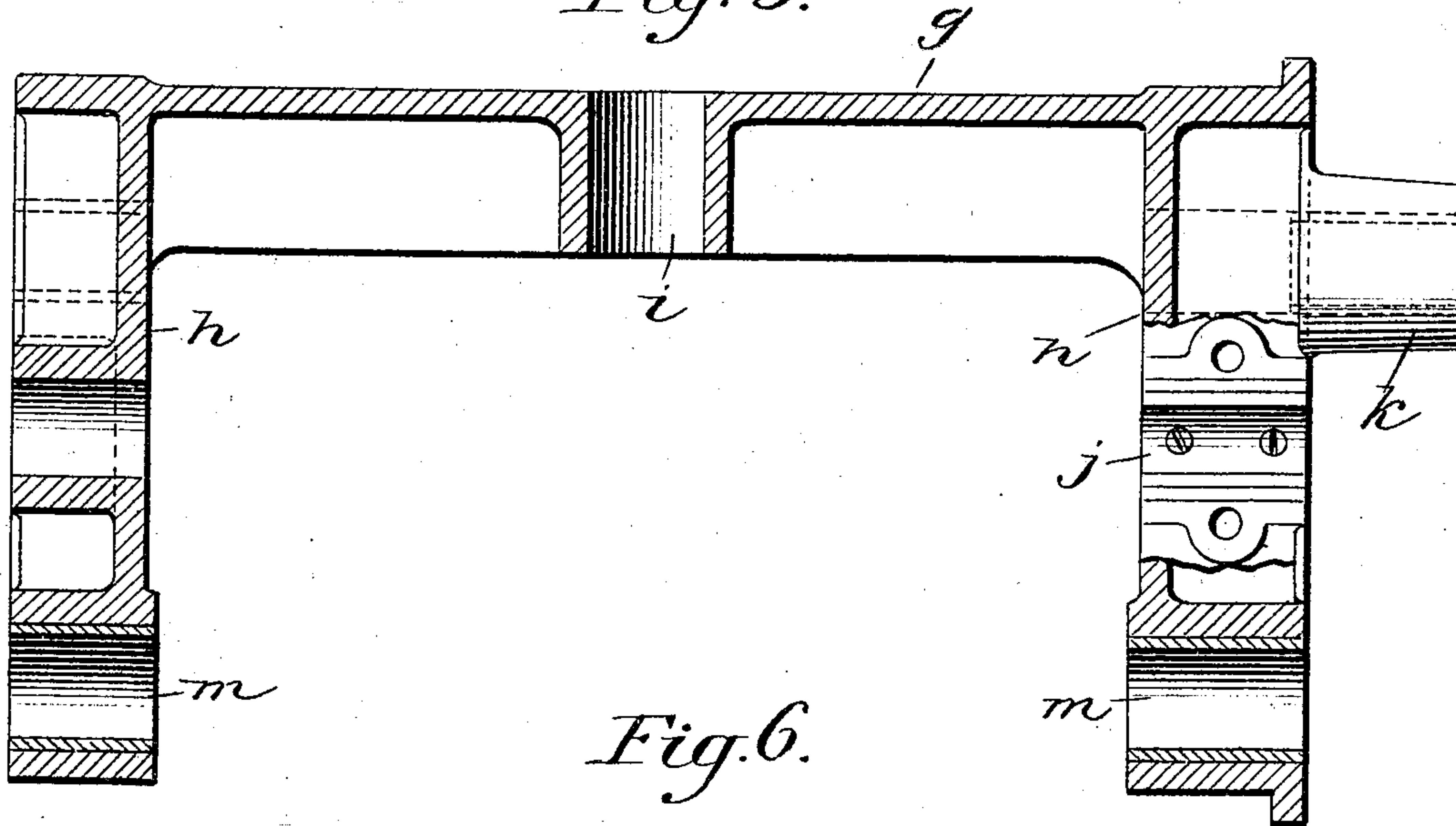
PATENTED JULY 26, 1904.

J. F. METTEN,  
AMMUNITION HOIST.  
APPLICATION FILED FEB. 19, 1904.

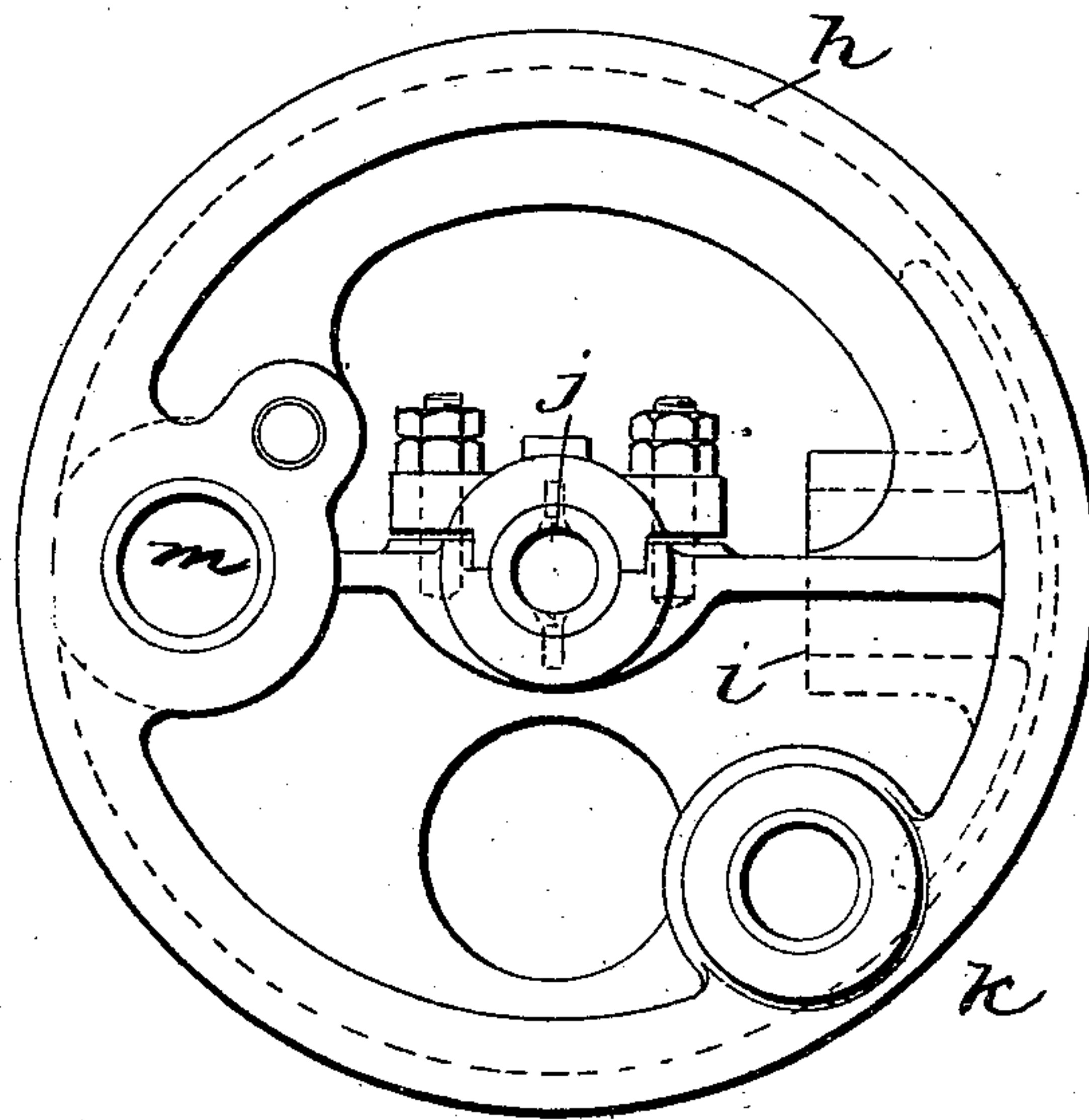
NO MODEL.

5 SHEETS—SHEET 5.

*Fig. 5.*



*Fig. 6.*



Witnesses:  
*J. H. H. H. H.*  
*J. E. Hutchinson.*

Inventor:  
*John F. Metten*  
By his atty  
*Pennie Goldborough*



# UNITED STATES PATENT OFFICE.

JOHN FARREL METTEN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR  
TO THE WILLIAM CRAMP & SONS SHIP AND ENGINE BUILDING COM-  
PANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENN-  
SYLVANIA.

## AMMUNITION-HOIST.

SPECIFICATION forming part of Letters Patent No. 765,672, dated July 26, 1904.

Application filed February 19, 1904. Serial No. 194,395. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN FARREL METTEN, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Ammunition-Hoists; and I 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.

This invention relates particularly to ammunition-hoists, and has for its object to provide an improved form of driving-gear and slack-adjuster for the endless carriers of ammunition-hoists and the like.

In the accompanying drawings, illustrative of a preferred form of my invention, Figure 1 is a front elevation of the lower portion of an ammunition-hoist, showing the mode of applying the driving-gear and chain-adjuster. Fig. 2 is a sectional plan view of the same. Fig. 3 is a side elevation thereof. Fig. 4 is a vertical section on line 4-4 of Fig. 1. Figs. 5 and 6 are a longitudinal section and an end view, respectively, of the adjusting spool or frame.

It is customary in the construction and operation of ammunition-hoists to drive the carrier-chains from a stationary motor or hand-crank mechanism located at the lower end of the trunk inclosing the hoist, and according to the practice heretofore in vogue the chains have been adjusted to regulate the tension of the sprocket-drive by means of sliding blocks located in opposite sides of the trunk-frame, said blocks serving as journal-bearings for the sprocket drive-shafts. Any adjustment of the sprocket-shaft of course necessitated a corresponding adjustment of the transmission-gearing connecting said shaft with the motor, thereby rendering the driving mechanism very complex and difficult of adjustment. Added to this inherent difficulty the character of the driving mechanism and the mode of adjusting the chains rendered it necessary to provide a special mounting for the driving-gear of each type of hoist, so that the gear-mounting for a vertical hoist could not be

employed with another hoist operating in an inclined trunk, nor could the mounting for the driving-gear of a hoist having a given inclination be substituted for that of a second hoist having a different inclination. As the ammunition-hoists have necessarily to be designed to meet the varying conditions as to space and the relative location of the guns and magazines on shipboard, it is obvious that each change of condition necessitates the provision of a new design of mount for the hoist-drive, thereby involving heavy expense in the first cost, as well as in subsequent maintenance of the various hoists.

It is essentially the purpose of my present invention to avoid all of the difficulties aforesaid by providing a driving-gear and chain-adjuster contained on a single base independent of the other structural parts of the hoist that is readily applicable as a self-contained mechanism to any hoist, whatever its location or inclination, without structurally changing said mechanism. To this end the invention comprises a lower frame-casting, upon which the loading-table rests, a rotatory spool or frame adjustably secured in said casting, a power-shaft concentrically journaled in said spool, and a sprocket-shaft journaled eccentrically in said spool, so that by rotating the spool the sprocket-shaft may be shifted to adjust the tension of the hoist-chains without disturbing the adjustment of the gearing between the power-shaft and the sprocket-shaft. By this means of adjustment also the bearings carrying the sprocket-shaft are always maintained in line, and the lead of chain for any angle of hoist is obtained by merely changing the position of the spool, thus allowing the parts to be employed interchangeably for all hoists, whether vertical or of different degrees of inclination. Furthermore, as all of the driving-gear is fixed in position on the spool there is no possibility of the parts shifting due to shock, and the construction insures uniform distances between the gear-centers under all conditions of service.

Referring to the drawings, *a* indicates the base or sole plate, upon which the driving-



gear is mounted. Said plate *a* is secured to the deck *b* near the base of trunk *l*, which in the present instance is shown as an inclined passage through which the carrier-chains pass to the gun-station. Mounted upon the sole-plate *a* are two side frames *d d*, each provided with circular openings, which constitute alined bearings for the adjusting-spool or gear-frame. Each of said side frames *d* is slit or cut radially, as at *e*, and is provided with a clamping-bolt *f*, which causes the frame to contract and securely bind the gear-frame in the circular opening when the nut on said bolt *f* is screwed up.

The driving-gear frame or support comprises a circular spool formed with two end disks *h h* and a web *g*, connecting the inner faces of said disks *h h* near their peripheries. Said end disks *h h* fit snugly within the circular openings in the side frames *d d*, so that the spool may be readily rotated in said side frames when clamping-screws *f* are eased up. Mounted in bearings *m m*, which are located eccentrically in the respective disks *h h*, is a driving-shaft *n*, upon which are secured two sprocket-wheels *o o*, carrying chains *g' g'*, provided with the usual means for carrying the charges of ammunition. Concentric with the axis of rotation of the spool and in one face thereof is a bearing *j*, in which is journaled the outboard end of the shaft of an electric or other prime motor *u*. Mounted loosely on the motor-shaft, hereinafter designated the "power-shaft," is a pinion *y*, provided with clutch-faces upon its opposite sides adapted to alternately engage corresponding clutch members *w* and *v* as the said pinion is moved to the right or left by means of the shifting-yoke *z*, mounted upon a stud *o'* on the side frame *d*. Clutch member *v* is fast to the shaft of motor *u*, and clutch member *w* is formed upon the hub of a sprocket-wheel *x*, which is loosely mounted upon the motor-shaft and is prevented from moving endwise on said shaft by any appropriate means. Suitable means, as a pin *b'*, passing through a hole in the yoke *z* and adapted to engage one of three holes *a'* in the stud *o'*, locks said pinion in coupled position with clutch *v* or clutch *w* or in mid-position between the two said clutch members, in which last position the driving mechanism is inoperative. Journaled in the opposite bearings *h* in the spool ends *h h* is a transmission-shaft *r*, having on one end a gear *s*, meshing with power-pinion *y* and provided on its opposite end with a pinion *q*, constantly in mesh with a gear *p*, fast to the sprocket-shaft *n*. A safety friction slipping clutch *t* connects gear *s* to the shaft *r* to prevent damage to the machinery in case the hoist becomes jammed.

Secured to the bulkhead-framing above the motor *u* are bearing-brackets *f' f'*, in which is journaled a hand-crank *e'*, provided with a

sprocket-wheel *x'*, which is geared by a drive-chain (not shown) with sprocket *x* on the motor-shaft.

In operation when it is desired to drive the hoist from the motor *u* the pinion *y* is shifted toward the motor to cause the jaws of the clutch member *v* to engage the corresponding clutch-jaws on the said pinion. The hoist is then driven by sprockets *o o* through the train of reducing-gears *s*, *q*, and *p*, and the motor-shaft turns loosely in the hub of sprocket *x*. When it is desired to drive the hoist by hand, pinion *y* is shifted to the right to engage the right-hand clutch member thereof with clutch member *w* on sprocket *x*, and crank *e'* is manned, with the result that pinion *y* is driven from sprocket-wheel *x* and transmits motion to the sprocket-shaft *n* through the reducing-train, as before.

When it is found necessary to adjust the tension of the carrier-chains *g' g'* to take up the slack or compensate for wear in said chains, the nuts of clamping-bolts *f f* are loosened to permit the side frames *d d* to open at slits *e e* to release the end disks of the gear-carrying spool. Said spool is then rotated to the desired extent by means of an adjusting-bar inserted in socket *i*, so that the chains *g' g'* on each side are tightened or slackened equally, depending upon the direction in which the spool is rotated.

It is to be particularly noted that as the spool is rotated the motor-shaft is maintained in its concentric relation to the axis of said spool, and as sprocket-shaft *n* and transmission-shaft *r*, with their corresponding gears, move with the spool the gear-train remains accurately in mesh for all positions of said spool, and the rotation of the latter does not effect the alinement of the bearings in the spool in relation to the bearings in the motor-frame; but the relative distance of all the gear centers from the center of the power-shaft and pinion *y* remains fixed when the spool is rotated.

When the spool has been turned sufficiently to properly adjust the chains *g' g'*, the ends of the spool are again rigidly clamped in the side frames *d d* by tightening the nuts on the clamping-bolts *f f*. The side frames *d d* are provided with flanges along their upper edges to which the hoist-trunk *l* and the loading-table *i'* are secured, and the rear edge of each of said frames is also finished with a flange, by means of which the frame may be bolted to the bulkhead *c*.

As thus constructed it will be seen that the driving-gear frame may be applied to any type of hoist, whether inclined or vertical, and that whatever may be the character or location of the hoist all parts of the base and driving mechanism may be employed interchangeably in the different hoists, thereby securing the very desirable considerations of



cheapness of construction, facility of adjustment, compactness, and adaptability to any angle of hoist.

Having thus described my invention, what I claim is—

1. In ammunition-hoists and the like, an endless carrier, a driving-shaft therefor, a power-shaft geared to said driving-shaft, and means for adjusting the slack of the endless carrier, comprising a rotatory support for the driving-shaft, the axis of said support being concentric with said power-shaft and eccentric with the driving-shaft; substantially as described.

2. In ammunition-hoists and the like, an endless carrier, a driving-shaft therefor, a power-shaft geared to said driving-shaft, a rotatory support in which said driving-shaft is eccentrically mounted, the axis of said support being concentric with said power-shaft, whereby the driving-shaft may be revolved about the power-shaft to adjust the slack in the endless carrier, and means for securing said support in adjusted position; substantially as described.

3. In ammunition-hoists and the like, an endless-chain carrier, a sprocket-shaft for driving said carrier, a power-shaft geared to said sprocket-shaft, a rotatory spool in which said sprocket-shaft is eccentrically journaled, said spool being concentric with said power-shaft, and means for locking said spool in adjusted position; substantially as described.

4. In ammunition-hoists and the like, an endless-chain carrier, a sprocket-shaft for driving said carrier, a spool in which said

sprocket-shaft is eccentrically journaled, a motor-driven shaft concentric with the axis of said spool and geared to said sprocket-shaft, and clamping-frames in which said spool is rotatably mounted; substantially as described.

5. In ammunition-hoists and the like, an endless-chain carrier, a sprocket-shaft for driving said carrier, a spool comprising two end disks and a connecting-web in which said sprocket-shaft is eccentrically journaled, clamping-frames in which said spool-disks are rotatably supported, and a motor-driven shaft concentric with the axis of said spool and geared to said sprocket-shaft; substantially as described.

6. In ammunition-hoists and the like, an endless-chain carrier, a sprocket-shaft for driving said carrier, a rotatory support in which said sprocket-shaft is eccentrically journaled, a motor-driven shaft centrally journaled in said support, a transmission-shaft also eccentrically journaled in said support, gears on said transmission-shaft cooperating with corresponding gears on the motor-driven shaft and the sprocket-shaft, and means for locking said rotatory support in adjusted position to regulate the slack in the chain-carrier; substantially as described.

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

JOHN FARREL METTEN.

Witnesses:

NATHAN P. TOWNE,  
GEO. D. SHELLY.