

No. 704,985.

Patented July 15, 1902.

E. TROCHAIN.  
AMMUNITION HOIST FOR ORDNANCE.

(Application filed Oct. 17, 1899.)

(No Model.)

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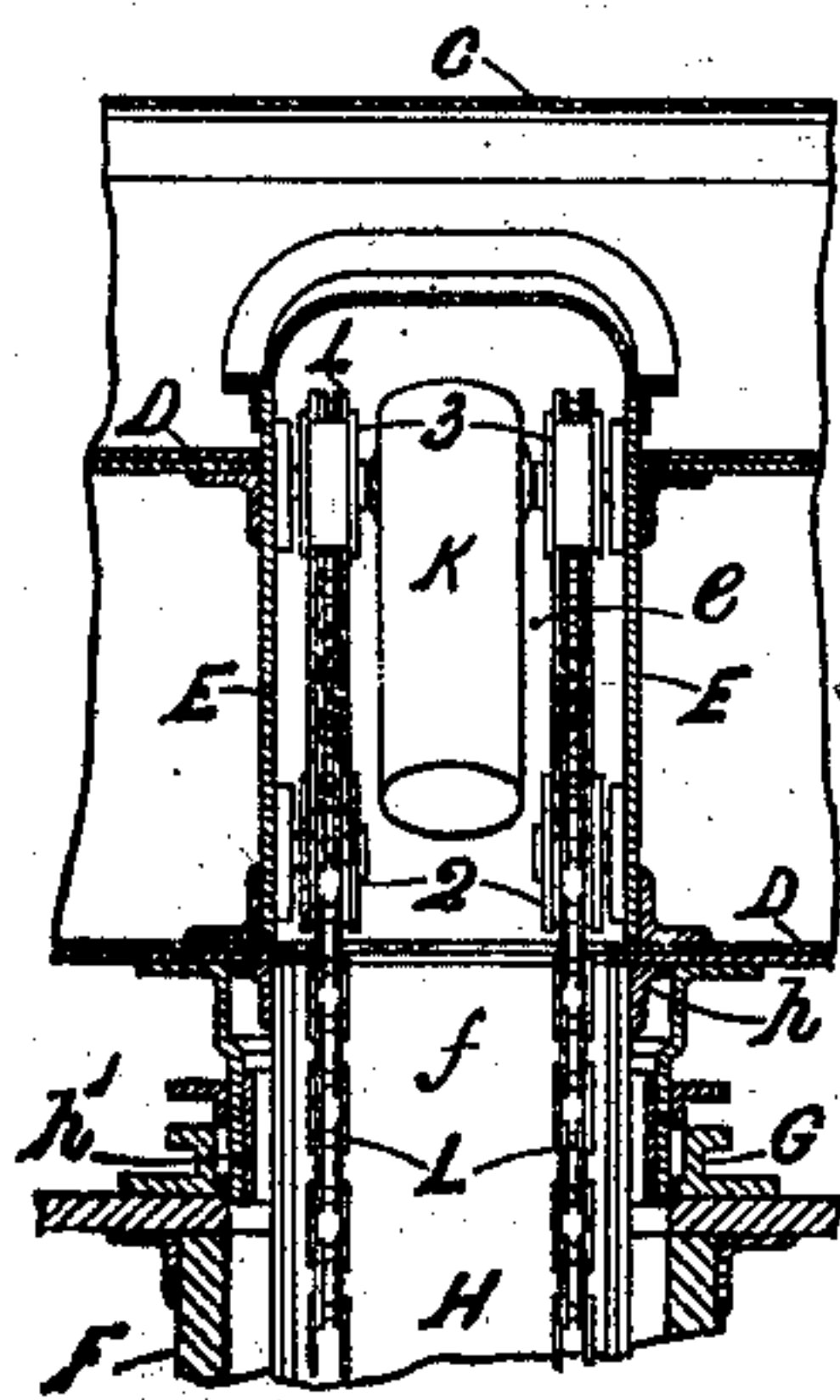
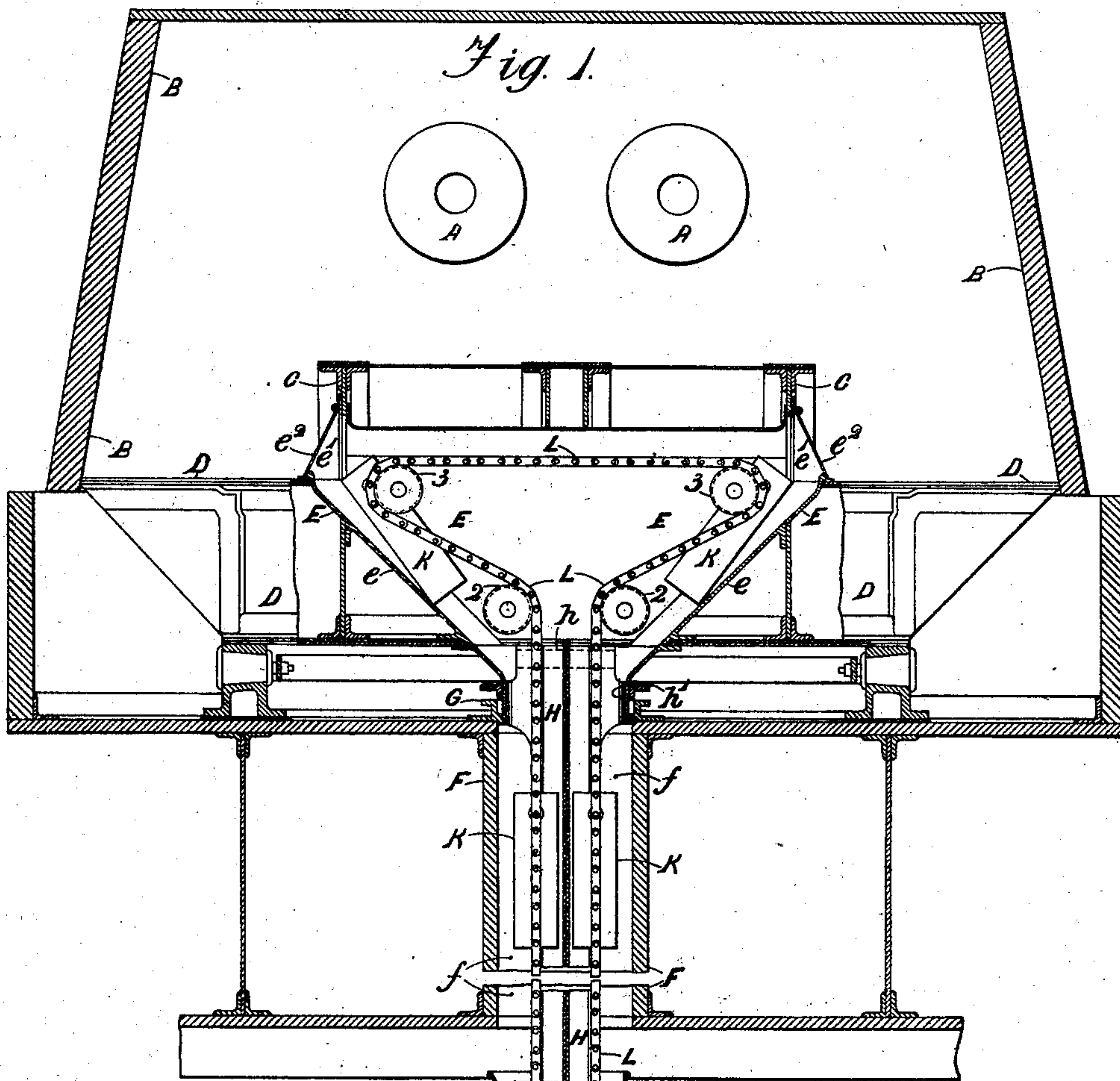


Fig. 2.

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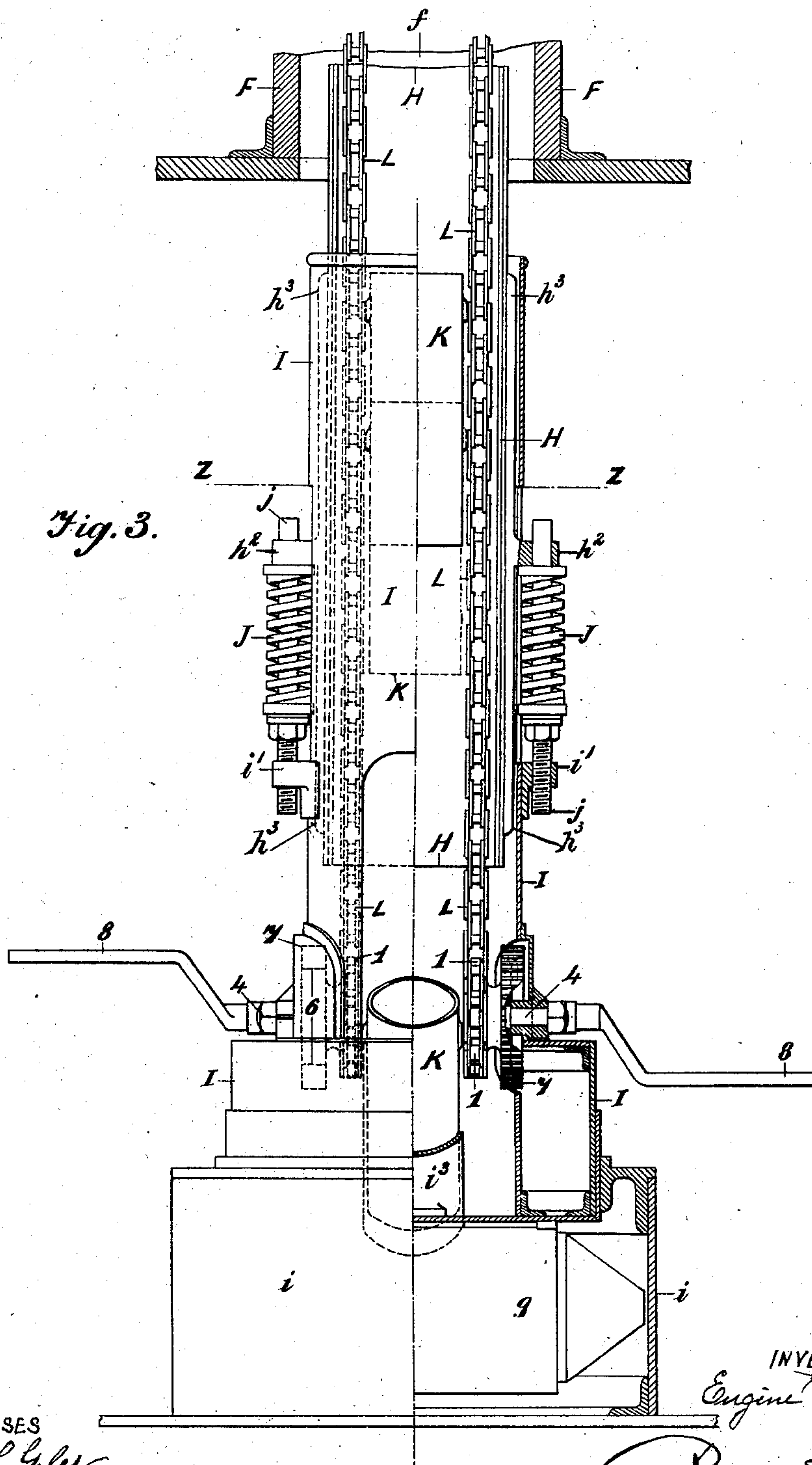
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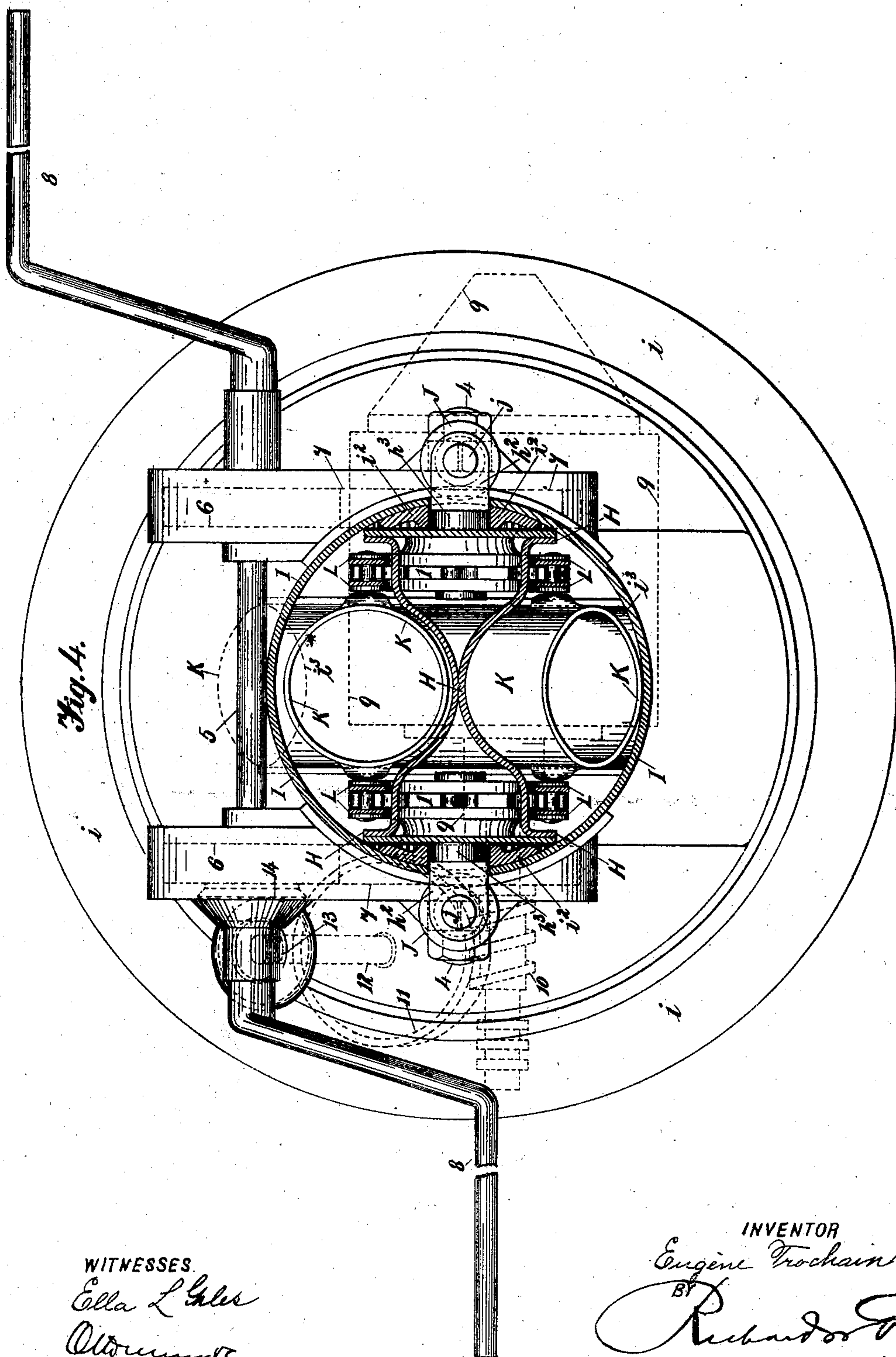
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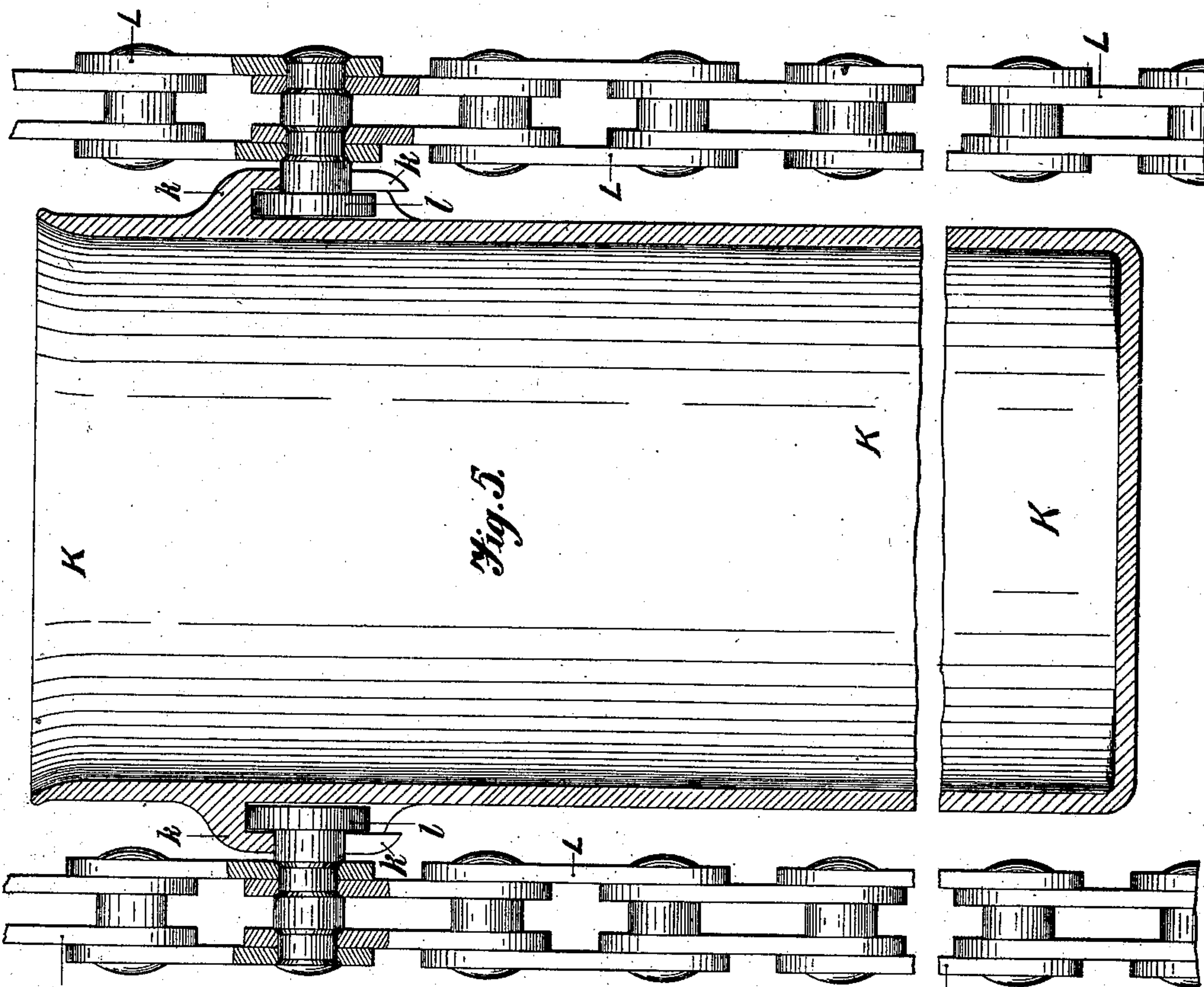
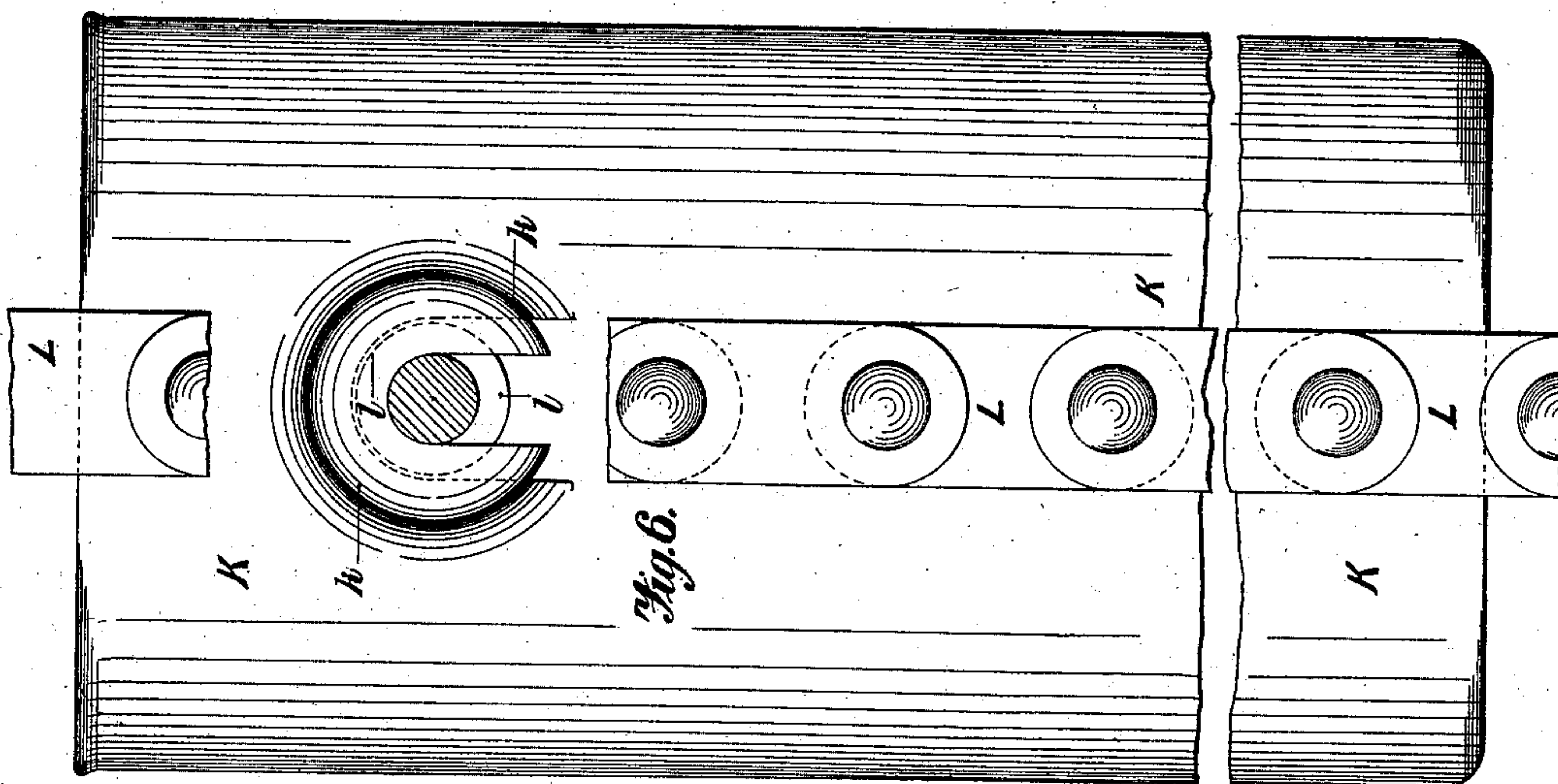
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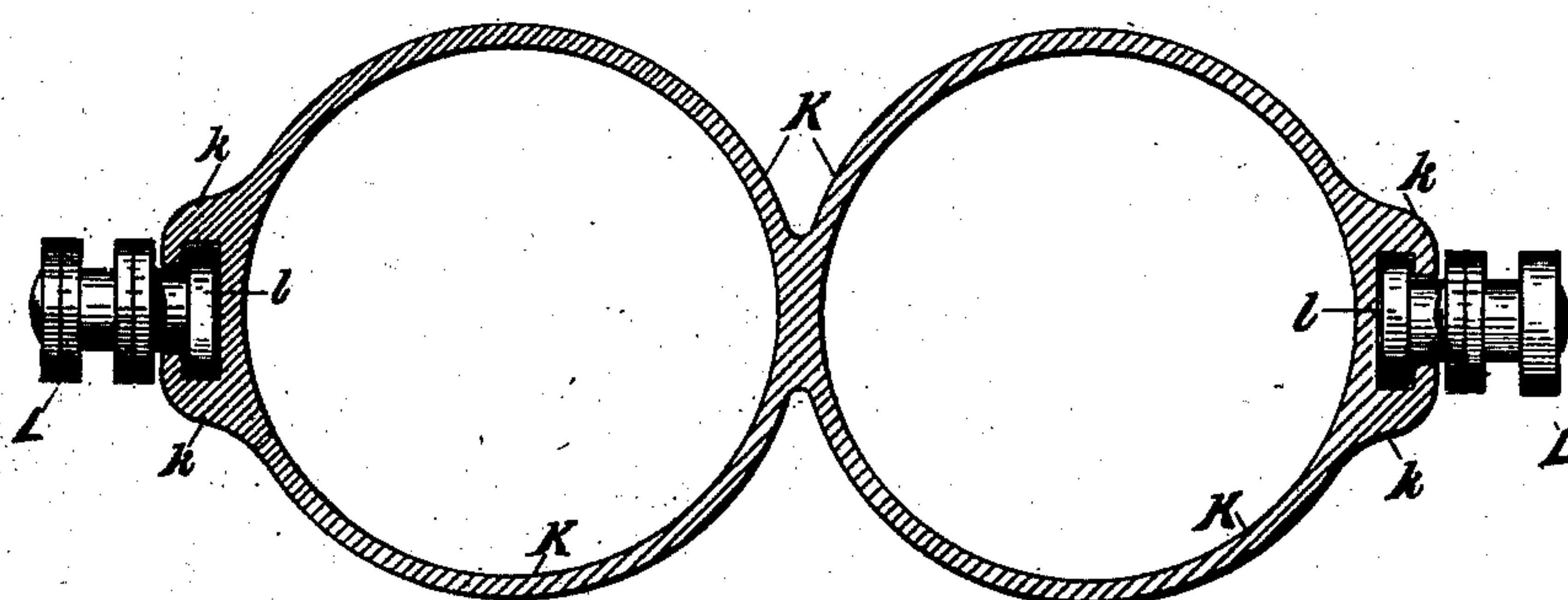
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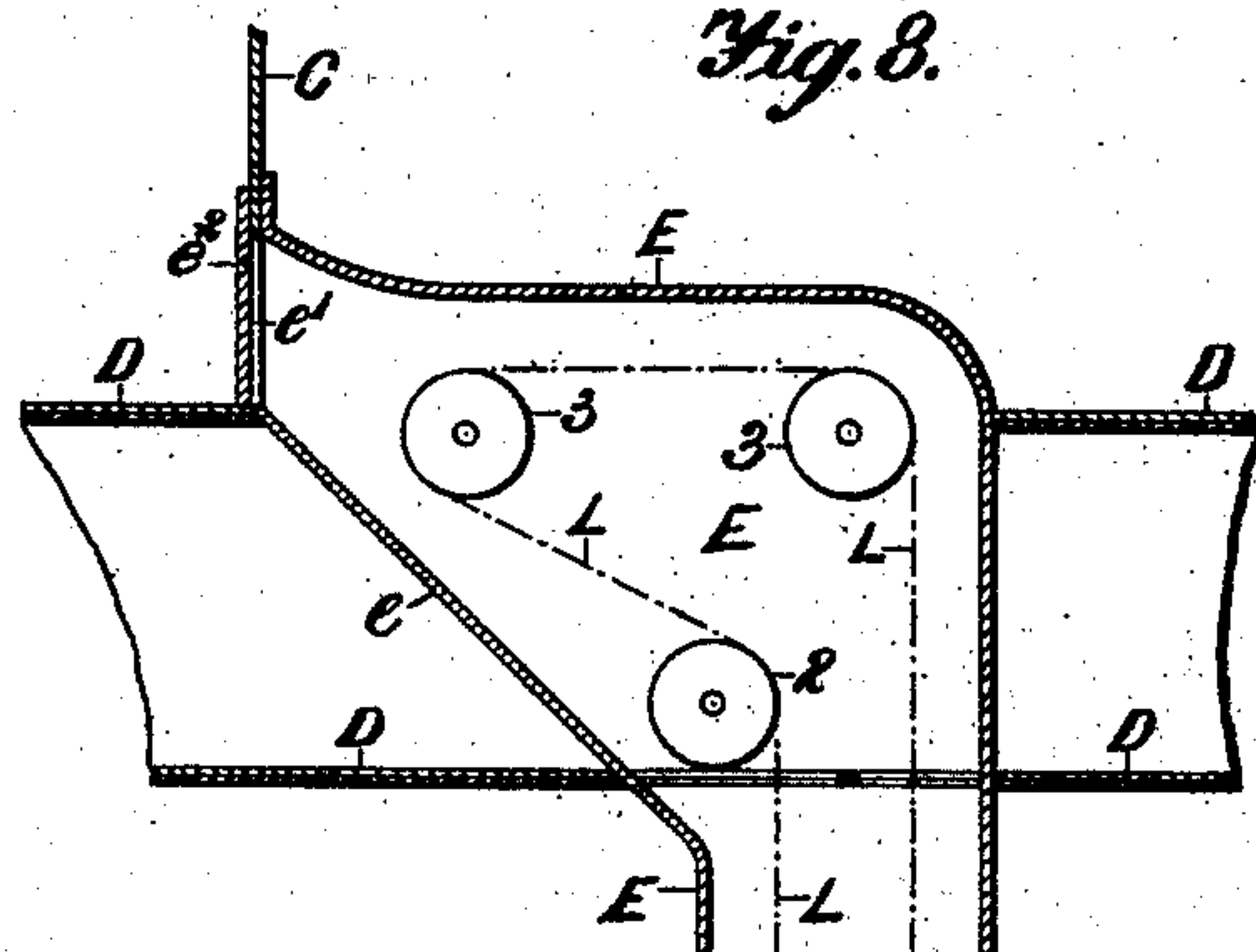
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*Fig. 7.*



*Fig. 8.*



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# UNITED STATES PATENT OFFICE.

EUGÈNE TROCHAIN, OF PARIS, FRANCE, ASSIGNOR TO VICKERS SONS & MAXIM, LIMITED, OF LONDON, ENGLAND, A CORPORATION OF GREAT BRITAIN.

## AMMUNITION-HOIST FOR ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 704,985, dated July 15, 1902.

Application filed October 17, 1899. Serial No. 733,893. (No model.)

*To all whom it may concern:*

Be it known that I, EUGÈNE TROCHAIN, a citizen of the Republic of France, residing at and whose post-office address is 41 Avenue Hoche, Paris, France, have invented certain new and useful Improvements in Ammunition-Hoists for Ordnance, of which the following is a specification.

My invention relates to ammunition-hoists for ordnance, and has for its objects simplicity of construction and facility for charging and discharging the buckets or carriers.

The improved hoist consists of endless chains, bands, or other flexible connectors and buckets or carriers suspended therefrom in combination with means for tilting the buckets, the said chains or the like traveling over driven wheels and guide-sheaves located at or about the magazine and firing-platform, at or near both of which (or only the latter) an incline or inclines is or are disposed to tilt the buckets, so as to present them conveniently for loading and unloading as they are brought toward the charging and discharging places on the operation of the said wheels, the whole being arranged in such manner as to revolve with the gun-mounting and always preserve the buckets in an upright or substantially upright position except when being filled or emptied.

As will be evident, the mode of carrying my improvements into practice will vary with the type of the mounting, and by way of example I will describe the adaptation to a pair-gun revoluble turret or barbette mounting. This application is illustrated in the accompanying drawings.

Of the various views, Figure 1 is a central sectional elevation showing the relative positions of the components of the hoist. Fig. 2 is a central vertical section of the upper part of the hoist, the section being taken at right angles to Fig. 1. Fig. 3 is an elevation of the lower part of the hoist looking at right angles to the view in Fig. 1, certain parts being broken away or shown in section for elucidatory purposes. Fig. 4 is a horizontal section on the line Z Z in Fig. 3. Fig. 5 is a detail vertical section of a bucket or carrier, and Fig. 6 is a side elevation of same. Fig.

7 is a horizontal section of a modified form of bucket. Fig. 8 is a central vertical section illustrating a modification of the disposition of the hood.

The several figures are drawn to various scales in order to obtain clearness.

The same reference letters and numerals used in the following description designate the same or similar parts in all the figures.

Referring to the drawings, A A denote the guns; B, the shield; C, the carriage, and D the turn-table of the mounting, which is constructed or arranged in any usual or appropriate manner.

According to my invention I fix to the carriage C and turn-table D the base or basal periphery of a truncate-cone-shaped hood E or equivalent, so that the hood forms part of same. The apex or mouth of the hood is adapted to coincide with the customary stationary hoist-trunk F, around which the turret or barbette revolves, as usual, the junction of the hood E and trunk F being rendered water-tight with the aid of a stuffing-box G, as shown, or by other fitting means permitting revolution of the hood E while maintaining tightness. By this arrangement it will be seen the sloping sides  $ee$  of the hood E constitute the inclines before referred to as being disposed at the firing-platform. For giving ingress to and egress from the hood E, I make at opposite points openings  $e'e'$ , which may be fitted with suitable closing devices, such as hinged doors  $e^2e^2$ , as indicated.

Longitudinally within the trunk I arrange a distance piece or guide H, having its upper and lower extremity united, respectively, to or about the hood E, and an appropriately-supported bracket I of suitable construction, situated near the magazine or handing-room, an incline or inclines being provided upon or in connection with this bracket, if desired. In the example the top of the distance-piece H is rigidly secured, by bolts or otherwise, to the turn-table D and hood E at  $h$  and  $h'$ , respectively; but its bottom is movably connected to the bracket I, which, as shown, is preferably made hollow and formed to serve as a continuation of the trunk F and seated



so that it can revolve upon a fixed hollow base  $i$ . The said movable connection may be effected in various ways; but a very convenient mode is as follows: At each side of the hoist I locate a spring J, normally acting in compression, the upward thrust being received by a lug  $h^2$ , passing through a slot in the side of the bracket I and furnished on a bar  $h^3$ , attached to the distance-piece H, and the downward thrust by an adjustable screw  $j$ , passing through a lug  $i'$ , fastened to the bracket I, and also through the lug  $h^2$ , which thereby guides it. Clips or guide-bars  $i^2 i^2$  are also secured to the bracket I, and their function is to receive between them and engage the bar  $h^3$ . Thus it will be seen that, first, when the mounting revolves so does the distance-piece H, due to its rigid connection aforesaid, and likewise the bracket I, consequent on the engagement of the bars  $h^3 h^3$  and guide-bars  $i^2 i^2 i^2 i^2$ , while, secondly, the distance-piece H and bracket I are pressed apart in an axial direction, and this latter serves the purpose I will presently explain. The bracket I is made with a bucket-tilting incline  $i^3$ , which is obtained as shown in Figs. 1 and 3. There may be more than one incline, if desired. The lip  $i^4$  (shown at the top of the bracket I in Fig. 1) is to guide the buckets or carriers into it in the event of the ship rolling.

The distance-piece H is formed, as illustrated best in Fig. 4, to constitute, with the trunk F, (and also in the example with the bracket I,) two chambers or passages  $f f$  for guiding the buckets K K, raised and lowered therethrough by two endless traveling chains L L, preferably of the pivoted flat-link type, between and to each of which the buckets K K are attached in a manner permitting free oscillation. This attachment may be effected in sundry ways—for example, as represented in Figs. 5 and 6, by furnishing lugs or recesses  $k k$  at diametrically opposite points on the buckets for receiving extensions  $l l$  of the pivotal pins of the chains L L, the lower portions of the lugs or recesses  $k k$  being slotted or cut away to permit the insertion and removal of the extensions  $l l$ . The buckets, which may be each constructed to carry one charge, as in Fig. 5, or two, as in Fig. 7, or more, are arranged one above another, and their width determines the spacing of the chains L L, each of which is driven by a sprocket-wheel 1 and guided by a series of loosely-mounted toothed sheaves 2 2 3 3, carried, respectively, by the bracket I and the hood E. The sprocket-wheels 1 1 are loosely mounted upon studs 4 4, supported on the said bracket I, and adapted to be rotated manually or mechanically. Mechanism for both hand and power operation is indicated in the drawings. For the former in appropriate bearings fixed to the bracket I is mounted a shaft 5, upon which is keyed at each end a pinion 6 for driving a spur-wheel 7, also loose on the adjoining stud 4 and formed integral with or fixed to the

sprocket 1 thereon. Thus the motion imparted to the shaft 5 by detachable handles 8 8 is transmitted to the chains L L. For power-driving the motor must be carried by the bracket I, so as to revolve therewith and be always in the driving position. The hollow base  $i$  forms a convenient housing for it. The use of an electromotor 9, bolted to the bottom of the bracket I, is illustrated, the motion therefrom being transmitted to the chains L L through a worm 10 on its shaft gearing with a worm-wheel 11 on a suitably-supported shaft 12, having keyed to its opposite end a bevel-wheel 13, driving another like wheel 14 on the shaft 5 and thence through the spur-wheels 6 6 and 7 7 and sprocket-wheels 1 1. Clutches of ordinary kind (not shown) are of course provided for putting the respective mechanisms into and out of gear. The guide-sheaves 2 2 3 3 are disposed within the hood E, some on each side of the vertical axis of the subjacent trunk F, one, 2, (or more,) being fitted near it and the other, 3, (or others,) near the contiguous hood-orifice  $e'$ . They are revolvably fitted upon studs fixed to or about the sides of the hood E. Spring, screw, or other contrivances for adjusting the tautness of the chains L L are applied in suitable fashion. In the example this is accomplished by the springs J J, for, as will now be perfectly obvious, the separation of the distance-piece H and the bracket I accomplishes the required tightening of the chains, since the sheaves 2 2 3 3 are carried by the hood E and the sprocket-wheels 1 1 by the bracket I.

The operation of a hoist arranged as explained is as follows: When the sprocket-wheels 1 1 are actuated, the chains L L raise the full buckets or carriers K K from the loading-place vertically up one of the aforesaid passages  $f f$  into the hood E, whose adjacent inclined portion  $e$  tilts and supports each in turn, so as to lie toward the opening  $e'$  thereat, whereby all or every alternate one can be expeditiously emptied, depending whether it is required to unload from one or both sides of the hood E. The buckets K K then travel to the opposite part of the hood E, where they are again tilted in turn by the other inclined portion  $e$  for discharging, and finally they are returned empty down the other passage  $f$  to the loading-place, the incline  $i^3$  (or inclines) thereat accomplishing their tilting in a like fashion to that already described for easy and speedy charging. Thus it will be seen that the buckets K K are always maintained in an erect, or approximately erect, position between the bracket I and hood E, and the training of the guns A A does not affect the loading, traveling, and unloading, since the bracket I, guide H, hood E, and turret or barbette all rotate together due to their connection.

In the foregoing I have described the hoist in the center of the mounting; but, as will be obvious, it may be situated at the side or rear to discharge at one point only, as will be un-



derstood from Fig. 8. In this connection all the components of the hoist are disposed practically as before, with the exception of the hood E, now shaped somewhat after the form of a ship's ventilating-cowl, the hole *e'* being made in the part of the carriage C uniting with it to permit communication therewith. In like manner the hoist may be otherwise arranged to meet specific cases and its details varied, as may be deemed necessary.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with the magazine and rotating firing-platform, of a hood arranged to rotate with said platform and having inclines, a trunk depending from said hood, a bracket located at the magazine, a distance-piece extending between the bracket and hood and dividing the trunk into two chambers, an endless connector traveling in said chambers, carriers pivoted to said connector and arranged to be tilted by said inclines, and means for operating said endless connector, substantially as described.

2. In combination with the magazine and rotating firing-platform, of a hood arranged to rotate with said platform and having inclines, a trunk depending from said hood, a revoluble hollow bracket located at the magazine, inclines carried by said bracket, a distance-piece extending between the bracket and hood and dividing the trunk into two chambers, an endless connector traveling in said chambers, carriers pivoted to said connector, and arranged to be tilted by said inclines, and means for operating said endless connectors, substantially as described.

3. In combination with the magazine and rotating firing-platform, of a hood arranged

to rotate with said platform, a trunk depending from said hood, a tubular bracket-carrier at the lower end of said trunk and forming a continuation thereof and revoluble therewith, said bracket being vertically movable in relation to the trunk, driving and guide sheaves carried by said hood and bracket, endless carriers traveling over said sheaves, and means for moving said bracket downward to tighten said endless carrier.

4. In combination, the hoist-trunk, the bracket forming a continuation thereof, and revolubly seated at the magazine, inclines carried thereby, and endless carriers in said trunk having buckets adapted to be tilted by said inclines, substantially as described.

5. In combination, the hood, the hoist-trunk, the bracket at the lower end of said trunk, the distance-piece within the trunk and united at its opposite ends to said hood and bracket and forming two chambers, and the endless carrier traveling in said compartments, substantially as described.

6. In combination, the hoist-trunk, the distance-piece therein dividing said trunk into two chambers, a revoluble bracket at the magazine end adapted to rotate with said trunk but movable axially thereof, and endless carrier-chains supported in said trunk and adapted to be tightened by the axial movement of said bracket, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

EUGÈNE TROCHAIN.

Witnesses:

GEORGES DELOUR,  
J. ALLISON BOWEN.