

No. 877,664.

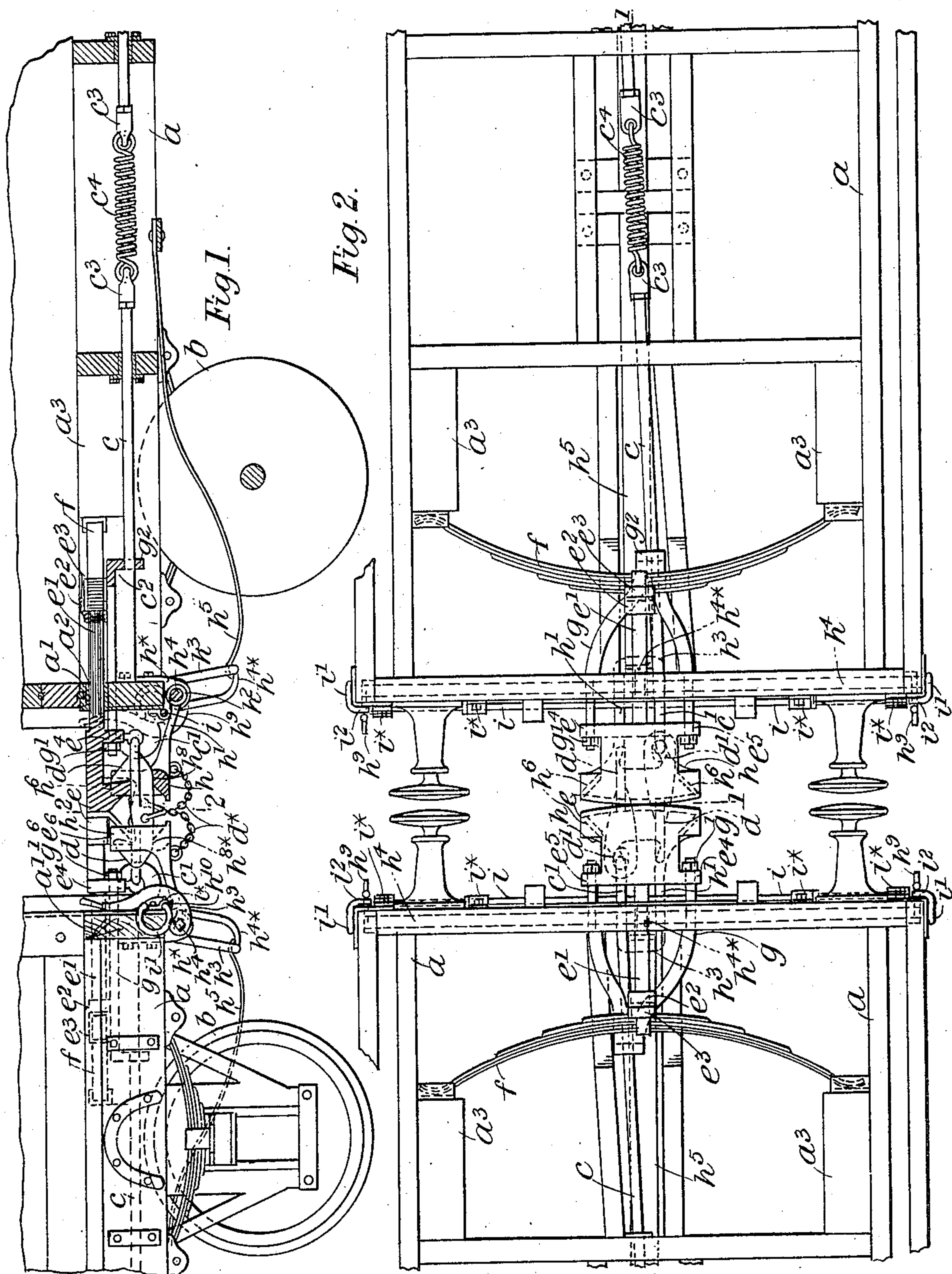
PATENTED JAN. 28, 1908.

J. RILEY & F. A. SPIERS.

AUTOMATIC COUPLING.

APPLICATION FILED JULY 25, 1907.

6 SHEETS—SHEET 1.



Witnesses:

C. H. White  
J. A. Hudson.

Inventors:

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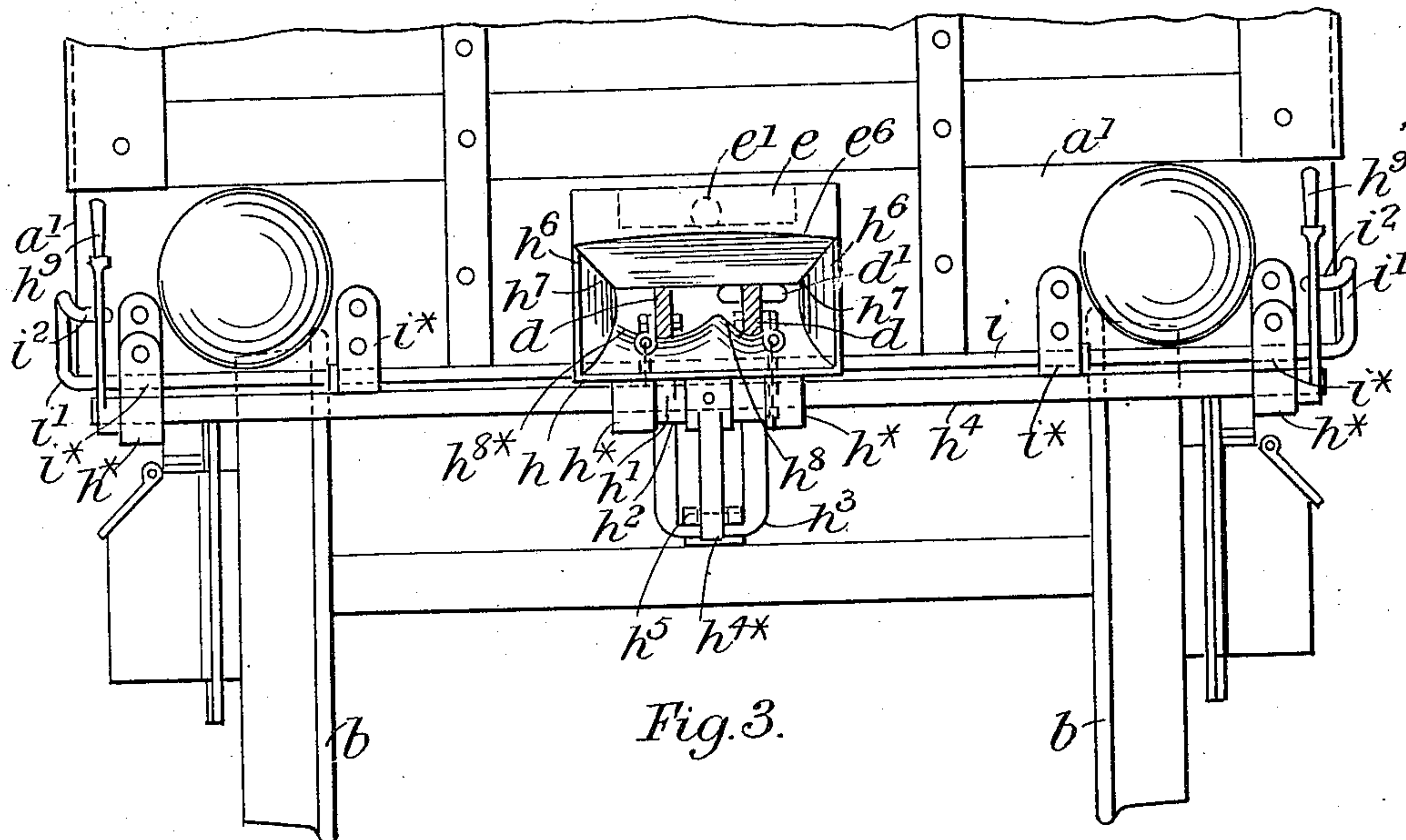


Fig. 3.

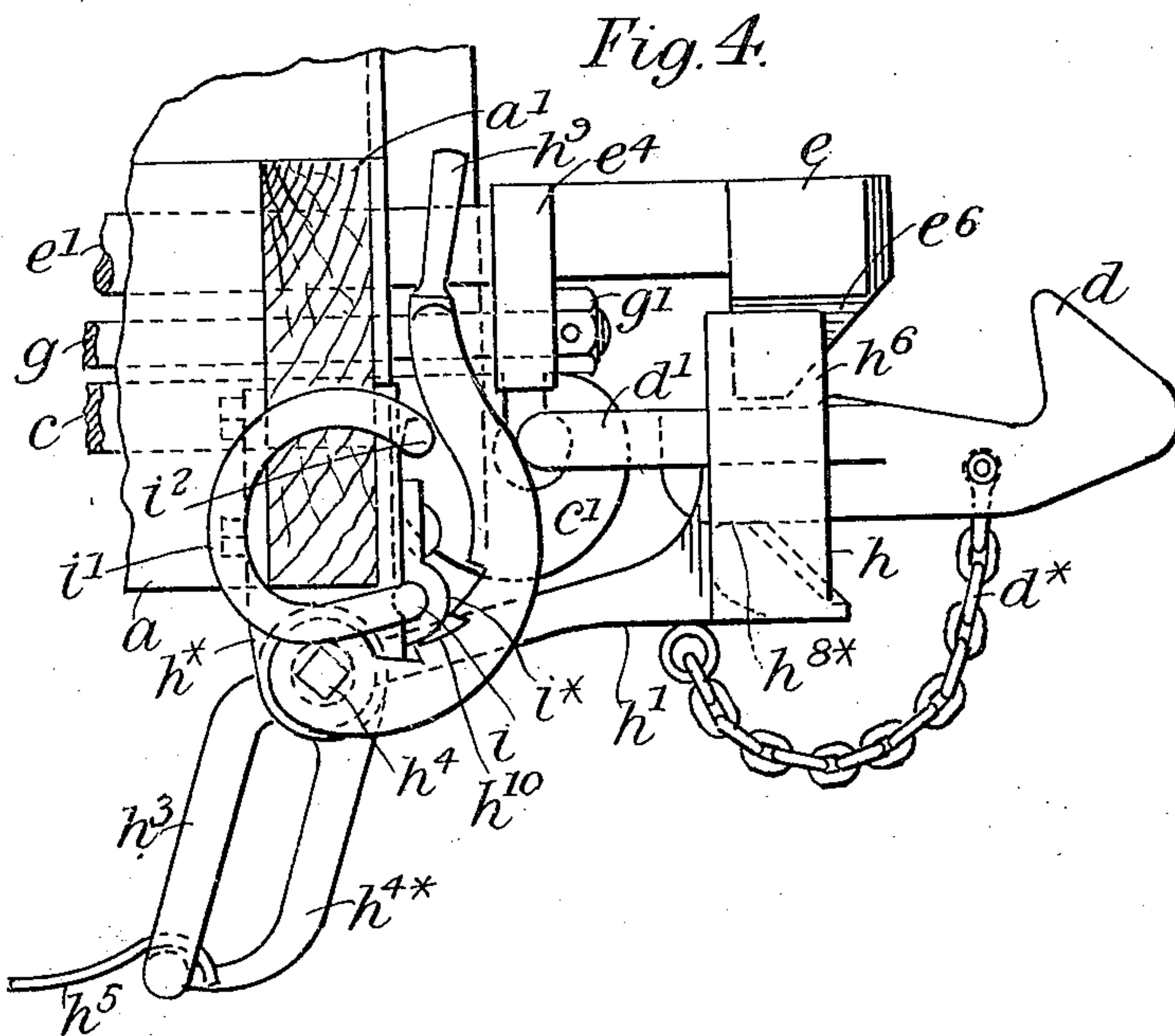


Fig. 4.

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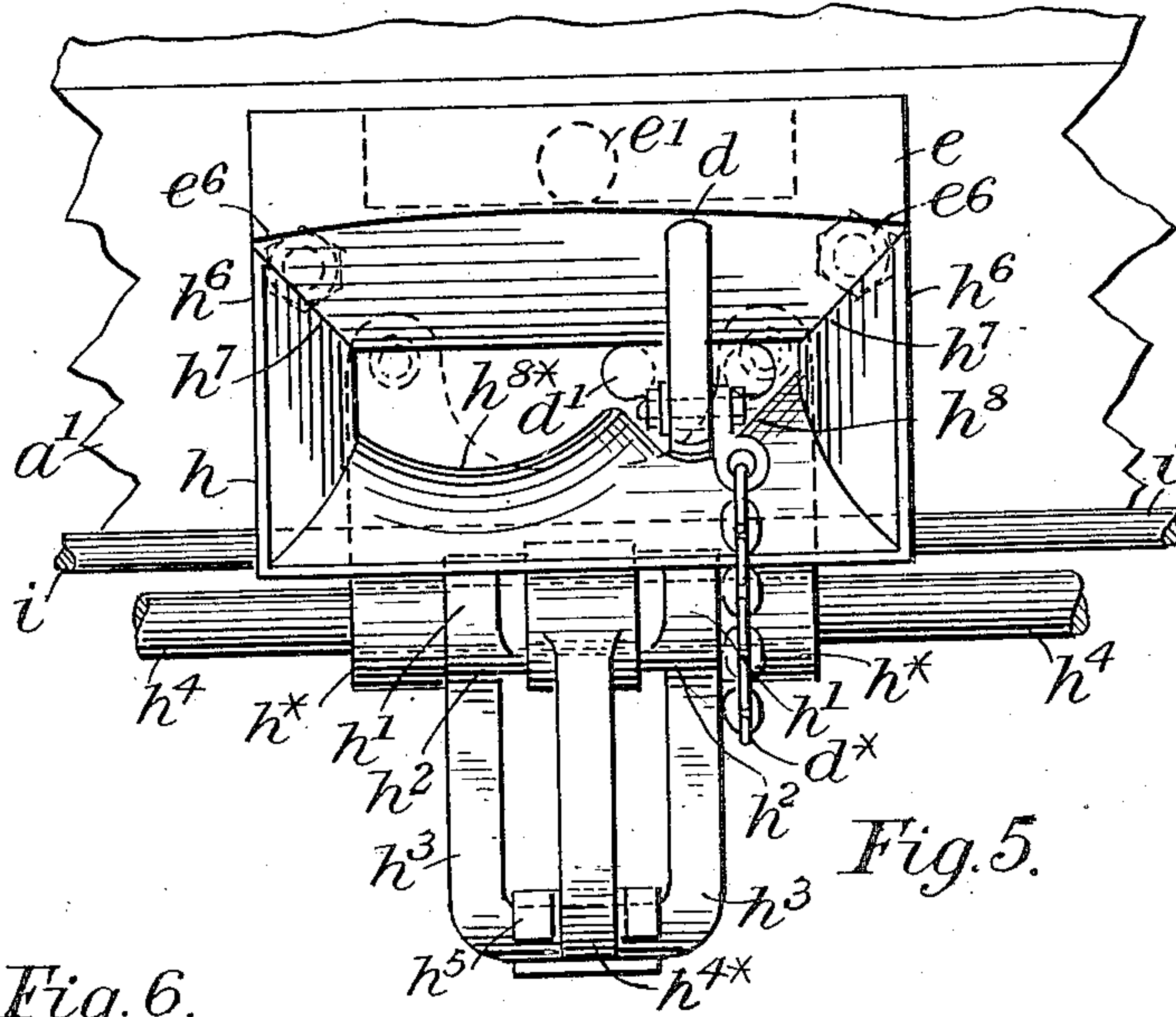
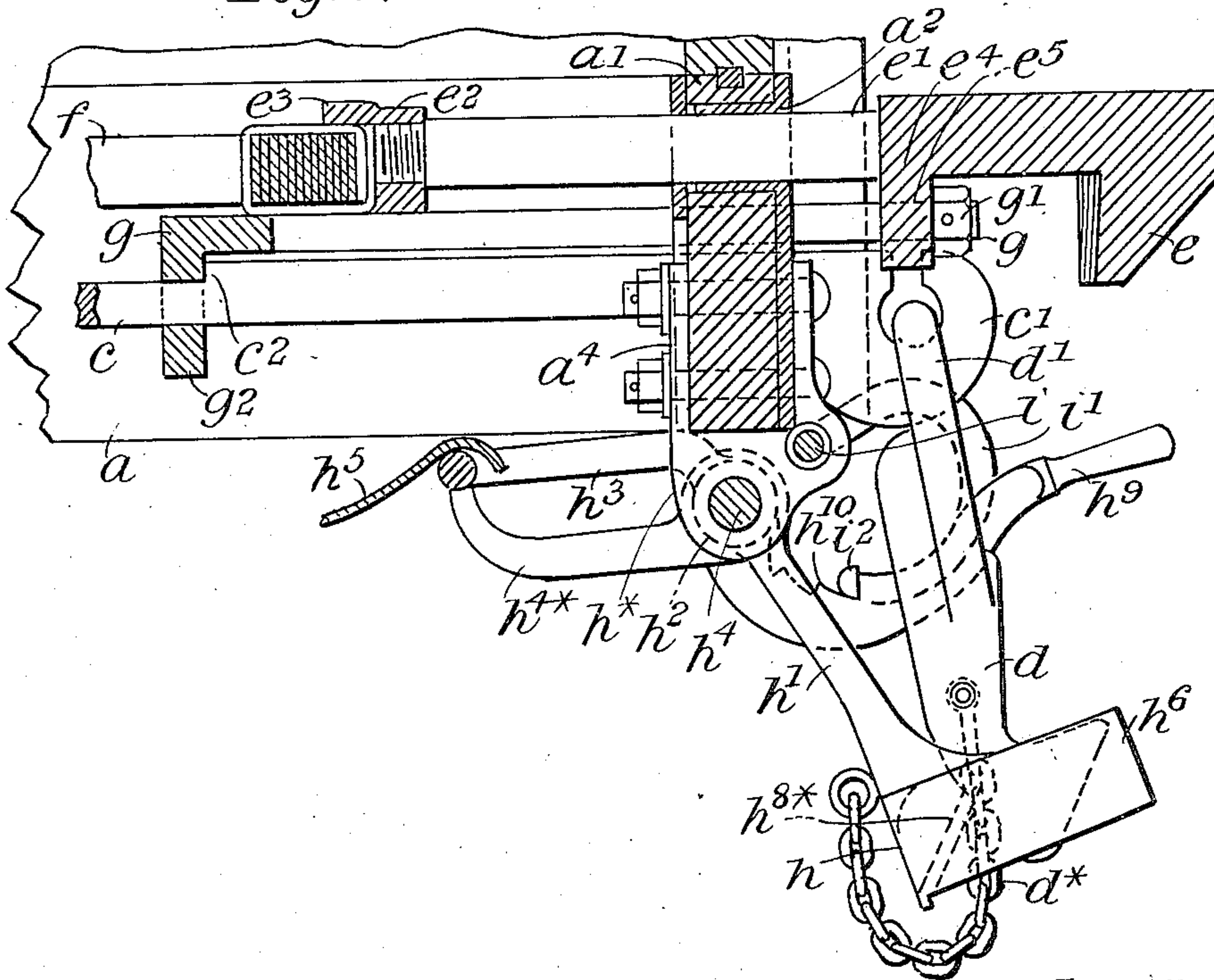


Fig. 6.



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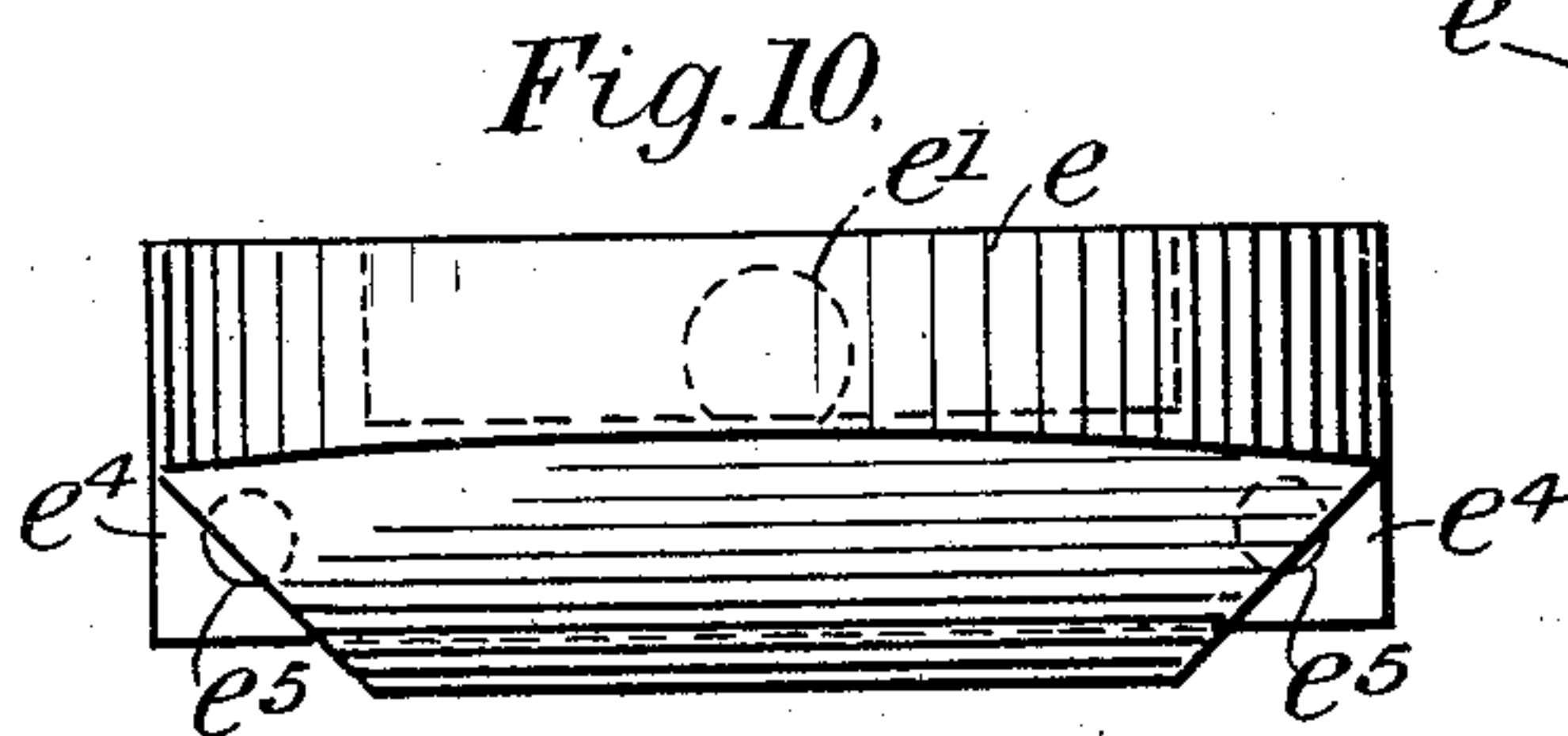
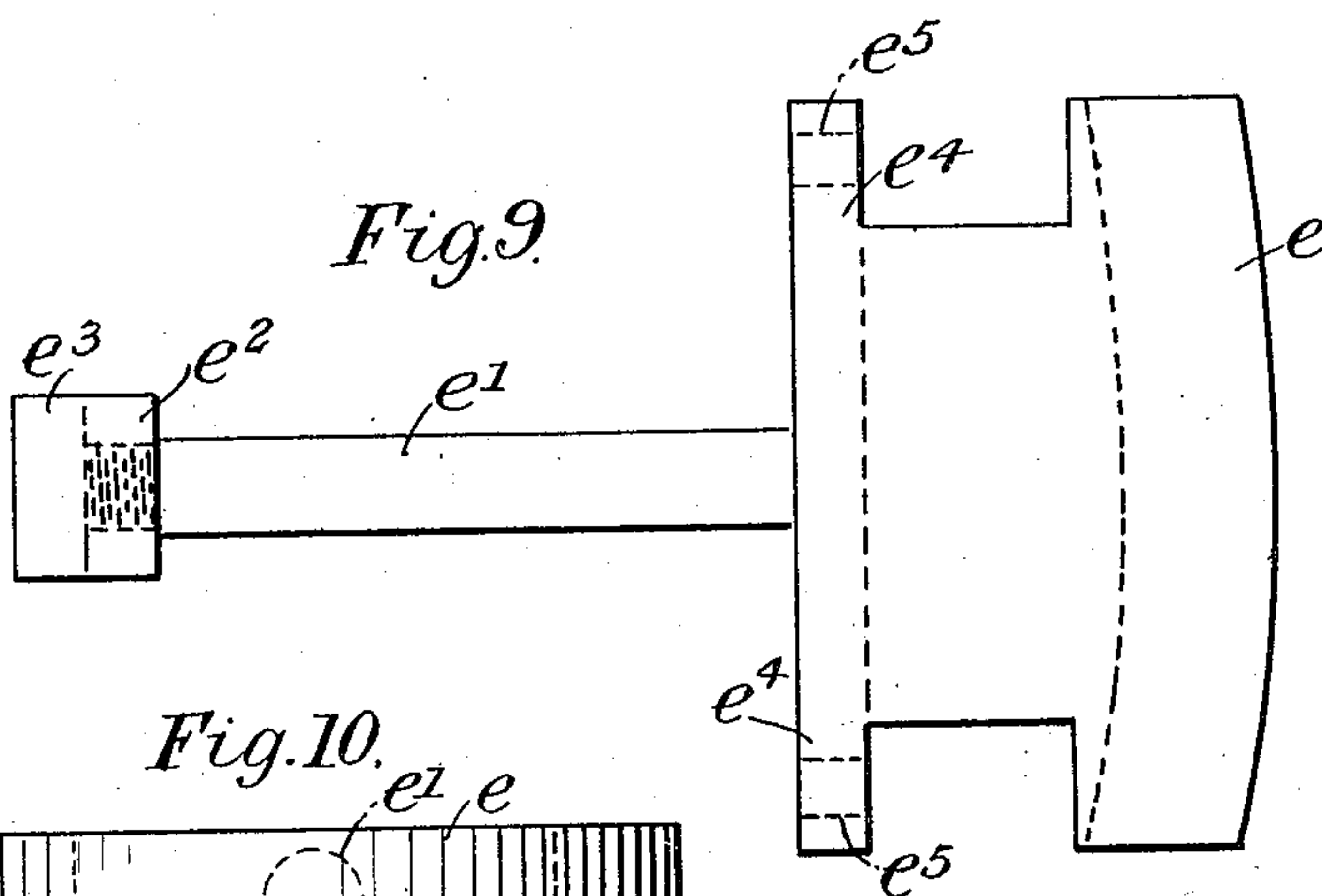
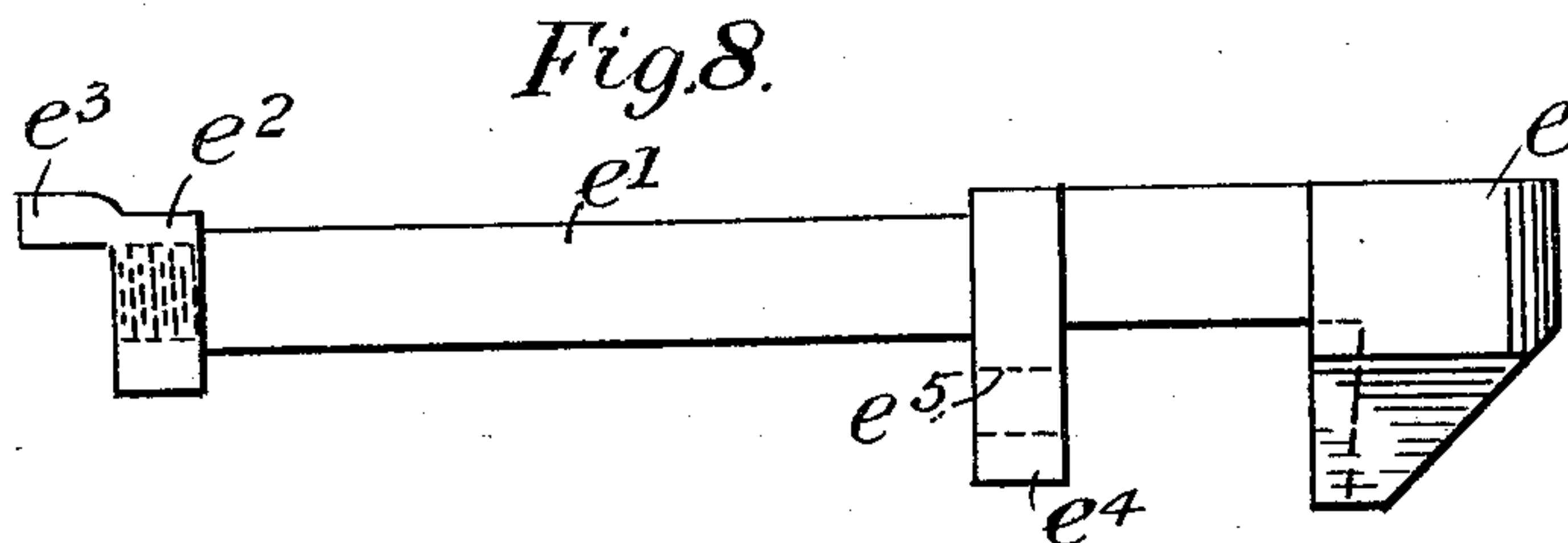
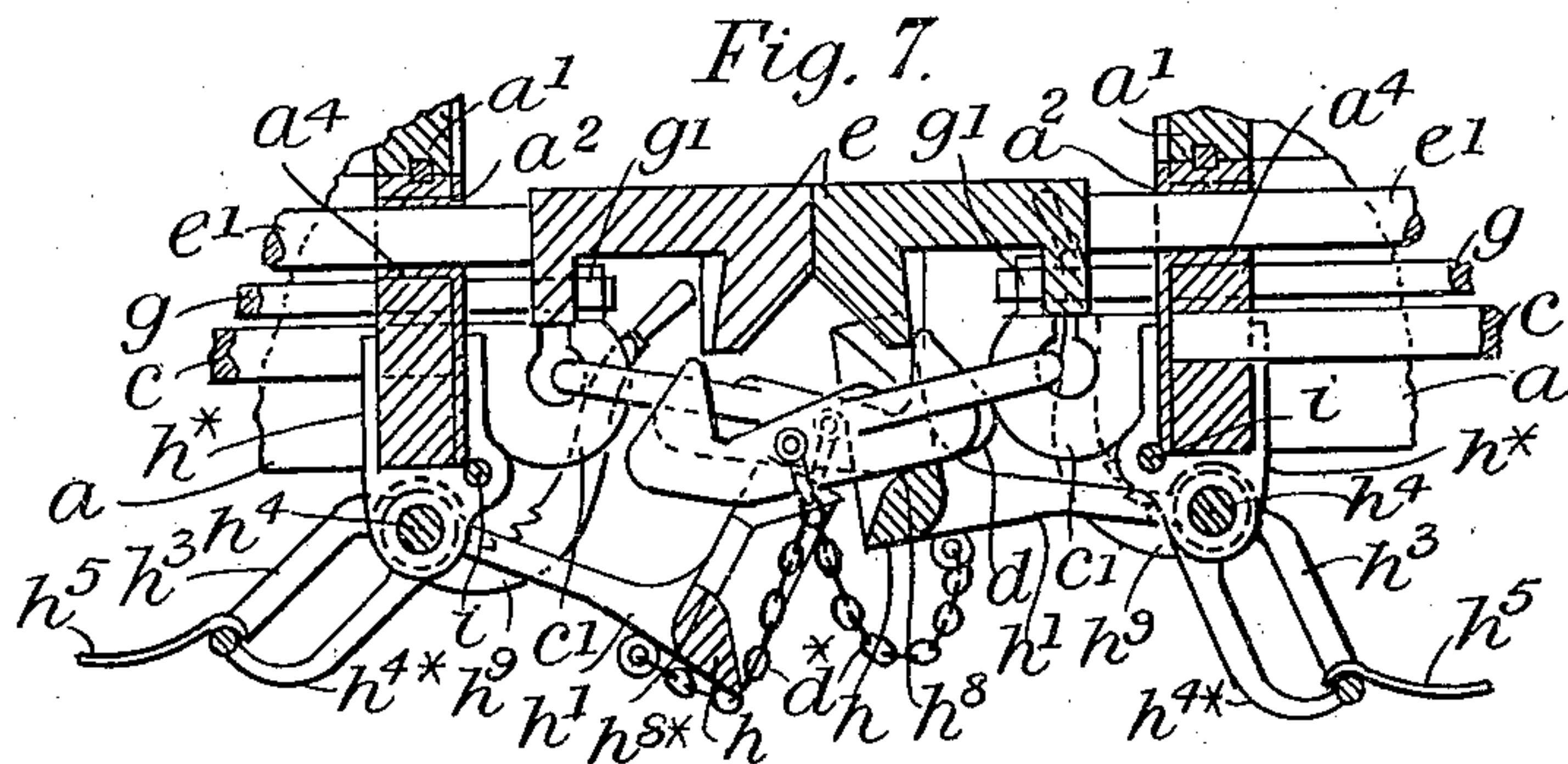
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Witnesses:

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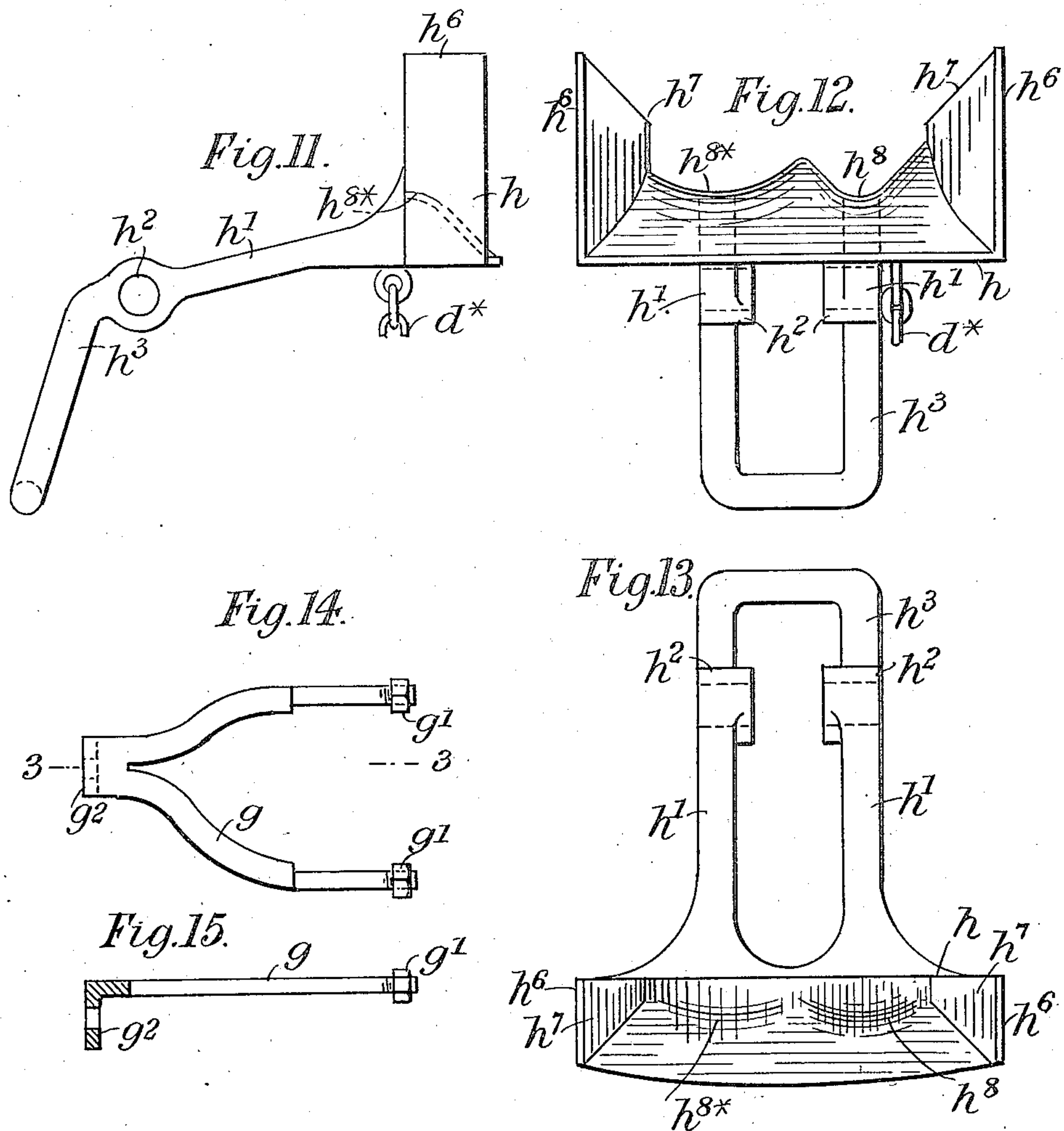
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6 SHEETS—SHEET 5.



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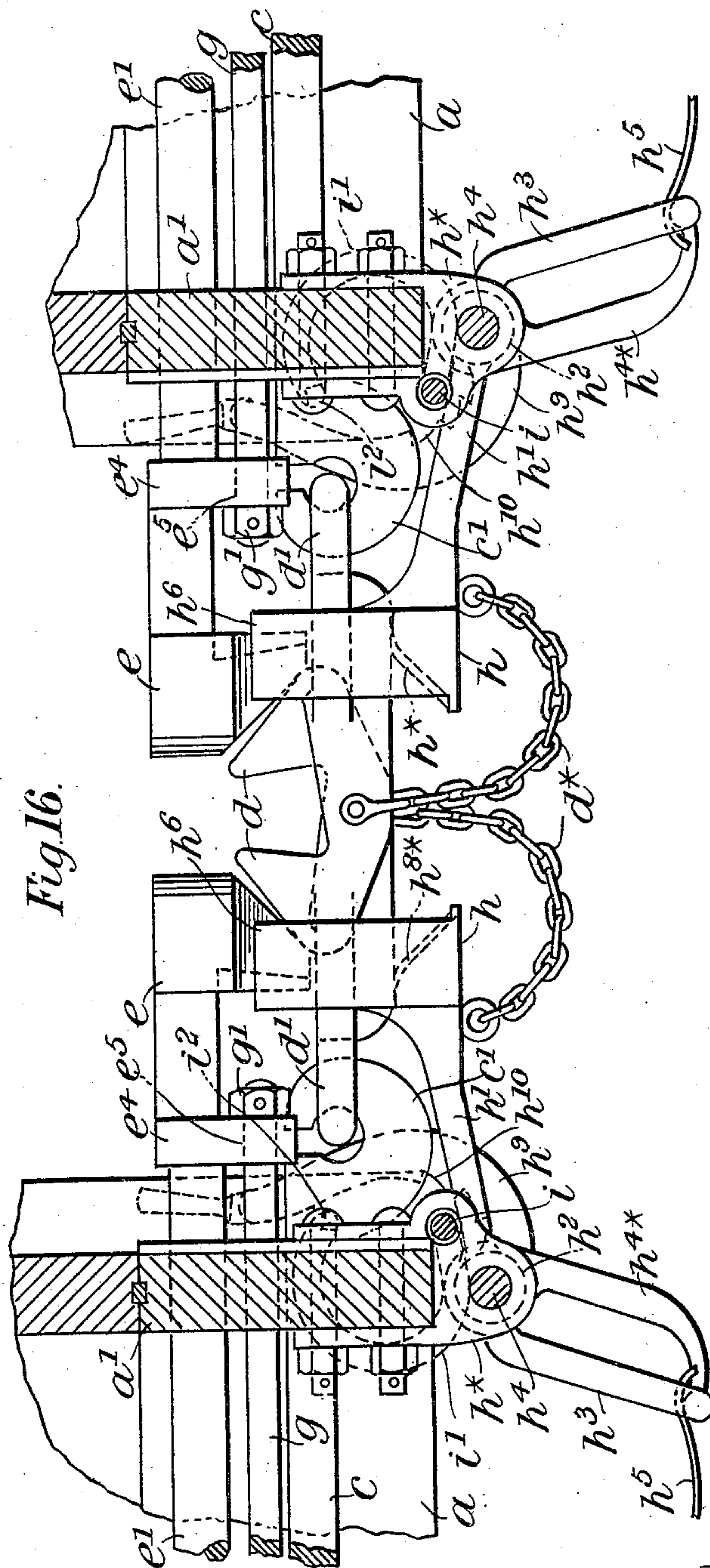


Fig. 16.

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# UNITED STATES PATENT OFFICE.

JAMES RILEY, OF SOUTHAMPTON, AND FREDERICK ALFRED SPIERS, OF HAMPSTEAD,  
ENGLAND.

## AUTOMATIC COUPLING.

No. 877,664.

Specification of Letters Patent.

Patented Jan. 28, 1908.

Application filed July 25, 1907. Serial No. 385,541.

*To all whom it may concern:*

Be it known that we, JAMES RILEY and FREDERICK ALFRED SPIERS, subjects of the King of Great Britain, the former residing at Hawarden, Bitterne Park, Southampton, in the county of Hants, engineer, and the latter formerly residing at St. Benet Chambers, 1 Fenchurch street, in the city of London, but now residing at Heatherlea, The Vale, Hampstead, in the county of Middlesex, auctioneer, both in England, have invented certain new and useful Improvements in Automatic Couplings, of which the following is a specification, reference being had to the accompanying drawings, and to the figures and letters marked thereon, that is to say:

The invention relates to improvements upon an invention in respect of which we filed an application for Letters Patent dated the 3rd day of May, 1906, Serial No. 371,734.

The primary object of the invention is to obtain a double coupling which will automatically engage when two vehicles are brought together which may be disengaged from the sides of the carriage without the necessity for passing between the same held disengaged and if desired used as a hand operated coupling. And in order that the said invention may be more clearly understood and readily carried into effect we will proceed aided by the accompanying drawings more fully to describe the same.

Description of the drawings: Figure 1 is a side elevation partly in section the section being taken on the line 1—1 of Fig. 2 of parts of two railway trucks or wagons having the present invention applied thereto and showing them coupled together the buffers being omitted for the sake of clearness. Fig. 2 is a plan thereof. Fig. 3 is an end elevation thereof partly in section the section being taken on the line 2—2 of Fig. 1. Fig. 4 represents part of Fig. 1 showing the hook of the draw bar in its raised or acting position. Fig. 5 is a front elevation of Fig. 4. Fig. 6 is a similar view to Fig. 4 but showing the hook of the draw bar in its lowered or non acting position. Fig. 7 is a similar view to Fig. 6 but showing one of the jaws being depressed by its hand lever and its coupling hook being pulled down by its chain and depressing the opposite jaw and coupling hook. Fig. 8 is a side elevation of the broad hook separately. Fig. 9 is a plan thereof. Fig. 10 is a front elevation thereof. Fig. 11 is a side elevation of the

movable jaw separately. Fig. 12 is a front elevation thereof. Fig. 13 is a plan thereof. Fig. 14 is a plan of the yoke separately. Fig. 15 is a vertical section taken on the line 3—3 of Fig. 14 and Fig. 16 is a somewhat similar view to Fig. 1 but showing the coupling hooks in the act of entering between the broad hooks and the jaws.

In the several figures like parts are indicated by similar letters of reference and Figs. 4 to 6 and 8 to 13 and 16 are drawn to an increased scale, with respect to the other figures of the drawings.

*a* represents the undercarriage or frame of the trucks which is of the usual character.

*a'* represents the buffer beam.

*b* represents the wheels and *c* represents the draw bar.

The hook *c'* of the draw bar *c* is provided with a link *d'* having fixed therewith a coupling hook *d* at its end formed pointed or beveled while its engaging part immediately to the rear of the point is formed flat or slightly under cut and which may be employed with the ordinary chain coupling if desired. Or the coupling hook *d* may be otherwise connected with the draw bar *c*.

Mounted upon the face of the buffer beam *a'* of each carriage is a broad downwardly directed hook *e* the face of which is curved to a suitable arc to admit of the carriage taking curves and the broad hook *e* is carried with capability of horizontal movement longitudinally of the carriage by the outer end of a central rod *e'* of round although it might be of other suitable section which passes through a bearing *a<sup>2</sup>* provided in the buffer beam *a'* and which at its inner end bears against an elliptic or it might be any other suitable form of spring *f* by which it and consequently the broad hook *e* is supported so that said hook will act as a buffer and the spring *f* at its ends takes an abutment against blocks *a<sup>3</sup>* bolted to the under carriage *a* or the spring *f* might be otherwise supported.

The inner end of the rod *e'* is fitted with a boss or enlargement *e<sup>2</sup>* which forms an extended bearing surface and said boss is provided with a flange *e<sup>3</sup>* which extends over the spring *f* and prevents it rising.

The broad hook *e* is formed with a flange *e<sup>4</sup>* and slidably passing through bearings *a<sup>4</sup>* in the buffer beam *a'* are the reduced or rounded ends of a yoke *g* and said reduced or rounded ends pass with capability of sliding through



plain holes  $e^5$  in the flange  $e^4$  of the broad hook  $e$  beyond which said ends are fitted with nuts  $g'$  or other stops so that the broad hook  $e$  may be forced inward to act as a buffer without giving motion to the yoke  $g$  in that direction while the movement of the yoke in the same direction will be arrested by or communicated to the broad hook  $e$ .

The inner end of the yoke  $g$  is cranked to form a plate  $g^2$  or it might be connected with a separate plate and said plate is perforated and mounted upon the draw bar  $c$  with capability of sliding and at a point to the rear of the buffer beam the draw bar  $c$  is provided with a shoulder  $c^2$  or it might be an equivalent contrivance so that a pull upon the broad hook  $e$  will partake of the spring resistance of the draw bar  $c$  while at the same time the broad hook  $e$  is free to move inward without giving motion to the draw bar  $c$ . Or the broad hook might be otherwise mounted and connected with the draw bar  $c$ .

Beneath the broad hook  $e$  is a broad jaw  $h$  which upon its face is curved similarly to the broad hook and said jaw is provided with rearward offsets  $h'$  formed with bosses  $h^2$  by which the jaw is loosely mounted upon a rock shaft  $h^4$  revolubly mounted in bearings provided in brackets or hangers  $h^*$  fixed with the buffer beam  $a'$ .

The offsets  $h'$  are continued beyond the rock shaft  $h^4$  in the form of a cranked loop or frame  $h^3$  which engages one end of a spring  $h^5$ , preferably a plate spring as shown the office of which is to retain the jaw  $h$  in its raised or normal position and the jaw is thus held up to the broad hook  $e$  with a yielding or spring pressure with the coupling hook  $d$  of the draw bar held securely between said parts and supported in the required horizontal or acting position for coupling purposes. Or a counter balance weight or any other suitable yielding means might be employed for thus supporting the jaw  $h$ .

The jaw  $h$  is provided with lateral cheeks  $h^6$  beveled at  $h^7$  to co-act with the corresponding bevels  $e^6$  upon the sides of the broad hook  $e$  and the front edges of both the jaw  $h$  and the broad hook  $e$  are inwardly beveled so that upon the two carriages or wagons being brought together the pointed or beveled coupling hook  $d$  of the opposite draw bar upon each carriage or wagon will come against the beveled edges of the coacting broad hook  $e$  and movable jaw  $h$  and force the latter downward so that the coupling hook  $d$  passes between them as shown at Fig. 16 and then being lifted up by the movable spring raised jaw  $h$  will engage the broad hook  $e$  and be so held as shown at Figs. 1 to 3.

Each of the movable jaws  $h$  is formed with notches or recesses  $h^8$   $h^{8*}$  the one  $h^8$  being somewhat deeper by reason of its being higher than that  $h^{8*}$  and the link or shank  $d'$  of the coupling hook  $d$  upon each carriage or wagon

lies on the deeper notch  $h^8$  of the movable jaw  $h$  so that in the normal or raised position of said jaw the coupling hook  $d$  will be held in the requisite engaging position relatively to the broad hook  $e$  and jaw  $h$  upon an opposite wagon the shallower notches  $h^{8*}$  in the jaw  $h$  serving to guide the coupling hooks  $d$  into the required positions relatively to the broad hooks  $e$  and jaws  $h$ .

The drawbar  $c$  is by way of example shown to be formed in two parts or lengths and the coupling hooks  $d$  of the drawbars  $c$  are suitably spaced by arranging each draw bar diagonally as shown at Fig. 2 so that the coupling hooks  $d$  upon the opposite ends of meeting wagons will be in different vertical planes and pass clear of one another.

The opposite ends  $c^3$  of the two parts of the drawbar  $c$  are connected by a spring  $c^4$  to afford the usual spring resistance or the drawbar might be formed in one length and springs such as  $c^4$  arranged to act in either direction of pull. Or the spacing of the coupling hooks  $d$  might be arrived at by cranking the drawbar or by employing two separate drawbars parallel to one another but located in different vertical planes and provided with separate springs or the same result might be attained in other ways.

The rock shaft  $h^4$  extends to the sides of the carriage or wagon where it is provided with curved handles or levers  $h^9$  fixed thereon by which it may be turned through a suitable angle and also fixed upon the rock shaft  $h^4$  centrally thereof is a finger or offset  $h^{4*}$  which is adapted to act upon the cranked loop or frame  $h^3$  of the offsets of the jaw  $h$  so that by turning the rock shaft  $h^4$  by means of the hand levers  $h^9$  it may be caused to raise the loop  $h^3$  and therefore depress the movable jaw  $h$  as shown at Fig. 6 and permit the coupling or draw bar hook  $d$  to fall for the purpose of uncoupling.

In order to render this action of the coupling hook  $d$  positive it is connected with the movable jaw  $h$  by a short length of chain  $d^*$  or it might be any other suitable connection and thus by operating one of the hand levers  $h^9$  at one side of one carriage or wagon the movable jaw  $h$  on the opposite carriage will be depressed by the coupling hook  $d$  of the first carriage as shown at Fig. 7 and the uncoupling of the carriages will be effected by one person by the use of one hand.

The movable jaw  $h$  and the hook  $d$  are held out of action by the hand lever  $h^9$  but in order to positively lock the parts in that position when desired the following device is provided.

The curved hand levers  $h^9$  of the rock shaft  $h^4$  are provided with ratchet teeth or notches  $h^{10}$  and extending across the end of the wagon or carriage to the sides thereof is a shaft  $i$  which is revolubly mounted in bearings provided in hangers or brackets  $i^*$  from



the buffer beam  $a'$  and on each end of this shaft is fixed by one extremity a U shaped arm  $i'$  formed with a laterally projecting tooth or detent  $i^2$  adapted to engage the teeth or notches  $h^{10}$  of the corresponding hand lever  $h^9$ .

The U shaped arms  $i'$  are adapted to be turned into such a position that their teeth or detents  $i^2$  engage the teeth or notches  $h^{10}$  of the hand levers  $h^9$  when they act to positively retain said hand levers and consequently the movable jaw  $h$  and coupling hook  $d$  in their depressed position out of action as shown at Fig. 6 by which means the coupling may be rendered inoperative when desired.

The U shaped arm forms a counterweight so that in its turned back position as shown at Figs. 1 to 4 it forms a counterweight to hold the tooth or detent  $i^2$  out of action or said arm might be otherwise counterweighted or the tooth or detent otherwise held out of action.

The coupling hooks  $d$  may be employed in connection with the ordinary chain coupling when desired while the coupling may be rendered hand operative when necessary.

By the means hereinbefore described a simple inexpensive and reliable coupling is obtained which whether worked automatically or by hand may be operated from either side of the carriage and the uncoupling or coupling effected by one person by the use of one hand thereby avoiding the necessity for the railway men passing between the carriages and the consequent risk of injury and economizing labor while the double construction that is the employment of a double set of hooks  $d$  and  $e$  affords great security against the breaking apart of the carriages or wagons.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed we declare that what we claim is

1. In an automatic coupling a broad hook mounted centrally upon each carriage with capability of movement longitudinally of the carriage, springs acting to support the same against inward pressure so that they will act as buffers, coupling hooks adapted to engage the broad hooks, shoulders upon the drawbar, connections from the broad hooks to the drawbars adapted to act upon said shoulders in the drawing direction and means for bringing the coupling hooks into and taking them out of engagement with the broad hooks substantially as herein shown and described and for the purpose stated.

2. In an automatic coupling a broad hook mounted centrally upon each carriage, a pivotally mounted broad jaw beneath each broad hook, a pivotally mounted coupling

hook supported by each jaw and adapted to engage the opposite broad hook, flexible connections between the broad jaws and the coupling hooks, means for holding the broad jaws in their raised positions and means for depressing the same from either side of the carriage substantially as herein shown and described and for the purpose stated.

3. In an automatic coupling a broad hook mounted centrally upon each carriage, a broad jaw loosely mounted upon a cross shaft beneath each broad hook, a pivotally mounted coupling hook supported by each jaw and adapted to engage the opposite broad hook, flexible connections between the broad jaws and the coupling hooks, a cross shaft loosely carrying each broad jaw and extending to the sides of the carriage, a downwardly cranked loop from the broad jaw, a spring constantly pressing on said loop in one direction to raise the jaw, an offset from the cross shaft engaging the other side of said loop and adapted to move it in the other direction to depress the jaw, a hand lever fixed on each end of the cross shaft at each side of the carriage and means for locking the hand levers in the position to which they have been turned substantially as herein shown and described and for the purpose stated.

4. In an automatic coupling a broad hook mounted centrally upon each carriage, a broad jaw loosely mounted on a cross shaft beneath each broad hook, a pivotally mounted coupling hook supported by each jaw and adapted to engage the opposite broad hook, flexible connections between the broad jaws and the coupling hooks, a cross shaft loosely carrying each broad jaw and extending to the sides of the carriage, a downwardly cranked loop from the broad jaw, a spring constantly pressing on said loop in one direction to raise the jaw, an offset from the cross shaft engaging the other side of said loop and adapted to move it in the other direction to depress the jaw, a curved hand lever fixed on each end of the cross shaft notches in the curved part of each lever, a second cross shaft extending to the sides of the carriage and having counterweighted arms fixed upon the ends thereof each provided with a tooth adapted to engage the notches of the hand levers substantially as herein shown and described and for the purpose stated.

In witness whereof we have hereunto set our hands in the presence of two witnesses.

JAMES RILEY.

FREDERICK ALFRED SPIERS.

Witnesses:

C. MELBOURNE WHITE,

JAMES A. HUDSON.