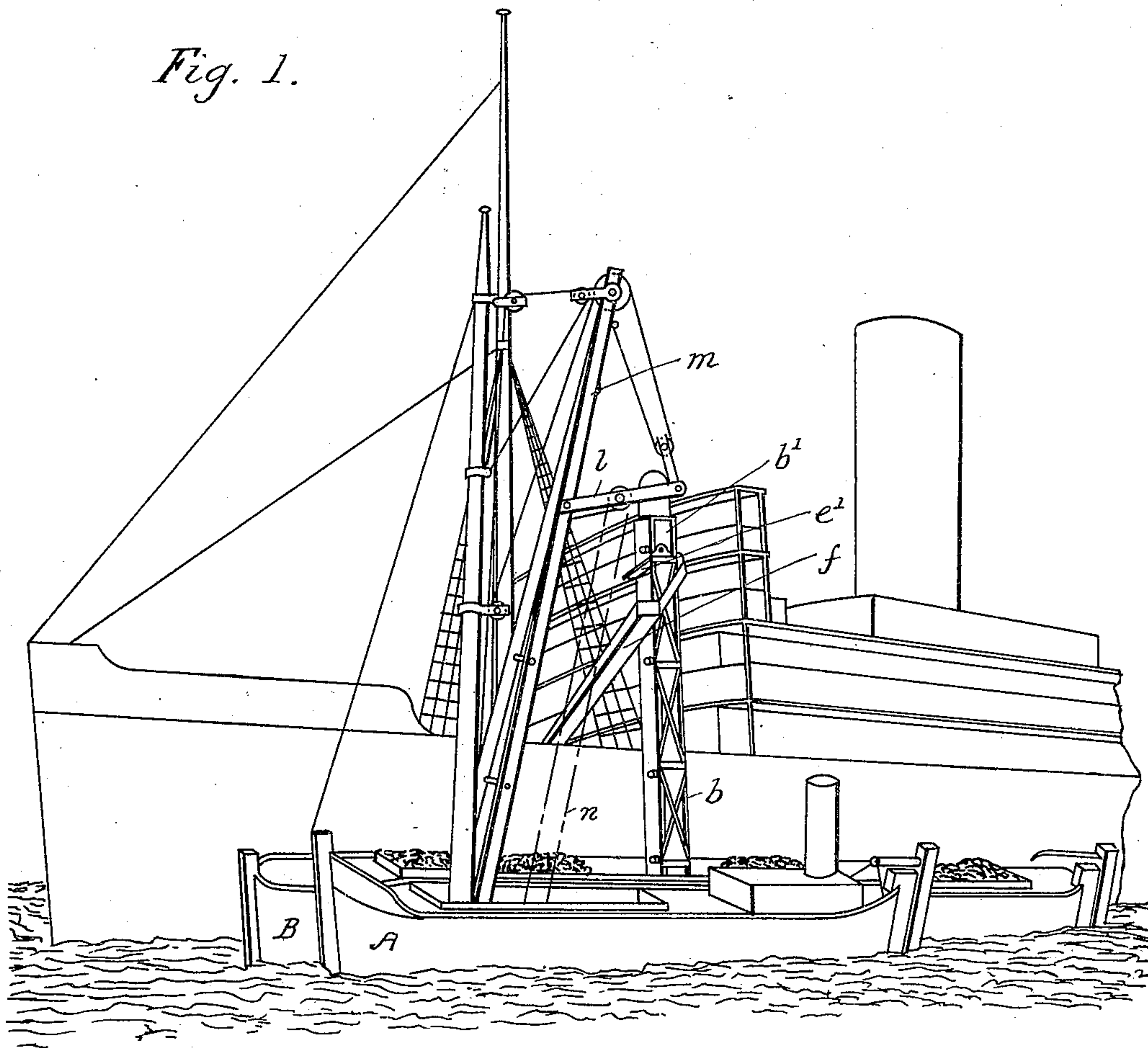


APPARATUS FOR TRIMMING AND ELEVATING COAL AND THE LIKE.

922,387.

7 SHEETS—SHEET 1.



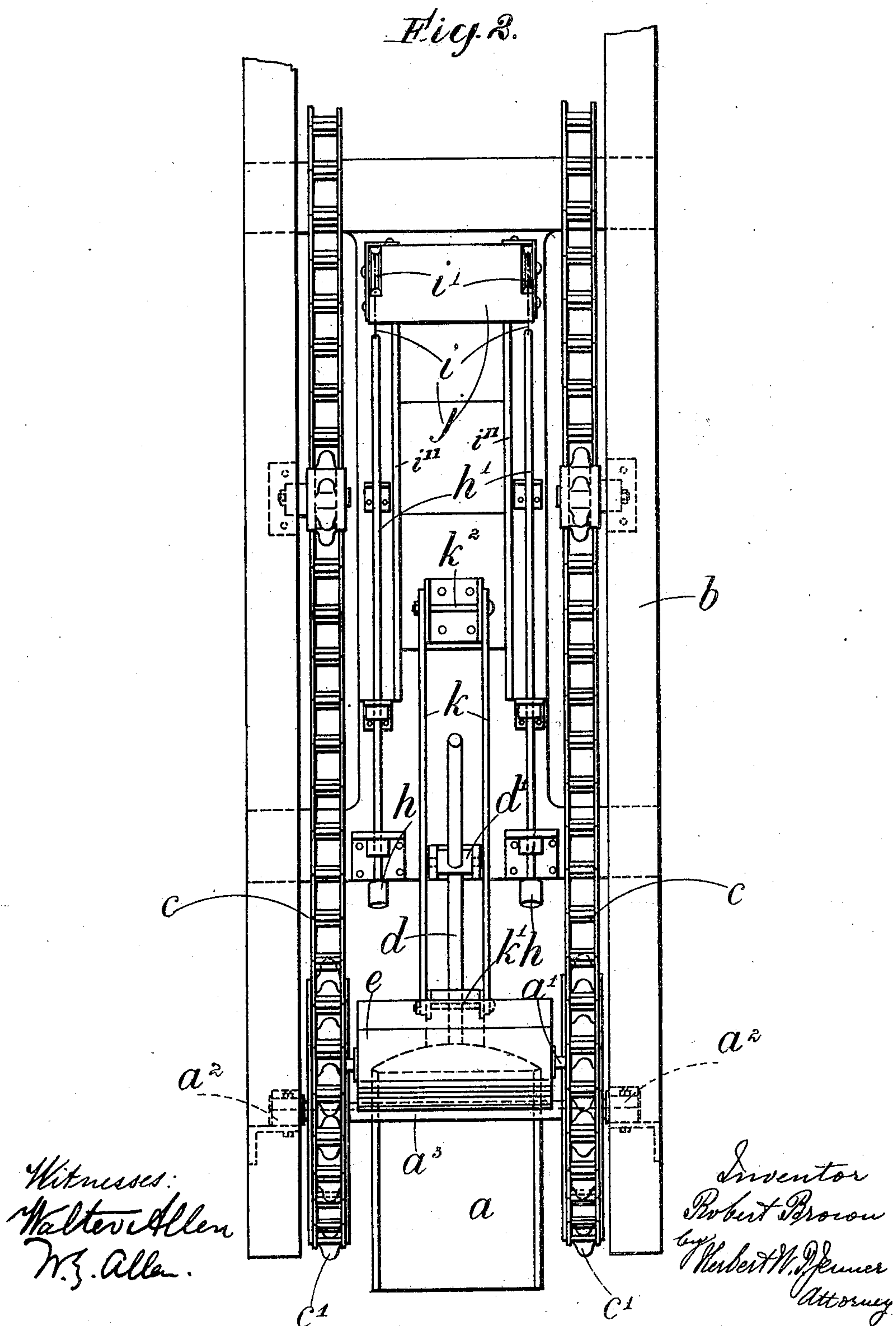
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APPARATUS FOR TRIMMING AND ELEVATING COAL AND THE LIKE,
APPLICATION FILED SEPT. 5, 1908.

Patented May 18, 1909.

7 SHEETS—SHEET 2.



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APPARATUS FOR TRIMMING AND ELEVATING COAL AND THE LIKE.

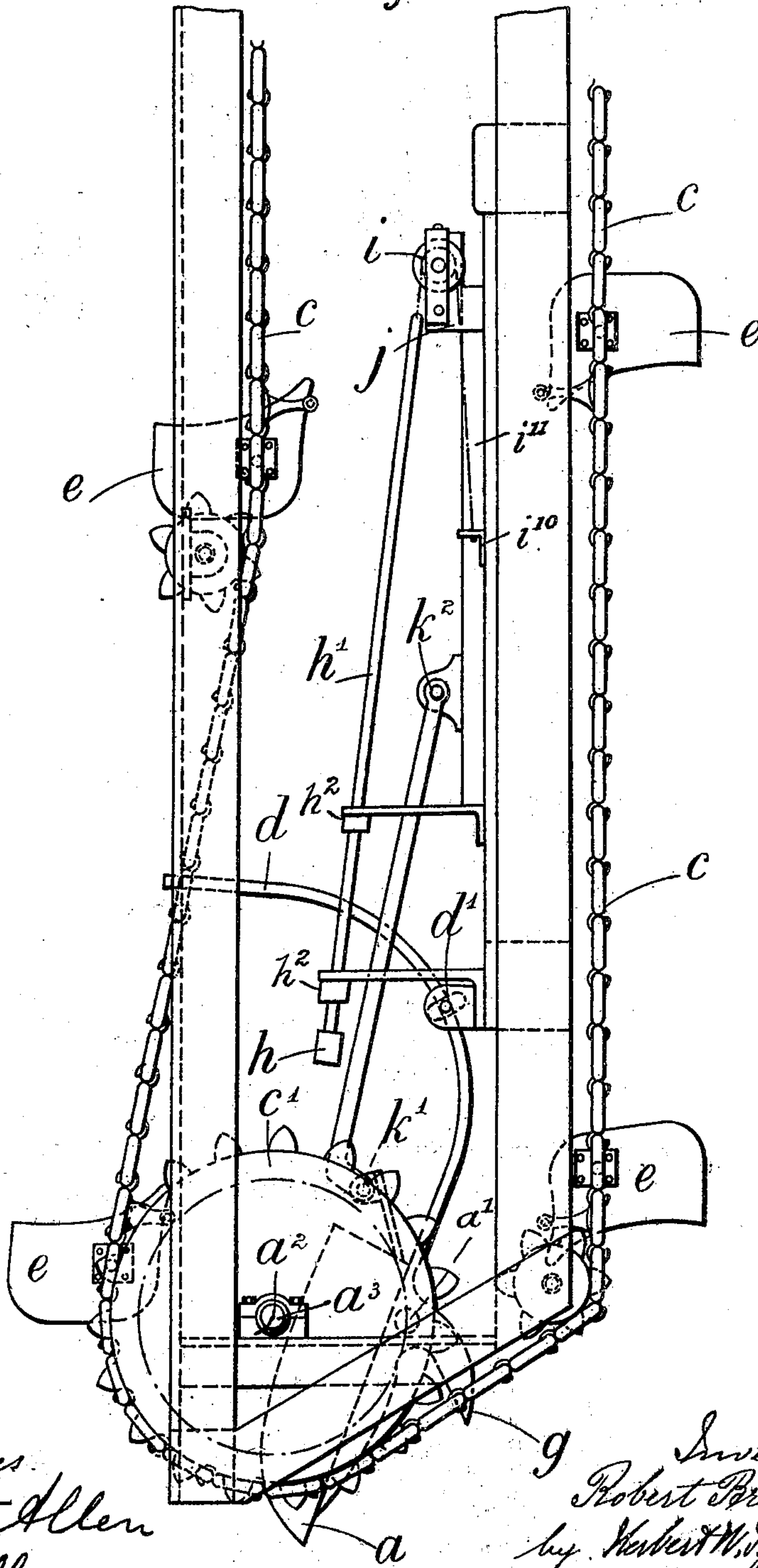
APPLICATION FILED SEPT. 5, 1908.

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7 SHEETS—SHEET 3.

Fig. 3.



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7 SHEETS—SHEET 4.

Fig. 4

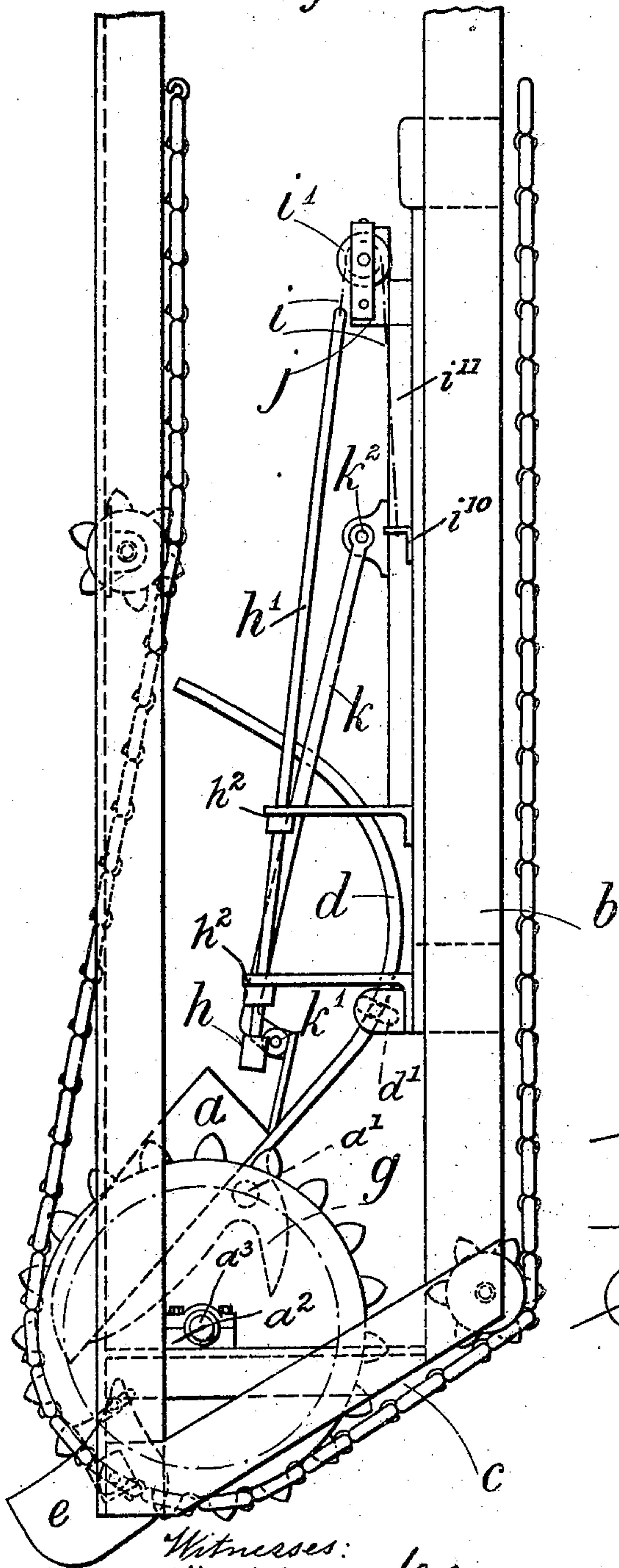
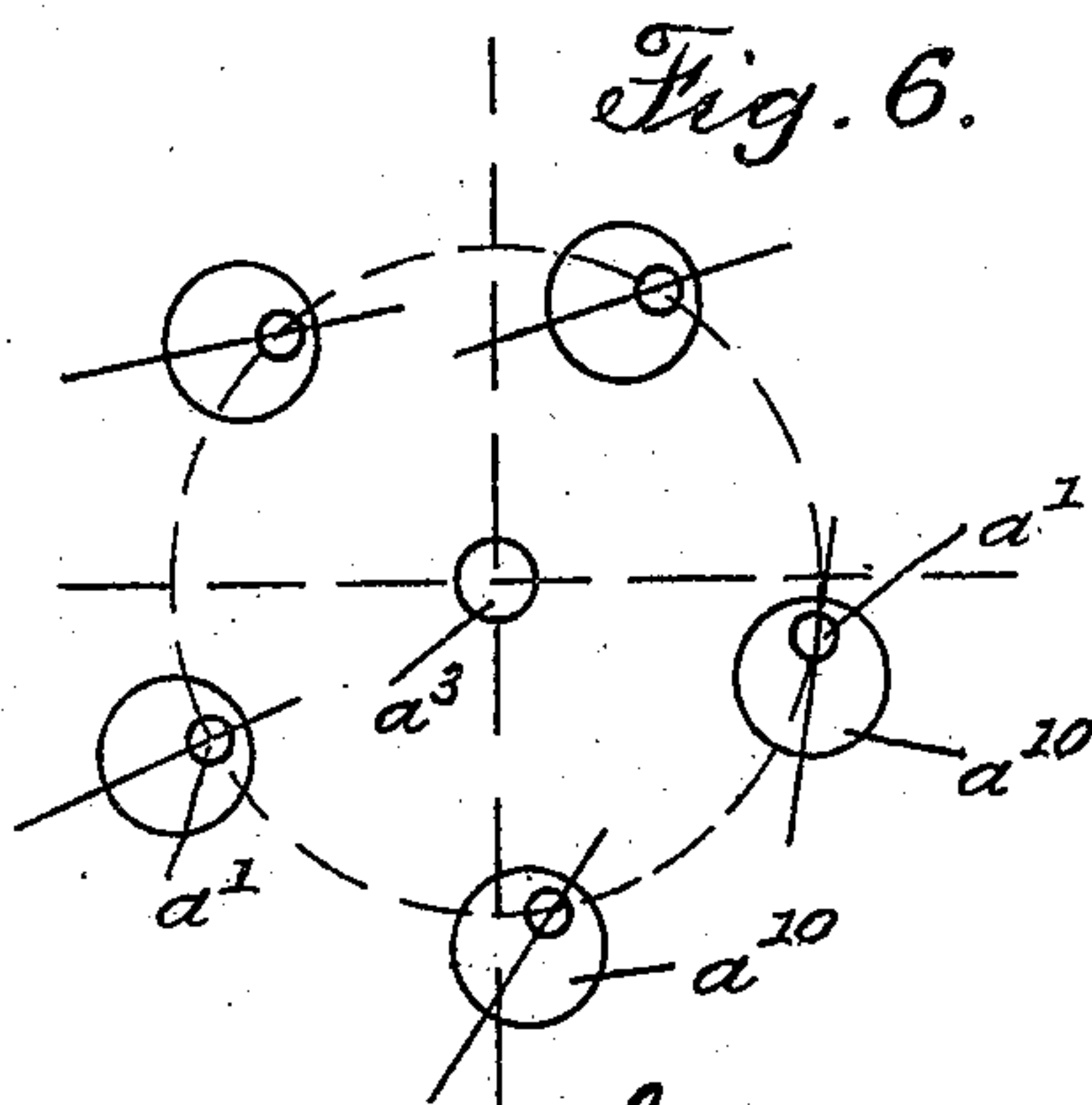


Fig. 6.



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APPARATUS FOR TRIMMING AND ELEVATING COAL AND THE LIKE.

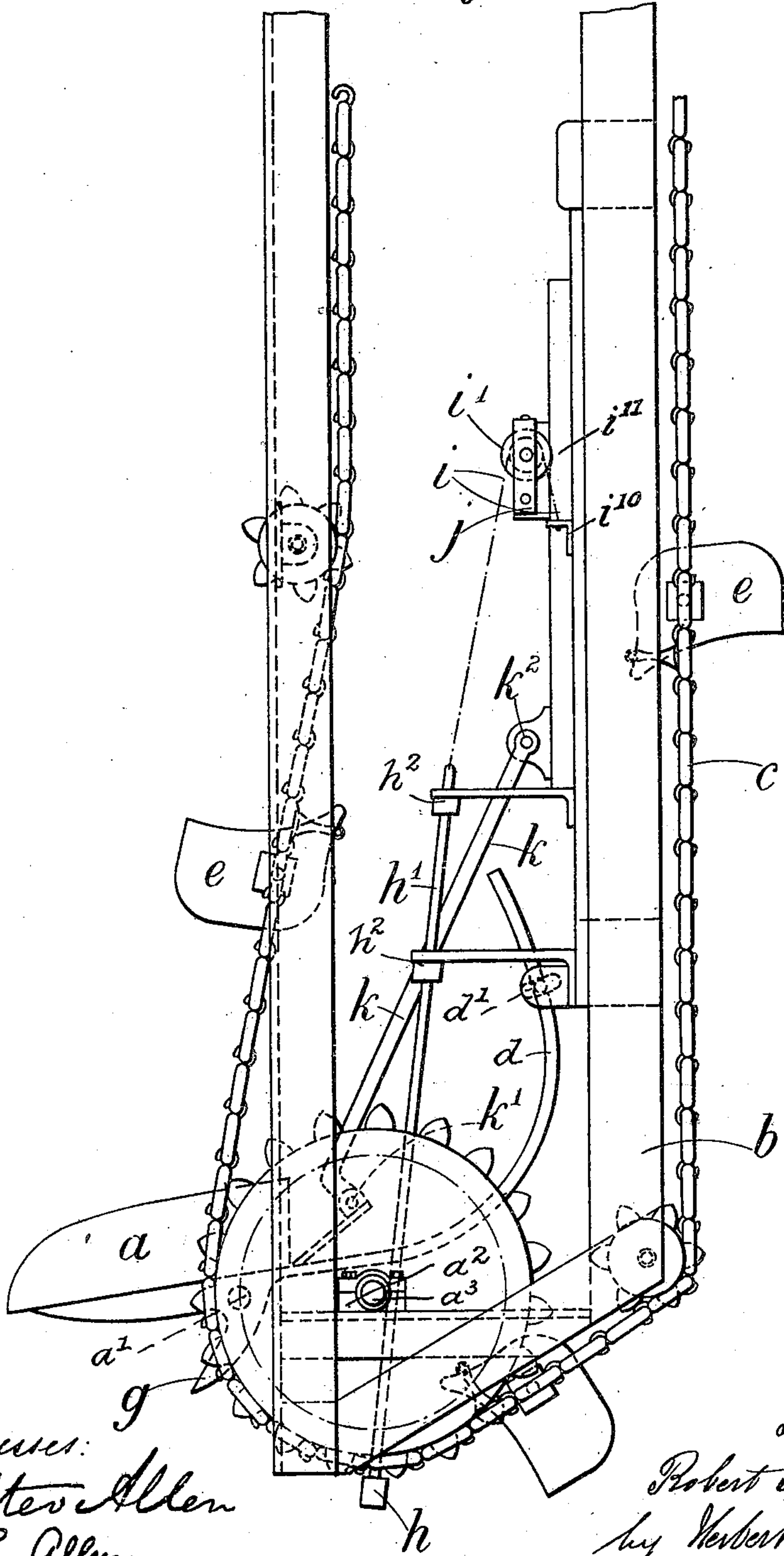
APPLICATION FILED SEPT. 6, 1908.

922,387.

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7 SHEETS—SHEET 5

Fig 5



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APPARATUS FOR TRIMMING AND ELEVATING COAL AND THE LIKE.

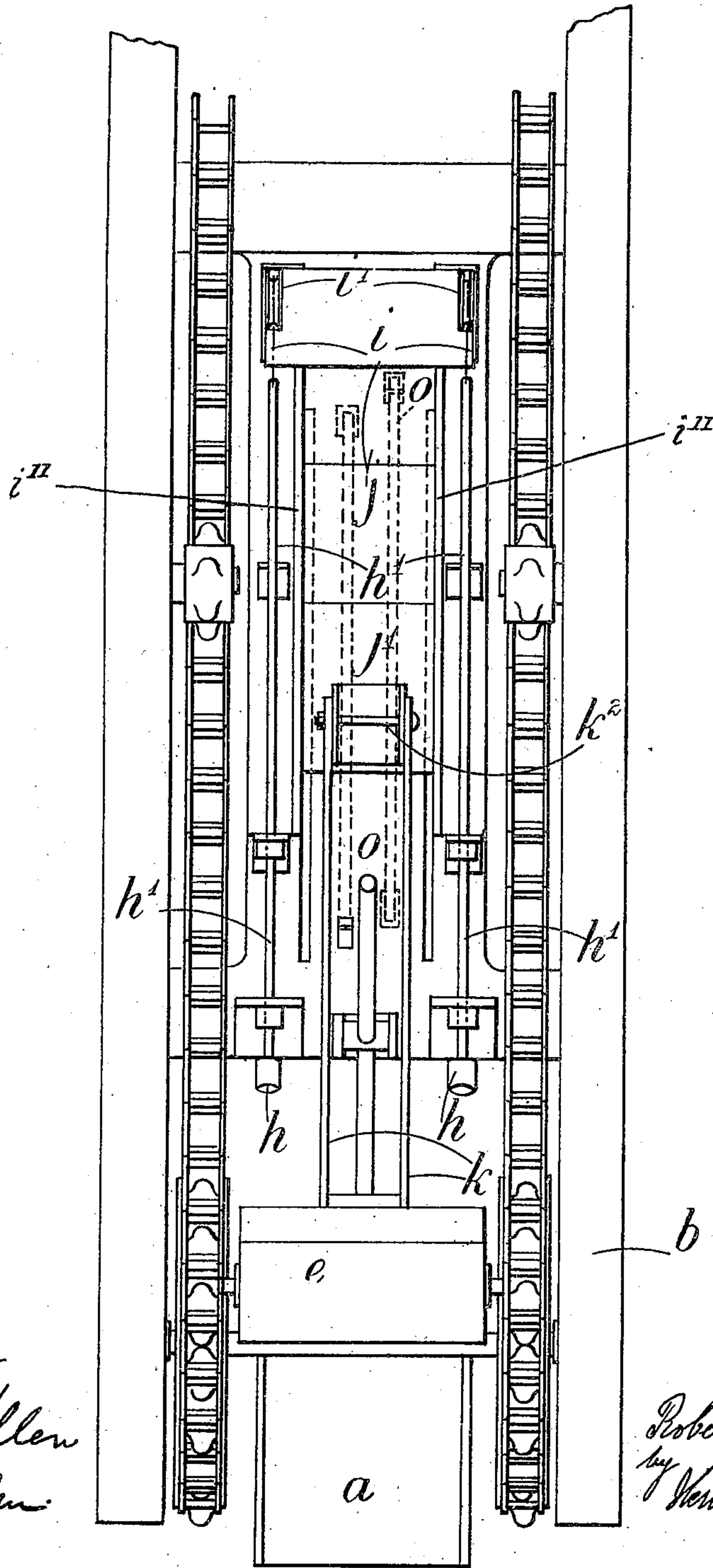
APPLICATION FILED SEPT. 5, 1908.

922,387.

Patented May 18, 1909.

7 SHEETS—SHEET 6.

Fig. 7.



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922,387.

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7 SHEETS—SHEET 7.

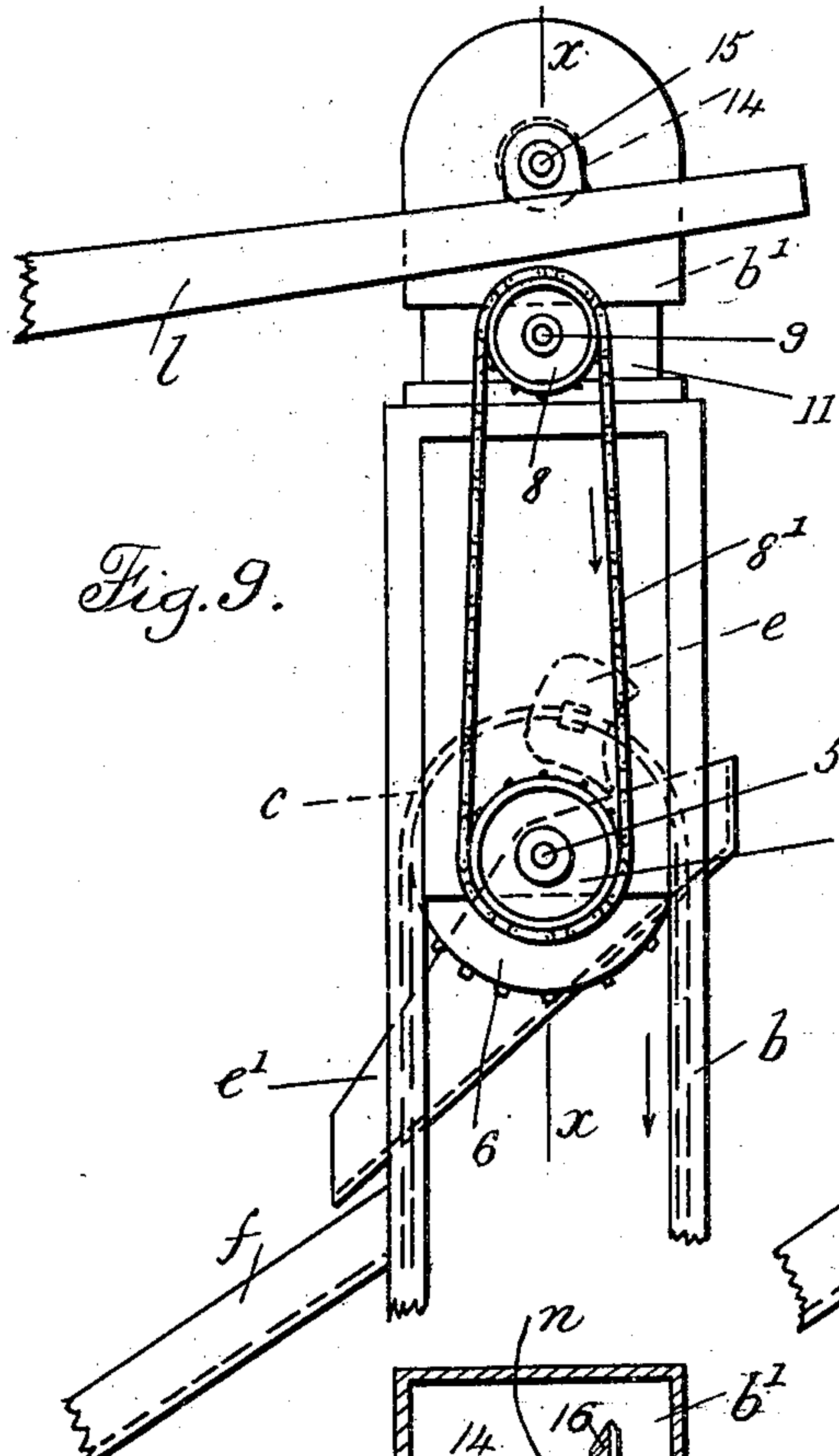


Fig. 9.

Fig. 11.

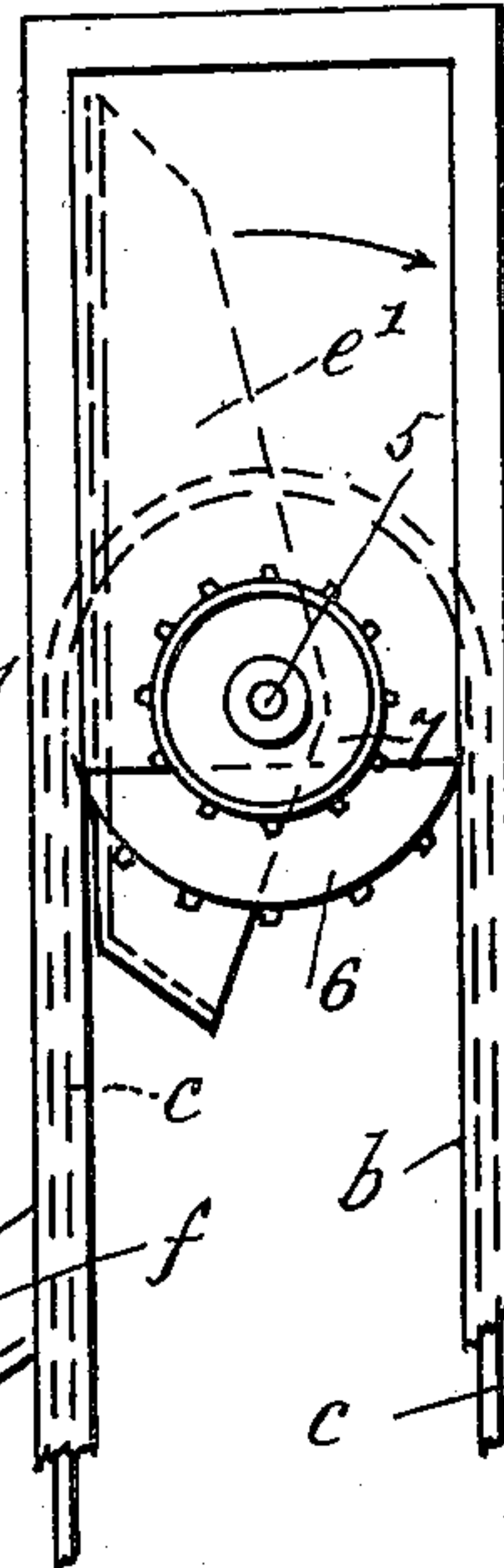


Fig. 8.

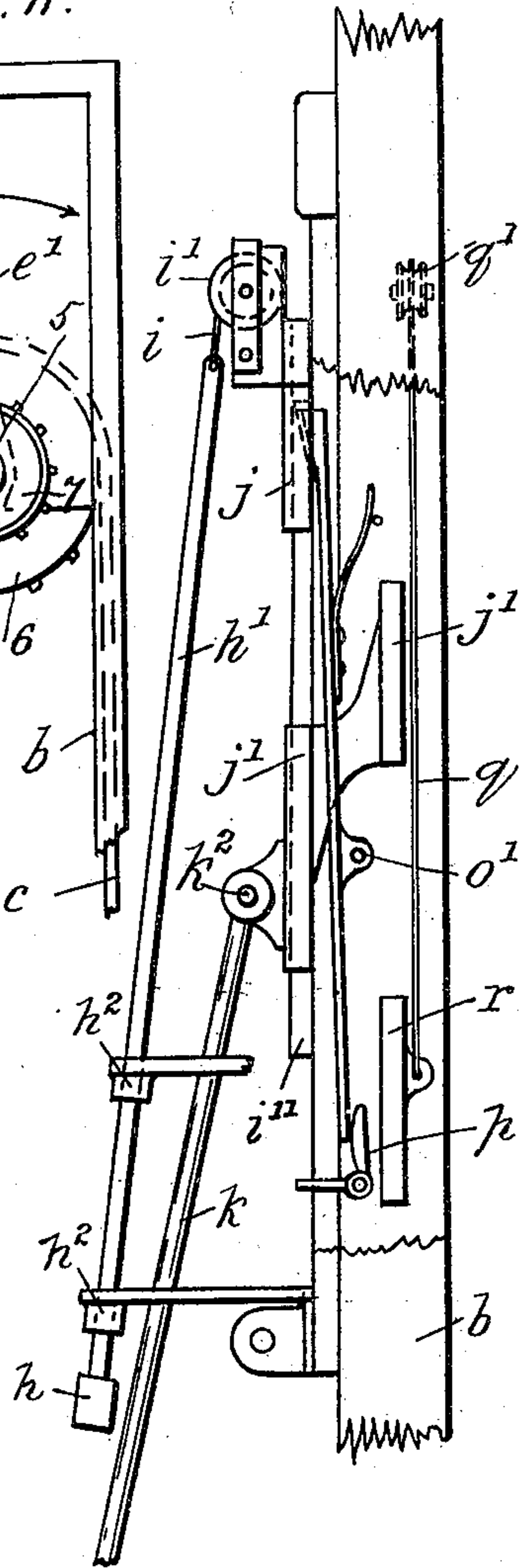
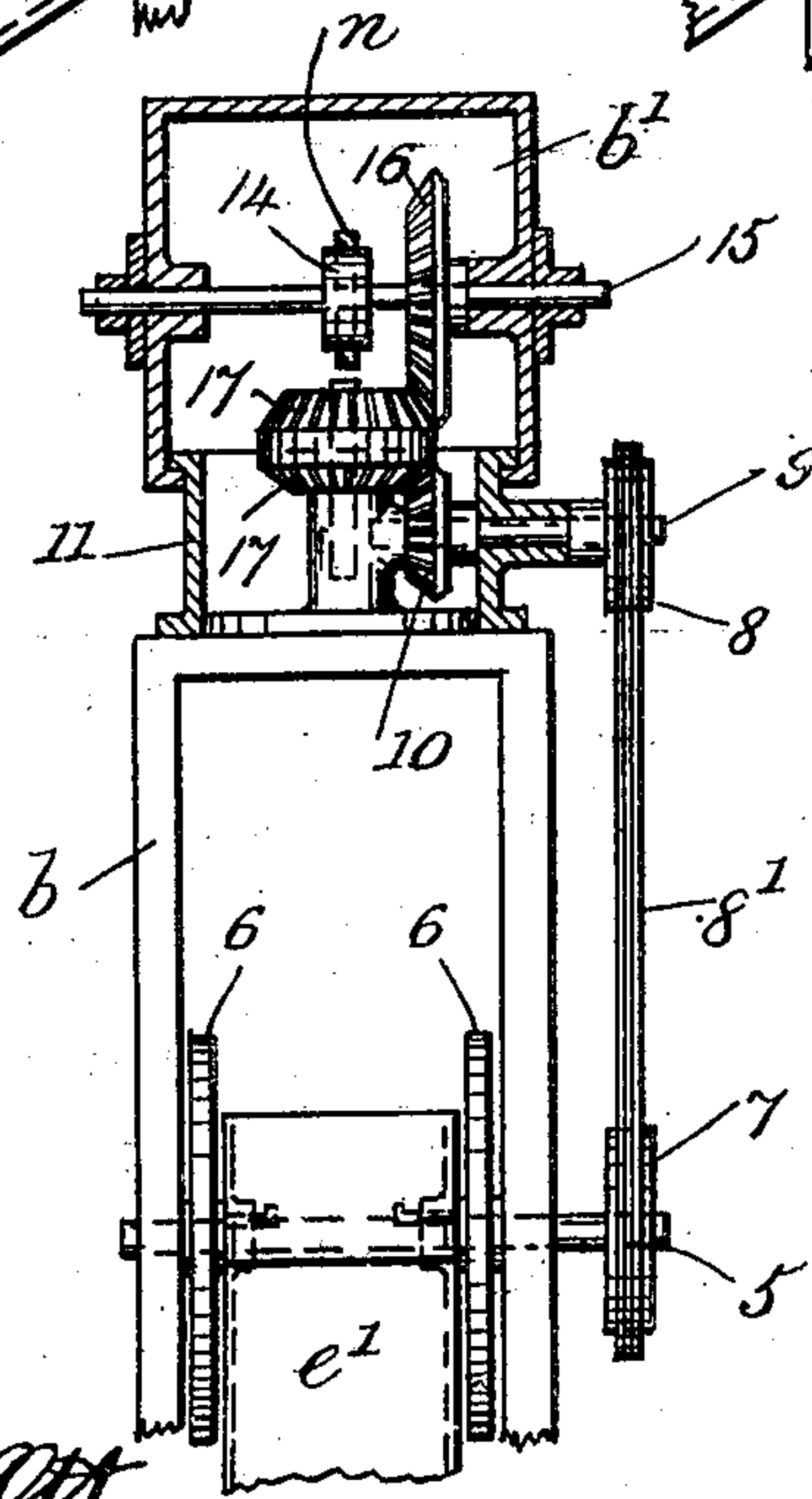


Fig. 10.



Witnesses

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR TRIMMING AND ELEVATING COAL AND THE LIKE.

No. 922,387.

Specification of Letters Patent.

Patented May 18, 1909.

Application filed September 5, 1908. Serial No. 451,913.

To all whom it may concern:

Be it known that I, ROBERT BROWN, a subject of the King of Great Britain and Ireland, residing at Liverpool, England, have invented certain new and useful Improvements in Coal-Elevators, of which the following is a specification.

This invention relates to a new or improved method of and means for trimming and elevating coal and the like, the object being to provide a comparatively simple and efficient contrivance whereby, for example, coal or the like may be quickly and readily unloaded from a barge or the like and transferred to the hold of a vessel or other required place.

In carrying this invention into practical effect, it consists essentially of a scoop or shovel designed to dip into the coal with a scoop-like movement thereby raising a certain quantity which it tilts into one of a convenient number of traveling receptacles which is raised to the required height, and in turn discharges its contents into a second shovel or the like which allows the coal to travel down a suitably arranged chute conveying it to the required position. Suitable hammers or the like are arranged in conjunction with the device for breaking any large coal which might be encountered while means is provided for bringing the coal behind the scoop into position ready for the next stroke.

In order that this invention may be more fully understood, it will now be described with reference to the accompanying drawings in which:—

Figure 1 is a general diagrammatic view illustrating the manner in which this apparatus is employed for transferring coal from a barge to a ship, Fig. 2 is a front elevation of the lower part of the device constructed according to this invention, Fig. 3 is a side elevation thereof, Figs. 4 and 5 are similar views to Fig. 3 with the part in various positions, Fig. 6 is a diagram illustrating a cycle of movements hereinafter referred to. Fig. 7 is a similar view to Fig. 2 showing additional details of hammer mechanism hereinafter described. Fig. 8 is a detail side view of portions of the hammer mechanism, parts of the frame and the guide i^{11} being broken away. Fig. 9 is a side view of the discharg-

ing devices at the top of the elevator at the time the coal falls from the elevator bucket. Fig. 10 is a section taken on the line $x-x$ in Fig. 9. Fig. 11 is a side view of a portion of the frame and the revolving chute, showing the latter in a different position from that shown in Fig. 9.

As shown in the drawings, the shovel or scoop a is carried upon a crank a^1 mounted in bearings a^2 at the lower extremity of a frame b , the crank shaft a^3 being revolved through chains c and gearing c^1 from a suitable driving pulley at the upper extremity of the frame b , the shovel or scoop a being furnished with a curved guide d designed to slide through a plate d^1 so mounted that as the shovel a commences its downward travel, as shown in Fig. 4, it is tilted upon the crank a^1 into an approximately vertical position as shown in Fig. 3 and as the travel further progresses, and the shovel a passes through the coal, it is gradually returned to the horizontal as shown in Fig. 5, thereby lifting a certain quantity of coal.

As the shovel is raised, one of a series of buckets or receptacles e carried by the endless driving chain c is brought beneath the front of the shovel a which, as it assumes the position shown in Fig. 4 deposits the coal into the bucket e which is lifted to the top of the frame b and as it turns over the upper driving wheel, deposits its contents into a small chute e^1 (Fig. 1) carried by the spindle of the upper driving wheel and revolving therewith, this small chute arriving at the position shown in Fig. 9 as the bucket tilts over, at which time the said bucket deposits its contents into the said chute which in turn discharges the coal which the bucket has deposited therein on to a suitably arranged main chute f (Fig. 1) and the buckets e are so arranged upon the chain c as to come in turn beneath the shovel or scoop a at the moment the latter is ready to deposit its contents therein, while similarly the buckets reach the chute e^1 at the moment the latter is in a position to receive their contents.

The shovel or scoop a carries on its under surface a series of claws g designed to engage the coal directly behind the shovel or scoop and bring it forward ready for the next stroke of the shovel as hereinbefore mentioned, these claws g also serving to facili-

tate the easy operation of the device by affording a clear passage for the shovel or scoop. It is preferred that the shovel or scoop *a* and claws *g* be flexibly mounted in a suitable manner in order to "give" in the event of too heavy material being encountered.

The crank *a*¹ is arranged below the rear end portion of the scoop *a*, so that the scoop may be tilted over in a similar manner to the eccentrics *a*¹⁰ shown in the diagram, in Fig. 6, which illustrates five different positions of the scoop around the crank-shaft.

Hammers *h* are provided to break up the large material. Each hammer *h* is carried by a bar *h*¹ which slides in guides *h*² secured to the frame *b*, see Fig. 8. A cord or chain *i* is secured to the top of each hammer-bar and passes over a sheave *i*¹ which is journaled in a bracket secured to a mounting *j*. The other end of the cord or chain is secured to a bracket *i*¹⁰ which is fastened to the frame *b*, see Fig. 4. The mounting *j* slides between vertical guides *i*¹¹ on the frame *b*. These guides are of any approved construction, and they prevent the mounting from moving except in a vertical direction. A sliding block *j*¹ is also slidable in the said guides below the mounting *j*, and is operated by a connecting-rod *k*, pivoted to the said block at one end by a pin *k*² and having its lower end pivoted to the shovel *a* by a pin *k*¹.

The hammer and the mounting *j* are raised by the upward movement of the block *j*¹ which pushes up the mounting. A spring-actuated catch *o* is pivoted at its middle part to the frame *b* by a pin *o*¹, and this catch retains the mounting and hammer in their raised position. A trigger *p* is pivoted to the frame *b* below the block *j*¹, and when the said block approaches the lower end of its travel it strikes this trigger, and moves the catch out of engagement with the mounting, thereby permitting the said mounting and hammer to descend suddenly by gravity.

Additional hammers, similar to the hammers *h*, may be operated by a sliding member *j*² secured to the sliding member *j*¹ and operating a sliding block *r*. The block *r* is attached to a flexible connection *q* which passes over a pulley *q*¹ and which is secured to a hammer in a similar manner to the connection *i* which is secured to the hammer *h*.

The frame *b* is revoluble in an upper frame *b*¹ from which it is suspended. The upper frame is supported by the derrick arm 1. The small chute *e*¹ is secured to the shaft 5 at the head of the conveyer, see Fig. 9. A driving wheel 14 is secured on a shaft 15 which is journaled in the frame *b*¹ as shown in Fig. 10. A train of beveled toothed wheels 16, 17, 17 and 10, transmits the motion of shaft 15 to shaft 9 which is journaled in the top part 11 of the frame *b*. The shaft 9 has

a sprocket-wheel 8 secured on it, and a drive-chain 8¹ passes over the wheel 8 and over a sprocket-wheel 7 secured on the shaft 5. The shaft 5 is journaled in the frame *b*, and it has a driving drum or wheels 6 secured on it which operates the elevator chains *c*.

The derrick *m* is mounted in a tender A which is secured on one side of the barge B which is to be unloaded. The elevator may be driven from an engine in the tender A by means of a belt or drive chain *n*.

What I claim is:

1. In a coal elevator, the combination, with a frame, and an endless driving chain provided with lifting-buckets and supported in the said frame; of a crank driven by the lower end portion of the said chain, a guide carried by the said frame, and a scoop operated by the said crank and provided with a curved guiding-arm which is slidable in the said guide, said scoop being arranged to discharge the coal into the said buckets one after the other.

2. In a coal elevator, the combination, with an endless driving chain provided with lifting-buckets, of a crank driven by the lower end portion of the said chain, a scoop operated by the said crank and arranged to discharge the coal into the said buckets one after the other, a shaft driven simultaneously with the upper end portion of the said chain, and a chute carried by the said shaft and arranged to receive the coal from the said buckets one after the other.

3. In a coal elevator, the combination, with an endless driving chain provided with lifting-buckets, of a crank driven by the lower end portion of the said chain, and a scoop provided with claws on its under or rear side for engaging with the coal, said scoop being operated by the said crank and arranged to deliver the coal into the said buckets one after the other.

4. In a coal elevator, the combination, with a frame, and an endless driving chain supported in the said frame; of a crank driven by the lower end portion of the said chain, a scoop operated by the said crank and arranged to discharge the coal into the said buckets one after another, a guide carried by the said frame, a hammer slidable in the said guide and arranged to strike the coal below the said scoop, and driving mechanism for operating the said hammer connected with the said scoop.

5. In a coal elevator, the combination, with a frame, and an endless driving chain supported in the said frame; of a crank driven by the lower end portion of the said chain, a scoop operated by the said crank and arranged to discharge the coal into the said buckets one after another, a guide carried by the said frame, a hammer slidable in the said guide and arranged to strike the coal

below the said scoop, driving mechanism for
raising the said hammer operatively connect-
ed with the said scoop, a catch for retaining
the hammer in its raised position, and trip-
5 mechanism operatively connected with the
said scoop and arranged to release the ham-
mer from the catch at prearranged intervals.

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

ROBERT BROWN.

Witnesses:

JOHN A. KEATING,
WM. PIERCE.