

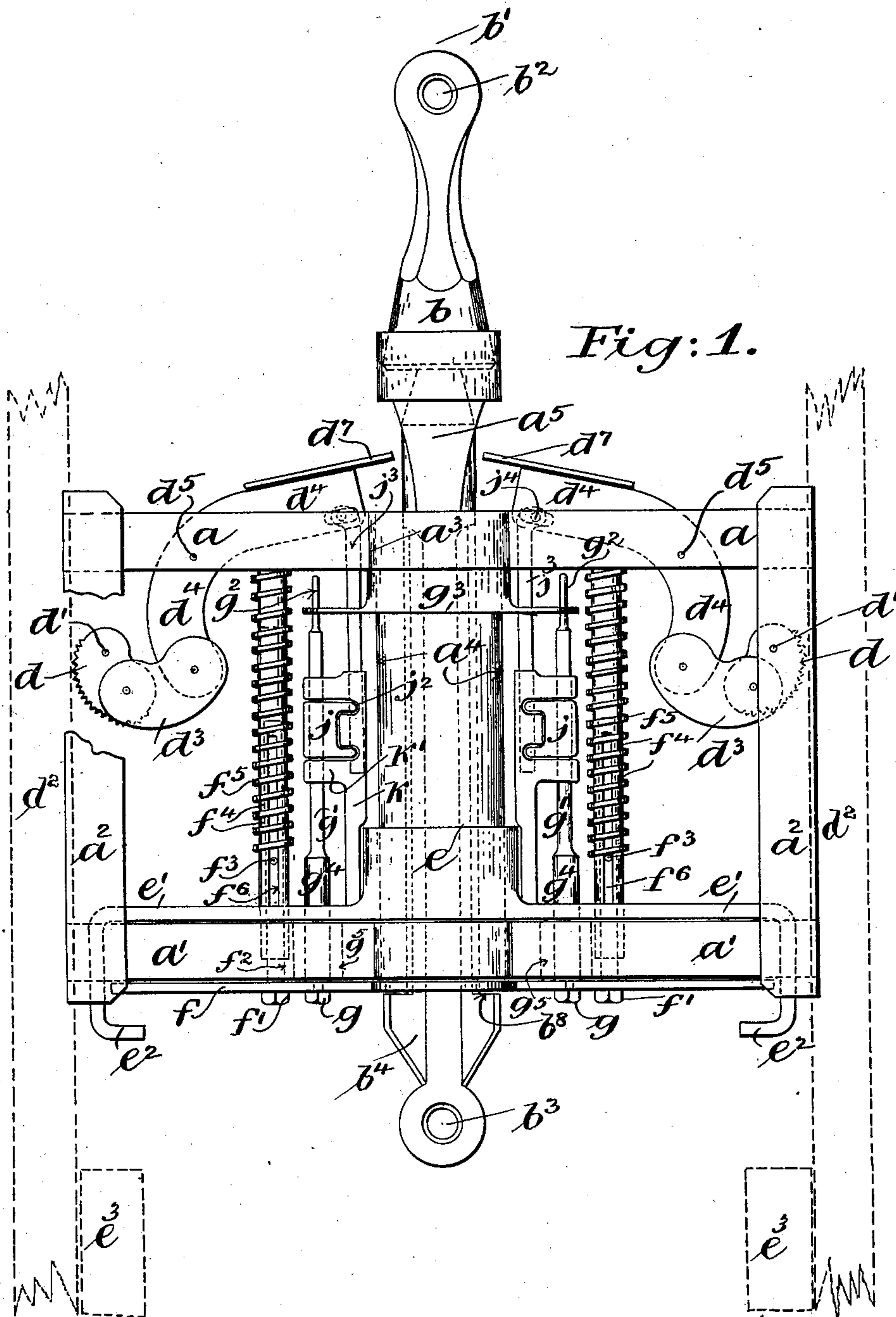
M. H. READ.

SAFETY DEVICE FOR HOISTING APPARATUS.

APPLICATION FILED NOV. 14, 1902.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses:  
J. M. Kuchner  
J. M. Downing

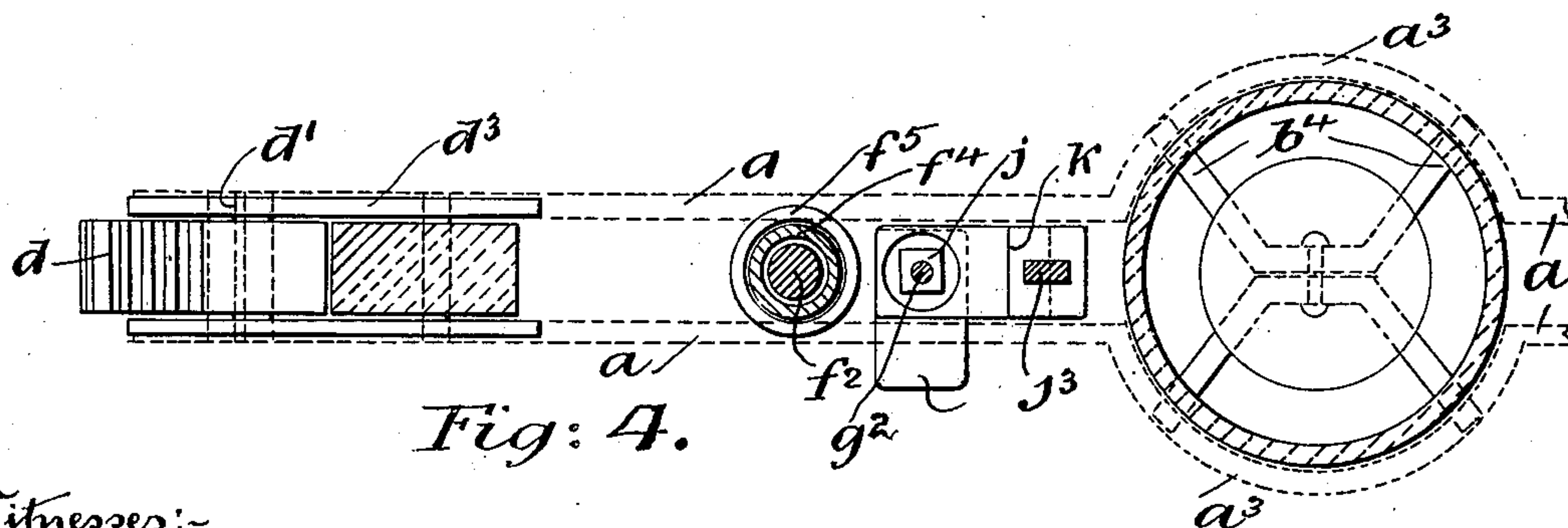
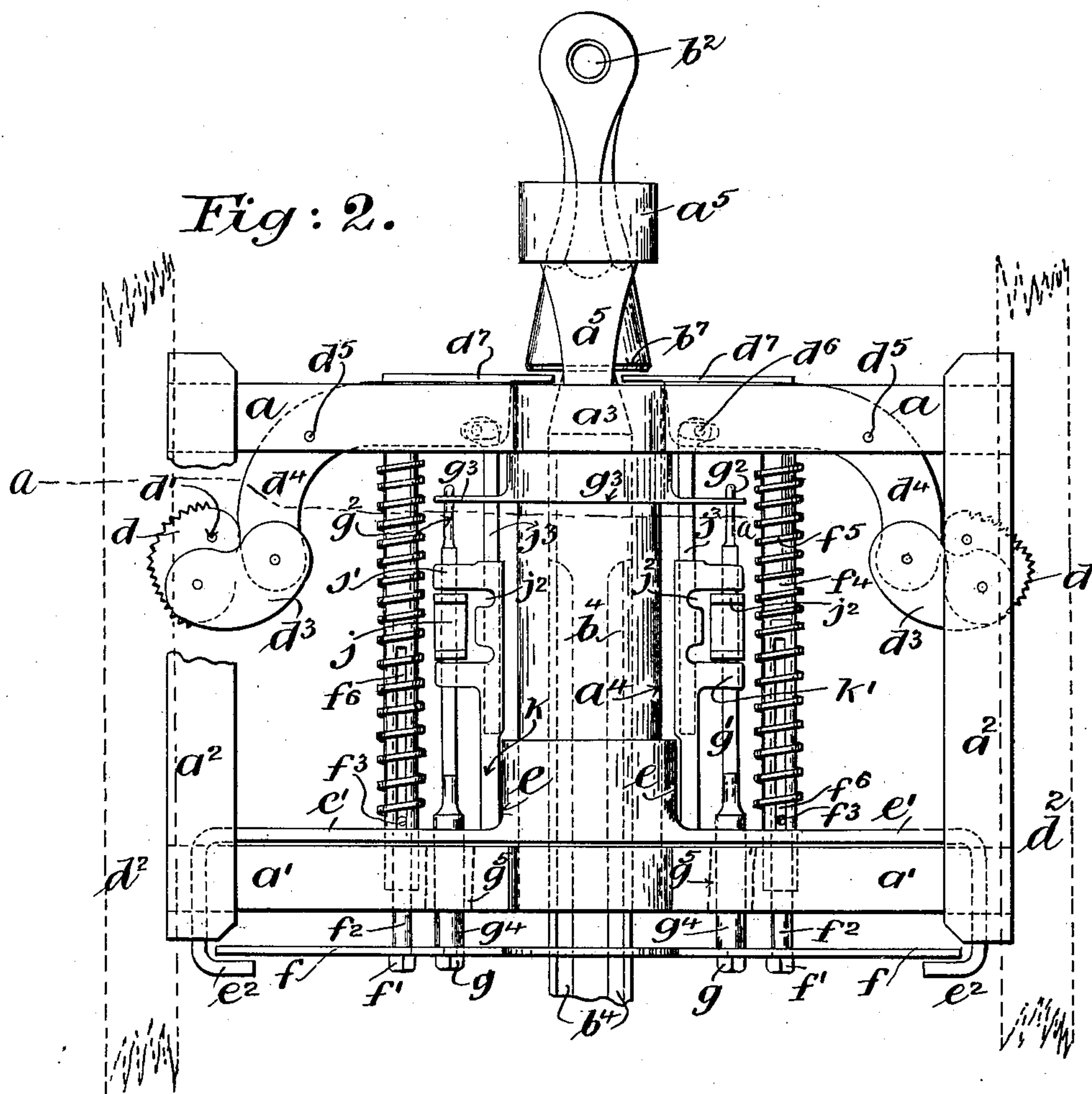
Inventor  
Matthew Henry Read  
By *[Signature]*  
ATTORNEYS

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4 SHEETS—SHEET 2.



Witnesses:-

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No. 744,233.

PATENTED NOV. 17, 1903.

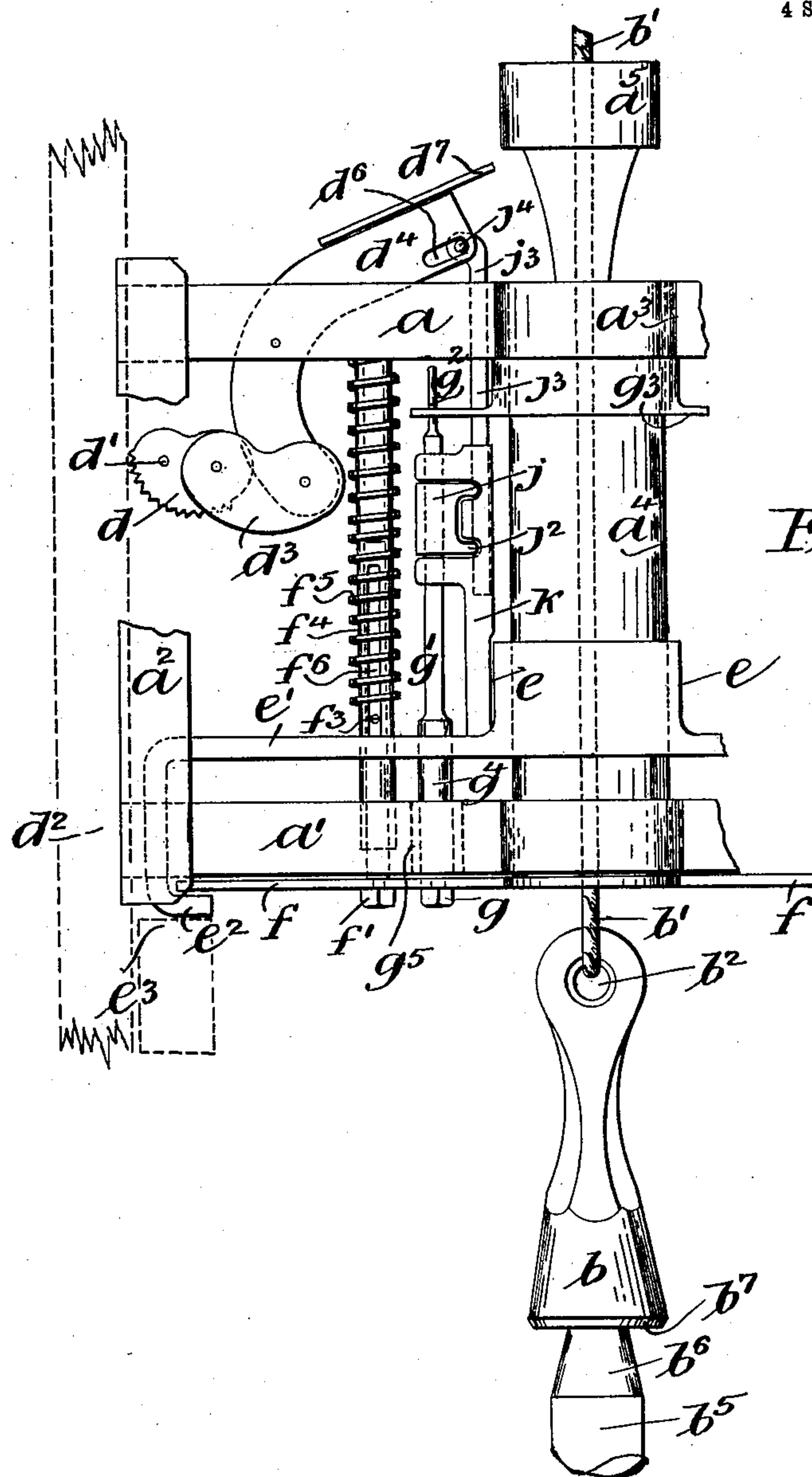
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4 SHEETS—SHEET 3.



Witnesses:

H. M. Kuchner  
J. M. Downing

Inventor:  
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No. 744,233.

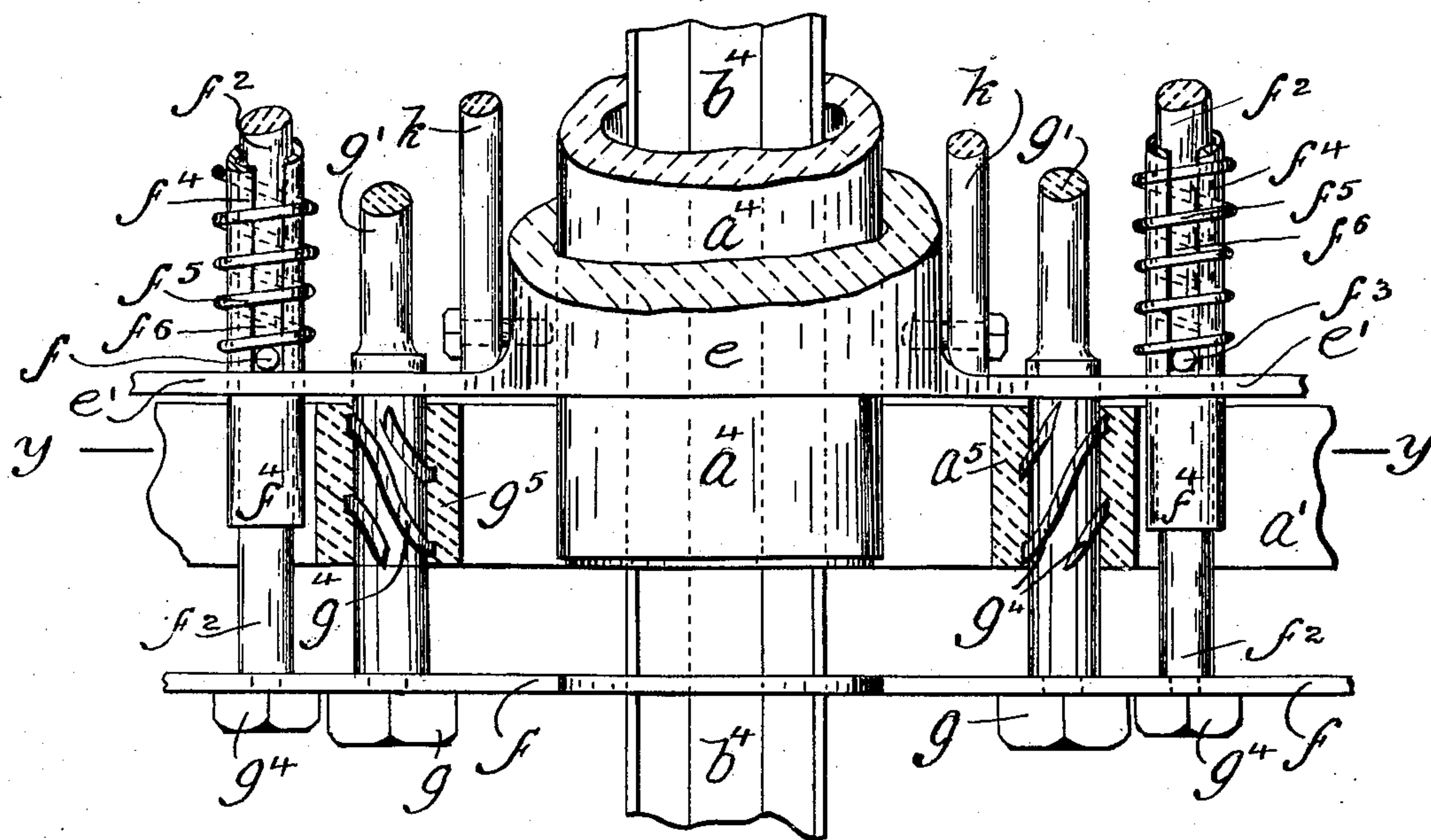
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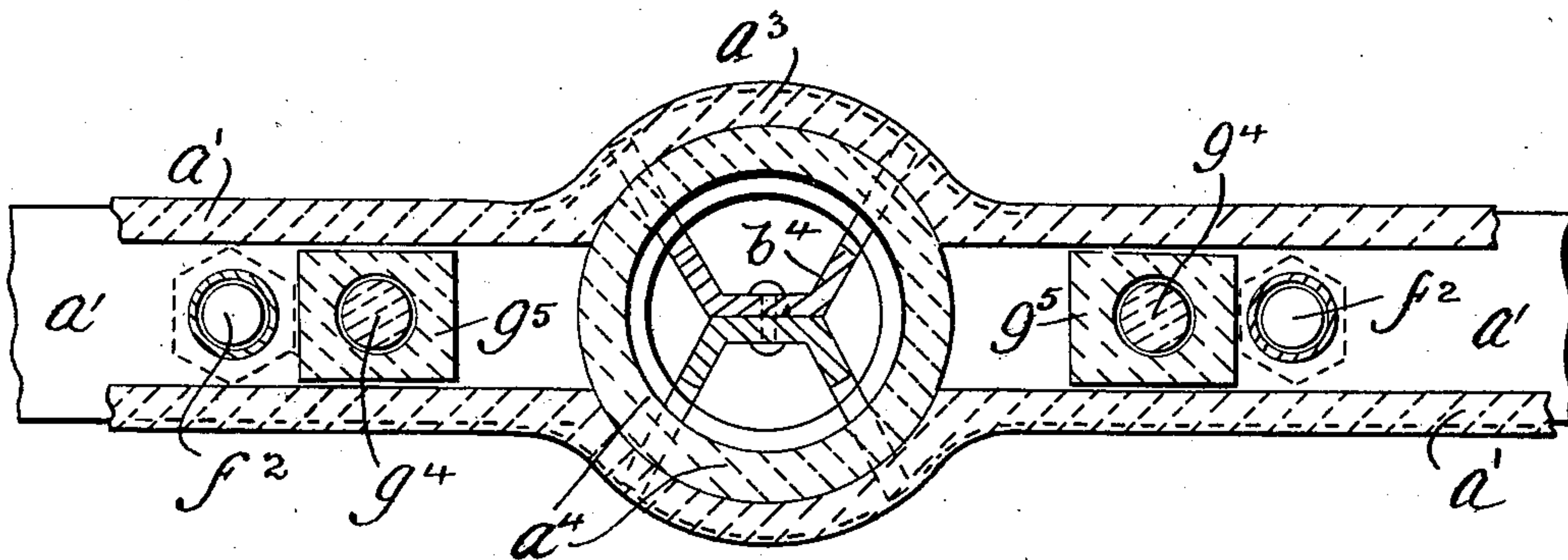
APPLICATION FILED NOV. 14, 1902.

NO MODEL.

4 SHEETS—SHEET 4.



*Fig: 5.*



*Fig: 6.*

WITNESSES

John A. Percival.

INVENTOR

Matthew Henry Read.

By Richard R.

ATTORNEYS



# UNITED STATES PATENT OFFICE.

MATTHEW HENRY READ, OF WOOLUBAR, WESTERN AUSTRALIA,  
AUSTRALIA.

## SAFETY DEVICE FOR HOISTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 744,233, dated November 17, 1903.

Application filed November 14, 1902. Serial No. 131,387. (No model.)

*To all whom it may concern:*

Be it known that I, MATTHEW HENRY READ, a subject of King Edward VII of Great Britain, residing at Woolubar, near Kalgoorlie, Western Australia, in the Commonwealth of Australia, have invented a certain new and useful Safety Device for Hoisting Apparatus, of which the following is a specification.

The object of this invention is to provide a safety monkey or haulage appliance for use in connection with mining cages, buckets, and such like haulage contrivances. The appliance is therefore employed as a safety auxiliary for such latter-named contrivances; and the invention comprises means whereby the grippers are automatically brought into action and also maintained in an idle position during hauling operations, and all as hereinafter explained.

In order that my invention and the manner of its operation may be clearly understood, reference will now be made to the attached drawings, and in same—

Figure 1 is an elevation of the safety-monkey and at its position during hauling operations, and consequently when the grippers and their interlocking and releasing mechanism are at rest. Fig. 2 is a similar view, but showing the altered position of the grippers and releasing mechanism as in action and when the hauling-rope has broken. Fig. 3 is also a similar but partly broken view and showing the position of the mechanism when the appliance is stationed at the bottom of the timbered portion of the shaft, and so allowing the coupling-bar and rope to run idly through the central sleeve for the purpose of further sinking operations to be conducted and prior to timbering. Fig. 4 is a sectional plan view of the appliance on line  $a a$  of Fig. 2. Fig. 5 is a partial side view of the appliance, but with the front plate  $a'$  removed, so as to clearly expose the spiral  $g^5$  and rod  $f^2$ , which latter works within the slotted tube  $f^4$  and carries the stop-pin  $f^3$ ; also the spiral fixed nuts  $g^5$  are shown in section. Fig. 6 is a sectional plan view on line  $y y$  of Fig. 5.

In the figures the frame which contains the operative mechanism is constructed of plate-iron or of other approved section designated by the top, bottom, and side plates, as  $a$ ,  $a'$ ,

and  $a^2$ , respectively. These top and bottom plates are provided with circular enlarged formations, as  $a^3$ , and which hold the central hollow sleeve, as  $a^4$ , and which sleeve extends between such top and bottom plates  $a$  and  $a'$ .

$b$  denotes the coupling-bar, which connects the rope, as  $b'$ , to the bucket or cage which is desired to be hauled and for which purpose it is respectively formed with the top and bottom eyes, as  $b^2$  and  $b^3$ . This bar is formed at its central part by the companion ribs, as  $b^4$ , which terminate in the circular portion  $b^5$  and taper or cut-away portion, as  $b^6$ . This bar is further provided with the top and bottom shoulder formations, as  $b^7$  and  $b^8$ , whose duty and purpose will be hereinafter explained. This bar is guided and held by the central sleeve  $a^4$  and by the extension or crown-piece  $a^5$  of the frame.

The gripper-jaws, as  $d$ , are formed with serrations, as shown, and pivoted at  $d'$  to the side plates  $a^2$  of the frame. When in operation, these jaws engage with the skids  $d^2$  of the shaft and which are shown in the drawings by broken lines. These grippers are connected to their actuating-levers by the knuckle-jointed links  $d^3$ .

The levers  $d^4$  are pivoted at  $d^5$  to the upper cross-plate  $a$  and formed with a slot, as  $d^6$ . To these levers are secured the extension-plates, as  $d^7$ , which engage with the taper portion  $b^6$  of the coupling-bar, above referred to. On the central sleeve  $a^4$  I employ the collar  $e$ , made with the extensions  $e'$ , which terminate in the turn-down formations, as  $e^2$ . These latter sustain the appliance when it is resting on the stops  $e^3$ , placed at the end of the timbered shaft and as shown in Fig. 3 of the drawings.

The interlocking and releasing mechanism for the grippers is operated by a plate-bar and which is controlled by springs. This operative plate, as  $f$ , is placed underneath the lower cross-plate  $a'$  of the appliance, and to this plate  $f$  is secured, as by nuts  $f'$ , the upwardly-extending rods  $f^2$ , and which rods carry the cross limit-pins  $f^3$ . These rods work within the tubes  $f^4$ , around which latter are placed the controlling spiral springs, as  $f^5$ , and said tubes having slots, as  $f^6$ , for the pins  $f^3$ . These springs are held within their working



limits by and between the under side of the top plate  $a$  and the stop-pins  $f^3$ , above mentioned. To this operative plate  $f$  the locking-rods  $g'$  are secured by the nuts  $g$ , and said rods, as at  $g^2$ , are held in the guide-bracket  $g^3$ , secured to and made one with the top frame-plates  $a$ , as shown. On these rods  $g'$  are formed at  $g^4$  the spiral ribs of an approved pitch, and such ribs  $g^4$  engage with and work in the correspondingly-threaded blocks  $j^5$ , which latter are secured between the lower frame-plates  $a'$ . Portions of these rods  $g'$  are made of a square section, and on such portions are loosely carried the locking-blocks  $j$ , so as to allow of the necessary up-and-down movement of such blocks. These blocks are formed with projections, as  $j'$ , which fit into and engage with corresponding recesses  $j^2$ , formed in the dropper or key rods  $j^3$ . These rods  $j^3$  are connected to the gripper-levers  $d^4$  by the pins  $j^4$ , which work in and along the slots  $d^6$ , as above referred to, and in a reciprocal manner with the radial movement of the levers  $d^4$ . These dropper-rods  $j^3$  are held in their operative positions by the bracket  $g^3$  and by the hollow guide-brackets  $k$ , which brackets are secured to the sliding collar, as  $e$  and as shown in the drawings. These brackets  $k$  are formed with the guide-checks  $k'$ , between which the locking-blocks  $j$  work, and are thereby held in position on the rods  $g'$ .

The operation of the invention is mainly as follows: During hauling operations the appliance is sustained and carried on the coupling-bar  $b$  by means of its lower shoulder  $b^8$ , and while in such position the operative mechanism is idle, and the extension-pieces  $d^7$  rest against the circular portion  $b^5$  of the coupling-bar, and the grippers are locked in their idle position—that is, prevented from action against the skids  $d^2$ . Upon the rope breaking the mechanism assumes the altered position, as shown in Fig. 2, in which case the weight of the falling cage or bucket has caused the coupling-bar  $b$  to drop, whereby its shoulder  $b^7$  engages with and presses upon the extension-pieces  $d^7$  of the gripper-levers, so resulting in such levers and connecting-links  $d^3$  forcing the gripper-jaws outward and embedding them in the skids  $d^2$ , and so arresting the further downward travel of the attached cage. In order to allow the grippers to become unlocked and ready for action, the tension is concurrently removed from the springs  $f^5$  by the removal of the sustaining-shoulder  $b^8$  from the bar-plate  $f$ , and these springs force the rods  $f^2$  downward, and consequently the operative bar-plate  $f$ . The downtravel of such plate  $f$  causes the attached rods  $g'$  to be also at the same time drawn down, and by the spiral grooves  $g^4$  a rotary movement is given to such rods and to their locking-blocks  $j$ . Such blocks upon being so moved allow the dropper-rods  $j^3$  to fall downward in the guides  $k$  to the required limit, and thereby the grippers and levers to open out, and all as shown in Fig. 2. It will be

noticed that the rods  $g'$  possess a vertical and rotary movement. Upon the upward travel of the coupling-bar the taper formation  $b^6$  returns the grippers and levers  $d^4$  to their idle position in an easy and gradual manner, and thereby raising the dropper-rods  $j^3$ , while by the bottom shoulder  $b^8$  meeting against the operative plate  $f$  a reverse action is given to the locking mechanism, and thereby retaining it in its locked position, all as shown in Fig. 1.

As shown in Fig. 3 where the weight of the appliance by its resting on the stops  $e^3$  causes the collar  $e$  and its attached guide-bracket  $k$  to move upward and thereby carrying the dropper-rods  $j^3$  which are now locked by the blocks  $j$  as shown in Fig. 1, and consequently the gripper-levers are lifted well open, so as to allow sufficient space between the plates  $d^7$  for the coupling-bar  $b$  to pass idly up and down and through the hollow sleeve. In the operation of the appliance the various operative parts all work in a fellowship and punctual manner.

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

1. In combination, a frame, a device for connection to a hoisting-rope having a limited movement vertically of the frame, grippers pivoted to the frame, levers pivoted to the frame and operatively connected with the grippers, said levers being adapted to be operated by the movement of the connecting device in relation to the frame, dropper devices adapted to hold said levers elevated and to drop them only on breaking of the rope, and means whereby on the breaking of the rope said dropper devices are operated, substantially as described.

2. In combination a frame, a bar having a limited vertical movement therein and having means at its upper end for connection with a hoisting-rope and at its lower end to the part to be hoisted, grippers pivoted in said frame, means interposed between said grippers and bar whereby the grippers are operated when the bar moves downwardly in relation to the frame, mechanism for holding said gripper-operating means normally inactive, and means rendered operative by the breaking of the rope and consequent movement of the bar whereby said holding mechanism is released, substantially as described.

3. In combination, a frame, a bar vertically movable therein having means at one end for attachment to a hoisting-rope and at its opposite end to the part to be hoisted, grippers pivoted in said frame, levers for operating said grippers, a flange or projection on said bar for engaging each of said levers, a pair of sliding dropper-rods connected to said levers, means for holding said dropper-rods normally against movement, a spring-pressed plate carried by the frame, shoulders or projections on the bar for engaging said plate and means interposed between said plate and the holding means for the dropper-rods for



releasing said holding means, substantially as described.

4. In combination, a frame, a spring-pressed plate connected thereto, a lifting-bar slidably  
5 mounted in said frame and having a shoulder for engaging said plate, levers pivoted in said frame, gripper devices operated by levers, dropper-bars guided in the frame and operatively connected to said levers, locking-  
10 dogs for engaging said bars and holding them elevated, and means controlled by the movement of said spring-plate for operating said dogs, substantially as described.

5. In combination, a frame, a spring-pressed  
15 plate connected thereto, a lifting-bar slidably mounted in said frame and having a shoulder

for engaging said plate, levers pivoted in said frame, gripper devices operated by levers, dropper-bars guided in the frame and operatively connected to said levers, vertical rods 20 rotatably connected to said spring-plate and having threaded portions engaging corresponding threaded portions in the frame, and dogs carried by said rods adapted to engage said dropper-bars, substantially as described. 25

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

MATTHEW HENRY READ.

Witnesses:

E. THO. KANDALL,

T. J. KINDOW.