

R. H. BEATTIE.

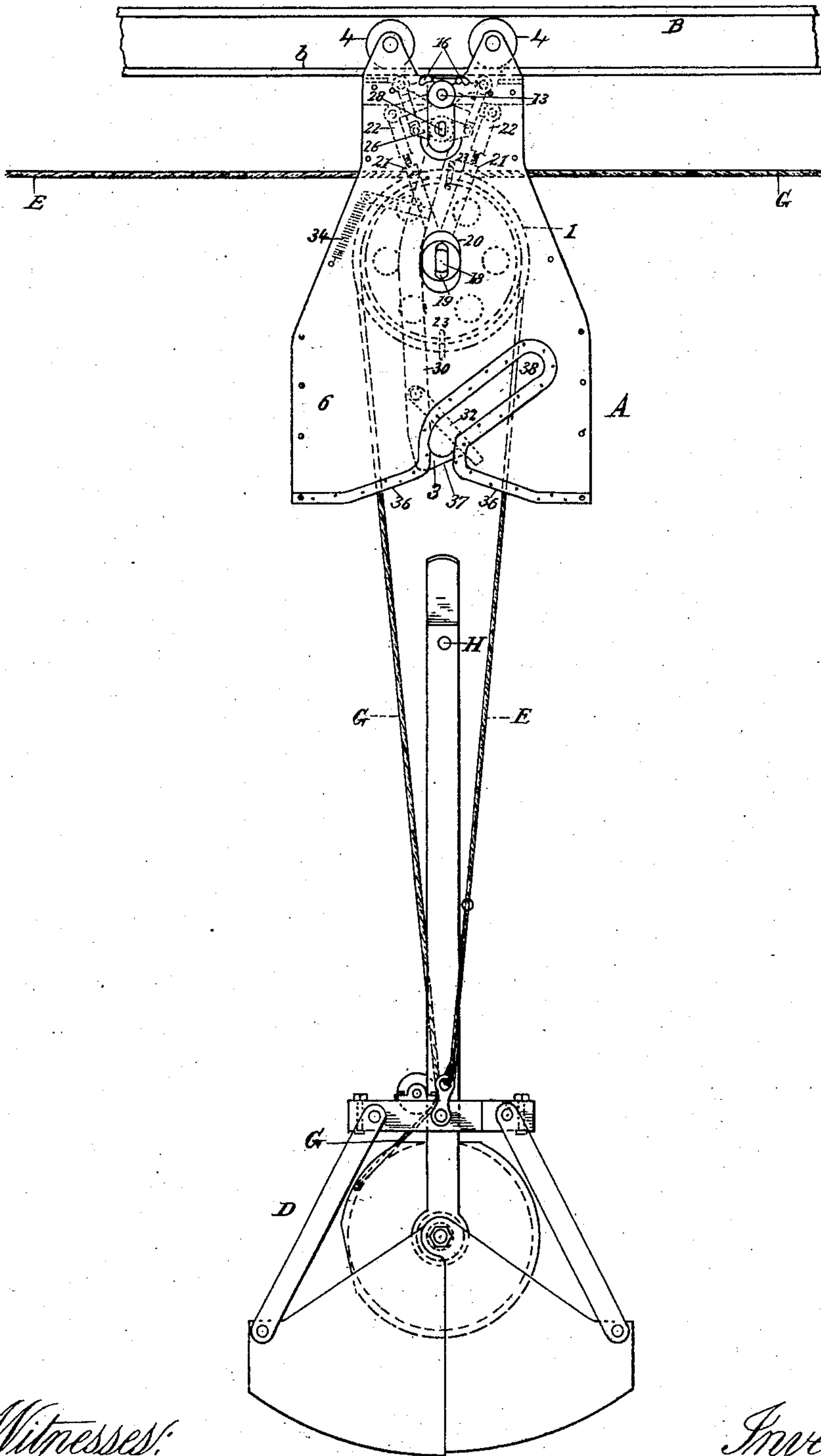
CARRIER.

APPLICATION FILED FEB. 16, 1911.

Patented May 23, 1911.

6 SHEETS—SHEET 1.

992,748.



Witnesses:

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Inventor:

R. H. Beattie  
by his attorney  
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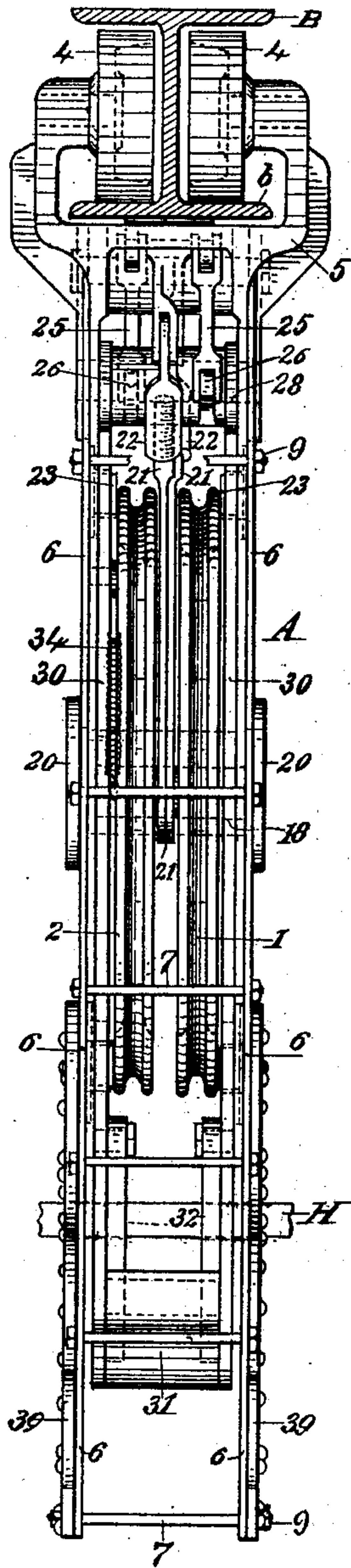


Fig. 3.

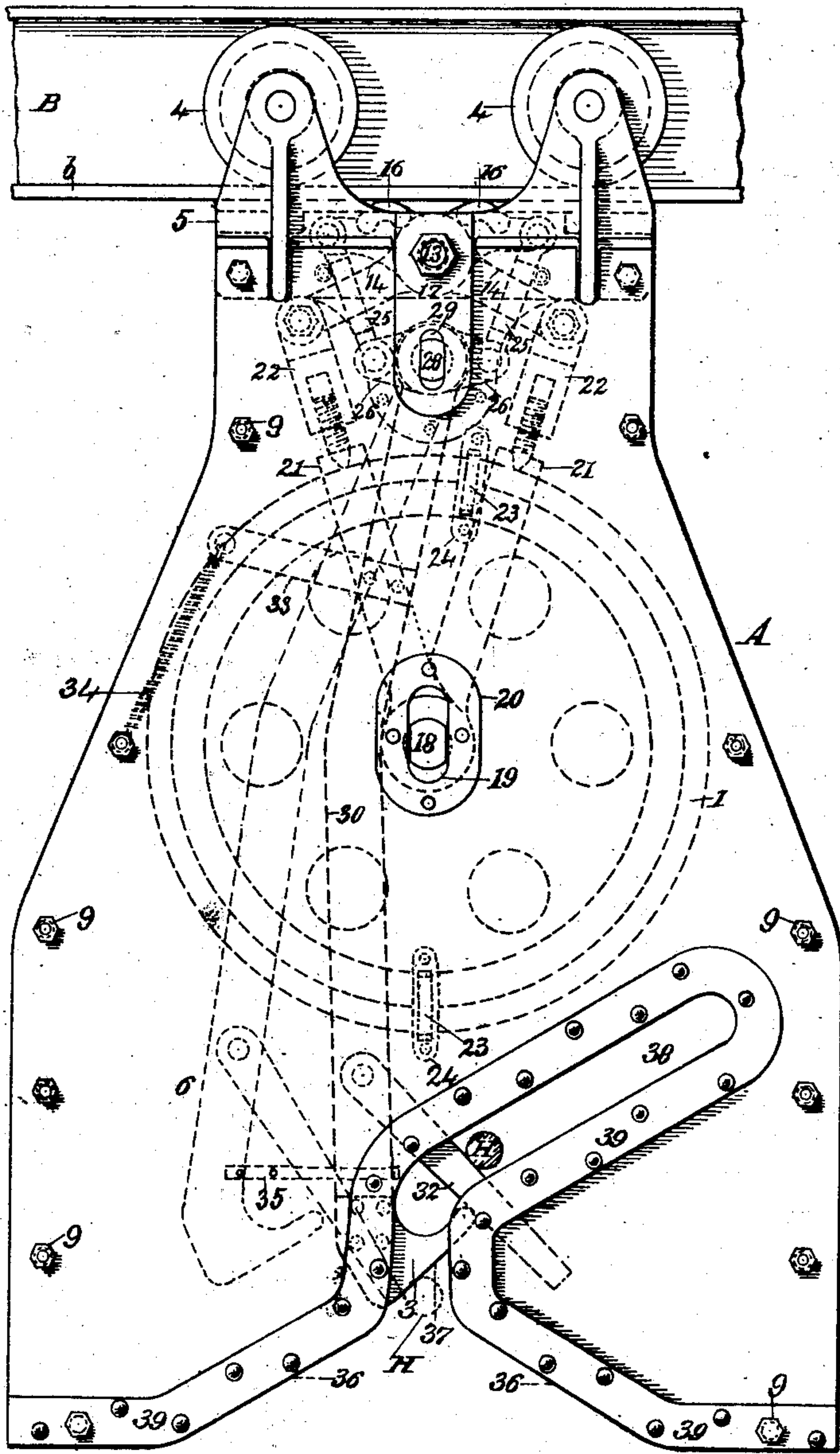


Fig. 2.

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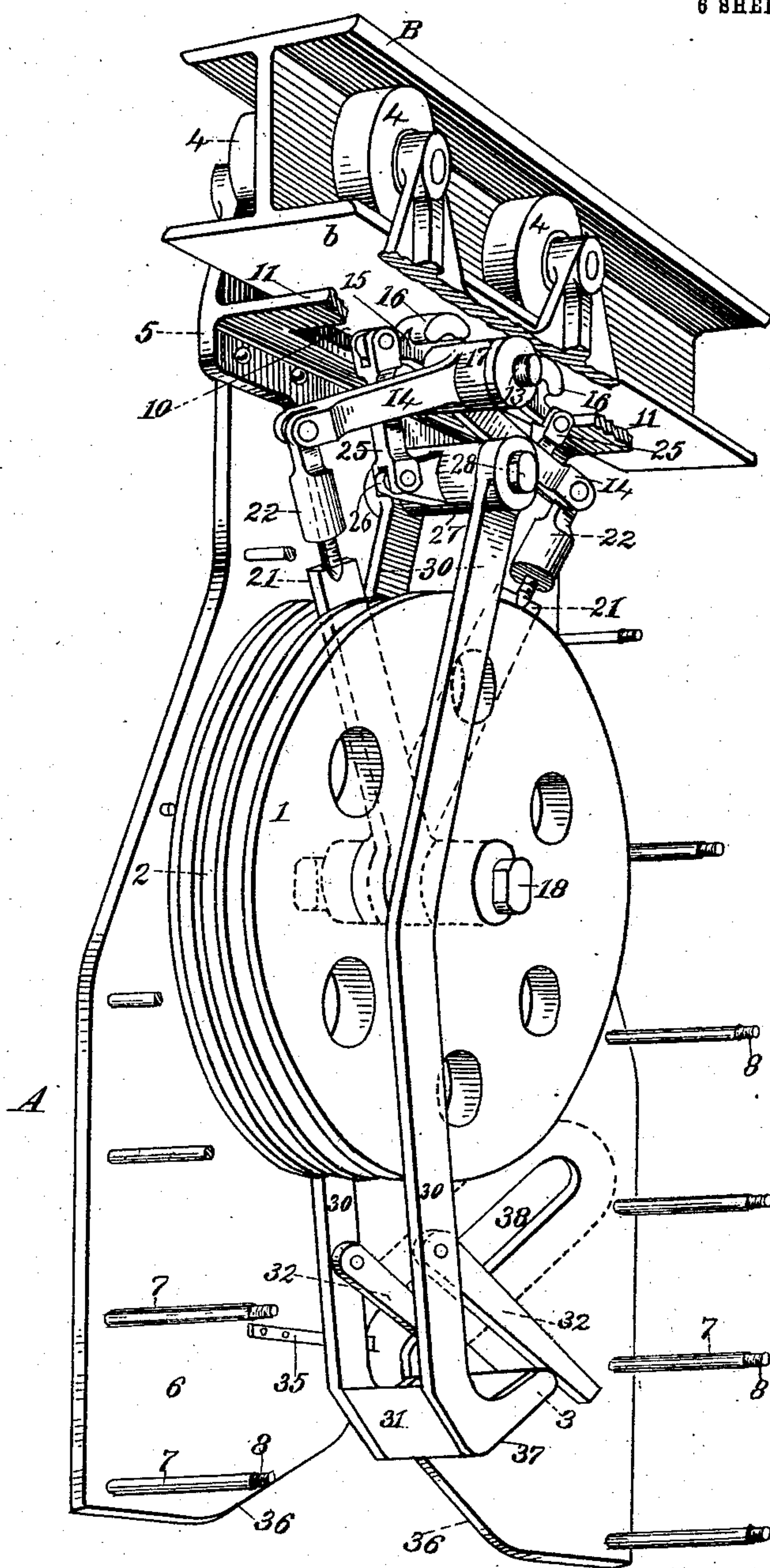


Fig. 4.

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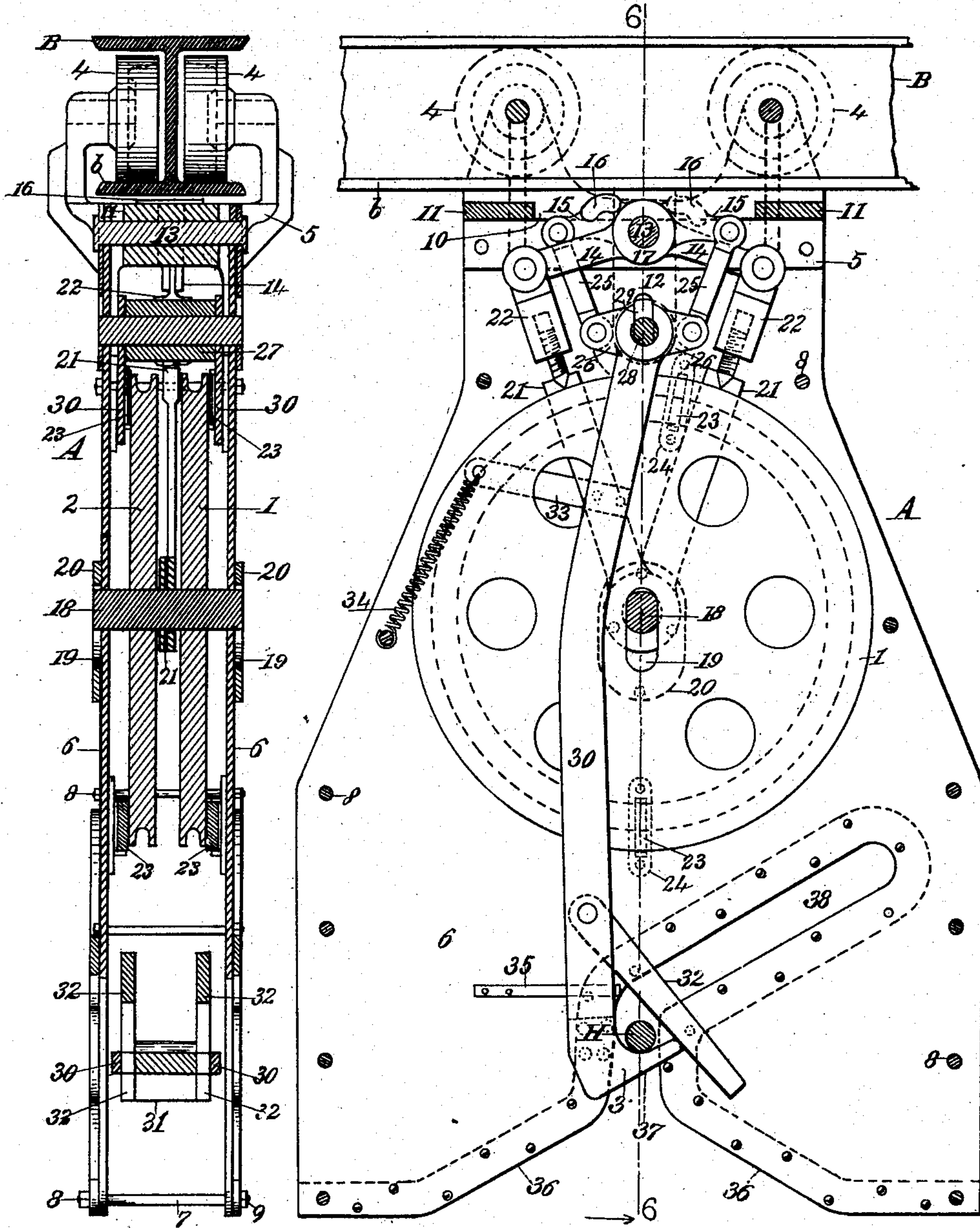
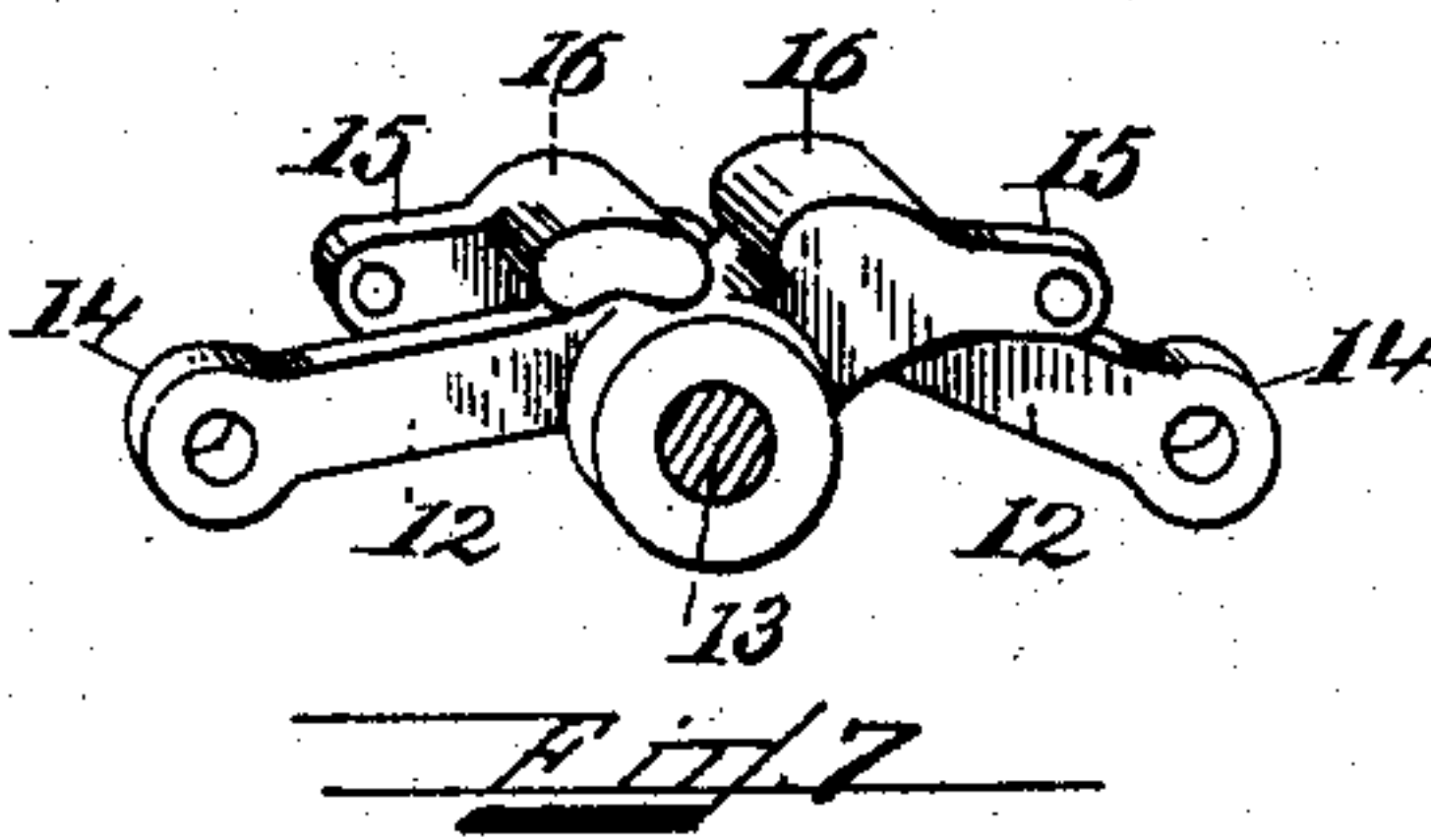


Fig. 6.

Fig. 5.

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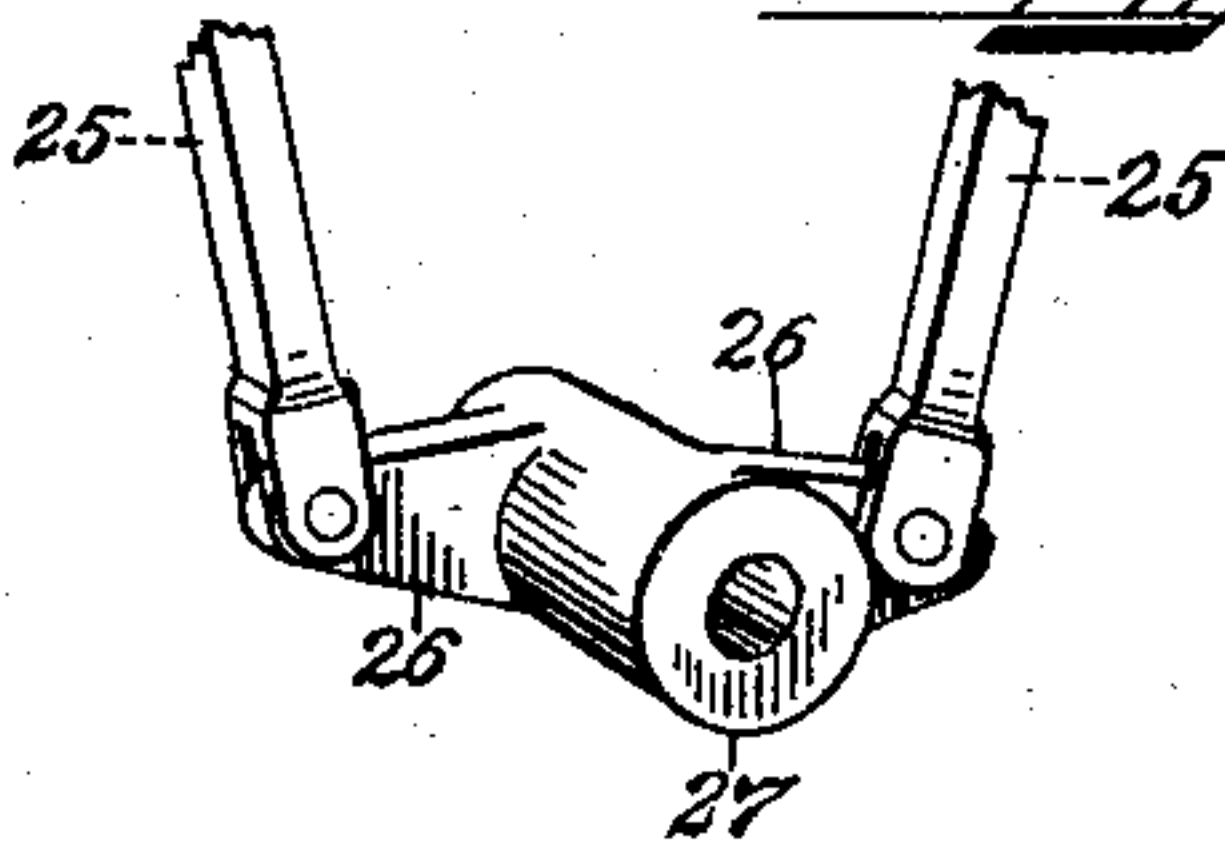
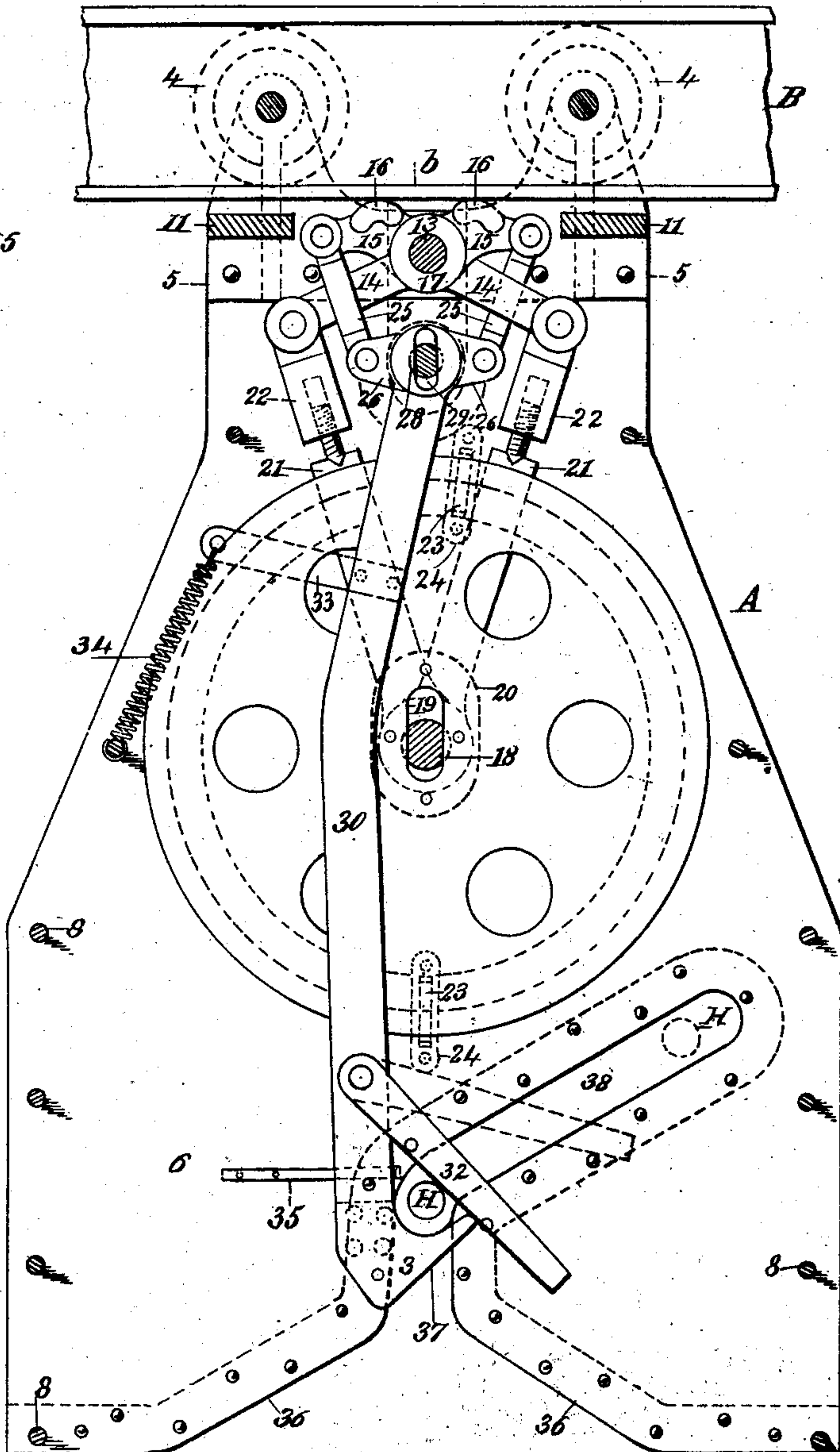
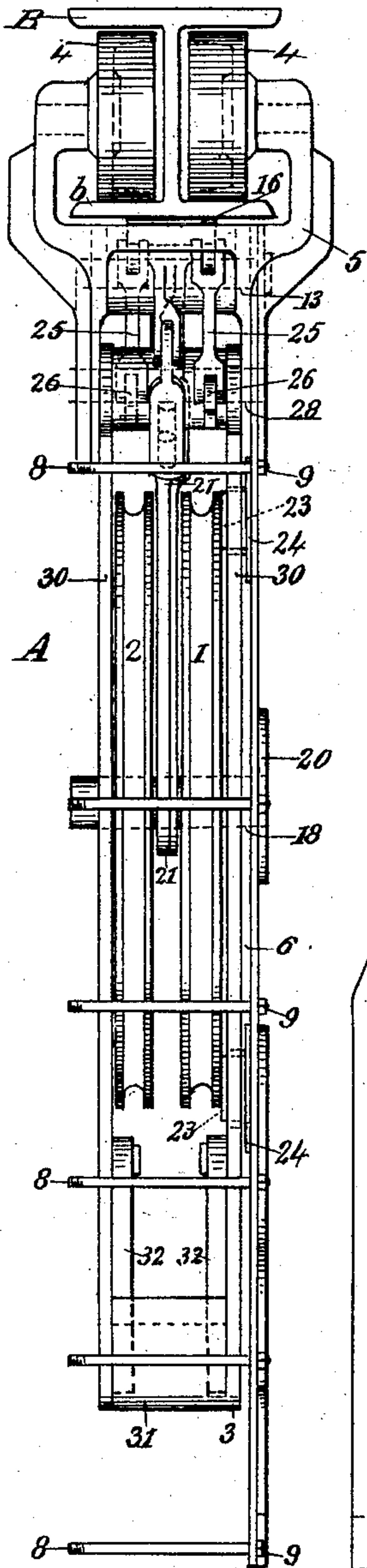
CARRIER.

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6 SHEETS—SHEET 5.

992,748.



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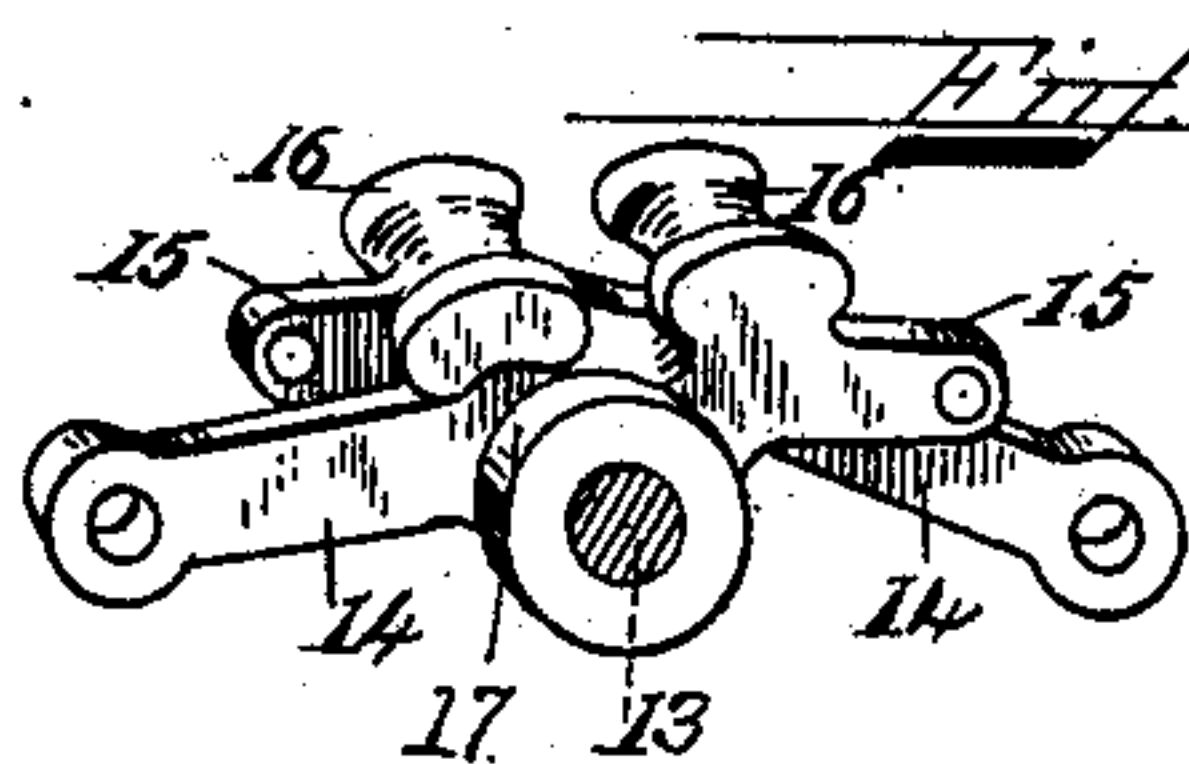
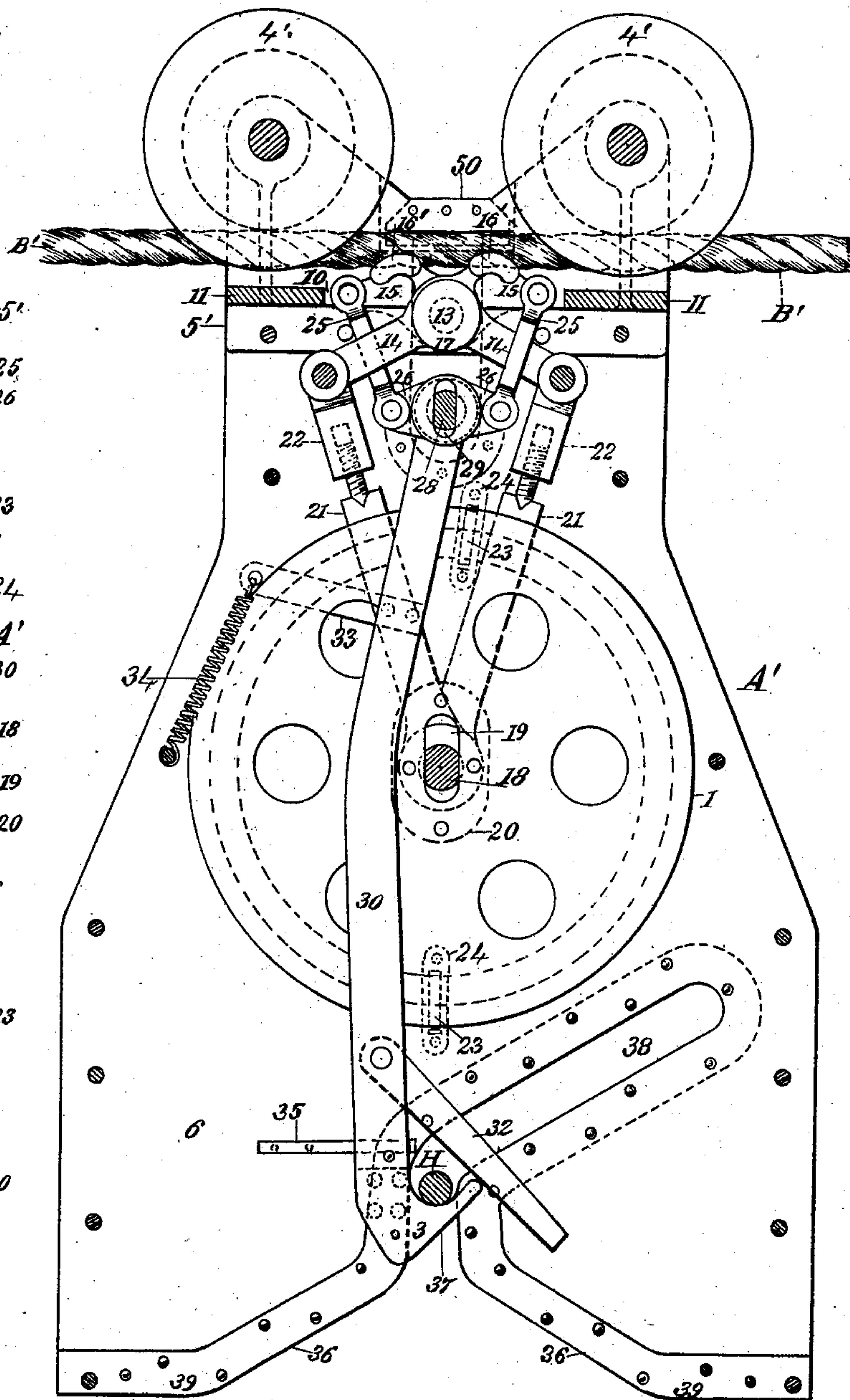
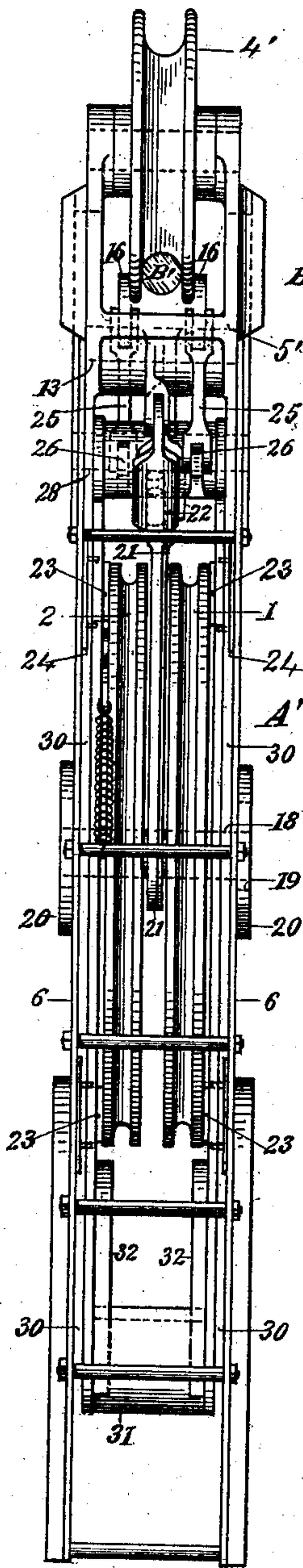
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6 SHEETS—SHEET 6.

992,748.



*Witnesses:*  
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# UNITED STATES PATENT OFFICE.

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## CARRIER.

992,748.

Specification of Letters Patent.

Patented May 23, 1911.

Application filed February 16, 1911. Serial No. 608,985.

*To all whom it may concern:*

Be it known that I, ROY H. BEATTIE, a citizen of the United States, residing at Tiverton, in the county of Newport and State of Rhode Island, have invented certain new and useful Improvements in Carriers, of which the following is a specification, reference being had therein to the accompanying drawings.

And my invention relates particularly to the gripping mechanism of a carrier that makes use of the weight of its load in locking and in unlocking the carrier and its support. Such a carrier is shown, described and claimed in United States Letters Patent for carriers, No. 960,534, issued to Gardner, Chase & Kent, June 7, 1910.

Some of the objects of my invention are to simplify the construction of the gripping mechanism; to reduce the number of its parts; to economize space occupied by the former carrier, and to attain various other objects that will become evident hereinafter. These objects may be said to result from using for gripping purposes a lever of the first order instead of that of the second order, and arranging the lever to operate in the plane of movement of the carrier, instead of that at right angles thereto, and, for locking the carrier to or unlocking it from its support, having the load act either through a sheave connected to one arm of the grip lever, or through a hook connected to the other arm of the grip lever.

Figure 1 is a front elevation of my improved carrier movably mounted upon a support, but locked thereto through suitable gripping mechanism, operated by the sustained weight of grab bucket. Fig. 2 is an enlarged elevation of the carrier, without the falls and bucket, the carrier and support being in locked relation. Fig. 3 is a side elevation of what is shown in Fig. 2. Fig. 4 is an enlarged perspective view of the carrier, with the front plate removed and a part of the head broken away, to show the relations of the operating parts more clearly. Fig. 5 is a front elevation of the carrier, with the front plate removed, and head in section, the load indicated by bail of bucket in section, being borne by the supporting hook, and the carrier and support being in unlocked relation. Fig. 6 is a

vertical section on line 6—6 of Fig. 5. Fig. 7 is a perspective view of the gripping jaw levers employed. Fig. 8 is a front elevation of the carrier with front plate removed and head broken away, the gripping mechanism and rail being in the locking position which results when the load, as a bucket, acts on the sheaves in the way indicated in Fig. 1. Fig. 9 is a side elevation of the carrier when the parts are in the position indicated in Fig. 8. Fig. 10 is a perspective view of release hanger-beam and portions of the release links. Fig. 11 is a side elevation of a modification of my invention, the carrier being adapted to travel upon a cable, instead of a rail; the front plate being removed and the head broken away for the sake of clearness. Fig. 12 is a side elevation of the complete carrier referred to in Fig. 11. Fig. 13 is a perspective detail view of grooved gripping levers used when the support of the carrier is a cable.

A reference to Fig. 1 of the drawings shows, in a general way, my improved carrier A in rolling engagement with a support B in the form of a column section rail. The carrier is locked to the rail, by gripping mechanism operated by the weight, in this instance, of a grab bucket D sustained and controlled by two falls, viz. a hoisting and lowering fall E, and a dumping and closing fall G, passing respectively over a hoisting and lowering sheave 1, Fig. 3, and a dumping sheave 2. When the bail H, Fig. 1, of the bucket is supported, not by the falls, but by a hook 3 which is operatively connected to the gripping mechanism, the weight acting through the hook causes the gripping mechanism to disengage the rail, and the carriage becomes free, and may be moved along the rail by either one of the falls.

I will now give a detailed description of the principal feature of my invention, viz. a pivoted jaw or friction shoe lever, a sheave hung from one arm of the lever, and a hook hung from the other arm of the lever. The carrier is supported on the rail by two pair of running wheels 4, 4, rolling upon the lower flange b of the column section rail, and mounted in the side portions of a cast steel head 5, (see Fig. 4) which is channeled and which is kept in alinement with the contained rail by means of the said wheels. Vertically depending from the two



outside faces of the head, are two parallel steel plates 6, 6, that serve as a suitable structural support for various moving elements, these plates being bolted to the head and held in rigid parallelism by means of distance pieces 7, 7, consisting of piping through which bolts 8 pass, to secure the same by nuts 9.

Through a hole 10 in the floor 11, Figs. 4 and 5, of the channeled head piece 5, the jaw levers 12, 12, of the gripping mechanism operate to grip in and release from, frictional engagement, the under side of the rail B. These jaw levers, see Figs. 4 and 7, comprise a pair of levers 12, 12, similar in shape, and pivotally connected shearwise, by means of a pivot pin 13, Figs. 2 and 4, secured in and passing through the lower sides of the channeled head, at right angles thereto. Each lever 12 may be said to be one of the first order; one arm 14 being called the lock or friction arm, and the other arm 15, the release arm. Extending to one side from the release arm is a gripping portion or shoe 16 having a suitable surface to engage the under side of the rail B; while from the pivotal or fulcrum portion of the lever projects a boss 17 through which is a suitable hole for the pivot pin 13. These two like jaw levers are mounted on the pivot pin 13; the two lock arms 14, 14, as well as the two release arms 15, 15, being on opposite sides of the pivot pin, and the shoe of each lever lying over the boss of the other; the result being that the two gripping portions or shoes are in alinement, and both levers are in the plane of the support, *i. e.* of the longitudinal movement of the carrier.

Operatively connected with these lock arms 14, 14, of the two jaw levers are the two center or working sheaves 1, 2, over which run the hoisting and lowering fall E and the dumping and closing fall G. These sheaves turn upon a center pin 18, the longitudinal axis of which is parallel with that of the pin 13 of the jaw levers. The end portions of the center pin (see Fig. 4) are chamfered in parallel planes, and are mounted, and free to be moved vertically, in two slots 19, Fig. 2, cut in the two plates 6, 6; the vertical axes of which slots lie in said vertical plane common to the longitudinal axes of the jaw lever pin 13 and the center sheave pin 18. The edge portions of the slots 19, Figs. 2 and 3, are reinforced by pieces 20. This center pin 18 is sustained from the two lock arms 14, 14, of the jaw levers by two lock links 21, 21, that are pivoted to the center pin 18, Figs. 3, 4 and 5, between the two sheaves 1, 2, and have their opposite end portions threaded and in engagement with two adjusting nuts 22, 22, one nut being pivoted to one lock arm 15, and the other nut to the other lock arm 15.

As already stated, the hoisting and lowering fall may run over one sheave, and the dumping and closing fall, over the other sheave; it makes no difference which one.

The center sheave pin 18 being supported by the links 21, 21, near its middle portion, two pair of side rolls 23, 23, Fig. 2 are provided to engage the outside circumferential portions of the sheaves near their top and bottom, and keep the sheaves in planes substantially parallel with the plates of the carrier. As these sheaves have some vertical movement, the side rolls are made of such length, and are so placed that they will always be in engagement with their respective wheels. Each roll is mounted on the outside of the plate in bearing blocks 24, 24, fixed to the plate 6, and, by means of a hole cut in the plate, a portion of the roll surface extends through the hole and is (or is almost) in touch with the top or bottom side circumferential portion of its respective sheave.

Having described the elements necessary to lock the carriage to the rail, I will take up the description of the elements employed to unlock the carrier from the rail.

Pivotally connected to the free end portions of the two release arms 15, 15, Figs. 4 and 5, of the jaw levers, are two release links 25, 25, the opposite ends of which are pivoted to the opposite arms 26, 26, of a release hanger beam 27, these arms being off-set, as clearly appears in the detail view shown in Fig. 10. Through this beam extends a hanger pin 28 similar to the center pin 18 of the center sheaves 1, 2. This pin has opposite chamfered end portions with parallel surfaces that engage two vertical slots 29, Fig. 2, formed in the sides of the channeled head 5. They thus permit the vertical movements of the release hanger beam, corresponding to the oscillations of the release arms. It will be noticed that the longitudinal axes of the center sheave pin 18, the hanger pin 28 and the jaw lever pin 13 are all in the same vertical plane. Also in this same plane is the hook 3 suspended from the release hanger beam 27 by two hangers or strips of steel plate 30, 30, that extend downward toward the bottom of the carrier, between the outside plates and the two center sheaves. A hanger block 31 of cast steel is fitted and fixed between the lower end portions of these strips 30, 30; the block and end portions forming the said hook, the seat of which is, as already stated, parallel with, and in the plane, of, the above mentioned pins. A pair of release tongues 32, 32, inclined downward is pivoted to the hanger plates 30, 30, and rest upon and extend beyond the edge of the hook. The hanger strips are crooked back upon themselves so as to pass to the rear of the center pin 18 supporting the sheaves, and not inter-



fere with the up and down movement of the center pin. That the hook may always tend to remain in the above mentioned vertical plane, a spring arm 33 extends rearwardly from the hanger plates 30, 30, and a taut spring 34, connected to the carrier frame, pulls downwardly upon this spring arm. To limit the movement brought about by the spring, two stops 35, 35, are fixed on the inside of the plates, so that the hangers will not interfere with the movements of the center pin.

The bottom edges 36, 36, of the plates 6, 6, converge inwardly and upwardly, and serve as guide ways for the bail H of the upwardly moving bucket, in its course into the hook. When these edge portions reach the middle part of the plates, they become parallel and form a vertical guide slot in which the hook 3 with its upwardly and forwardly inclined face 37 lies. The vertical slot above the seat of the hook has its sides move off in parallelism at an acute angle and form what is termed a release slot 38, terminating near the forward edges of the plates. The edge of the bottom of each plate 6 has throughout its crooked course, suitable reinforcement 39.

The operation of my invention will now be plain.

When the load, represented by the bail H, Fig. 5, is supported by the hook 3, the weight of the bucket D, acting downward, acts on the hook, which through the hangers 30, 30, causes the release hanger beam 27 to descend in the slots 29, 29, in the plates 6, 6, and with it the release links 25, 25, and the release arms 15, 15, of the jaw levers pivoted on the pin 13. The shoe portions 16, 16, of the levers thus move downward and away from the underside of the rail B, and the carrier is free to be rolled along the rail in either direction, as by the dumping and closing fall G, Fig. 1, or by the hoisting and lowering fall E.

To lock the carrier to the rail, when it has reached any particular place upon the rail, the weight of the bucket D must be transferred from the hook 3 which operates the release arms, to one or the other or both of the sheaves which act downwardly on the lock links 21, 21, of the jaw levers, and cause them to move downwardly and the gripping or shoe portions 16, 16, on the release arms 15, 15, to move upwardly and into engagement with the underside of the rail for the purpose of locking the carrier to the rail at the point desired, as shown in Fig. 8. This result is brought about by tightening either one or both falls E, G, so that the load H is transferred from the hook 3, Fig. 5, to one or both of the sheaves 6, 6, Figs. 1 and 8. At the moment of transfer the sheaves move downward, the chamfered ends of the pin 18 following down the sides of the slots

19, 19, in the side plates 6, 6. With the pin 18 follow downward the lock links 21, 21, and the connected lock arms 14, 14; the gripping or shoe portions 16, 16, of the opposite arms moving up into frictional engagement with the underside of the rail and locking the carrier and rail together.

The carrier being locked to the rail as shown in Fig. 8, the bucket may be released from the carrier, as follows: The fall or falls E, G, continue to raise the bail H of the bucket out of the hook 3, and the bail follows up along the oblique release slot 38, Fig. 8, and, in so doing, lifts up and passes by, as indicated in dotted lines, the release tongues 32, 32, which drop back upon, and close the mouth of, the hook. The fall or falls are then let go slowly. The bail at once follows back and down the release slot 38, engages the top side of the release tongues 32, 32, Fig. 2, and pushes them and the hook, as indicated in dotted lines, back out of the channel formed by the sides of the release slot 38; the hook 3 by means of the hangers 30, 30, turning on the pivot formed by the pin 28 passing through the hanger beam. The hook being out of the way, the bail H is allowed to descend down and out of the mouth of the release channel. The bucket is now freed from the carrier which remains locked to the rail while the weight of the bucket is borne by the sheaves. To attach the bucket to the carrier and unlock the carrier from the rail, the bucket is raised by the falls, the bottom edges 36, 36, Fig. 2, of the plates 6, 6, guiding the bail H' of the bucket upon into the guide slot, where the bail engages the upwardly inclined face 37 of the hook, pushes the hook back out of the guide slot, until the bail passes the point of the hook and engages the underside of the release arms; at the moment of passage, the spring 34 operating through the arm 33 and the hanger plates 30, 30, causes the hook to snap in under the bail H, Fig. 8, at once close the release slot, and, upon a lowering of the bucket, catch the bail, as appears in Fig. 5. The weight of the bucket is thus transferred from the falls and sheaves to the hook, and, as already explained, the descending hook and connecting mechanism, pull the shoes down and away from the rail, and the carrier is again unlocked therefrom. In fine, when the load is borne by the hook, the latter causes the release arms of the jaw levers to descend, and the lock arms and connected sheaves to rise; while when the load is borne by the falls and the sheaves, the lock arms descend, and the release arms and connected hook rise; that is, the locking and unlocking is brought about by the weight of the sustained load being transferred alternately from the hook to the sheaves and vice versa.



In Figs. 11, 12 and 13 of the drawings, appears a modification required to adapt my carrier for use upon a cable instead of a rail. The changes made are in the carrier head and the gripping levers.

Two grooved wheels 4', 4', ride upon the cable B', and are centrally and longitudinally disposed in the head 5', so that the carrier A' hangs vertically in relation to the cable. In order that the shoes 16', 16', may effectively grip the cable, a friction block 50 is secured between the sides of the head and just over and across the cable; the shoes being directly beneath the cable and the block. When the shoe surfaces are pressed up against the underside of the cable, the friction block resists the upward movement of the cable and the latter is squeezed between the shoes and the block. It is desirable that both the block and the shoes be grooved, as indicated in the drawings, for the purpose of increasing the frictional area of contact between the engaging surfaces, and, at the same time, of confining the cable in the operative relations intended.

Desiring to protect my invention in the broadest manner legally possible, what I claim is:—

1. In a carrier movably mounted upon a support, a grip-lever mechanism of the first order, to engage and to disengage the support; a seat member, hung from release-arm apparatus of the grip-lever mechanism, to support the load and cause the carrier and support to become unlocked while the load is borne by the seat; and a sheave hung in bearings operatively supported from grip-arm apparatus of the grip-lever mechanism, to cause the carrier and its support to become locked together when the sheave supports the load by a rope.

2. In a carrier movably mounted upon a support, a grip-lever mechanism to engage and disengage the support, said mechanism comprising two opposite but parallel levers of the first order, lying in the plane of movement of the carrier and support, and having a common fulcrum; each lever having (1) a portion frictionally to engage the under side of the support; (2) a release arm, and (3) a grip-arm; a hook or seat member depending from and operatively connected to the two release arms of said levers; a sheave hung in bearings operatively connected to the two grip-arms of said two levers; all so designed that when the load is borne by the sheave, the load acting through the release arms, unlocks the carrier and the support; and when the load is borne by the hook, the load acting through the grip-arms, causes

the levers frictionally to engage the support and lock the carrier and support together.

3. In a carrier movably mounted upon a support, and having a grip-lever mechanism; a hook or seat member, and a hoisting and lowering sheave; a grip-lever of the first order, an arm of which is connected to the hook member, and the other arm of which is connected to the hoisting and lowering sheave; all so arranged and designed that when a load is borne by the sheave, the grip-lever engages the support and the carrier becomes locked to the support; and when the load is borne by the hook or seat member, the grip-lever disengages the support and the carrier is free to be moved along the support.

4. In a carrier movably mounted upon a support, and having a hook or seat member, and a hoisting and lowering sheave; a pair of grip-levers of the first order, arranged shear-wise beneath but in the plane of the support, to engage and to disengage the underside of the support; each lever having a grip-arm and a release-arm; means for connecting the hook member to the two release-arms; and means for connecting the hoisting and lowering sheave to the two grip-arms; all arranged so that if the load borne by the carrier is thrown upon the hook, the carrier is free to be moved along the support; while if the load is transferred to the sheave, the carrier at once becomes locked to the support.

5. A carrier movably mounted upon a support; a pair of grip-levers of the first order, arranged shear-wise, beneath but in the plane of the support; each lever having a grip-arm, and a release-arm; a hook or seat member operatively connected to the two release-arms of said pair of grip-levers, so that the hook member may be oscillated in the plane of the support; a hoisting and lowering sheave operatively connected to the two grip-arms of said pair of grip-levers; a load guide slot in said carrier; said hook normally lying in said slot but free to move into and out of said slot, and having pivoted to the shank of the hook, a release tongue, which may be operated by the load to move the hook out of the slot, and permit the escape of the load from the hook and the slot.

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

ROY H. BEATTIE.

Witnesses:

A. I. CRAWFORD,  
E. F. UNIAC.