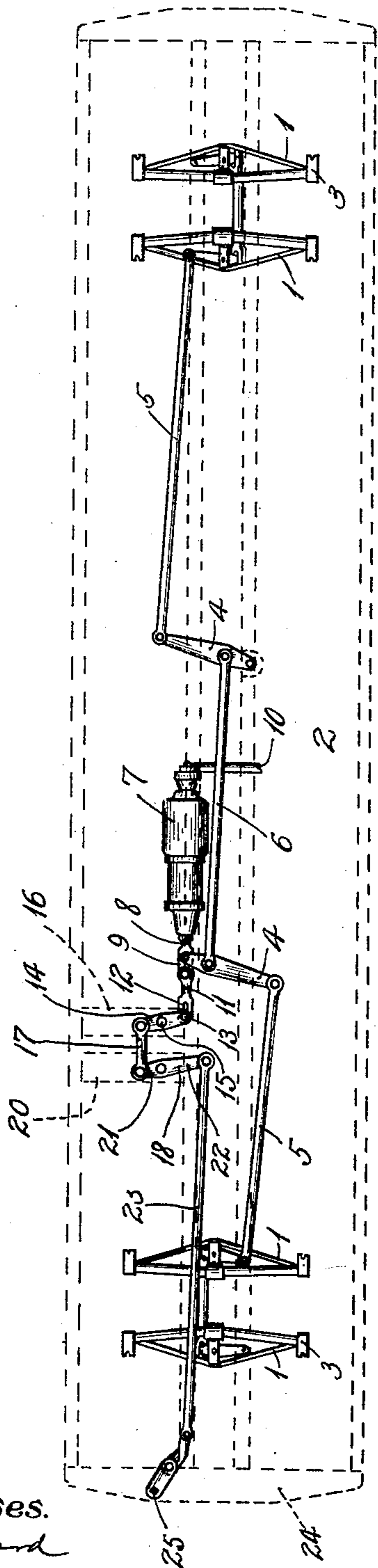


R. T. BURDETTE.
HAND BRAKE FOR RAILWAY CARS.
APPLICATION FILED JAN. 10, 1910.

962,693.

Patented June 28, 1910.

Fig. 1.



Witnesses.
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Fig. 4.

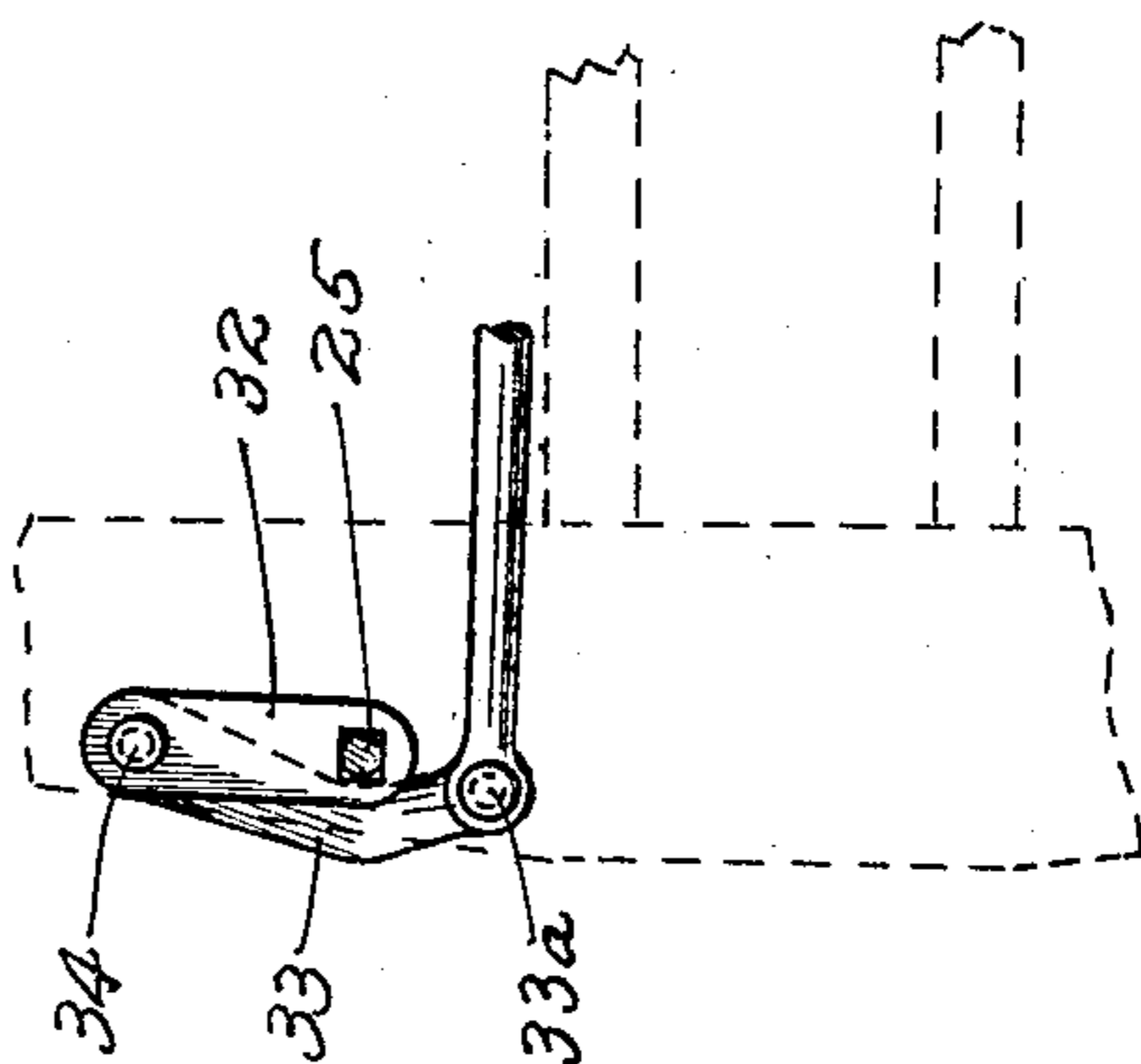


Fig. 2.

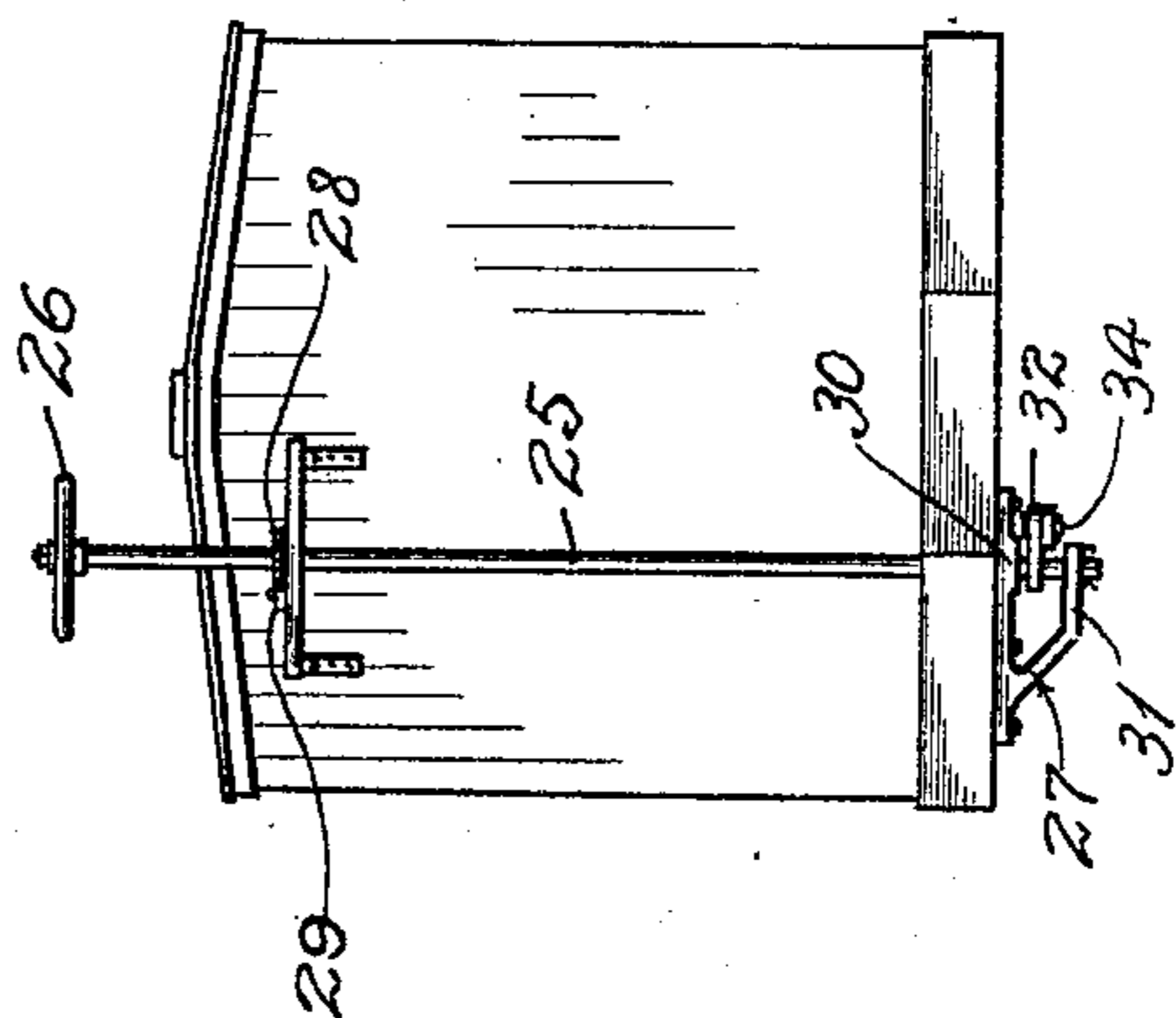
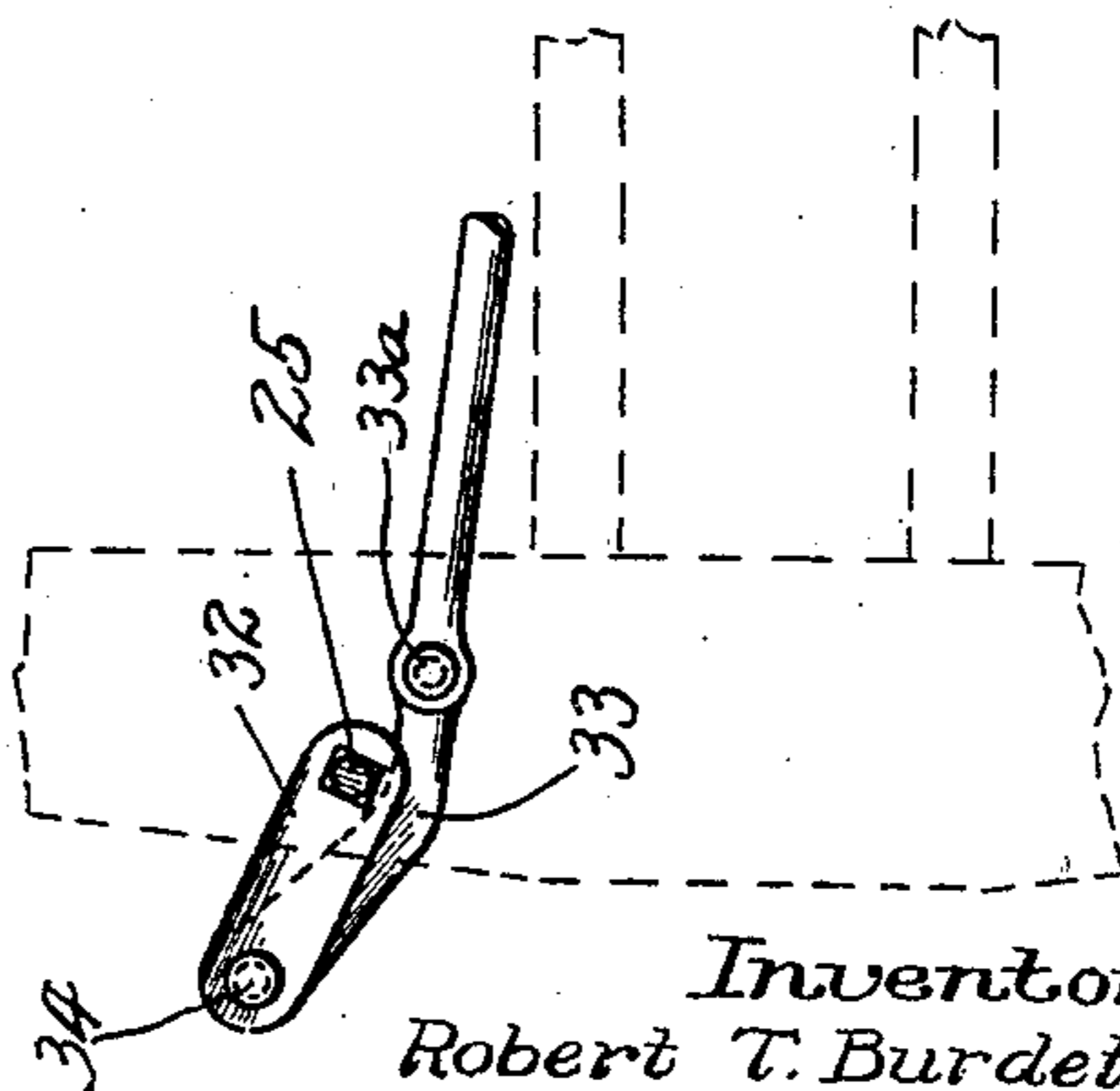


Fig. 3.



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ROBERT T. BURDETTE, OF LOS ANGELES, CALIFORNIA.

HAND-BRAKE FOR RAILWAY-CARS.

962,693.

Specification of Letters Patent. Patented June 28, 1910.

Application filed January 10, 1910. Serial No. 537,172.

To all whom it may concern:

Be it known that I, ROBERT T. BURDETTE, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Hand-Brakes for Railway-Cars, of which the following is a specification.

This invention relates to brake mechanism of railway cars and concerns itself particularly with the construction of a hand brake mechanism to be used in connection with a power brake or air brake.

One object of the invention is to produce a simple construction for connecting the spindle of the hand wheel with the brake beams which will obviate the necessity of using chains for this purpose, and which will give substantially the same effect as a chain, permitting independent action of the power brake and the hand brake.

A further object of the invention is to provide an arrangement whereby the brake can be operated so as to give a relatively great movement at the brake shoes, and this feature of the invention renders it especially useful where the brake shoes have become lost or very greatly worn.

As hand brake mechanisms are usually constructed a spindle is provided operated by a hand wheel and this spindle rotates a chain drum under the end of the car. This chain drum affords means for pulling in a loop of chain which passes toward the brake mechanism. Through the medium of this chain the hand brake is applied. The weakest link of these brake chains frequently snaps when the brake is being applied and while the brakeman is applying his greatest strength to rotate the hand wheel. When the chain snaps as suggested, the hand wheel suddenly becomes free and on account of the strained position of the brakeman's body, considerable personal danger results. Brakemen applying hand brakes of this kind are frequently thrown from the trains and killed.

According to my construction I do away with the use of a chain, although my hand brake enables the brakes to be applied with substantially the same effect in other respects.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

In the annexed drawing which fully illustrates my invention, Figure 1 is a plan illustrating the application of the invention to the brakes of an ordinary railway car. Fig. 2 is an end elevation of a car provided with my hand brake. Fig. 3 is a plan taken at one end of the car upon an enlarged scale particularly illustrating details of the construction and showing the brakes as normally applied. Fig. 4 is a view similar to Fig. 3 but showing the brake mechanism in its applied position in case some of the brake shoes are lost or greatly worn. This may be considered as an abnormal use of the brake.

Referring more particularly to the parts, 1 indicates the brake beams which are mounted in the usual manner under the car bottom 2. These brake beams carry the usual shoes 3 which are applied to the wheels of the car through the operation of the usual floating levers 4 and links 5, 5 and 6, actuated by a brake cylinder 7. From the brake cylinder 7 the usual piston rod 8 extends, having a head 9 which is connected with one of the floating levers 4 in the usual manner. The brake cylinder 7 is supplied with compressed air through a suitable service pipe 10.

In applying my hand brake mechanism to a power brake mechanism such as that described, I provide a link 11 which is pivotally connected to the head 9 and the other end of this link is formed with a longitudinal slot 12. In this slot 12 there is received a pin 13 which is carried by the end of an auxiliary lever 14, which lever has its fulcrum 15 on the under side of a suitable plate 16 fixed under the car. The other arm of the lever 14 is connected by a link 17 with a main lever 18 which has its fulcrum on a plate 20 similar to the plate 16 and fixed under the car. This lever 18 has a short arm 21 to which the link 17 attaches, and its other arm 22 is of substantially twice the length of its short arm. To this lever arm a link or rod 23 is attached and this link extends longitudinally of the car and toward the adjacent bumper 24. Through this bumper 24 the spindle 25 operated by the usual hand wheel extends, and on the under side of the bumper a bracket 27 is attached as indicated in Fig. 2. In this bracket the lower end of the spindle 25 is rotatably mounted and the upper end of this spindle is provided with the usual hand wheel 26 for rotating it.

addition to this, this spindle 25 is provided with the usual ratchet 28 with which a pawl 29 coöperates as indicated in Fig. 2.

The bracket 27 comprises a base plate 30 which is secured to the under side of the bumper and it comprises also a downward extension 31 in which the spindle 25 has a bearing. On the spindle 25 between the base plate 30 and the extension 31 an arm 32 is rigidly attached, and to the free end of this arm the link 23 is pivotally attached. The adjacent end of the link 23 is connected by an inclined or bent link 33 with the end of the arm 32 by means of a suitable pivot bolt 34. The other end of this link is connected by a pivot pin 33^a with the link 23 as shown.

As shown in Fig. 1, the hand brake mechanism is in its "off" position, that is, the brakes are not applied. When the brakes are to be applied by hand, the hand wheel 26 is rotated in a right hand direction, that is, so as to rotate the spindle 25 in the direction indicated by the arrow in Fig. 1. This will swing the arm 32 from the normal position shown in Fig. 1 toward the position shown in Fig. 3, and will draw the link rod 23 toward this end of the car. The force exerted in the link 23 is transmitted to the levers 18 and 14 and the link 17 so as to pull the link 11 also toward the end of the car. This will move the head 9 as though it were being forced outwardly by the application of power in the brake cylinder. The movement of the head 9 will be transmitted through the floating levers 4 and the links 5 to the brake beams.

In applying the brake under normal conditions, the arm 32 will be swung in a right hand direction until it comes into substantially the position in which it is shown in Fig. 3. When the arm 32 arrives in this position, on account of the bend in the link 33, the axis of the pivot bolt 34 will have crossed the line of pull on the arm so that the tension in the link 23 and the link 33 will tend to prevent the arm from swinging back in a direction which will release the brake. In other words, the arm 32 will be thrown on to or beyond its dead center so that the line of pull in the link passes on the upper side of the axis of the spindle 25. With this arrangement it will be evident that in my mechanism the brake will lock itself in the "on" position. For this reason it will be seen that my hand brake mechanism is, in a sense, independent of the usual pawl 29 in so far as the function of the pawl in holding the brake applied is concerned. But the pawl still operates to prevent the backward movement of the spindle 25 and is useful in permitting the brakeman to change his hold on the hand wheel.

In Fig. 4 the mechanism is represented as applying the brakes under abnormal condi-

tions, that is, when it is necessary to take up a great movement at the brake shoes. Under these conditions the arm 32 will be rotated beyond the position in which it is shown in Fig. 3, and it may be brought around to a position in which it lies transversely to the track. In giving the arm this movement the side of the link 33 will come against the side of the spindle 25, and after it does engage the side of the spindle as suggested, the link 33 will then cease to operate as a link and will operate as a lever. In this way, by giving the arm an extreme movement, I can impart a greatly increased movement to the link 23 and this will compensate for the absence of brake shoes or for greatly worn brake shoes.

From the above explanation it should be clearly understood that under normal conditions the hand wheel 26 can apply the brakes as in the usual manner, but when desired, a greatly increased movement of the brake beams can be secured.

Special attention is called to the fact that the lever arm 22 is substantially twice the length of the lever arm 21, while the arms of the lever 14 are of equal length. From this arrangement it follows that a reduction of movement occurs between the end of the link 23 and the link 11, that is, there is a reduction of movement in the ratio of 2 to 1. This is the same ratio of reduction which takes place with the ordinary hand brake when applied by means of a chain in the usual manner.

It will be evident that the link 11 with its slot 12 forms a slip connection permitting a lost motion when the brake mechanism is operated by power, and hence it will be evident that the power brake mechanism is capable of action independent of the hand brake.

On account of the lever arrangement described for the hand brake, it will be evident that this hand brake can be substituted for the ordinary hand brake employing a chain and will give the same movement of the brakes for a given rotation of the hand wheel. It should be evident that my hand brake can be substituted for the usual hand brake without necessitating any changes whatever in the power brake mechanism.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In combination, power actuated brake mechanism having a fixed fulcrum, a lever, a link having a pin and slot connection with said lever and connected with said brake mechanism, a hand brake spindle, a link-bar, and means for positively connecting said bar with said spindle and with said lever and enabling the said spindle to advance and return said lever.

2. In combination, a brake cylinder hav-

ing a piston rod extending therefrom, a head on said rod, brake mechanism connected with said head for applying the brakes by power, a lever, a link having a
 5 pin and slot connection to said lever and connected with said head to operate said brake mechanism, a second lever connected with said first lever, having arms of unequal length, a rod forming a link and con-
 10 nected with the long arm of said second lever, a hand operated spindle, and an arm rigidly carried thereby and pivotally connected with said link.

3. In combination, power operated brake
 15 mechanism, a spindle adapted to be rotated by hand, an arm rigidly attached to said spindle, a link in the form of a rod pivotally connected with said arm, means for connect-
 20 ing said link with said brake mechanism and including a slip device permitting the independent action of said brake mechanism, said link and said arm being arranged so
 25 that said arm is thrown beyond the dead center when the brakes have been applied through the rotation of said spindle.

4. In combination, power actuated brake
 mechanism, a spindle adapted to be rotated by hand, an arm rigid with said spindle, a
 30 long link, a short link connecting the same with said arm, means for connecting the inner end of said long link with said brake mechanism, said last means including a slip
 35 connection permitting the independent action of said brake mechanism by power, said arm being adapted to pass beyond the dead center when the brakes are applied by hand,

whereby the tension in said link will be maintained.

5. A hand brake mechanism comprising a spindle, a member carried thereby and
 40 adapted to be rotated, a link pivotally attached to said member, a second link connected with said first link and adapted to apply the brakes, said first link being adapt-
 45 ed to engage said spindle when said member is rotated to an extreme position whereby said first link may operate as a lever.

6. A hand brake mechanism comprising a spindle, means for rotating the same, an
 arm rigidly attached to said spindle, a bent
 50 link pivotally attached to said arm and adapted to engage said spindle upon an extreme rotation of said arm, brakes, and means for connecting said bent link with
 55 said brakes.

7. A brake mechanism comprising a spindle, means for rotating the same, an arm
 rigidly attached to said spindle, a short bent
 link, pivotally attached to said arm, a long
 60 link pivotally attached to said bent link, brakes, and means for connecting said long link with said brakes, said short bent link
 65 being adapted to engage said spindle upon an extreme rotation of said arm and operating then as a lever.

In witness that I claim the foregoing I have hereunto subscribed my name this 30th day of December 1909.

R. T. BURDETTE.

Witnesses:

F. D. AMMEN,
 EDMUND A. STRAUSE.