W. H. SAUVAGE.

SLACK ADJUSTER.

APPLICATION FILED JAN. 31, 1918.

1,298,575.

Patented Mar. 25, 1919.

4 SHEETS—SHEET 1.

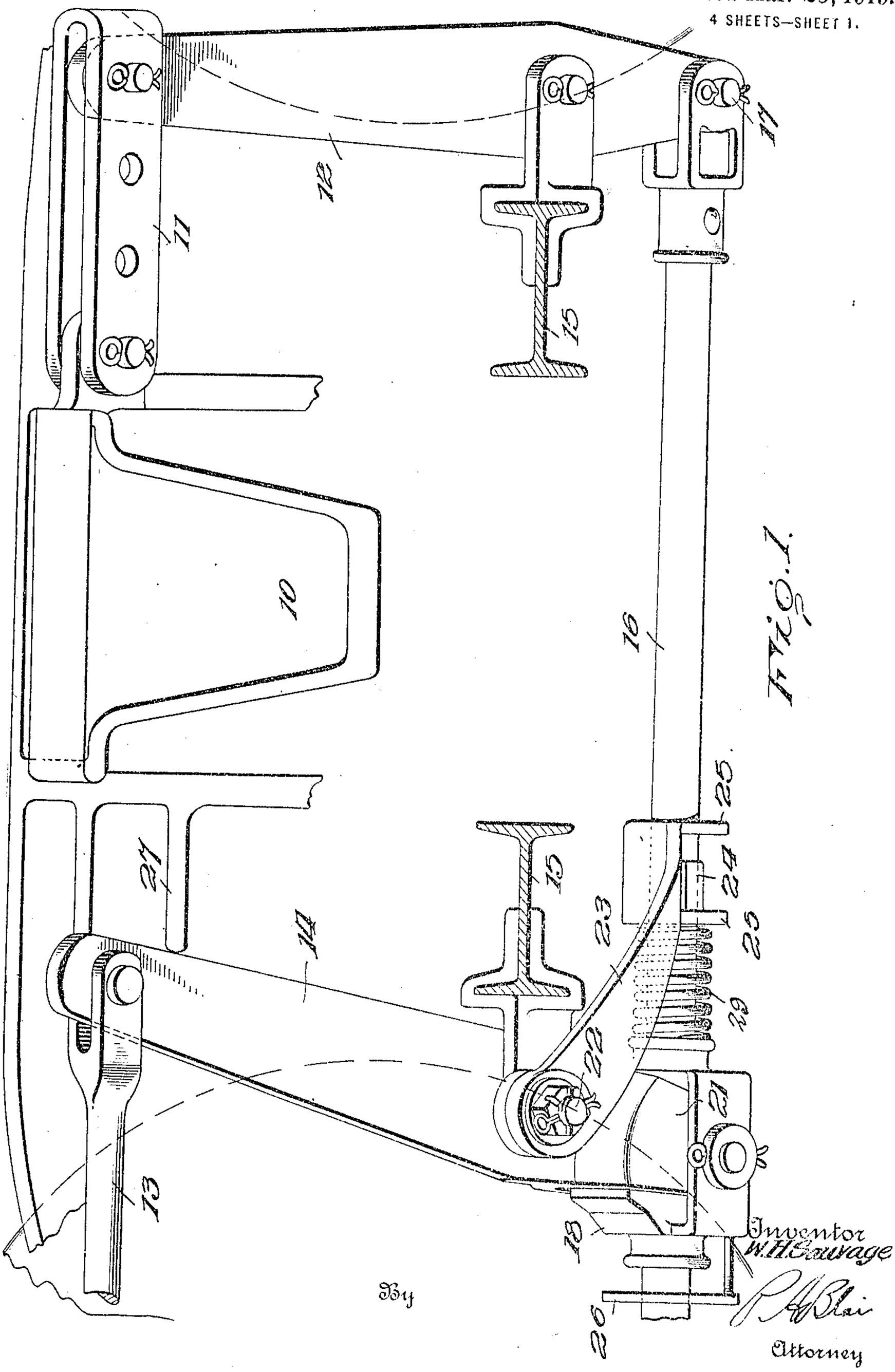

Fig. 1.

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By

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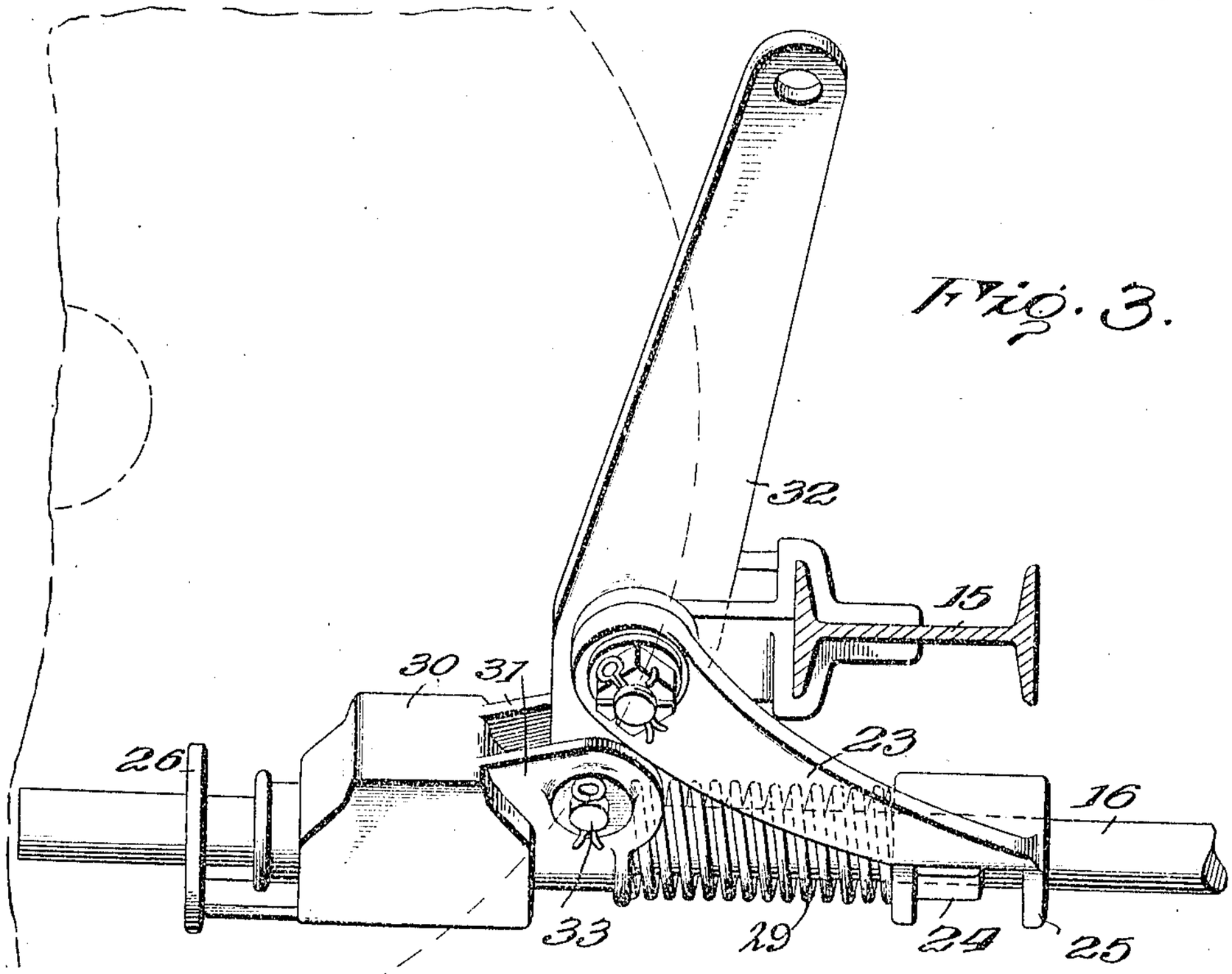

Fig. 3.

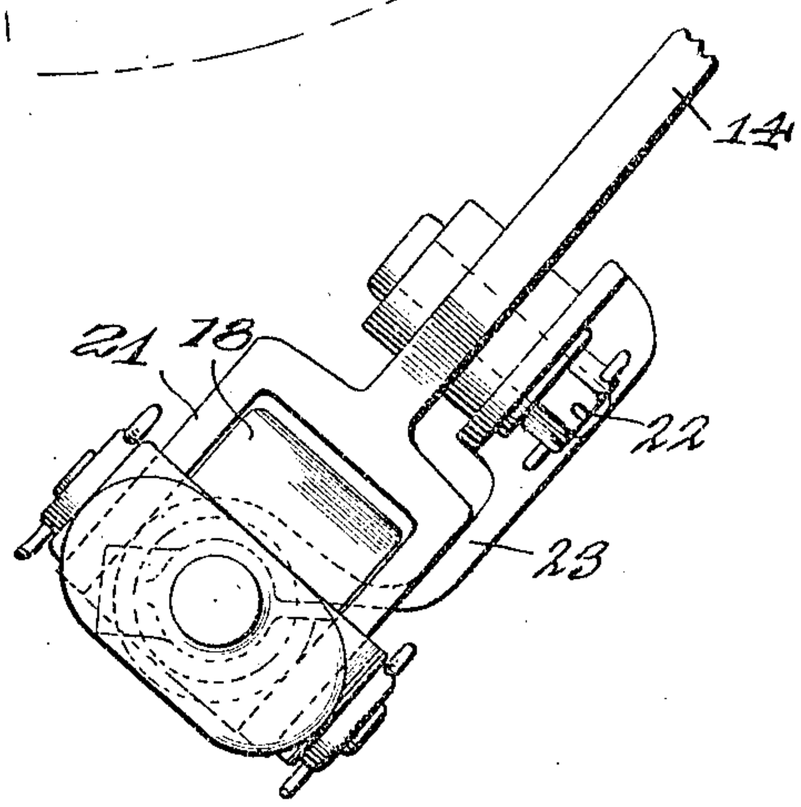

Fig. 2.

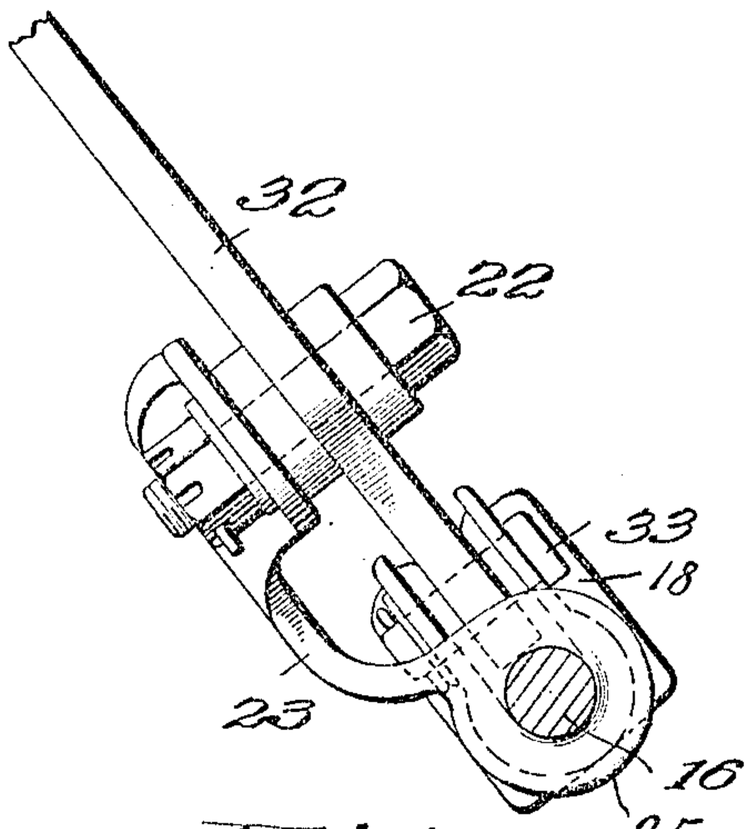

Fig. 4.

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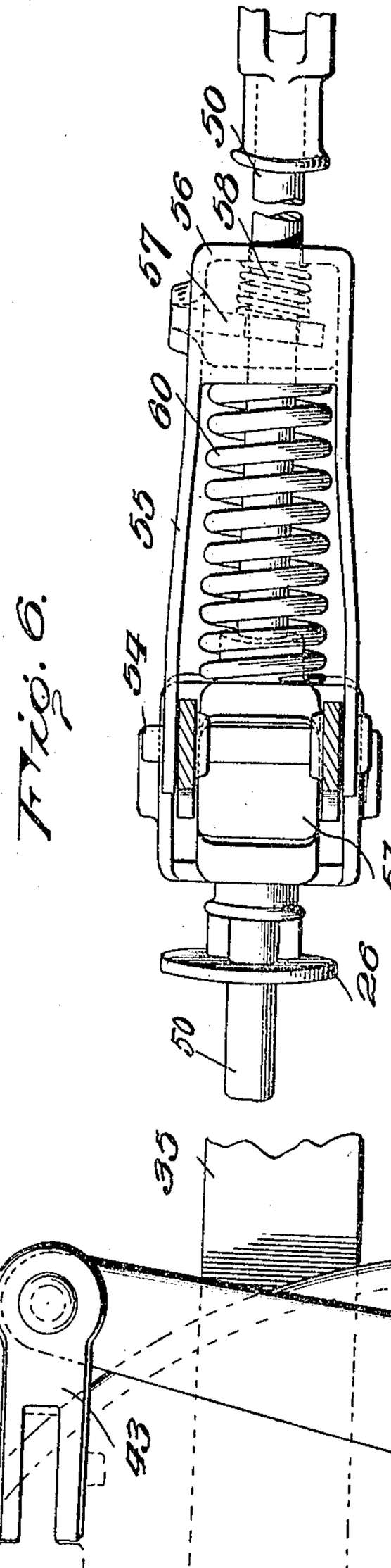

Fig. 6.

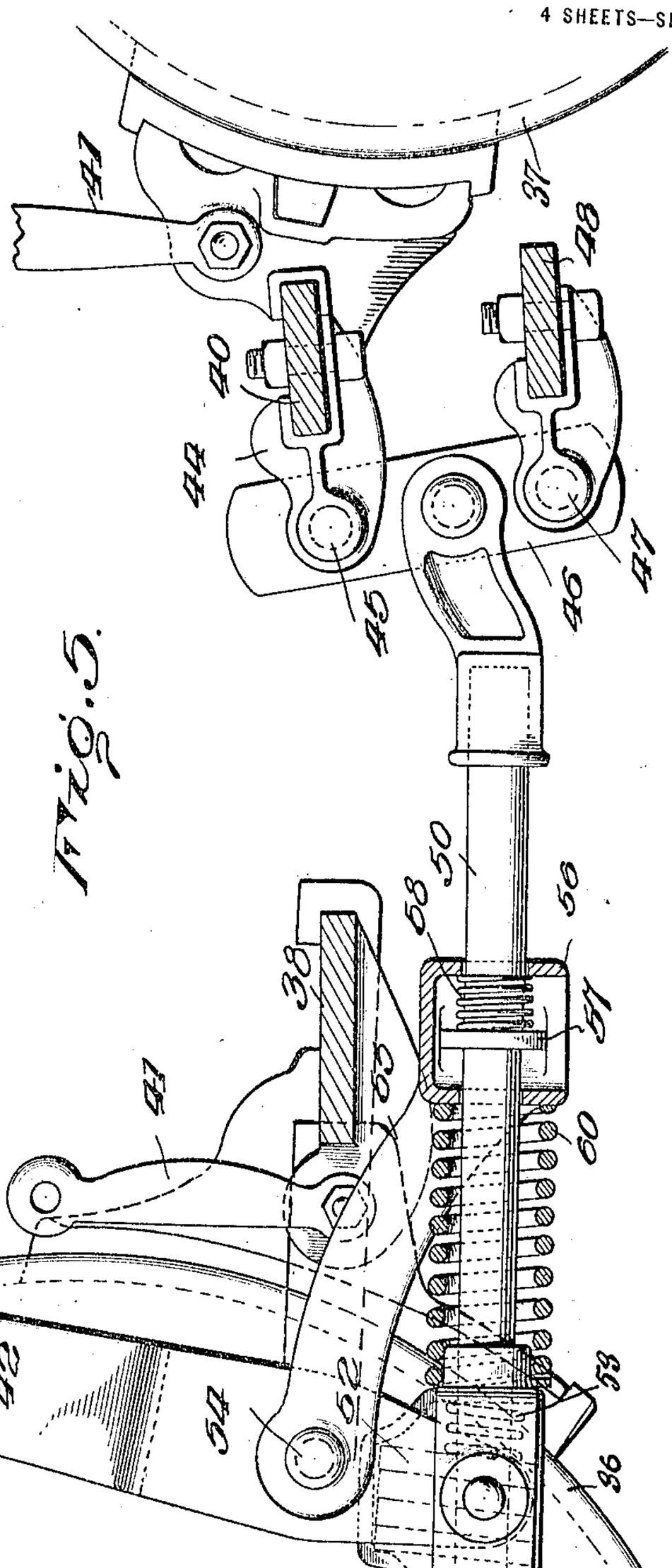

Fig. 5.

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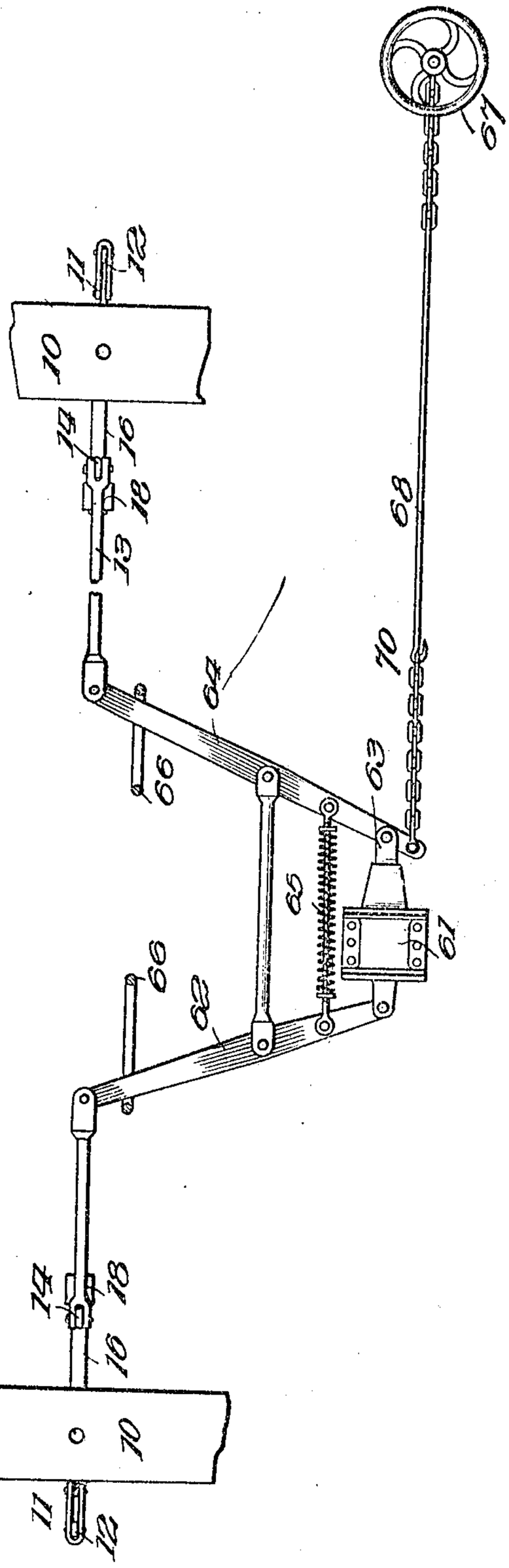

Fig. 1.

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UNITED STATES PATENT OFFICE.

WILLIAM H. SAUVAGE, OF FLUSHING, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO GOULD COUPLER COMPANY, OF NEW YORK, N. Y.

SLACK-ADJUSTER.

1,298,575. Specification of Letters Patent. **Patented Mar. 25, 1919.**

Application filed January 31, 1918. Serial No. 214,688.

To all whom it may concern:

Be it known that I, WILLIAM H. SAUVAGE, a citizen of the United States of America, residing at Flushing, Long Island, in the county of Queens and State of New York, have invented certain new and useful Improvements in Slack-Adjusters, of which the following is a specification.

This invention relates to slack adjusters for railway truck brake rigging and more particularly to automatic slack adjusters.

One of the objects of the present invention is to provide an automatic slack adjuster particularly designed for railway trucks which will be of simple and practical construction and reliable and efficient in use and operation. Another object is to provide an automatic slack adjuster which may be easily and quickly applied to trucks now in general use without unnecessary expense and trouble in adding, altering and substituting parts. Another object is to provide a combined brake rigging and slack adjuster system in which the parts are interchangeable, thus reducing the number of extra parts required. Other objects will be in part obvious from the annexed drawings and in part indicated in connection therewith by the following analysis of this invention.

This invention accordingly consists in the features of construction, combination of parts and in the unique relations of the members and in the relative proportioning and disposition thereof; all as more completely outlined herein.

To enable others skilled in the art so fully to comprehend the underlying features thereof that they may embody the same by the numerous modifications in structure and relation contemplated by this invention, drawings depicting several modified forms have been annexed as a part of this disclosure, and in such drawings, like characters of reference denote corresponding parts throughout all the views, of which:—

Figure 1 is a side elevational view, partly in section, of such parts of a truck and associated brake rigging as are necessary to understand one application of the present invention.

Fig. 2 is an end elevation of a part of the mechanism shown in Fig. 1, looking toward the right;

Fig. 3 is a partial view similar to Fig. 1, showing a modification;

Fig. 4 is an end view of this modification looking toward the left;

Fig. 5 is a view similar to Fig. 1, showing a further modification;

Fig. 6 is a detail plan view;

Fig. 7 is a diagrammatic view of the complete system of brake rigging and slack adjusters showing the truck levers positioned vertically.

Referring now to the drawing in detail and more particularly to Fig. 1, 10 denotes the frame of a truck of usual construction provided at one side with a support 11 for the upper end of a dead lever 12. At the opposite side of the truck is a pull rod 13 connected to the upper end of a live lever 14. Both of these levers are provided intermediate their ends with brake beams 15 carrying the usual brake shoe heads and shoes, (not shown).

The lower ends of the brake levers are connected by means of an expansible telescopic push rod comprising a solid member 16 pivotally connected at 17 to the lower end of the dead lever 12 and a telescopic tubular member in the form of a housing 18 pivoted or trunnioned at 20 between bifurcated ends 21 of the live lever 14. An adjusting rod 23 extends between fulcrum point 22 on the live lever and the push rod 16, the latter of which is provided with a friction clamp 24 adapted to slide along the rod 16 under conditions hereinafter described. The adjusting rod 23 is provided with a bifurcated end 25 surrounding the push rod, as shown more clearly in Fig. 2 and inclosing or embracing the friction clamp 24 therebetween. The clamp 24 is of less width than the bifurcations 25 in order to insure certain lost motion for brake shoe clearance.

The housing 18 is provided with permanent take up and holding means preferably in the form of holding dogs normally held in canted position by means of a spiral spring, as shown clearly in my prior Patent #1,227,940, dated May 29, 1917. A releasing lever 26 as also shown in said patent may be applied thereto, if desired.

On operation of the brakes the upper end of the live lever 14 moves toward the left and reacts through the push rod 16 to actuate the dead lever 12. If excess travel oc-

curs exceeding that provided by the difference in width between the length of the friction clamp 24 and the space between the bifurcation 25 then this friction clamp will be moved along the rod 16 toward the left a corresponding amount.

'On release of the brakes the parts normally drop back to the position shown in Fig. 1, by reason of the return spring 29 acting between the housing and the lost motion device, thus clearing the shoes from the periphery of the wheels, and further retractive movement of the adjusting rod 23 is held by means of this yielding friction clamp 24, thereby moving the casing relatively toward the left causing an elongation of the telescopic push rod to permanently take up and hold the excess slack due to wear of the parts. Any desired form of return spring may be used but preferably the form indicated at 29 interposed between the housing 18 and the lower end of the adjusting rod 23. This will cause a full return of the live lever into engagement with stop 27 on the truck frame.

In Fig. 3, the construction and operation of the parts are substantially the same as that above described. The principal difference, however, resides in the construction of housing 30 for the permanent take up and holding means which in this case, it will be noted is provided with two projecting lugs 31 between which a flat live lever 32 of usual and standard construction is pivoted at point 33. Such construction permits the use of brake rigging now in general use without material alteration for heretofore a solid push rod has been connected between this point 33 and the lower end of the dead lever 12.

In Fig. 5, a slightly different modification is shown, particularly adapted for maximum traction trucks of street cars in which 35 denotes a portion of the truck frame carried by the large and small wheels 36 and 37 respectively. Both sets of wheels are provided with brake beams 38 and 40 carrying the usual brake shoe heads and shoes supported from hangers 41. The power or upper end of a live lever 42 is provided with a stirrup or clevis 43 for attachment to the pull rod (not shown) leading to the power cylinder.

The brake beam 40 is also provided with a strut 44 pivotally connected at 45 in the upper end of a dead lever 46, the lower end of which lever is pivoted at 47 to a relatively fixed transverse member 48 of the truck frame. Between the central part of the dead lever 46 and the lower bifurcated end of the live lever 42 extends a telescopic push rod 50 coacting with a housing or a push rod casing 51 containing a permanent take up and holding means such as a plurality of rectangular dogs 52 having holes therein with case hardened edges through which the push rod 50 passes. These dogs are normally held in canted or gripping position by means of a spring 53 coiled about the push rod 50 and urging the lower ends of the dogs toward the left, as clearly shown.

Pivoted at 54 to the central part of the live lever 42 is an adjusting rod 55. The right hand end of this adjusting rod surrounds the push rod 50 and has a bifurcated part 56 between the branches of which is a device or dog 57 held in gripping relation with the rod 50 by means of a spring 58, as shown. A return spring 60 acts between the housing 52 and part 56 to restore the parts to full return position.

The operation of this device is substantially as follows: On application of the brakes, the upper end of the live lever 42 moves toward the left and reacts through the push rod 50 to carry the upper end of the dead lever 46 toward the right. This will bring the brake shoes into contact with the periphery of the wheels and if any excess travel occurs due to wear of the parts and more particularly on the faces of the shoes, the spring actuated dog 57 will be moved along the adjusting rod an amount exactly equal thereto, thus permitting a full and complete application of the brakes. On release of the brakes, the live lever is returned to normal position by means of the return spring 60, and the brake shoes drop away from the face of the wheels. The adjusting rod stop dog then acts as a brace whereby the live lever may complete its movement to full return position. This movement will cause the push rod casing and gripping rods contained therein to move relatively along the push rod toward the left an amount exactly corresponding to the excess travel of the brake rigging previously temporarily taken up and held by the friction dog. The dogs 52 are free to move in this direction but so long as they are held in canted position by means of the spring 53 a relative movement of the push rod in the opposite direction is positively prevented. In this manner, the slack is taken up and permanently held, thus insuring uniform brake shoe clearance and uniform piston travel at all times.

When it is necessary to substitute new brake shoes the worn brake shoes are removed, the gripping dogs moved to upright position as by means of the dog release mechanism shown in my above referred to patent, after which a bar is inserted between one of the brake shoe heads and the wheel, preferably that carried by the live lever, and the live lever is then moved bodily toward the right causing the push rod to slide through the gripping dogs. When the parts are returned a sufficient distance the new brake shoes are applied to the heads and

an application of the brakes will immediately take up the slack and automatically adjust the parts to the new conditions.

In Fig. 7, there is shown diagrammatically the complete braking system with the truck brake levers arranged in vertical position instead of inclined, as shown in Figs. 1 and 3. This has certain advantages as it permits interchangeability of the various parts, as may be necessary in case of breakdown and reduces the number of supporting parts that would otherwise have to be carried for right and left hand brakes.

In this drawing 61 denotes the power cylinder located beneath the central part of the car to one side of which is connected a dead lever 62, while the opposite side is connected through piston 63 with live lever 64. A return spring 65 coacts with the usual cylinder spring for restoring these parts to normal position. Lever guides 66 are provided where necessary for supporting from the under side of the car beneath the live and dead levers and their general U-shape construction permits them to act as stops whereby when the brakes are fully released they have the very important advantage of being always in the same uniform angular relation. The free ends of the live and dead levers are connected by means of pull rods 13 to the truck brake rigging, as shown in Fig. 1. A hand wheel is indicated at 67 connected by means of pull rod 68 and chain 70 with the live lever 64 adjacent its point of connection with the piston 63. This will permit the brakes to be operated either by hand or air brake power, as desired.

It is thus seen that the present invention is directed to several forms of reliable and efficient slack adjusters each having relatively few parts of simple and practical construction and adapted to accomplish, among others, all of the objects and advantages herein set forth.

I realize that considerable variation is possible in the details of construction and arrangement of parts without departing from the spirit of my invention, and I therefore do not intend to limit myself to the specific form shown and described.

I claim:—

1. In an apparatus of the character described, in combination, a live lever, a dead lever, a two-part extensible telescopic push rod connecting said levers, one of the parts of said push rod comprising a housing containing permanent take up and holding means therein, and an adjusting rod acting between the live lever and the push rod, having a lost motion yielding frictional connection with one of said parts.

2. In an apparatus of the character described, in combination, a live lever, a dead lever, a two-part extensible telescopic push rod connecting said levers, one of the parts of said push rod comprising a housing containing permanent take up and holding means therein, an adjusting rod acting between the live lever and the push rod having a lost motion connection with the latter, and a return spring between the housing and adjusting rod.

3. In an apparatus of the character described, in combination, a live lever, a dead lever, a push rod extending therebetween of greater length than the distance between said levers, a housing slidably mounted upon said push rod capable of normal movement in one direction only and having a pivotal connection with the lower end of said live lever and a freely movable spring mounted on said rod outside of said housing adapted to slide said housing along said rod when excess travel has taken place and the slack is to be taken up, positive take up means within the housing and coacting with said push rod, and means for releasing said positive take up means operable from without the housing when new brake shoes are to be applied.

4. In an apparatus of the character described, in combination, a live lever, a dead lever, a push rod extending therebetween of greater length than the distance between said levers, a housing slidably mounted upon said push rod capable of normal movement in one direction only and having a pivotal connection with the lower end of said live lever, positively acting take up means within the housing coacting with said push rod, and an adjusting rod acting between said live lever and the push rod and having a lost motion connection at one end and a return spring acting directly on said housing and positioned between said housing and adjusting rod adapted to slide said housing along said rod when excess travel has taken place and the slack is to be taken up.

5. In an apparatus of the character described, in combination, a live lever, a dead lever, a push rod extendinig therebetween of greater length than the distance between said levers, a housing slidably mounted upon said push rod capable of normal movement in one direction only and having a pivotal connection with the lower end of said live lever, positively acting take up means within the housing coacting with said push rod, and an adjusting rod acting between said live lever and the push rod and having a lost motion connection at one end, and a return spring acting between the housing and adjusting rod.

6. In an apparatus of the character described, in combination, a live lever, a dead lever, a push rod extending therebetween of greater length than the distance between said levers, a housing slidably mounted upon said push rod capable of normal movement

in one direction only and having a pivotal connection with the lower end of said live lever, positively acting take up means within the housing coacting with said push rod, and an adjusting rod extending between said live lever and the push rod and having a lost motion connection at one end, and means associated with the lost motion means and engaging said push rod adapted to be moved therealong on excess travel of the brake rigging.

7. In a slack adjuster, in combination, a live lever, a dead lever, a push rod, an adjusting rod interposed between the push rod and the central part of the live lever, and a telescopic push rod between the dead lever and the lower part of the live lever, said telescopic push rod comprising a housing pivotally mounted at the lower end of the live lever and containing permanent take up and holding mechanism adapted to coact with the push rod, and a return spring coiled about said rod and acting between said housing and the point of connection of the adjusting rod with the push rod, said holding mechanism including a plurality of rectangular dogs yieldingly held in canted position.

8. In a slack adjuster, in combination, a live lever, a dead lever, a push rod, an adjusting rod interposed between the push rod and the central part of the live lever, and a telescopic push rod between the dead lever and the lower part of the live lever, said adjusting rod being pivotally mounted on the live lever near its central part having a bifurcated end through which the push rod is adapted to pass, and temporary holding means acting on the push rod and movable between said bifurcated ends.

9. In a slack adjuster, in combination, a live lever, a dead lever supported from a fixed part of the truck, a telescopic push rod connecting the dead lever with the live lever, permanent take up and holding means operating between the effective ends of the telescopic push rod including a housing pivotally mounted at the lower end of the live lever, and temporary take up and holding mechanism connected with the central part of the live lever including an adjusting rod having a bifurcated part mounted upon the push rod and through which said push rod is adapted to pass, and holding means carried by said adjusting rod and movable between the said bifurcated ends and adapted to be moved when excess travel of the brake rigging occurs.

10. In a slack adjuster, in combination with a truck, a live lever having a bifurcated lower end, a dead lever supported from a relatively fixed part of the truck, struts associated with said live and dead levers, a telescopic push rod between the dead lever and the lower bifurcated end of the live lever, a housing carried by said bifurcated end having permanent take up and holding means adapted to coact with said push rod and permit relative movement of the push rod with respect thereto in one direction only and a return spring mounted directly on said rod adapted to be compressed when excess travel takes place and expand on release of the brakes to move said housing along said push rod equal to said excess travel.

11. In a slack adjuster, in combination with a truck, a live lever having a bifurcated lower end, a dead lever supported from a relatively fixed part of the truck, struts associated with said live and dead levers, a telescopic push rod between the dead lever and the lower end of the live lever, a housing carried by said bifurcated end having permanent take up and holding means adapted to coact with said push rod and permit relative movement of the push rod with respect thereto in one direction only, adjusting means acting between the live lever and push rod and a spring between the adjusting means and housing.

12. In a slack adjuster, in combination with a truck, a live lever having a bifurcated lower end, a dead lever supported from a relatively fixed part of the truck, struts associated with said live and dead levers, a telescopic push rod between the dead lever and the lower end of the live lever, a housing carried by said bifurcated end having permanent take up and holding means adapted to coact with said push rod and permit relative movement of the push rod with respect thereto in one direction, and adjusting means acting between the live lever and push rod, and a return spring acting between the housing and adjusting means.

13. In a slack adjuster, in combination with a truck, a live lever, a dead lever supported on a relatively fixed part of the truck, struts associated with said live and dead levers, a telescopic push rod between the dead lever and the lower end of the live lever, including permanent take up and holding means adapted to coact with the rod portion and permit relative movement of the rod with respect thereto in one direction only, adjusting means between the live lever and rod, temporary take up and holding means associated therewith and said live lever adapted to be actuated on excess travel of the brake rigging and prior to the actuation of the permanent take up and holding means and a spring acting between said take up and holding mechanisms.

14. In a slack adjuster, in combination with a maximum traction truck, a live lever, a dead lever supported on a relatively fixed part of the truck, struts associated with said live and dead levers, a telescopic push rod

between the dead lever and the lower end of the live lever including a housing carried by said live lever and having permanent take up and holding means adapted to coact with the rod portion and permit relative movement of the rod with respect thereto in one direction only, and an adjusting rod acting between the central part of the live lever and push rod having temporary take up and holding means associated therewith adapted to be actuated on excess travel of the brake rigging prior to the actuation of the permanent take up and holding means, said temporary take up and holding means including a bifurcated part through which said push rod passes, and a friction clamp upon said push rod operable between the bifurcations and provided with lost motion means to insure brake shoe clearance.

15. In an apparatus of the character described, in combination, a live lever, a two-part extensible push rod, one of which parts is connected with said live lever, temporary take up and holding means between the live lever and the other part of said push rod, and a spring acting between said temporary take up means and that part of the extensible push rod connected with the live lever.

16. In an apparatus of the character described, in combination, a live lever, an extensible two-part push rod including permanent take up and holding means connected with said live lever, an adjusting rod between the live lever and one part of said extensible push rod, and a spring acting between the adjusting rod and the permanent take up and holding means.

17. In an apparatus of the character described, in combination, a live lever, a brake beam strut pivotally connected to said live lever intermediate the ends thereof, a permanent take up and holding device connected with the lower end of said live lever constituting one part of a two-part extensible push rod, an adjusting rod connected with the live lever adjacent its point of connection with the strut, and a return spring acting between said permanent take up and holding means and the adjusting rod at the point of connection of said adjusting rod with said push rod.

18. In an apparatus of the character described, a live lever, a brake beam supporting said live lever intermediate its ends, a two-part extensible push rod including a housing pivoted at the lower end of said live lever, an adjusting rod acting between the live lever and the push rod, a lost motion device associated with one of said parts, and a spring acting between said adjusting rod and said housing.

19. In an apparatus of the character described, a live lever, a two-part extensible push rod including a permanent take up and holding means pivotally connected with the lower end of said live lever, and adjusting rod connected with said live lever intermediate its ends at one end and having its other end slidably supported upon the push rod, a lost motion device associated with one of said points of connection including a yielding friction clamp, and a spring acting between said adjusting rod and the permanent take up and holding means.

20. In an apparatus of the character described, a live lever, a two-part extensible push rod including a permanent take up and holding means connected with the lower end of said live lever, an adjusting rod connected with said live lever intermediate its ends at one end and having its other end slidably supported upon the push rod, a lost motion device associated with one of said points of connection including a yielding clamp, and a spring acting between said adjusting rod and the permanent take up and holding means, said permanent take up and holding means including a housing having a plurality of dogs normally inclined with respect to the axis of said rod.

21. In an apparatus of the character described, a live lever, a two-part extensible push rod including a permanent take up and holding means connected with the lower end of said live lever, an adjusting rod connected with said live lever intermediate its ends at one end and having its other end slidably supported upon the push rod, a lost motion device associated with one of said points of connection, and a spring acting between said adjusting rod and the permanent take up and holding means, said permanent take up and holding means including a housing having a plurality of dogs normally inclined with respect to the axis of said rod, and a release means associated with said housing adapted to straighten said dogs when it is desired to restore the parts to normal position.

In testimony whereof I affix my signature in the presence of a witness.

WILLIAM H. SAUVAGE.

Witness:
G. H. DIETZ.