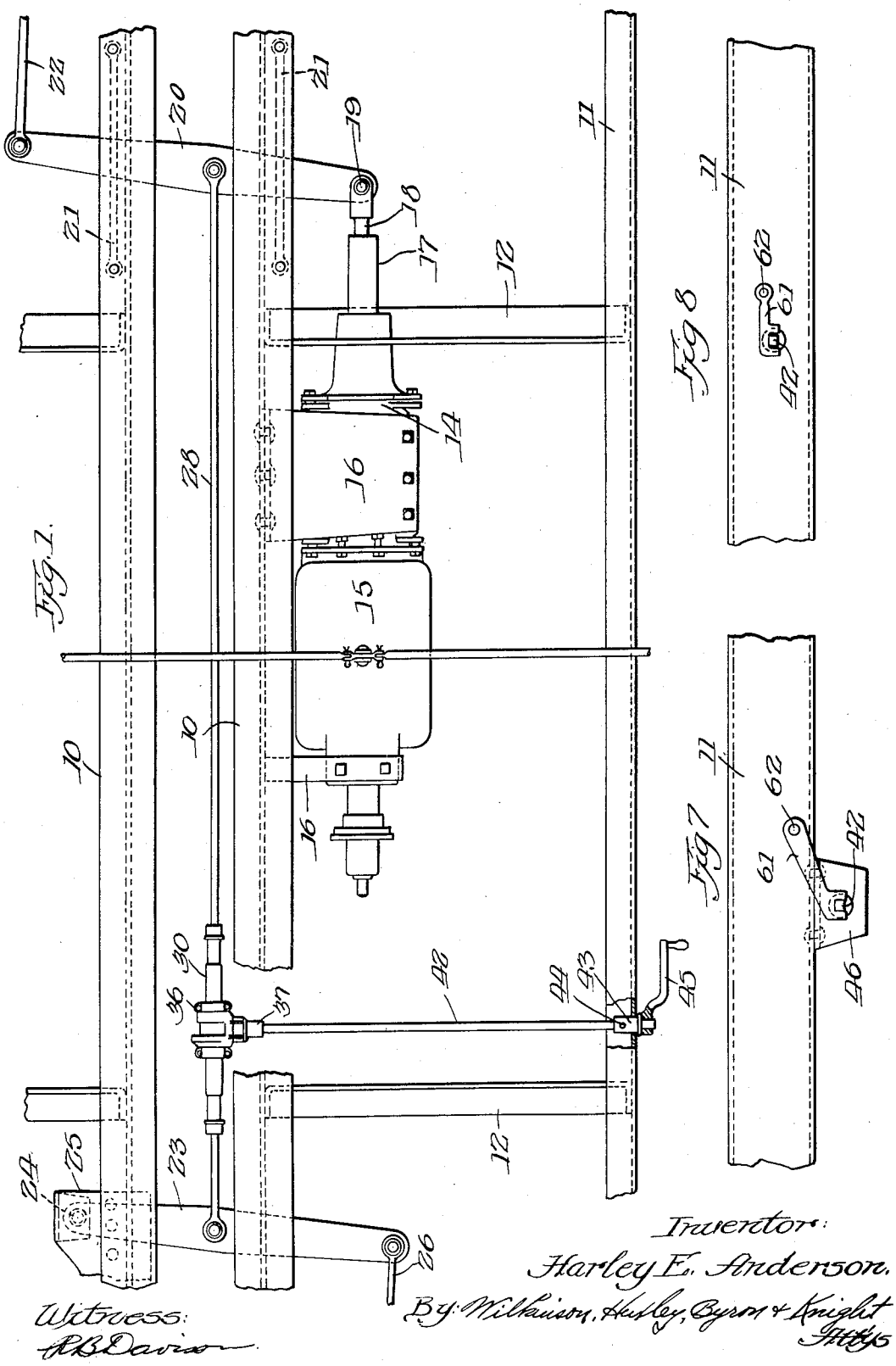
Nov. 21, 1933. H. E. ANDERSON 1,935,607

SLACK ADJUSTER

Filed Aug. 31, 1931 3 Sheets-Sheet 1



Nov. 21, 1933. H. E. ANDERSON 1,935,607

SLACK ADJUSTER

Filed Aug. 31, 1931 3 Sheets-Sheet 2

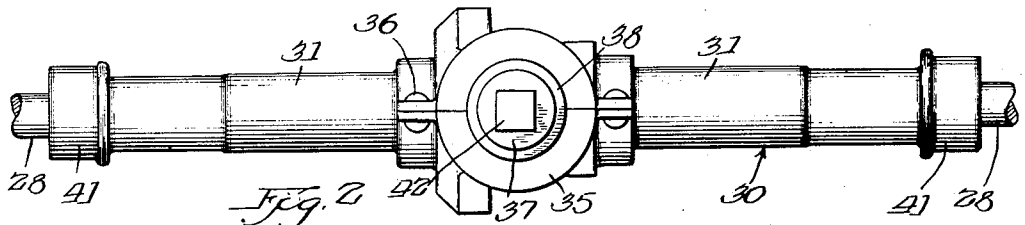


Fig. 2

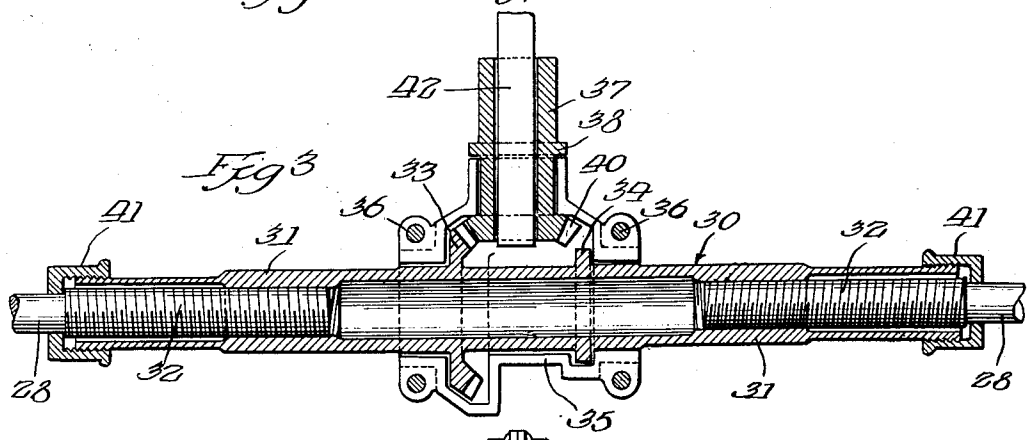


Fig 3

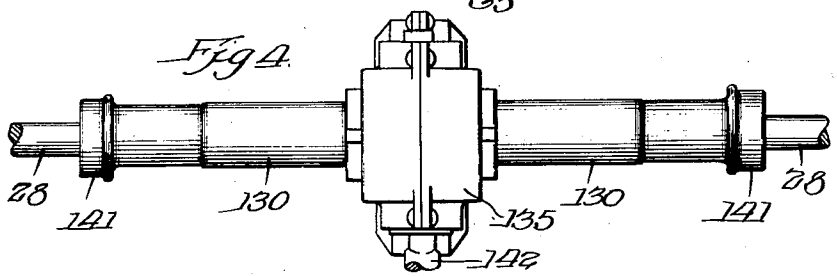


Fig 4

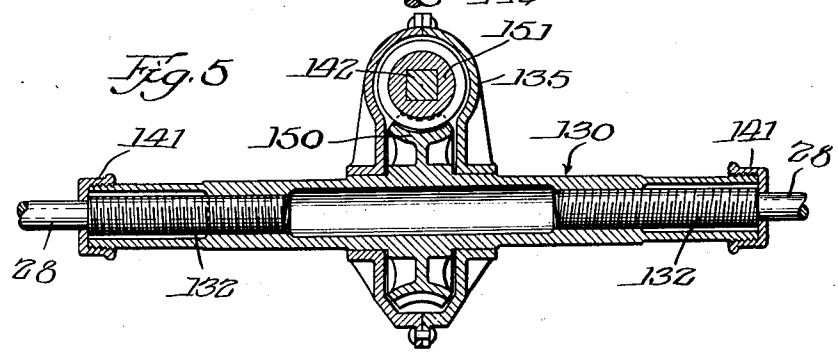


Fig. 5

Witness:
R. B. Davison

Inventor:
Harley E. Anderson.
By: Wilkinson, Huxley, Byron & Knight
Attys

Nov. 21, 1933. H. E. ANDERSON 1,935,607

SLACK ADJUSTER

Filed Aug. 31, 1931 3 Sheets-Sheet 3

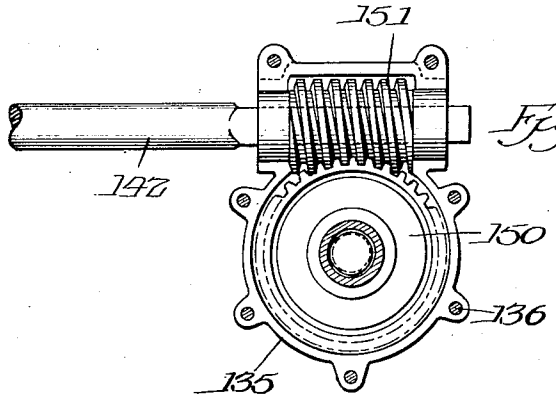


Fig. 6.

Fig. 9.

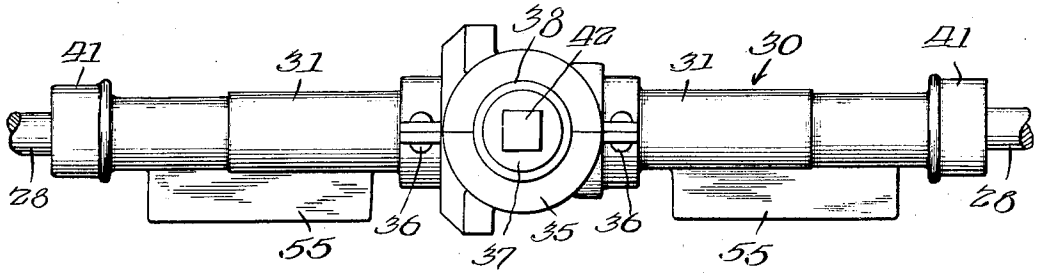
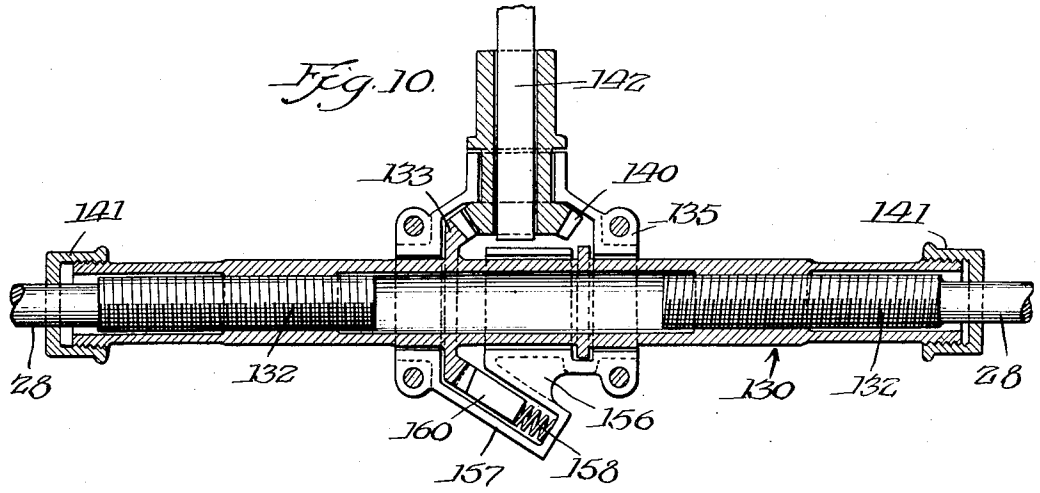


Fig. 10.



Witness:
R. B. Davison

Inventor:
Harley E. Anderson
By: Wilkinson, Huxley, Byron & Knight
Attys

Patented Nov. 21, 1933 1,935,607

UNITED STATES PATENT OFFICE

1,935,607

SLACK ADJUSTER

Harley E. Anderson, Kansas City, Mo., assignor to Gustin Bacon Manufacturing Company, Kansas City, Mo., a corporation of Missouri

Application August 31, 1931. Serial No. 560,284

5 Claims. (Cl. 188—197)

The invention relates to improvements in foundation brake rigging and has particular reference to manually operated adjusters for regulating the same to maintain the proper piston travel and brake shoe clearance.

An object of the invention is to provide an adjuster or regulator of the above general character which will permit of ready installation in connection with the brake systems now in use without any material change or expense.

A further object is to provide an adjuster having association with the floating cylinder and dead levers of the foundation rigging and which will permit a rapid, accurate and equal adjustment of the rigging on both trucks of the system to ensure correct brake shoe clearance.

Another object is to provide a single adjuster so positioned as to permit regulation or adjustment of the foundation rigging with one operation, and which can be made at the side of the car within sight of the cylinder so that the piston travel is visible during regulation.

A still further object is to provide a regulator adapted for insertion in the pull rod in connection between the floating cylinder and dead levers of the foundation rigging and which in operation will function to lengthen or shorten the pull rod to regulate the slack in the system, the adjuster and its operating rod incorporating a slip fit to permit operation of the same from the side of the car.

A further object is to provide an adjuster of the class described which will embody novel means to prevent inadvertent actuation of the same by the vibration of the car.

With these and other objects in view, the invention may consist of certain novel features of construction and operation as will be more fully described and particularly pointed out in the specification, drawings and claims appended hereto.

In the drawings which illustrate an embodiment of the device,

Figure 1 is a plane view of the underframe of a railway car showing a portion of the foundation brake rigging having the present invention associated therewith;

Figure 2 is an elevational view of the adjuster of the present invention;

Figure 3 is a sectional view taken horizontally of the adjuster shown in Figure 2;

Figure 4 is an elevational view of a modified form of adjuster;

Figure 5 is a horizontal sectional view through the adjuster shown in Figure 4;

Figure 6 is a vertical sectional view taken substantially through the center of the adjuster shown in Figure 4;

Figure 7 is a detailed view showing one form of means for locking the operating rod for the adjuster against movement;

Figure 8 is a detailed view of another form of locking means with the operating rod being shown journaled in the side frames;

Figure 9 is an elevational view of the adjuster shown in Figure 2 showing another form of means for preventing inadvertent rotation of the same; and

Figure 10 is a horizontal sectional view of an adjuster similar to that shown in Figure 2 equipped with a modified arrangement for preventing inadvertent rotation of device.

The invention is shown as applied to the foundation rigging of a railway car consisting of center sills 10 and side sills 11 suitably interconnected by transverse members 12. The rigging consists in a pressure cylinder 14 having associated therewith the air reservoir 15 and being suitably supported from one of the center sills by brackets 16. The pressure cylinder 14 actuates a piston to which is secured the hollow piston rod 17, which has in turn associated therewith the push rod 18 pivotally connected at 19 to the cylinder lever 20 supported from the center sills by the supports 21. To the extreme outer end of the cylinder lever is pivotally secured a top rod 22 which connects with the live lever of the brake rigging on the forward truck to cause actuation of the same in response to the actuation of the push rod.

The foundation rigging also includes a floating lever 23 pivotally secured at 24 to the underframe of the car by means of the bracket 25 and having connection at its other end to a top rod 26 which in turn connects with the live lever of the brake rigging on the rearward truck. In standard rigging the cylinder lever 20 and the floating lever 23 are pivotally connected at points intermediate their ends to a pull rod 28 so that in operation of the rigging by outward movement of the push rod 18 the cylinder lever will impart actuation to the top rod 22 and simultaneously through pull rod 28 to the floating lever 23 to actuate its associated top rod 26. In this manner the brake rigging on both trucks are simultaneously actuated.

Continued application of the brakes to the car wheels soon causes the brake shoes to wear with the result that the clearance between the brake shoe and the car wheels is increased causing an increase in piston travel to apply the

brakes. To maintain an ideal piston travel requires frequent adjustment of the brakes as new brake shoes must be applied at various times to replace worn ones necessitating adjustment of the brake rigging with additional adjustment being required before a car starts down a long grade as a shorter piston travel is needed to conserve air. The present invention provides an adjuster whereby the pull rod connecting the cylinder and floating levers can be lengthened or shortened to take up the slack in the brake rigging on the trucks. The adjuster is located in this pull rod since this rod has the least travel when the brakes are applied, is positioned substantially centrally of the car and by shortening the rod the brakes can be adjusted equally on the forward and rearward trucks.

Referring to Figures 2 and 3 the adjuster is shown as comprising an adjuster housing 30 having a bore extending therethrough with threads provided on the interior surface of the adjuster at portions 31, for receiving the threaded ends 32 of sections of the pull rod 28. In applying the adjuster to brake rigging the pull rod 28 has a portion removed and the ends are threaded so that they can be connected to the adjuster housing by being threaded to the portions 31 of the same. In those cases where it is necessary to equip rigging already in operation on a railway car the adjuster is provided with the members 32 forming short extensions of the same, the extensions being adapted to be suitably welded to the separated portions of the pull rod. In either case the adjuster housing 30 functions as a turnbuckle on the pull rod as the threads at one end are right hand while those at the other are left hand so that rotation of the housing will cause the threaded portions 32 to either be retracted within the housing or to travel outwardly of the housing to, in effect, shorten or lengthen the pull rod. Formed integrally with and positioned centrally of the housing 30 is a bevel gear 33 and a thrust collar 34 which positions on the housing a split gear housing 35. The gear housing is suitably joined by means of rivets 36 and provides bearings for journaling the housing 30, and also a bearing for journaling the shaft 37 having formed integrally therewith the collar 38 and the bevel pinion 40. The gear housing thus rotatively mounts the housing 30 provided with the bevel gear 33 and the shaft 37 provided with the bevel pinion 40 and maintains the gears in meshing engagement. As a stop for limiting the outward travel of the threaded portions 32 of the pull rod the housing has suitably threaded to each end the caps 41 provided with openings in their end wall through which the rod projects.

The operating means for rotating the adjuster housing 30 includes an operating shaft 42 of square cross section which is operatively associated with the shaft 37 provided for the purpose with a bore extending from end to end and also of square cross section. The operating shaft 42 has one end inserted in the square bore provided in shaft 37 and has its other end mounted in the side frame of the car by means of a spool 43 which is suitably pinned to the operating shaft by the cotter pin 44. Rotation of the shaft is accomplished by fitting to the projecting end of the same a crank handle 45, adapted to be rotated by the brakeman when it is desired to adjust the rigging.

By the construction of the gear housing it will be seen that the operating shaft can be raised or lowered to any angle to suit various side sills since the height of these sills from the rails differs on the various classes of cars. As shown in Figure 7 the side sill in this modification is provided with a depending bracket 46 through which the operating shaft 42 projects while the showing of Figure 8 journals the operating shaft directly in center of the side sills. The shaft 37 is provided with the bore extending its full length for the purpose of forming a bearing for the operating shaft of maximum length. This is very desirable since it is seen that the shaft 37 and the operating shaft 42 have a slip fit which permits the operating shaft to be withdrawn to the extent of several inches and still maintain operative connection so that rotation can be imparted to the pinion 40. In operation, to apply the brakes to the car wheels the pull rod 28 has a limited amount of movement sideways as one end of the rod is pivotally secured to the lever 23 fulcrumed to the frame. Thus the movement of the housing 30 which carries with it the shaft 37 is permitted with operative connection between shaft 42 and shaft 37 being maintained at all times.

Referring to Figures 4, 5 and 6 a modified form of slack adjuster is shown including an adjuster housing 130 having threaded engagement at its ends with threaded portions 132 of the pull rod 28 and a split gear housing 135 forming the journaling means for the housing. In this case the housing has formed integrally therewith a worm gear 150 adapted to mesh with the worm 151 suitably journaled in the gear housing 135. An operating shaft 142 has operative engagement with the worm 151 by means of the square bore provided in same which receives the square end of the shaft. The other end of the operating shaft is positioned in the side frame or in a bracket depending therefrom as in the preferred modification and by rotation of the same the adjuster housing 130 is caused to rotate to lengthen or shorten the pull rod 28. With the operating shaft extending beyond the side frame, permitting operation from the side of the car the operator has a clear view of the cylinder so that the extent of travel of the push rod 18 is visible during adjustment.

When the brakes are in release position tension is removed from the adjuster housing so that the weight of the device is placed on the pull rod causing friction between the threaded ends of the rod and the threaded portions of the housing. It has been found that this friction is sufficient in practically all instances to prevent inadvertent rotation of the adjuster housing by the vibration of the car, since any rotation would necessarily have to revolve the long operating shaft 42 which requires considerable effort. However, in order to ensure that the adjuster housing will not rotate to cause inadvertent lengthening or shortening of the pull rod, the invention contemplates the provision of weighted members 55 formed integrally with the adjuster housing 30 and positioned between the gear housing and the end caps. The weighted members would tend to come to rest when in their lowermost position shown in Figure 9 and would thus tend to prevent any rotation at the adjuster housing unless the same was definitely imparted thereto by actuation of the operating shaft.

In Figure 10 a form of locking means is shown particularly adaptable to the form of adjuster that is shown in Figure 3. The gear housing 135 is provided with a portion 156 forming a receptacle 157 for receiving a coil spring 158 and a latch 160. The receptacle is so positioned that

the latch has engagement with the teeth formed on the double gear 133 and since the latch is provided with a pointed end it moves into and out of mesh as the bevel gear is turned. With the parts at rest the spring 158 is strong enough to lock the adjuster housing in adjusted position and prevent any inadvertent rotation of the same by vibration of the car.

One advantage of the form of operating means including the worm gear and worm shown in Figures 4, 5, and 6, is that this type is self locking, since the worm locks the worm gears against turning and the adjuster housing cannot be revolved unless the worm is rotated through actuation of the operating shaft. An additional form of latching mechanism is shown in Figures 7 and 8 including a latch 61 pivoted to the side frames at 62 and having a jaw adapted to interfit with the squared operating shaft 42. With the latch in lowered position engaging the operating shaft, rotation of the same is prevented and it is therefore necessary for operator to release the latch before adjustment of the rigging can be accomplished.

I claim:

1. In foundation brake rigging of the character described, in combination, a cylinder and floating lever with connecting pull rod, means for adjusting said rigging including an adjuster located intermediate the ends of said rod, and an operating shaft therefor having a slip fit with the adjuster to permit movement of the same during application of the brakes.

2. In foundation brake rigging of the character described, in combination, a cylinder and floating lever with connecting pull rod, means for adjusting said rigging including an adjuster located intermediate the ends of said rod, said adjuster having threaded connection with the separated portions of said rod, and an operating shaft having a slip fit with the adjuster to permit movement of the same with respect to the shaft.

3. In foundation brake rigging for railway vehicles, in combination, a cylinder and pull rod operatively associated therewith, means for adjusting said rigging including an adjuster interposed in said pull rod for varying the length of said rod, an operating shaft having a slip fit with the adjuster to permit movement of the same with respect to the shaft, and means mounting the other end of the shaft in the side of the vehicle, whereby the operator may have a view of the cylinder during adjustment.

4. In a regulator for foundation brake rigging, a pull rod, an adjuster housing positioned intermediate the ends of said rod and forming a turnbuckle therewith, a gear provided on said housing, a second gear meshing therewith, a gear housing for journaling said second gear, and an operating shaft having a slip fit with the second gear.

5. In foundation brake rigging, in combination, a cylinder and floating lever with connecting pull rod, means for adjusting said rigging including an adjuster located intermediate the rod, the opposed ends of the rod being enlarged in diameter and threaded for connection with the adjuster, an operating shaft for rotating the adjuster, and end members secured to the adjuster for engaging the enlarged threaded ends of the rod to limit their outward travel.

HARLEY E. ANDERSON.