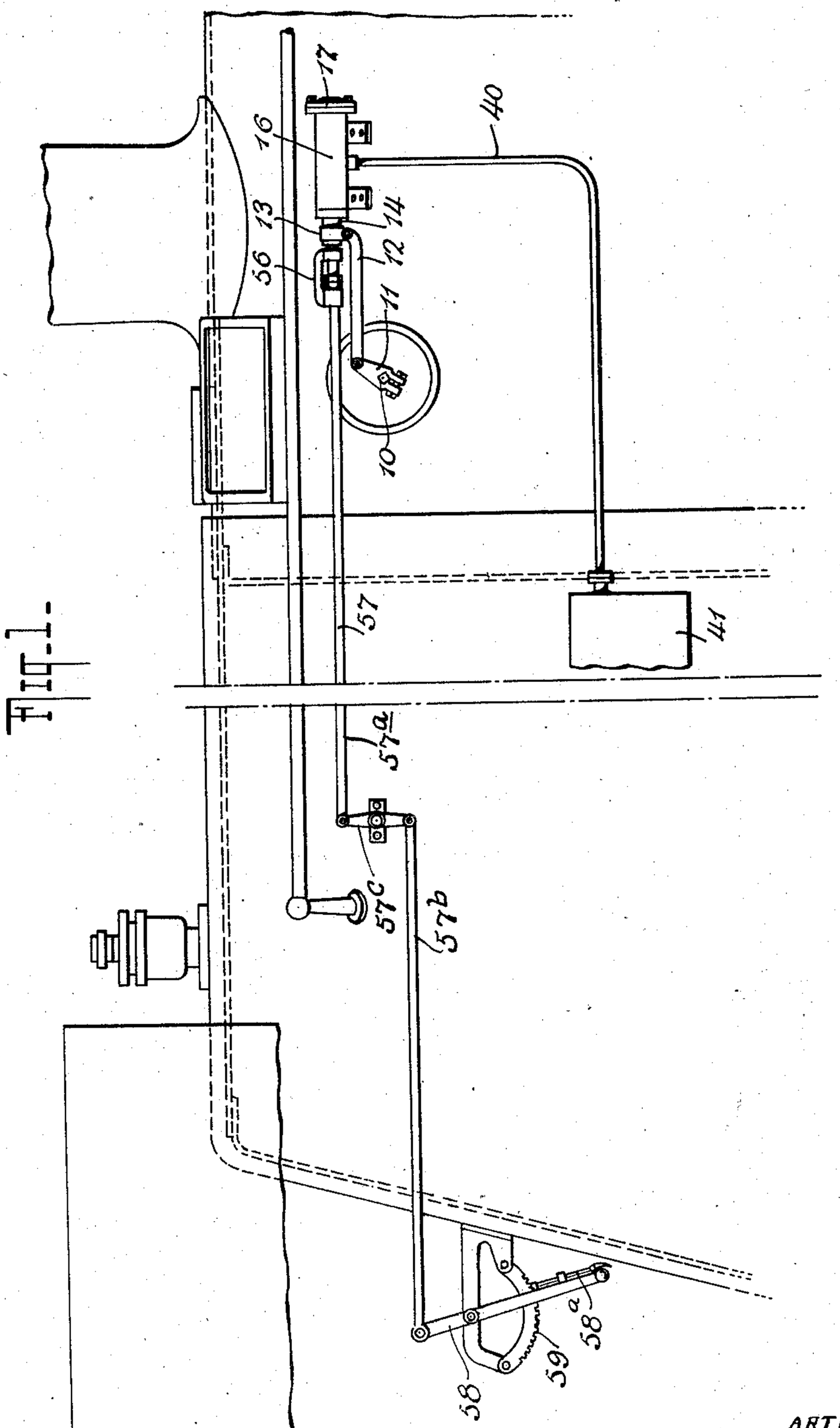
Oct. 7, 1930. A. WILLIAMS 1,777,819

POWER ACTUATED THROTTLE VALVE CONTROL

Filed Sept. 22, 1928 2 Sheets-Sheet 1

Fig. 1.



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POWER ACTUATED THROTTLE VALVE CONTROL

Filed Sept. 22, 1928 2 Sheets-Sheet 2

Fig. 2.

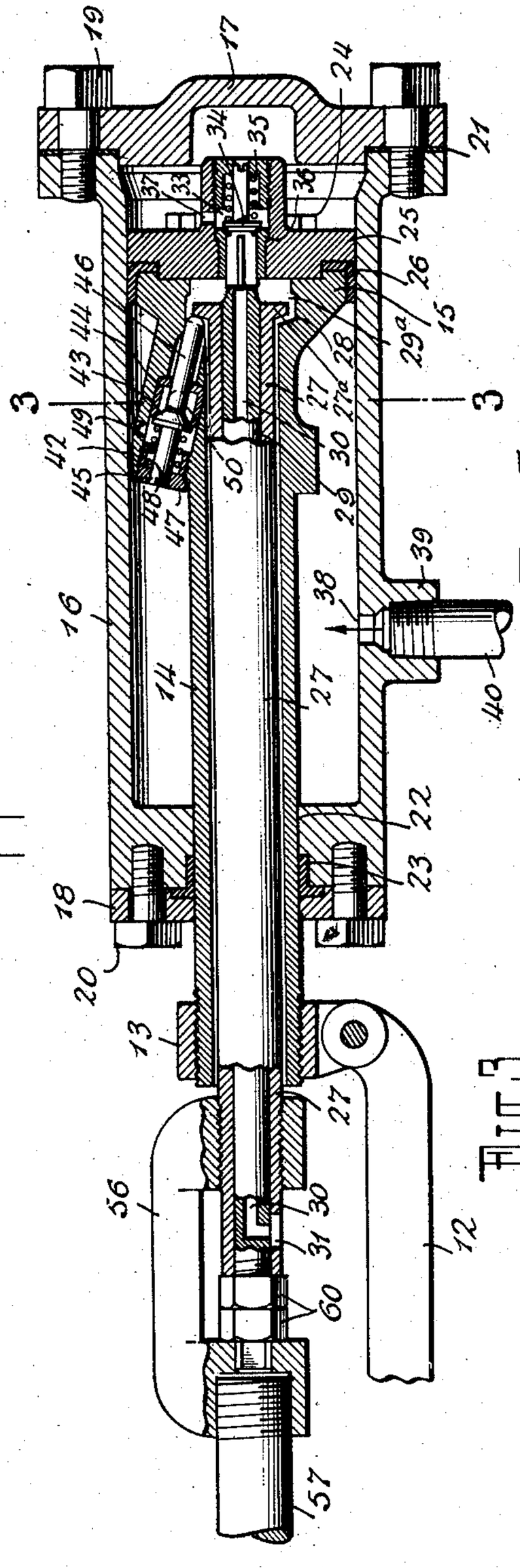


Fig. 4.

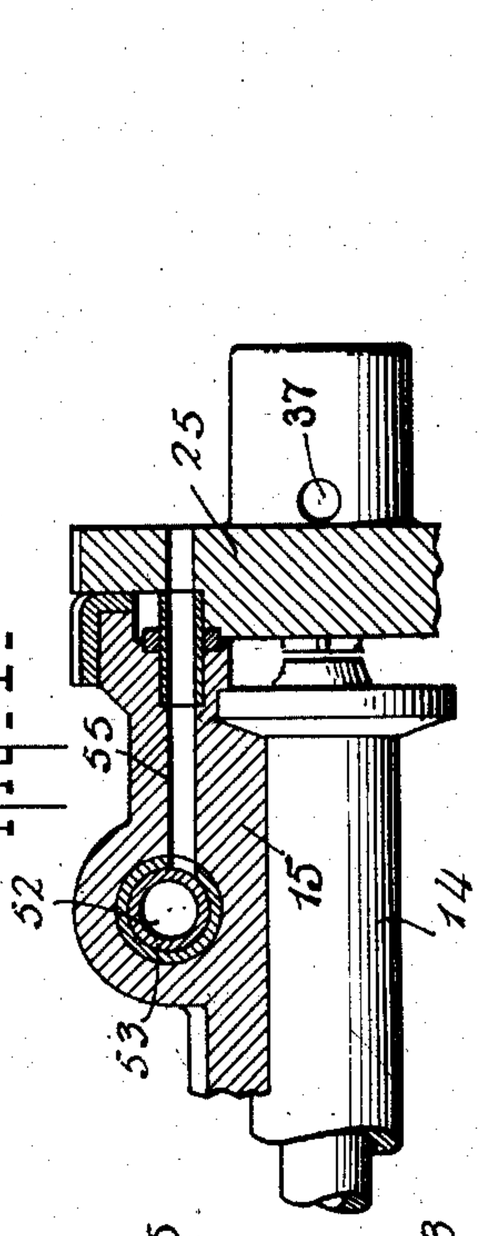
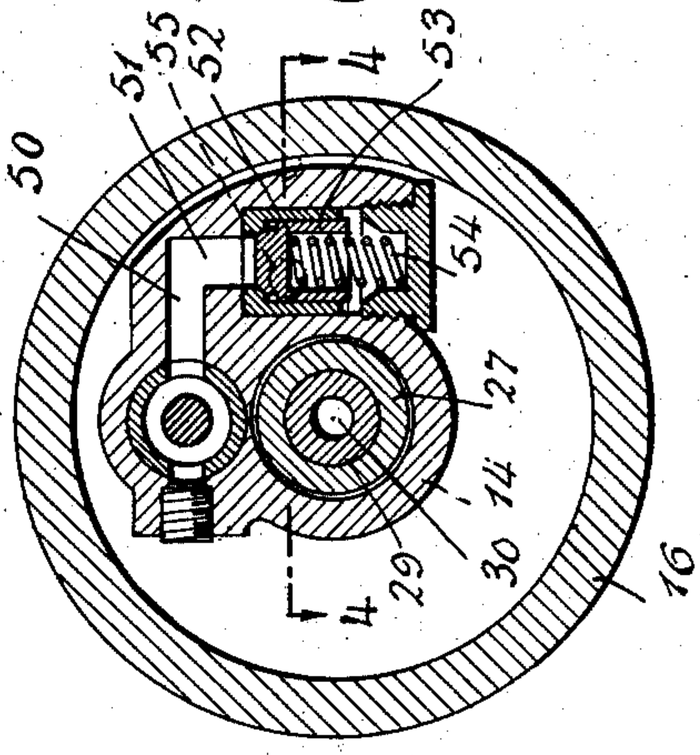


Fig. 3.



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UNITED STATES PATENT OFFICE

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POWER-ACTUATED THROTTLE-VALVE CONTROL

Application filed September 22, 1928. Serial No. 307,755.

This invention relates to throttle operating means for locomotives and particularly to power actuated throttle operating means.

The principal object of the present invention is to provide a new and improved construction for a throttle valve control of marked simplicity having a minimum number of operating parts and therefore of low manufacturing and maintenance cost.

Another object of the present invention is to provide a power operated throttle valve control which is capable of being operated manually in the event the power means should fail to function.

Considered from another angle a principal object of the present invention is to improve upon and simplify the throttle operating means disclosed in the co-pending application Serial No. 279,451 filed May 21, 1928 by Neal T. McKee.

The above and other objects of the present invention will appear more fully from the following more detailed description and by reference to the accompanying drawings forming a part hereof, wherein Fig. 1 is a diagrammatic side view showing the manner in which the throttle control of the present invention is installed upon a locomotive; Fig. 2 is an enlarged vertical section through a fluid pressure cylinder and piston which forms the power actuating means of the present invention; Fig. 3 is a section on the line 3—3 of Fig. 2 and Fig. 4 is a section on the line 4—4 of Fig. 3.

As shown in Fig. 1 of the drawings, the numerical 10 indicates the throttle valve actuating shaft of a locomotive of the type wherein highly superheated steam is employed. In this type of locomotive a plurality of poppet valves are actuated successively by cams formed upon or secured to the shaft 10 and said cams are caused to actuate said valves by the rotation of the shaft 10. The constructional details of this type of throttle valve are well known and, as such details form no part of the present invention, the throttle valves and cams have not been shown in the drawings. In accordance with the usual custom the valve shaft 10 has secured thereto an actuating lever 11. With the present invention the lever has secured to its outer free end, one end of a connecting rod or strap 12. The other end of said strap 12 is pivotally secured to a sleeve or coupling 13, which, as shown in Fig. 2, is provided with a screwthreaded bore adapted to engage the rear end of a piston rod 14. The piston rod 14 is integrally associated with a piston 15 slidably mounted within a cylinder 16. The ends of the cylinder are closed by cylinder heads 17 and 18 which are bolted to the cylinder 16 by any suitable means such as the bolts or studs 19, 20. Suitable packing 21 is secured between the cylinder head 17 and the flanged front end of the cylinder 16. The rear cylinder head 18 is provided with a central bore 22 through which the piston rod 14 passes. The inner face of the head 18 is counterbored concentrically with the bore 22 for the reception of a cup washer or gasket 23 constructed of any suitable material which engages the outer cylindrical surface of the piston rod 14 and prevents leakage between said piston rod and cylinder head. The piston 15 forms in effect a continuation or enlargement of the piston rod 14. Secured to the inner face of the piston 15, as by the bolts 24, is a packing retaining plate 25. This plate serves to secure to the piston 15 a second cup washer 26.

The piston rod 14, as clearly shown in the drawings, is hollow to permit the passage therethrough of a hollow, valve actuating rod 27. The rod 27 has an enlargement 27ª at its inner end which is seated within a counterbore 28 formed in the inner end of the piston 15. The rod 27 is hollow for its entire length and has mounted in its bore an adjusting rod or shaft 29, the forward end of which is reduced as indicated at 29ª and which end projects outwardly beyond the enlarged end 27ª for a purpose presently to be more fully described. The rod 29 is hollow for the major portion of its length to provide a passage 30 which passage is open to the atmosphere through a laterally extending hole 31, provided in the rod 27, said hole being located at any convenient point along said rod exteriorly of the cylinder 16. At its front end the passage 30 communicates with a valve cham-

ber 33 formed in the plate 25. A valve 34 is slidably mounted within said chamber 33 and is provided with an enlarged seat adapted to be held normally, by a spring 35, against a suitable valve seat formed on the packing plate 25, or, as shown, upon a bushing 36 held in the central bore of said plate. The valve chamber 33 communicates through a small laterally extending port or conduit 37 with the space defined between the front face of the plate 25, the rear of the cylinder head 17 and the cylinder 16.

Fluid under pressure from any suitable source thereof, as, for example, the main air tank of the locomotive, is admitted into the interior of the cylinder 16 rearwardly of the piston 15 through an inlet 38; said inlet communicating with a screwthreaded boss 39 into which is threaded the end of a pipe 40, leading to said pressure.

Mounted within a lateral extension 42 formed upon the piston 15 is a valve 43. Said valve 43, as shown, is of the poppet type, the enlarged head of which engages with a valve seat preferably formed on a bushing 44 seated within a suitable bore provided within said lateral extension 42. The valve 43 is guided for sliding movement by a stem 45 and valve rod 46 preferably made integral with the valve. The stem 45 passes through a central aperture in a cap 47 screwed into the end of the bore formed in the extension 42. Coiled about the stem 45 is a spring 48 the ends of which abut against the valve cap 47 and the enlarged head of the valve 43 for holding the valve normally in its closed or seated position. The space within the bore of the extension 42 and between the valve 43 and the valve cap 47 communicates through a small lateral port 49 with the interior of the cylinder 16 rearwardly of the piston 15.

Communicating with that part of the bore of the extension 42, which forms the chamber for the valve 43, and forwardly of said valve is a lateral conduit 50, which communicates at its end through a branch conduit 51 (see Fig. 3) with a valve chamber 52, in which is seated a check valve 53 normally held in closed or seated position by a spring 54. The check valve 53 is located adjacent to the end of a longitudinally extending conduit 55, (see Fig. 4) which passes through the piston 15 and plate 25 and communicates at its front end with the space between the packing plate 25 and front cylinder head 17. Threaded upon the outer projecting rear end of the hollow rod 27 is a connecting member 56 which, as shown, is in the form of a U-shaped member, the legs of which terminate in interiorly threaded bosses, one of which is screwed upon the rod 27 and the other upon the front end of a compensating reach rod 57. At its rear end the latter is secured to the usual throttle lever 58 which in accordance with the usual practice is provided with a spring pressed latch 58^a adapted to engage with the teeth of a toothed quadrant 59. The reach rod 57 is preferably constructed so that it will be compensating for temperature changes, and as shown, may consist of two rod sections 57^a and 57^b, the section 57^a being connected at its front end to the member 56 and at its rear end to the pivoted lever 57^c, while the section 57^b is connected at its rear end to the throttle lever 58 and at its front end to said lever 57^c.

The rear end of the rod 29 projects beyond the hollow rod 27 and has screwed upon it a pair of adjusting nuts 60 which nuts, as clearly shown in Fig. 2 of the drawing, are seated within the space spanned by the legs of the U-shaped connecting member 56. The rod 29 projects slightly beyond the nuts 60 and is of non-circular cross section for engagement with a similarly shaped bore or recess provided in the rear boss of said member 56; the purpose of this construction just described being to hold the rod 29 against rotation when the nuts 60 are adjusted.

It will be noted by referring to Fig. 2 of the drawings that the ends 27^a and 29^a of the rods 27, 29 respectively, are seated within the counterbore 28 of the piston 15 and that they are located between the front end of the valve rod 46 of the valve 43 and the rear end of the valve 34. The rods 27, 29 are arranged to move normally as an integral structure, the distance between the rear face of the end 27^a and the front face of the end 29^a is adapted to be adjusted by means of the nuts 60. The nuts 60 should be so adjusted that the engaging faces of the end 27^a and the end 29^a with the valves 43 and 34 respectively will lie between the front end of the valve stem 46 and the rear end of the valve 34 with a slight amount of clearance as indicated in Fig. 2, the purpose of which clearance will appear more fully from the following description of operation.

The manner in which the device operates is as follows: Let it be assumed that air or other fluid under pressure is delivered through the pipe 40 and port 38 to the interior of the cylinder 16 and to the rear of the piston 15. Let it also be assumed that the throttle lever is set in the throttle closed position. If now the engineman wishes to open the throttle, the latch 58^a is unlatched and the throttle lever is pulled rearwardly in the usual manner. This movement of the throttle lever is communicated through the compensating lever reach rod 57 and connecting member 56 to the rods 27, 29, both of which are therefore also moved rearwardly or from right to left, as shown in Fig. 2. After but a very slight movement of the rods 27, 29 in the direction described, the engagement of the enlarged head 27^a with the front end of the valve rod 46, will cause the valve 43 to be moved rearwardly against

the action of the spring 48. The valve 43 obviously will move off its seat and the fluid under pressure within the cylinder 16 will flow through the conduit 49 past the valve 43 and through the conduits 50 and 51. The check valve 52 will be raised off its seat and the fluid will flow through the conduit 55 to the space at the front end of the cylinder 16 between the front cylinder head 17 and the packing retaining plate 25. The pressure of such fluid obviously will cause the piston 15 to move rearwardly or from right to left and as the piston is connected through its piston rod 14 and connecting link 12 to the lever 11 secured to the throttle valve shaft 10, the said shaft 10 will be actuated in a direction such as to open the throttle valve. As the piston 15 moves rearwardly, its movement is followed by the engineman with a similar movement of the throttle lever 58 until the desired amount of throttle valve opening is secured. During this opening movement of the throttle valve above described it will be necessary for the engineman to exert a force upon the throttle lever sufficient only to overcome the slight frictional resistances of the reach rod 57 and rods 27, 29 and to maintain but a slight pressure of the head 27ª upon the end of the valve stem 46 so as to hold the valve 43 off its seat. When the desired extent of throttle valve opening has been secured, the latch 58ª is engaged with one of the teeth of the quadrant 59 to hold the throttle lever in adjusted position.

After the throttle lever has been set as above described, the construction of the parts is such that the throttle valve will be maintained in position and practically no change in its said position is permitted. Should there be a tendency of the fluid to leak past the valve 43 and to build up in the space in front of the retaining plate 25, obviously this will cause the piston 15 to move rearwardly. Owing to the fact that there is but a slight amount of clearance between the enlarged ends 27ª and 29ª and the ends of the valves 43 and 34 respectively but a very slight amount of movement of the piston rearwardly can occur after the throttle lever has been latched in adjusted position before the end of the valve 34 will contact with the front end 29ª of the rod end 29. When this occurs, the valve 34 obviously will be lifted off its seat against the pressure of the spring 35, thus permitting the fluid in the space between the packing retaining plate 25 and the cylinder head 17 to escape through the bore 30 of the rod 29, and to atmosphere through the hole 31.

Should there be a drop of the fluid pressure in the space in front of the piston such, for example, as might be caused by air leakage past the gasket 23, the piston 15 would obviously be permitted to move forwardly because of the pressure exerted on the rear wall thereof. Only a very slight movement of the piston forwardly can occur before the end of the valve rod 46 will contact with the rear wall of the enlargement 27ª, it being remembered that the rods 27, 29 are held stationary by engagement of the latch 58ª of the throttle lever 58. The valve 43 would therefore be lifted off its seat thereby permitting the fluid pressure within the space in front of the packing retaining plate 25 again to be built up.

It will thus be seen that the construction herein disclosed provides an automatic compensation for changes in the fluid pressure in the space between the front cylinder head 17 and the piston whether such changes in pressure are brought about by leakage to, or leakage from, such space. This automatic compensation is accomplished by a creeping of the piston, which creeping is limited by the amount of clearance provided between the ends 27ª, 29ª and the ends of the valves 43, 34 respectively. In order to adjust the extent of this clearance space within small limits, the rods 27, 29 and their respective ends 27ª, 29ª may be adjusted by means of the nuts 60 in a manner which will be readily understood. In the normal operation of the device the two rods 27, 29 and their ends 27ª, 29ª respectively, function in effect as but a single member, the two part construction being merely for the purpose of adjustment of the clearance space above referred to, and said rods being moved relatively to each other only at such times as may be necessary to adjust the extent of said clearance space.

When it is desired to close the throttle, the throttle lever 58 is moved forwardly in the usual manner. This will cause the ends 27ª, 29ª to move forwardly in unison, thus bringing the front face of the end 29ª into engagement with the rear end of the valve 34 and lifting the latter against the pressure of the spring 35, off its seat. The lifting of the valve 34 off its seat will, as above described, permit the fluid to escape from the space in front of the piston 15 and retaining plate 25. As the space to the rear of the piston 15 is always under pressure, the piston will therefore travel forwardly. As the piston moves forwardly, its movement is followed by a forward movement of the throttle lever and, as with the opening movement of the throttle, it is necessary for the engineman to exert merely sufficient pressure to hold the valve 34 off its seat.

Should the device fail to function to operate the throttle valve by power because of a failure of the fluid pressure supply to the cylinder 16, or for any other cause, the construction permits the manual operation of the piston 15 and therefore of the throttle valve. It will be noted that the head 27ª is of quite substantial construction and that but a slight

amount of rearward movement thereof can occur within the space defined between the inner end of the counterbore 28 and the rear wall of said head before the latter will engage the inner end of the counterbore 28. While when the throttle lever is moved forwardly the small clearance between the forward end of the connecting member 56 and the end of the piston rod 14 will permit but a slight amount of forward movement before the front face of said member 56 will engage with the rear end of the piston rod 14. If therefore the fluid pressure is ineffective and the desired movement of the piston is not brought about by the unseating of either the valve 43 or the valve 34, as the case may be, it will be seen that the engineman may, by exerting sufficient force, open or close the throttle valve solely by manual effort.

It will be noted that the effective area presented by the rear face of the piston 15 is less than the effective area furnished by the front face of the retaining plate 25. Consequently when the piston is at rest, the pressure per unit of area exerted against the latter surface will necessarily be less than that exerted upon the former surface.

It will be noted that the construction herein disclosed has very important advantages in that only two packing cups are required. No spring is required for returning the piston to the throttle closed position. The number of moving parts are but few and such parts are of compact, sturdy construction. The device is therefore of small compact, durable construction capable of being manufactured at a low cost and furthermore maintenance costs due to breakage, etc., are reduced to a minimum. It will be perfectly obvious that the two part construction of the rods 27, 29 may, if desired, be dispensed with and a rod of one part construction be substituted therefor. The two part rod construction shown however, permits the clearance space hereinbefore referred to, to be adjusted from the exterior of the cylinder. Similarly the compensating reach rod construction shown, may be replaced without any change whatsoever in the construction of the other parts, by a single rod, such as shown in the co-pending McKee application. The use of the former is preferred, because increase or decrease in the length of the rod sections 57^a, 57^b due to temperature changes will merely result in producing a rotation of the lever 57^c upon its pivot without causing any movement of the throttle valve. It will likewise be understood that many other changes, variations and modifications may be resorted to without departing from the spirit of the invention, for example; while I have described the apparatus as being in the throttle closed position when the parts are as shown in the drawings or in other words, when the piston 15 is at the right hand end of the cylinder it will be obvious that the closed throttle position could be effected when the piston is at the left hand end of the cylinder such a change being effected merely by changing the position of the arm 11 on the shaft 10. In such case it will be understood that then the piston would move from right to left for closing and from left to right for opening the throttle.

I claim:—

1. The combination with a throttle valve of a locomotive, of a differential piston operatively associated with said valve, a cylinder in which said piston is slidably mounted, means for connecting one end of said cylinder to a source of fluid under pressure, a pair of valves carried by said piston, one for permitting the passage of said fluid from one end of said cylinder to the other end thereof and the other for permitting escape of said fluid from said other end of said cylinder, a manually operable device having a portion located between said valves with a small clearance, and means for locking said device in a stationary position.

2. The combination with a throttle valve of a locomotive, of a differential piston operatively associated with said valve, a cylinder in which said piston is slidably mounted, means for maintaining a supply of fluid under pressure in one section of said cylinder to act upon one face of said piston normally to urge the same in one direction and manually operable valve means for admitting fluid under pressure from said one section of the cylinder to another section thereof to act upon another face of said piston and to force it in an opposite direction.

3. In a locomotive throttle valve operating means, a cylinder having a differential piston slidably mounted therein, connections from said piston to the throttle valve, means for admitting and maintaining fluid under pressure to one end of said cylinder to act upon a smaller face of said piston and normally urge the same in one direction, valve means for admitting fluid under pressure from said one end of the cylinder to the other end of said cylinder to act upon a larger face of said piston and urge it in the opposite direction and a manually operable control for said valve means.

4. In a locomotive throttle valve operating means, a cylinder having a differential piston slidably mounted therein, connections from said piston to the throttle valve, means for admitting and maintaining fluid under pressure to one end of said cylinder to act upon a smaller face of said piston and normally urge the same in one direction, and manually operable valve means carried by said piston for placing the other end of said cylinder in communication with said one end thereof to cause said fluid to act upon a larger face of

said piston and urge it in an opposite direction.

5. In a locomotive throttle valve operating means, a cylinder having a differential piston slidably mounted therein, connections from said piston to the throttle valve, means for admitting and maintaining fluid under pressure to one end of said cylinder to act upon a smaller face of said piston and normally urge the same in one direction, said piston being provided with a conduit having communication with both ends of said cylinder, valve means for controlling the passage of fluid through said conduit and a manually operable control for actuating said valve means.

6. In a locomotive throttle valve operating means, a cylinder having a differential piston slidably mounted therein, connections from said piston to the throttle valve, means for admitting and maintaining fluid under pressure to one end of said cylinder to act upon a smaller face of said piston and normally urge the same in one direction, valve means carried by said piston for placing the other end of said cylinder in communication with said one end thereof, and a manual control for said valve means movable with said piston.

7. In a locomotive throttle valve operating means, a cylinder having a differential piston slidably mounted therein, connections from said piston to the throttle valve, means for admitting and maintaining fluid under pressure to one end of said cylinder to act upon a smaller face of said piston and normally urge the same in one direction, valve means carried by said piston for placing the other end of said cylinder in communication with said one end and including a valve for venting said other end of said cylinder and a manually operable control having lost motion connection with said valve means.

8. In a locomotive throttle valve operating means, a cylinder having a differential piston slidably mounted therein, connections from said piston to the throttle valve, means for admitting and maintaining fluid under pressure to one end of said cylinder to act upon a smaller face of said piston and normally urge the same in one direction, and a pair of valves carried by said piston, one for placing the other end of said cylinder in communication with said one end thereof, and another for venting said other end of said cylinder to atmosphere, and a normally operable control for selectively operating either of said valves after a limited predetermined amount of lost motion.

9. In a locomotive throttle valve operating means, a cylinder having a differential piston slidably mounted therein, connections from said piston to the throttle valve, means for admitting and maintaining fluid under pressure to one end of said cylinder to act upon a smaller face of said piston and normally urge the same in one direction to close the throttle valve, a pair of valves carried by said piston, one for placing the other end of said cylinder in communication with said one end thereof, and another for venting said other end of said cylinder to atmosphere, and a normally operable control for selectively operating either of said valves after a limited predetermined amount of lost motion, said control including means for permitting the amount of said lost motion to be adjusted.

10. In a locomotive throttle valve operating means, a cylinder having a differential piston slidably mounted therein, connections from said piston to the throttle valve, means for admitting and maintaining fluid under pressure to one end of said cylinder to act upon a smaller face of said piston and normally urge the same in one direction, a pair of valves carried by said piston, one for placing the other end of said cylinder in communication with said one end thereof, and another for venting said other end of said cylinder to atmosphere, and a normally operable control for selectively operating either of said valves after a limited predetermined amount of lost motion, said control including means located exteriorly of said cylinder for permitting the amount of said lost motion to be adjusted.

11. In a locomotive throttle valve operating means, a fluid pressure operated cylinder and piston, connections between said piston and said throttle valve for causing movement of said piston to actuate said valve, means for admitting and maintaining fluid under pressure to one end of said cylinder to urge said piston normally in one direction, and valve means carried by said piston for governing the admission and discharge of fluid from the other end of said cylinder.

12. In a locomotive throttle valve operating means, a fluid pressure operated cylinder and piston, connections between said piston and said throttle valve for causing movement of said piston to actuate said valve, means for admitting and maintaining fluid under pressure to one end of said cylinder to urge said piston normally in one direction, valve means carried by said piston for governing the admission and discharge of fluid from the other end of said cylinder, said valve means comprising an admission valve and an exhaust valve, and a normally inactive manual control having a portion interposed between said admission and exhaust valves with a clearance space therebetween.

13. In a locomotive throttle valve operating means, a fluid pressure operated cylinder and piston, connections between said piston and said throttle valve for causing movement of said piston to actuate said valve, means for admitting and maintaining fluid under pressure to one end of said cylinder to urge said

piston normally in one direction, valve means carried by said piston for governing the admission and discharge of fluid from the other end of said cylinder, said valve means comprising an admission valve and an exhaust valve, and a normally inactive manual control having a portion interposed between said admission and exhaust valves with a clearance space therebetween, said control being movable with said piston to different positions corresponding to different amounts of throttle opening, and means for locking said control in said different positions.

14. In a locomotive throttle valve operating means, a fluid pressure operated cylinder and piston, connections between said piston and said throttle valve for causing movement of said piston to actuate said valve, means for admitting and maintaining fluid under pressure to one end of said cylinder to urge said piston normally in one direction, valve means carried by said piston for governing the admission and discharge of fluid from the other end of said cylinder, a manually operable control for said valve means, and means for locking it in different set positions corresponding to different amounts of throttle valve opening, said control including means for automatically actuating said valve means to compensate for leakage of fluid to or from said other end of said cylinder and thereby preventing change in the extent of said throttle valve opening for every adjusted position of said control.

15. In a locomotive throttle valve operating means, a fluid pressure operated cylinder and piston, connections between said piston and said throttle valve for causing movement of said piston to actuate said valve, means for admitting and maintaining fluid under pressure to one end of said cylinder to urge said piston normally in one direction, valve means carried by said piston for governing the admission and discharge of fluid from the other end of said cylinder, said valve means comprising an admission valve and an exhaust valve and a normally inactive manual control having a portion interposed between said admission and exhaust valves with a clearance space therebetween and means for adjusting the extent of said clearance space.

16. The combination with the throttle valve of a locomotive, of a piston, and connections from it to said throttle valve, a cylinder in which said piston is slidably mounted, means for maintaining a supply of fluid under pressure upon one end of said piston, valve means carried by said piston including a pair of valves one for controlling the admission and the other the exhaust of fluid under pressure for acting upon the other end of said piston, and a manually operable control having a portion located between a pair of rigid abutments of said piston and between said pair of valves, said portion of said control being operative upon an initial movement of said control in one direction to actuate one of said valves and upon further movement thereof to engage one of said abutments.

17. The combination with the throttle valve of a locomotive, of a piston, and connections from it to said throttle valve, a cylinder in which said piston is slidably mounted, means for maintaining a supply of fluid under pressure upon one end of said piston, valve means carried by said piston including a pair of valves one for controlling the admission and the other the exhaust of fluid under pressure for acting upon the other end of said piston, and a manually operable control having a portion located between said pair of valves, there being a limited amount of clearance between said portion and said valves, and means for locking said control in adjusted position whereby relative movement between said piston and control in one direction will cause said admission valve to be actuated automatically and movement in the opposite direction will cause said exhaust valve to be actuated automatically.

18. In a locomotive throttle valve operating means, a piston adapted to be operatively connected with said throttle valve, a cylinder in which said piston is slidably mounted, said piston being provided with a rigid abutment, means for maintaining a supply of fluid under pressure upon one end of said piston and means for selectively producing movement of said piston in either of two directions, including a pair of valves, one for admitting fluid under pressure to said cylinder to act upon the other end of said piston thereby to produce a movement of said piston against the action of said supply of fluid to actuate said throttle valve in one direction and the other of said pair of valves establishing a communication to atmosphere of the fluid acting upon said other end of said piston, thereby to permit said supply of fluid to move said piston and throttle valve in the opposite direction and a manually operable control having a portion normally located substantially midway between and spaced from the members of said pair of valves and said control also having an abutment adapted to engage a second abutment of said piston, there being a greater clearance between said abutments than between said portion of said control and valves, thereby after a limited amount of relative movement between said control and piston in one direction, one of said valves will first be actuated and after a further amount of such movement, said portion will engage one of said abutments or upon relative movement in the other direction, the abutment of said control will engage said second abutment, the engagement of said control with either of said abutments permitting said piston to be actuated manually by said control.

19. A locomotive throttle valve operating means as set forth in claim 18 in which the manually operable control includes means for adjusting the amount of clearance between said control and said pair of valves and between said control and said abutments.

20. The combination with the throttle valve of a locomotive, of fluid pressure actuated means and connections therefrom to said valve, a manually operable lever and valve means actuated thereby for controlling the operation of said fluid pressure means, means for locking said lever in different adjusted positions corresponding to different set positions of throttle valve opening, and means for automatically preventing change in the extent of throttle opening as a result of leakage of fluid to or from said fluid pressure means when said lever is locked in adjusted position.

In testimony whereof I have hereunto set my hand.

ARTHUR WILLIAMS.