Feb. 2, 1932. J. R. GRAVES 1,843,153

THROTTLE LEVER

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Fig. 4.

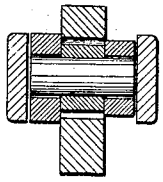


Fig. 1.

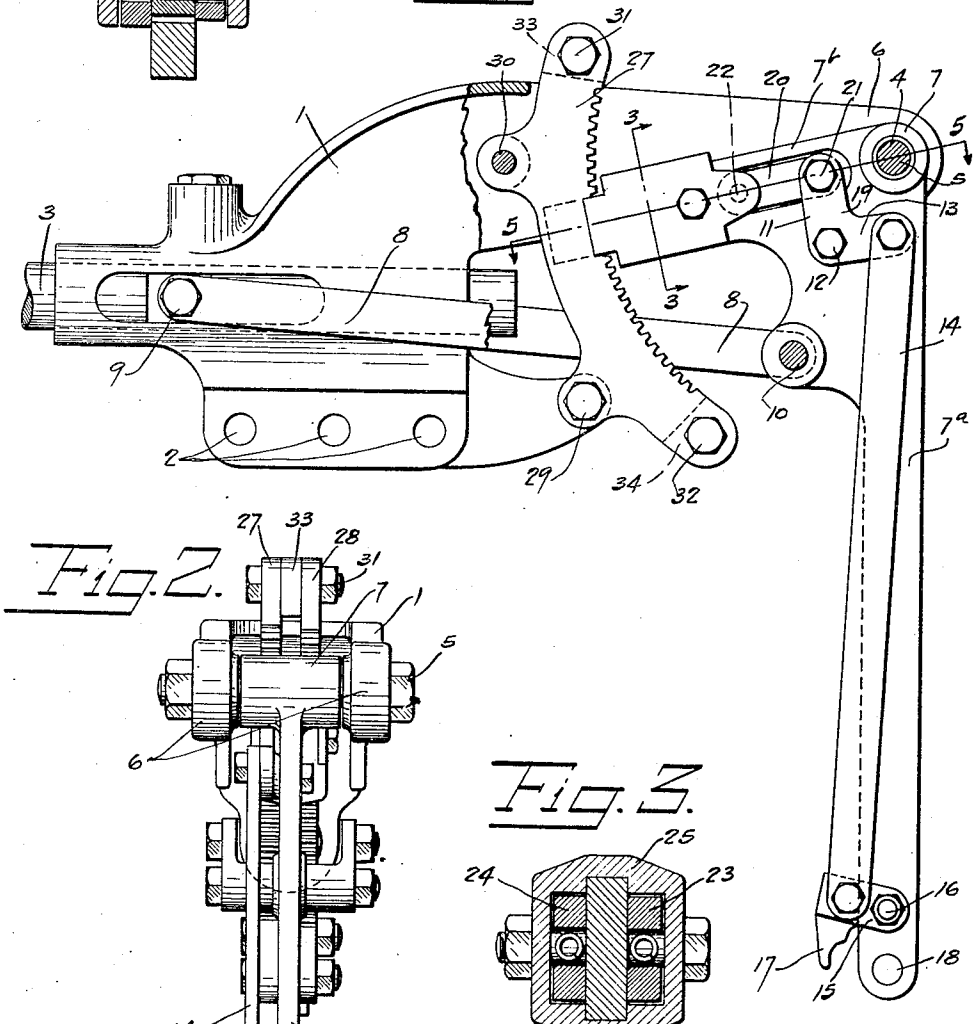


Fig. 2.

Fig. 3.

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Fig. 5.

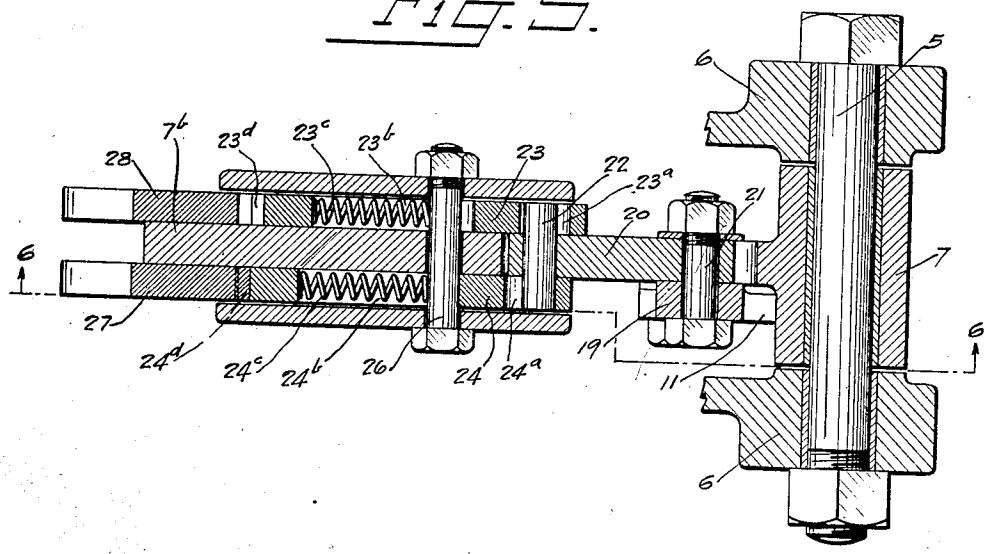
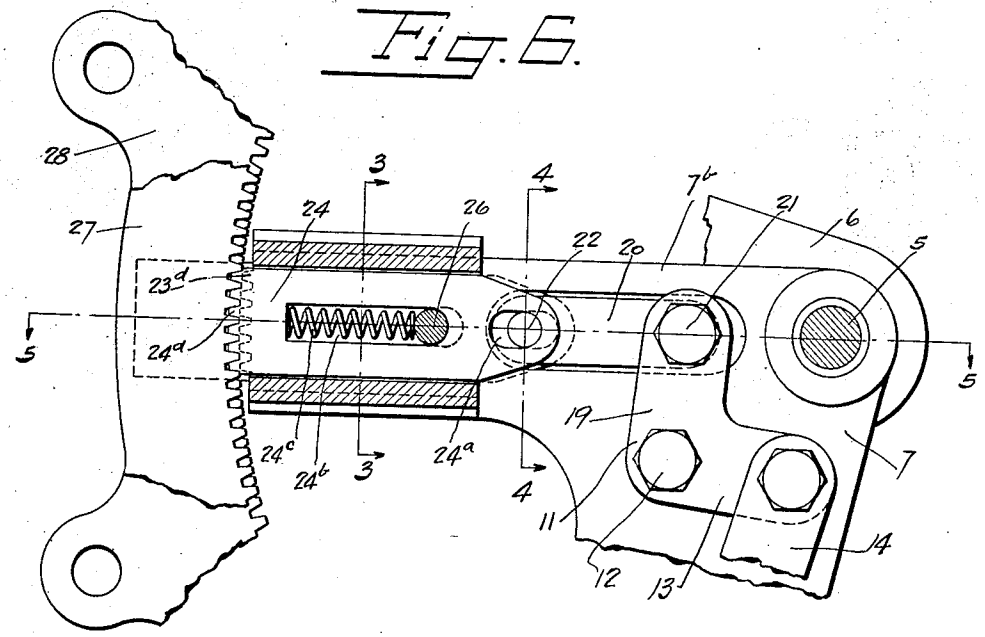


Fig. 6.



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UNITED STATES PATENT OFFICE

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THROTTLE LEVER

Application filed July 26, 1928. Serial No. 295,370.

This invention relates to rigging for operating locomotive throttles and particularly to that portion of such rigging by which the throttle lever is held in the desired position. While this is the principal use contemplated, it will be obvious from the ensuing description that the invention may have application in other relations.

The invention has for its purpose the provision of apparatus of this kind which will allow a fine gradation of the various positions in which the throttle lever can be held and at the same time puts the "quadrant" of the device in such a position and makes possible making it of such size that it does not interfere with the movements of the engineer.

The invention is illustrated in the drawings filed herewith in which Fig. 1 shows the invention in lateral elevation, portions being broken away for the sake of clearness; Fig. 2 shows an end elevation; Figs. 3 and 4 are sections on lines 3—3 and 4—4 respectively of Fig. 6; Fig. 5 is a section on line 5—5 of Fig. 6, and Fig. 6 is a sectional view on line 6—6 of Fig. 5; Figs. 3, 4, 5 and 6 are on a larger scale than the first two figures.

The bracket 1 is secured by means of bolts or rivets passing through holes 2—2 to the rear portion of the boiler in the usual position. The throttle rod 3 reciprocates in the usual manner through a bearing in this bracket. This throttle rod it will be understood extends forward in the usual manner to the throttle which may be located either in the dome or at the forward end of the boiler. At the point 4 a bolt 5 passes through the two bearings 6—6 in the bracket and carries pivotally mounted on it the lever 7. This lever has an arm 7*a* extending generally downward and an arm 7*b* extending at approximately right-angles from the former. Two links 8—8 mounted pivotally at their ends by means of bolts 9 and 10 connect the throttle rod 3 to the lever 7. A lever 11 is pivotally mounted on the throttle lever 7 by means of the bolt 12. The arm 13 of this lever is connected by means of the link 14 to the lever 15. The latter is mounted pivotally on the lower portion of the throttle lever by the bolt 16 and has a handle 17 which is normally spaced a little distance from the throttle lever handle 18 and is during the manipulation of the throttle pressed by the engineer's hand toward this handle 18.

The other arm 19 of the lever 11 has connected to it the link 20 by means of the bolt 21, and carries a pin 22. These two latches 23 and 24 are slidably mounted in the housing 25. The pin 22 is fixed firmly in the link 20 and extends into the slots 23*a* and 24*a* of the two latches respectively. A bolt 26 extends through the housing 25, through two slots 23*b* and 24*b* in the two latches respectively, and through arm 7*b* of the levers. Springs 23*c* and 24*c* engage the bolt 26 and the bottoms of the two slots 23*b* and 24*b*. Their pressure tends to place the latches into the position which the latch 24 occupies in Figs. 5 and 6. When the engineer moves handle 17 in a direction toward handle 18, pin 22 will engage the right hand side of the slots 23*a* and 24*a* and move the two latches toward the right in opposition to the compressive force of the two springs.

The left hand ends of the latches 23 and 24 are provided with teeth 23*d* and 24*d*. These teeth are adapted to engage the teeth of the two quadrants 27 and 28. These two quadrants are fixed to the bracket 1 by means of the bolts 29 and 30. Bolts 31 and 32 passing through them and the distance pieces 33 and 34 further clamp these two quadrants in their relative position.

The two sides of the housing 25 and the central piece engage the outer sides of the two quadrants as clearly shown in Fig. 5, and the end of 7*b* extends between the two quadrants, thus guiding the latches in their arcuate movement about the point 4.

The two quadrants, as well as the two latches, all have teeth of the same shape and spacing. The teeth of the latches are abreast of each other, while the teeth of the quadrants are relatively staggered as appears clearly from an inspection of Fig. 6. As a result, only one of the latches can be in engagement with its quadrant at a given time, the teeth of the other latch riding on top of the teeth of its quadrant when the first latch and quadrant are in engagement. As a con-

sequence a very much finer gradation is possible of the points at which the throttle lever can be locked. If, for instance, one of the latches is in engagement with its quadrant and it is desired to move the lever a very small amount, it would be possible to lock it only after having traveled the full pitch of the teeth if there were only one latch and quadrant used. With the arrangement described, it is possible to let the other latch engage its quadrant after traveling only half the pitch between adjacent teeth.

Of course the same fine gradation can be had with a single latch and quadrant and the same pitch of teeth, if the quadrant be located at twice the radial distance from the center 4, or with a quadrant at the same distance but with teeth of half the pitch. In the former case the quadrant would have to be twice as long and when it is given such a length it is constantly in the engineer's way and he is likely to strike against it. With the latter form, the teeth are too small for firm engagement. In other words, with my improved arrangement the same gradation of throttle setting is possible with a quadrant of half the length of the ordinary quadrant.

It will be understood that the specific arrangement described is only illustrative of my inventive idea and that it may be considerably varied without departing from the spirit of the invention.

I claim:

In apparatus of the class described, the combination of a lever pivotally mounted on a fixed pin, two fixed toothed quadrants concentric with the pin, two toothed latches mounted on the lever radially slidable into and out of engagement with the two quadrants respectively, and resilient means urging the latches into, and manual means to withdraw them from such engagement, the relative arrangement of the quadrant and latch teeth being such that when one latch is in engagement the teeth of the other latch ride on the teeth of its quadrant, the teeth of the two latches being abreast of each other and the teeth of the two quadrants being relatively staggered.

JOHN R. GRAVES.