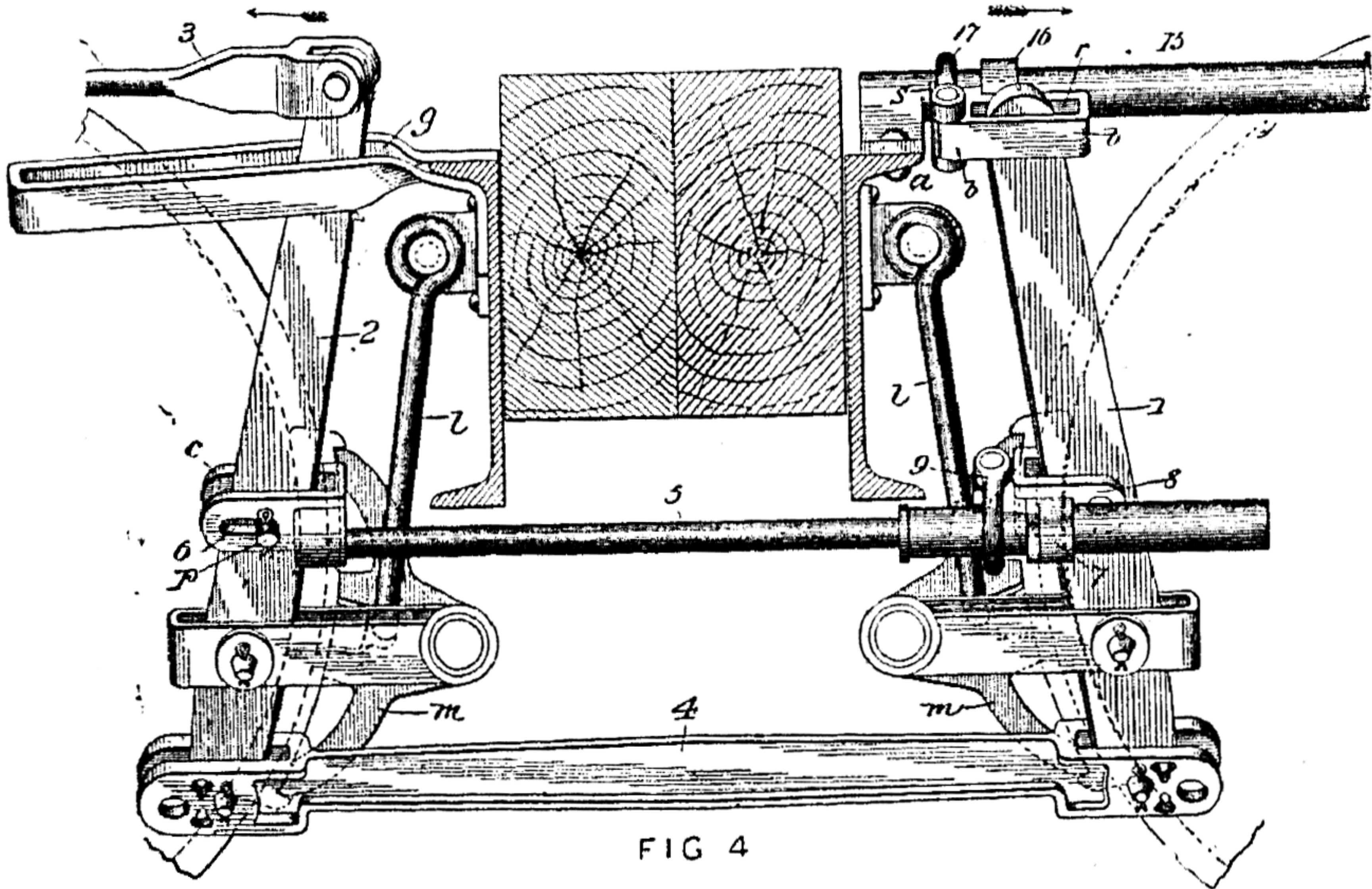


as the throw or extent of movement of the levers is normal, will remain inactive, but which, when the movement of the levers, or either of them, increases by reason of slack in the rigging, operates to shift the fulcrum of the lever which has a stationary fulcrum.

Specifically the invention consists in connecting the live lever 2 and the dead lever 1 together by means of a rod, 5, having a connection with one of the levers which allows it to move independently of the lever in one direction, and causes it to carry the lever with it when moved in the opposite direction, and which rod is automatically extensible so that any increase in the movement of the live lever due to slack will cause the dead lever to shift its fulcrum.



THE HINCKLEY BRAKE SLACK ADJUSTER.

Fig. 3 is a side view, in which 1 indicates what is commonly known as the dead lever; 2 the usual live lever; 3 a portion of the brake operating rod; 4 a connecting-rod securing the two levers together for operation in the ordinary manner.

15 denotes a guide-rod and support for the adjustable fulcrum of the dead lever 1. It is firmly bolted at its inner end to any convenient part of the truck or framing, as indicated in the drawings at *a*, and is preferably made hollow or tubular for lightness and strength. A sleeve, 16, encircles this guide-rod and slides freely to and fro thereon, and the outer end of the rod is preferably provided with a flange, *f*, to prevent the sleeve from going off the end of the rod. Cast or formed integrally with this sleeve is a fulcrum block, *b*, having a recess or opening, *r*, therein to form a keeper for the upper end of the dead lever. This block carries an automatic gripping device which permits it to move along the supporting rod freely in one direction, but which grips and binds the block to the rod and prevents it from moving in the opposite direction. The gripping device consists of a loop or shackle, 17, pivoted upon the block and encircling the guide-rod, stops *s* being formed on the block to prevent the shackles from swinging past a line perpendicular with the face of the block in one direction. When the loop rests against these stops the fulcrum block is free to move outwardly on the supporting rod, but any movement of the block in the opposite direction will cause the shackle, which, as will be understood, fits the surface of the rod rather snugly, to grip and bind upon the rod, thereby forming a positive lock or stop against reverse movement of the block.

5 indicates a connecting-rod between the live and dead levers, which, in connection with the said levers and the automatic gripping devices hereinafter described, constitutes the adjuster proper. This rod is pivotally connected to the live lever in any suitable manner so as to move longitudinally as the lever swings backward and forward. It is preferable to connect the lever with the rod, so that it (the lever) may have a certain movement independently of the rod, and this connection is shown in the drawings as formed by means of a pin, *p*, in the lever which passes through a slot, 6, in the clip or stirrup *c* secured to the end of the rod and forming the immediate connection between it and the lever.

Pivoted to the dead lever is a stirrup or clip, 8, preferably similar in general structure to the clip *c* on the live lever. The stirrup 8 has formed upon one side of it a sleeve, 7, into which fits the free end of the connecting-rod 5, so that the rod may have a sliding connection with the stirrup and the dead lever. The stirrup carries an automatic gripping device similar to that carried by the fulcrum block for the dead lever, except that it is arranged to permit the rod to slide freely through the stirrup in the opposite direction to that of the movement of the fulcrum block.

The operation of the apparatus is briefly as follows: When the brakes are applied, the rod 3 and the live lever move in the direction of the arrow. It is not intended that the adjuster-rod 5 should be moved by the live lever except when slack exists in the rigging. The loose connection between the lever and the rod heretofore described—viz., the pin and slot connection between the stirrup *c* and the lever—is therefore provided. When the shoes are new and there is no slack in the rigging, the lever will move to and fro without moving the rod, the slot 6 being of sufficient length to permit this in the normal throw of the lever. When, however, slack occurs, the increased movement of the lever carries the rod 5 with it, the gripping device on the stirrup 8 permitting the free end of the rod to slide through the sleeve 7. When the brakes are released the reverse movement of the lever 2 pushes back the rod 5, but at this time the shackle 9 binds upon the surface of the rod and grips it firmly to the stirrup, causing the dead lever 1 to move back with it. As heretofore described, the fulcrum carrying block for the dead lever is free to move outward along its supporting bar, and the thrust of the adjuster-rod 5 on the return stroke of the live lever 2 causes the dead lever to push the fulcrum in the direction of the arrow in fig. 1. These movements are repeated at every application of the brakes, but the adjuster rod and the dead lever are operated only when there is slack in the rigging.

Howard Hinckley, of Trenton, N. J., is the inventor. His patent is No. 531,034, and dated December 18, 1894.

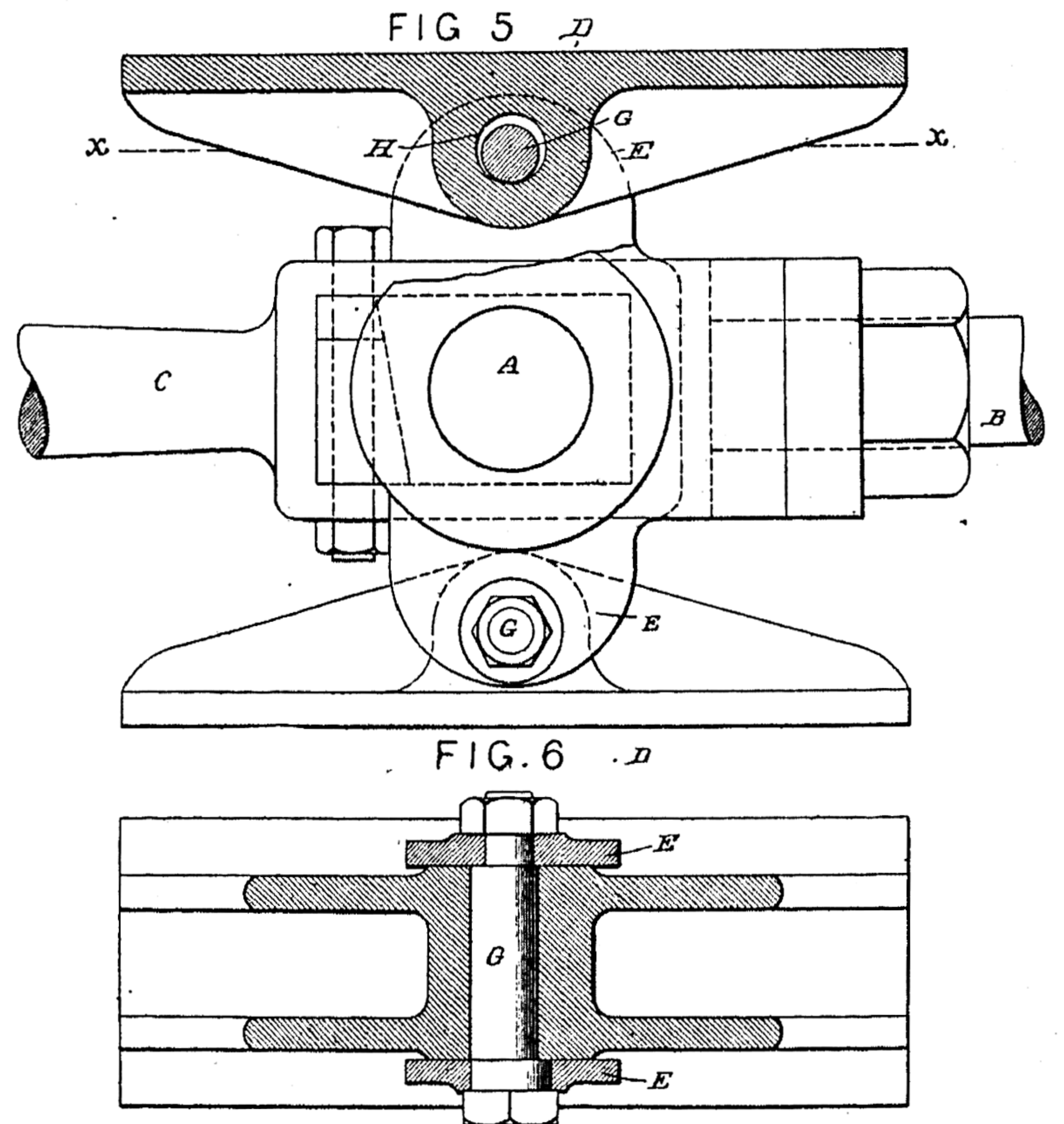
BEGTRUP'S ENGINE CROSS-HEAD.

Figs. 5 and 6 represent a method for adjusting the shoes or slides of cross-heads designed by Mr. Julius Begtrup, of Ridgeway, Pa.

*A* represents a cross-head of any approved construction, *B* is a piston-rod, and *C* the connecting-rod.

*D* are the shoes or bearings adapted to work in suitable ways or guides (not shown).

*E* represents oppositely projecting ears attached to the cross-head, having suitable bearings for an eccentric bolt, *G*, which passes through the ears and through an opening, *G*, formed in the shoe. The shoes are adjustably set in and out from the cross-head by means of the eccentric bolt *G* being



BEGTRUP'S ENGINE CROSS-HEAD.

rotated to more or less extent, and then locked in that position by the lock-nuts upon said bolt, leaving the shoe free to oscillate upon the bolt.

In the cross-head shown in the present drawings each shoe is adjustably set by means of a single eccentric bolt, and the shoe has a rocking bearing adjustment in addition upon said bolt; but if desired, the shoe may not have a rocking bearing, and it may also be adjustably set by means of more than one bolt *G* for each shoe.

The patent is December 4, 1894, and is numbered 530,320.