(No Model.)

J. PLAYER.

REVERSING LEVER.

No. 369,994. Patented Sept. 13, 1887.

Fig. 1.

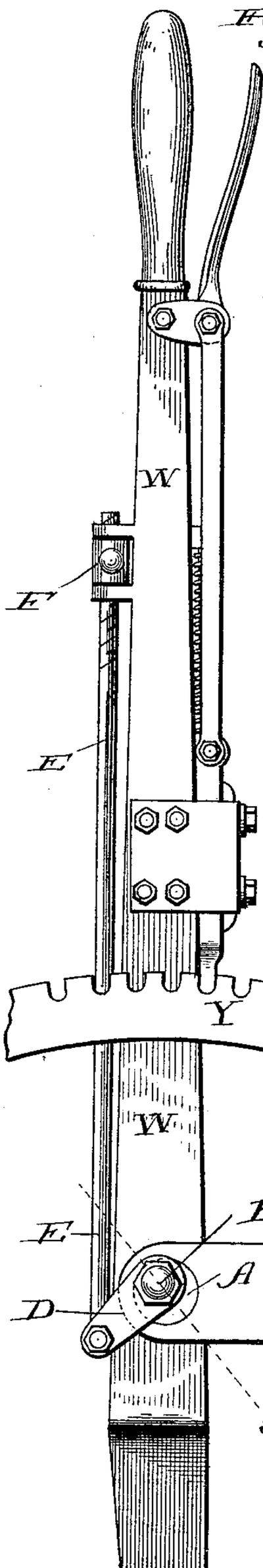


Fig. 3.

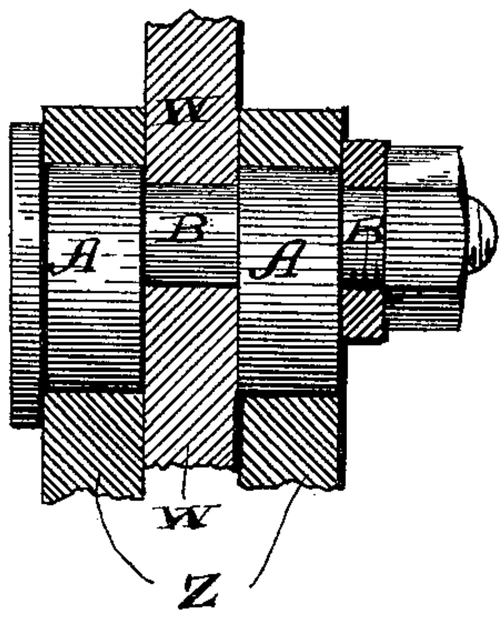
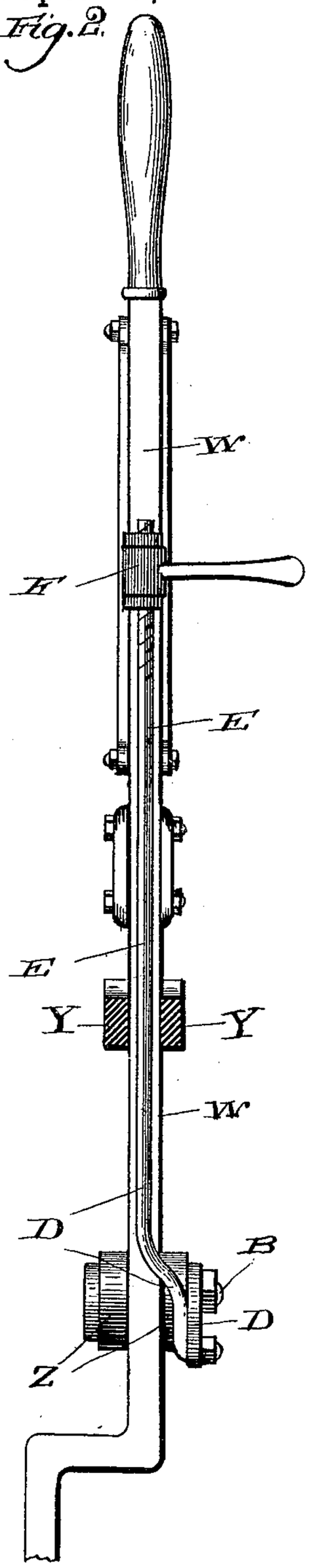


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN PLAYER, OF MARSHALLTOWN, IOWA, ASSIGNOR OF ONE-HALF TO ANGUS SINCLAIR, OF CHICAGO, ILLINOIS.

REVERSING-LEVER.

SPECIFICATION forming part of Letters Patent No. 369,994, dated September 13, 1887.

Application filed April 13, 1887. Serial No. 234,623. (No model.)

To all whom it may concern:

Be it known that I, JOHN PLAYER, a citizen of the United States, residing at Marshalltown, in the county of Marshall and State of Iowa, have invented certain new and useful Improvements in Reversing-Levers for Regulating the Amount of Steam Admitted to the Cylinder of a Locomotive or other Engine having a Reverse-Lever; and I do hereby declare the following, taken in connection with the drawings accompanying and forming a part hereof, to be a full and complete description of the same.

It is well known to those skilled in the art to which my invention pertains that the cut-off or point at which the admission of steam into the cylinder of a locomotive ceases is shifted and controlled by the movement of a lever known as the "reverse-lever;" that by means of such lever steam may be admitted into the cylinder of the locomotive for such proportion of the length of the stroke of the piston therein as is desired, and that in order to insure that the cut-off be constant—that is, that the steam be cut off at any given point in said stroke of the piston for any appreciable or stated time—a quadrant having notches on the upper side or surface thereof is required, into which notches a bolt or catch forming an attachment to and part of the said reverse-lever locks. It is also well known that, because of such necessity existing for notches in said quadrant and a lock or catch on the reverse-lever engaging therewith, the admission of steam in the cylinder of a locomotive cannot be graded or changed by a continuously-augmenting portion of the length of stroke of the piston in said cylinder, but must be changed, either augmented or lessened, by steps of definite stated intervals, and in order that the requisite strength be retained in that portion of the quadrant between the notches thereon it has heretofore been impracticable to regulate or cut off the steam entering the cylinder at lesser intervals in the movement of the piston therein than of about three inches. In practice it often occurs that if steam be admitted into the cylinder for a given portion of the stroke or movement of the piston therein—as, say, nine inches—sufficient force is not obtained to maintain the locomotive and train attached at the desired speed. Steam must therefore be admitted into such cylinder for a longer portion of the stroke of the piston, the next higher notch must therefore be used, and twelve inches of steam, or thereabout, be given said cylinder. If, now, as is sometimes the case, the admission of steam into the cylinder of the engine for twelve inches of the stroke of the piston produces greater speed than is desired, it becomes necessary to constantly change the length of such steam admission, or, as is preferably done, reduce the amount of steam admitted to the cylinder during the twelve-inch movement of the piston, hereinbefore referred to, by throttling it—in other words, by reducing the area of the steamway. For the reasons above given and many others it is desirable to cut off the admission of steam in the cylinder at much shorter intervals than had been done prior to my herein-described invention; and the object of my invention is to secure a simple and economically-constructed mechanism of sufficient strength to avoid all danger of accidental breakage and easily controlled by the person in charge of the locomotive or the reverse-lever thereof, by which the steam admitted to the cylinder of the locomotive may be cut off at much shorter intervals in the stroke of the piston in said cylinder than has heretofore been done.

I have illustrated my invention by the drawings accompanying this specification and forming a part hereof, in which—

Figure 1 is a side elevation of a reverse-lever of a locomotive and an elevation of a portion of a notched quadrant. Fig. 2 is a front elevation of the same. Fig. 3 is a cross-section on line 3 3 of Fig. 1.

Like letters refer to like parts throughout the several views.

W is the reverse-lever.

X is the catch or bolt locking into quadrant Y, and is controlled or locked and unlocked by handle X′.

Z is the reach-rod.

Lock or catch X, reverse-lever W, and reach-

rod Z are the ordinary parts forming the mechanism now in use for controlling the point of cut-off.

A A are eccentrics secured to and turning with shaft B.

D is a lever secured to shaft B, by which said shaft may be partially rotated or turned on its axis. This shaft B turns in the reverse-lever, and the eccentrics A A turn in reach-rod Z. Suitable movement in lever D to turn shaft B and eccentrics A A causes a movement in the reach-rod Z equivalent to lengthening or shortening said reach-rod, and it is evident that if the eccentrics A A were placed at the other extremity of the reach-rod, together with shaft B and lever D, and a suitable connection were made between the said lever D and the present lever D, a like shortening or lengthening of reach-rod Z as is obtained by the mechanism herein described would be secured by the movement of lever D.

E is a rod attached at its lower end to lever D, and at its upper end to a "long-reach thumb-screw," F, (so called,) in the mechanism so far constructed by me to embody my invention; but it is not my intention to limit myself to the use of thumb-screw F as the upper connection to rod E, as any of the ordinary means for producing a longitudinal movement in said rod E may be used.

The operation of my device is as follows: Bolt or catch X being locked in any given notch of quadrant Y, steam is admitted to the piston-cylinder of the locomotive for a certain portion of the length of the stroke of the piston, (say six inches,) and if it be desired to admit steam for a greater portion of the length of said stroke, (as, say, seven inches,) lever D and shaft B are caused to partially rotate by the longitudinal movement of lever E by its upper connection. By the partial rotation of shaft B eccentrics A A are also partially rotated in reach-rod Z, and by such rotation said reach-rod is lengthened or shortened the desired amount, the same result being secured as if the reverse-lever were slightly changed in position. If, now, it be desired to change the cut-off or admission of steam in the cylinder three, six, or nine inches, or any other given amount as graded by the notched quadrant, the said reverse-lever is changed to the desired notch, in the same manner as is now done, without disturbing the position of eccentrics A A or any of their connections.

Having thus described my invention and its construction, what I claim, and desire to secure by Letters Patent of the United States, is—

In a locomotive reversing-lever, the combination of eccentrics centrally pivoted in said reversing-lever and suitably connected with the reach-rod of the locomotive, a lever attached to the pivotal shaft of said eccentrics, and a rod leading upward therefrom, with suitable means of actuating the said rod and eccentrics at the upper end of said reverse-lever, all substantially as described, and for the purpose set forth.

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