

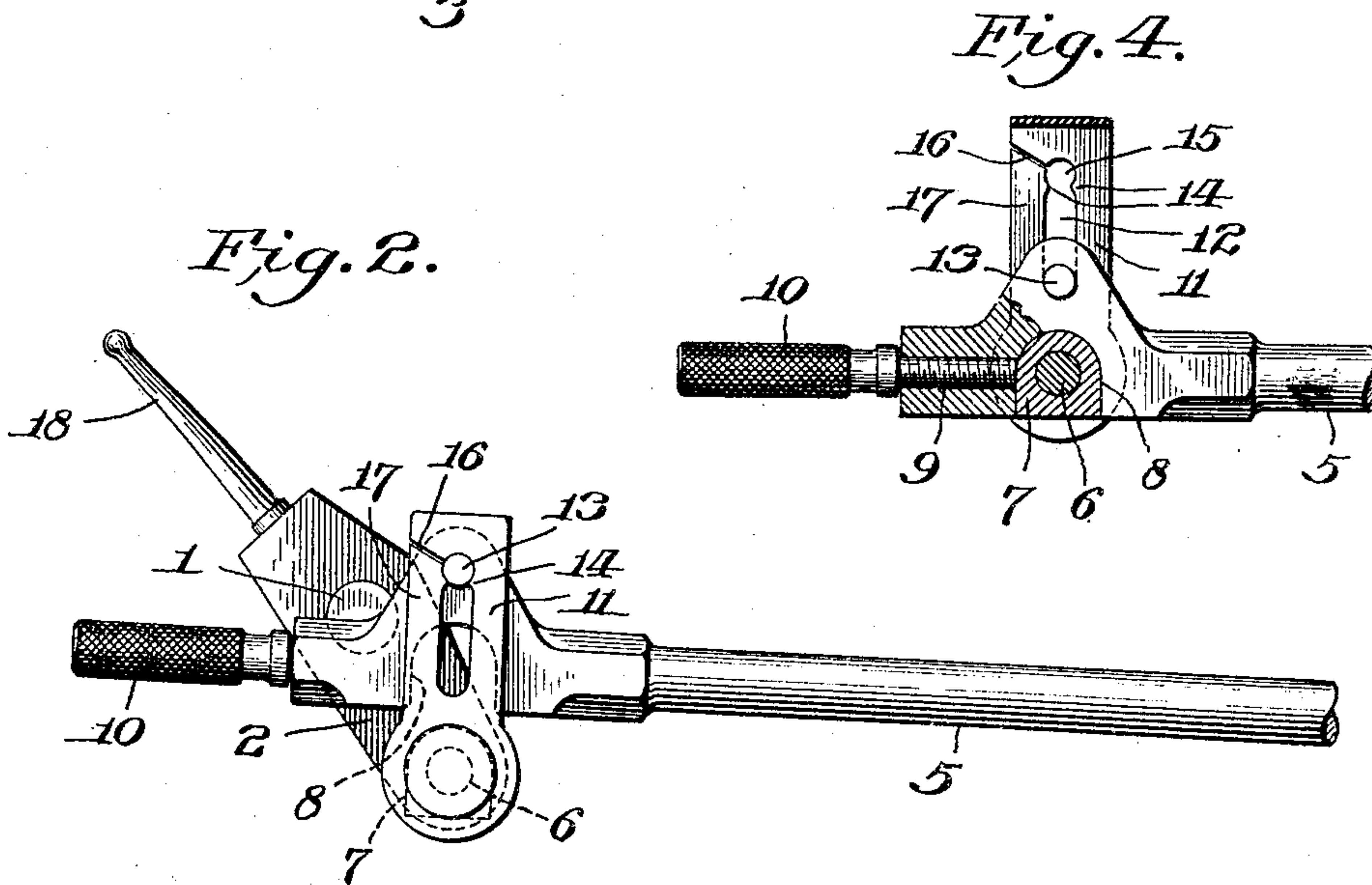
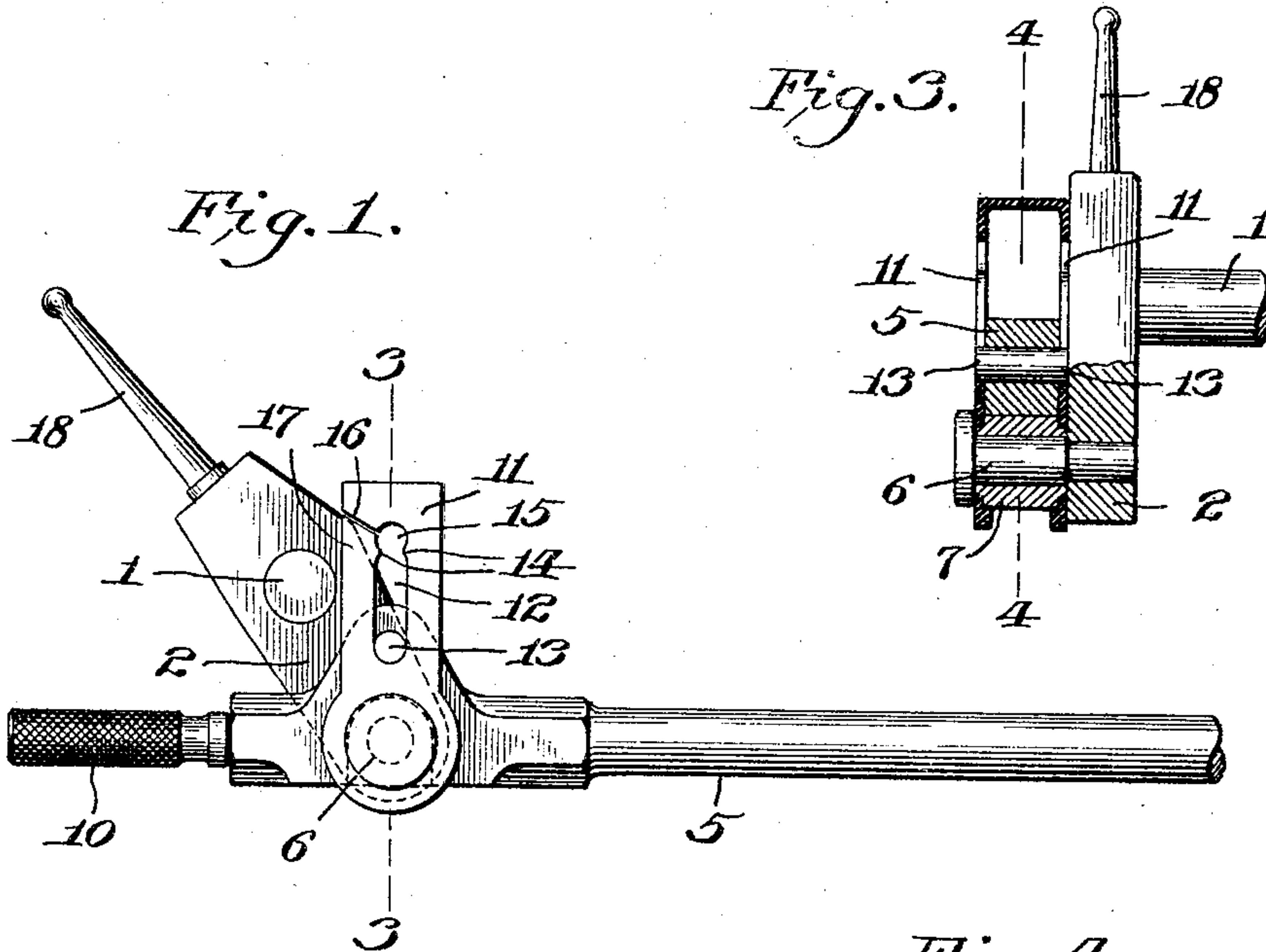
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T. KITCHIN.

VALVE ACTUATING MECHANISM FOR STEAM ENGINES.

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## VALVE-ACTUATING MECHANISM FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 782,856, dated February 21, 1905.

Application filed February 17, 1904. Serial No. 194,006.

*To all whom it may concern:*

Be it known that I, THOMAS KITCHIN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Valve-Actuating Mechanism for Steam-Engines, of which the following is a specification.

This invention relates to that class of steam-engines wherein the sliding valve for controlling the admission of steam to the respective sides of the driving-piston is reciprocated by mechanism under the control of a rock-shaft which is actuated by the mechanism of the engine.

The object of the invention is to provide a simple, efficient, and durable means having advantages not heretofore attained whereby the connection of the rock-shaft with its actuating mechanism may be rendered inoperative in order to permit the rock-shaft to be manually operated to start the engine and whereby the said connection may be rendered operative after the engine has been set in motion.

With this object in view the invention consists in the novel construction and combinations of parts, which will be hereinafter fully described and claimed.

In the drawings, Figure 1 is an elevation of my invention as applied to the valve-actuating rock-shaft of a steam-engine and its reciprocative actuating-bar. Fig. 2 is a similar view showing the parts in a different position. Fig. 3 is a sectional view as on the line 3 3 of Fig. 1. Fig. 4 is a sectional view as on the line 4 4 of Fig. 3.

1 designates a rock-shaft which is adapted by suitable mechanism (not shown) to reciprocate the slide-valve in the steam-chest for the admission of steam to the respective sides of the driving-piston. This shaft 1 is provided with a projecting arm 2, and pivotally connected to the arm 2 is a bar 5, which is reciprocated by the mechanism of the engine to rock the shaft 1 through the arm 2. The mechanism which the rock-shaft 1 actuates to control the slide-valve and the mechanism which reciprocates the bar 5 are both well known and need no description herein.

In starting the engine of the class to which my invention relates it is the practice to disconnect the bar 5 from the arm 2 in order to permit the shaft 1 to be manually rocked to operate the slide-valve to admit steam to the respective sides of the driving-piston and after the engine is started and the bar 5 is being reciprocated thereby to then connect the bar 5 with the arm 2 to be actuated by the engine.

I shall now proceed to describe the preferred embodiment of my invention, which resides in the means whereby the bar 5 may be rendered operative to rock the shaft 1 or whereby it may be rendered inoperative to permit the shaft 1 to be manually rocked.

Projecting from the arm 2 is a pin 6, on which is rotatably mounted a bushing 7, which is adapted to fit a socket 8 in the bar 5. The bushing 7 is provided with straight sides connected by a rounded portion, and the socket 8 is also provided with straight sides connected by a rounded portion, to the end that when the socket is in engagement with the bushing 7 the latter will be held against rotation within the socket and at the same time will be free to rotate upon the pin 6. Fitted to internal threads in an opening in the end of the bar 5 is a screw 9, the inner end of which occupies a position adjacent to the socket 8. The outer end of the screw 9 is provided with a head 10, by means of which the screw may be forced inwardly to take against and secure the bushing 7 within the socket 8 or moved outwardly to release the bushing and permit the bar 5 to be disengaged therefrom.

Projecting from the respective sides of the bushing 7, adjacent to the respective sides of the bar 5, is a pair of projecting arms 11 11, the outer ends of which are connected so as to form, in effect, a single arm embracing the bar 5. The arms 11 11 are provided with parallel slots 12 12, into which extend studs 13 13, projecting from the respective sides of the bar 5. The side walls of the slots 12 12 are provided with oppositely-disposed projecting portions 14 14, so as to form sockets 15 15 between said portions and the outer ends of the slots 12 12, into which the studs 13 13 are



adapted to be moved. One side wall of each slot 12 12 is cut through, as at 16, thereby forming spring-arms 17 17, which will yield outwardly and permit the studs 13 13 to pass 5 the projecting portions 14 14 as said studs are moved through the slots 12 12 and into register with the sockets 15 15. The spring-arms 17 17 returning to normal position will retain the studs 13 13 in engagement with the 10 sockets 15 15.

The arm 2 is provided with a projecting handle 18, by means of which the shaft 1 may be manually rocked.

The operation of the invention may be 15 briefly described as follows: When it is desired to render the bar 5 inoperative to permit the shaft 1 to be rocked by hand, the screw 9 is turned to release the bushing 7 and the bar 5 is moved to engage its projecting 20 studs 13 13 with the sockets 15 15, in which they are retained by the spring-arms 17 17, as shown in Fig. 2. When the parts occupy this position, the operator may operate the 25 handle 18 to rock the shaft 1 to start the engine independently of the bar 5, and as the engine starts the bar 5 may be reciprocated thereby independently of the shaft 1. After the engine has been started, as just described, the bar 5 is moved against the action of the 30 spring-arms 17 17 to disengage the studs 13 13 from the sockets 15 15 and to reengage the bushing 7 with the socket 8, the slots 12 12 acting as guides to direct the socket 8 into register with the bushing 7, as shown in Fig. 35 1. The screw 9 is then turned to secure the bar 5 to the bushing 7, whereupon the shaft 1 is rocked by the reciprocations of said bar.

I claim—

1. In a steam-engine, the combination of the 40 valve-actuating rock-shaft, an arm projecting therefrom, a pin carried by said arm, the reciprocative bar for actuating the rock-shaft, means whereby said bar may be connected with or disconnected from said pin, and means 45 carried by said arm for supporting said bar away from said pin when disconnected therefrom.

2. In a steam-engine, the combination of the 50 valve-actuating rock-shaft, an arm projecting therefrom, a pin carried by said arm, a bushing rotatably mounted on said pin, the reciprocative bar for actuating the rock-shaft, means whereby said bar may be connected with or disconnected from said bushing, and 55 means for supporting said bar away from said bushing when disconnected therefrom.

3. In a steam-engine, the combination of the valve-actuating rock-shaft, an arm projecting therefrom, a second arm pivotally connected with the first-named arm, the reciprocative 60 bar for actuating the rock-shaft, means whereby said bar may be connected with or disconnected from the pivotal connection of said arms, and means whereby said bar may be pivotally supported by the second-named arm 65 away from said pivotal connection.

4. In a steam-engine, the combination of the valve-actuating rock-shaft, an arm projecting therefrom, a pin carried by said arm, a bushing rotatably mounted on said pin, a pivoted 70 arm projecting from said pin, the reciprocative bar for actuating the rock-shaft, means whereby said bar may be connected with or disconnected from said bushing, and means whereby said bar may be pivotally supported 75 by the second-named arm away from said bushing.

5. In a steam-engine, the combination of the valve-actuating rock-shaft, an arm projecting therefrom, a second arm pivotally connected 80 with the first-named arm and provided with a socket away from its pivotal connection, the reciprocative bar for actuating the rock-shaft, means whereby said bar may be connected with or disconnected from the pivotal connection 85 of said arms, a stud projecting from said bar and adapted to be moved into register with said socket when the bar is disconnected from the pivotal connections of said arms, and a spring to maintain the stud in register with 90 the socket.

6. In a steam-engine, the combination of the valve-actuating rock-shaft, an arm projecting therefrom, a pin carried by said arm, a pair 95 of arms pivotally mounted on and projecting from said pin and provided with parallel slots leading to sockets in said arms, the reciprocative bar for actuating the rock-shaft, said bar extending between said pair of arms, means whereby said bar may be connected 100 with or disconnected from said pin, studs projecting from said bar and into said slots and adapted to be moved into register with said sockets, and springs to maintain the studs in register with the sockets. 105

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS KITCHIN.

Witnesses:

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