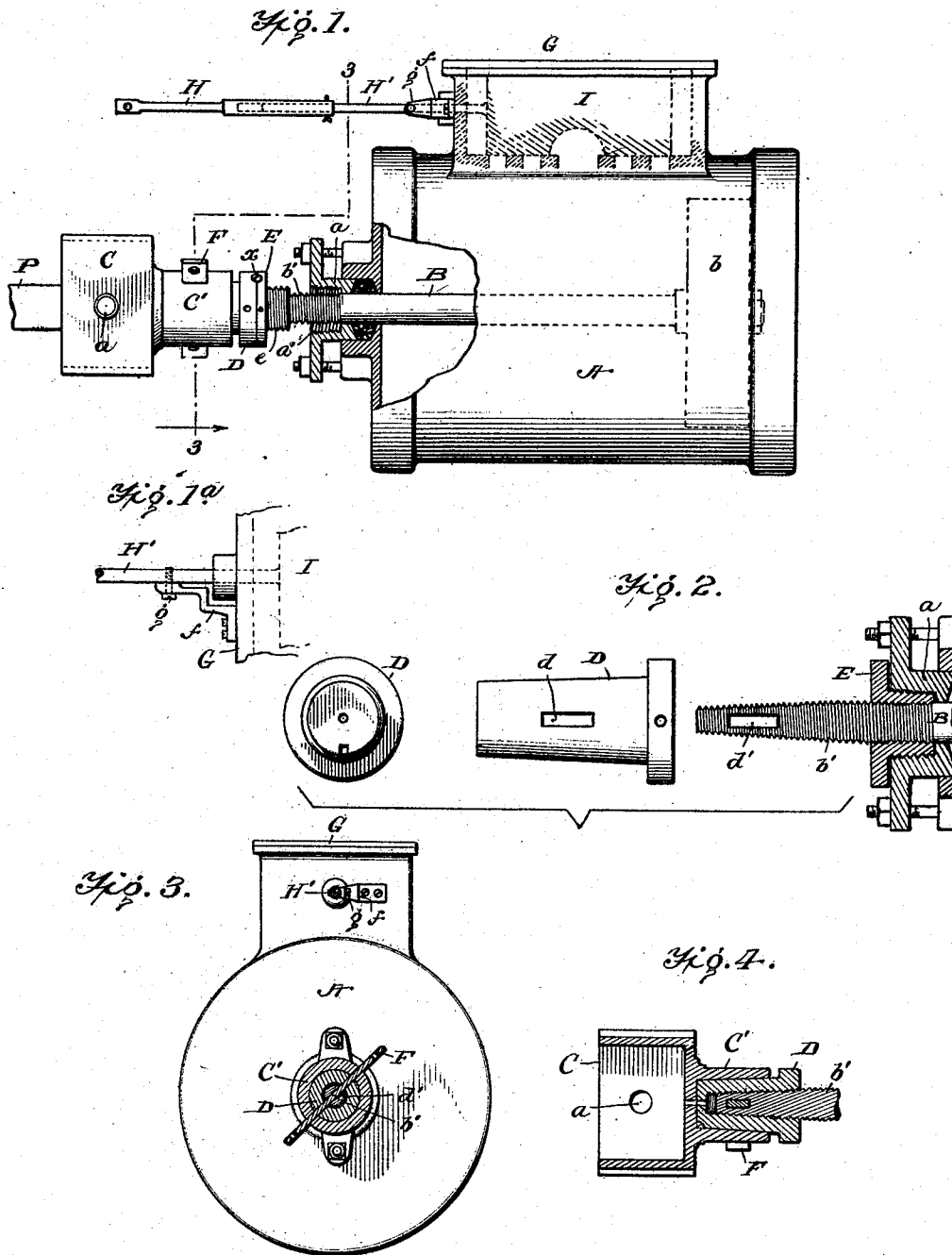


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MEANS FOR CONNECTING AND DISCONNECTING RECIPROCATING ENGINES.
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MEANS FOR CONNECTING AND DISCONNECTING RECIPROCATING ENGINES.

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To all whom it may concern:

Be it known that I, SEAMER S. SMITH, a citizen of the United States, and a resident of Osage, in the county of Mitchell and State of Iowa, have invented certain new and useful Improvements in Means for Connecting and Disconnecting Reciprocating Engines, of which the following is a specification.

The object of my invention is to easily and quickly disconnect any reciprocating engine, and especially those of a locomotive, and leave the same balanced after it has been disconnected, as it was while working, or under normal working conditions. In such engine construction, counterbalances are used to equalize the weight of the pitman or connecting rod.

By the present method, when such engines are disconnected, to prevent the piston from moving while other parts of the engine are in motion, the connecting rod is taken down or removed. By such taking down or removal of the connecting rod, the engine is taken out of balance equal to the number of pounds of the said part or parts removed.

When the condition of being thus out of balance exists in any such engine, and especially where two or more engines work in conjunction, as in a locomotive; and movement of the same is imparted by the application of power in or to its parts, its frame and structures are damaged and injured by this unequal counterbalancing. Damage and injury also results to all track systems, foundations, or supports with which such engine is connected or comes in contact.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar figures of reference indicate corresponding parts in all the figures.

Figure 1 is a side view of an engine with my improvements, with cylinder casing and shell partly in section. Fig. 1^a is a top plan view in detail of the lock for the valve rod. Fig. 2 are detached views of the coupling for the piston rod. Fig. 3 is a cross sectional view of the engine on line 3—3 of Fig. 1, and Fig. 4 is a longitudinal section of the cross-head, its sleeve and bushing, and the tapered portion of piston-rod.

By the use of my invention the disconnection of an engine can be accomplished without taking down or removing the connecting rod, or pitman, thus leaving the engine prop-

erly balanced, and avoiding all damage attendant upon present methods.

My invention enables me to secure this result by blanking all ports of the steam-chest, disconnecting the piston-rod from the cross-head and locking the piston and piston-rod in the forward end of the cylinder.

To blank all the ports of the steam-chest, I provide a right angular or bracket-shaped metal spring *f*, Figs. 1 and 1^a, bolted to the rear end of the steam-chest, and extending back a short distance, parallel to and alongside, but at a slight distance from the valve-stem *H'*. In the back end of this spring *f*, a hole is made. With the valve so adjusted that all ports are blanked in the steam-chest; as indicated in dotted lines in Fig. 1, a hole is made through the valve-stem *H'* at a point directly opposite the hole in rear end of spring *f*. Through the hole in this spring and valve-stem, a screw or bolt *g*, is inserted. The section *H* of the valve rod is formed with a telescopic tube sliding over the valve stem *H'* and pinned to it. The sections are separated by removing their connecting pin. This disconnects the valve from its working machinery and locks the valve with all ports securely blanked.

To disconnect the piston-rod, this is effected at the juncture of the piston-rod and cross-head. As means to accomplish this, I provide a piston-rod *B*, tapering and threaded at the rear end *b'*, and a bushing *D*, which is screwed over the tapered threaded end of the piston-rod. The outside of this bushing is also slightly tapered. The sleeve *C'* of the cross-head *C* is reamed out to receive bushing *D*, and the bushing *D* is fitted into the sleeve of the cross-head as in Figs. 1 and 4. The bushing *D* and threaded end of the piston-rod have registering key holes *d* and *d'*, as has also the sleeve *C'* of the cross-head, and a key *F* is inserted transversely through these holes, binding the parts securely together and coupling the piston-rod to the pitman or connecting rod *P*. The disconnection is secured as follows: Remove the transverse key *F*, then remove the sleeve *C'* of the cross-head from the bushing and then unscrew the bushing from the piston-rod.

To lock the piston and piston-rod in the forward end of the cylinder, this is achieved by means of a lock-nut *E*, Figs. 1 and 2, provided with a sleeve *e* having threads inside

and outside. The inner threads screw over the threads on the piston-rod, between the bushing D and stuffing-gland *a*, at the rear end of the cylinder-head, and the outer threads screw into the threads within the extended portion of stuffing-gland.

To secure the result of locking the piston and piston rod in the front end of the cylinder, the lock-nut E is screwed forward on the threaded piston-rod, and into the extended, threaded portion of the stuffing-gland *a* at the rear end of the cylinder-head, as seen on the right of Fig. 2, thus securing the piston in the front of the cylinder. When the piston is in the forward end of the cylinder, the threaded portion of the piston rod is all outside of the stuffing gland. When not in use, this locking-nut is screwed back on the piston-rod, to and in contact with the front end of bushing D and is there secured by inserting a set screw *x* between the two, as seen in Fig. 1. To turn the bushing D and lock-nut E, the flanges of these parts are provided with spanner holes as seen in Figs. 1 and 2.

Thus is accomplished the result of full disconnection; permitting the cross-head to travel back and forth between the guides without connection with or interruption from the piston-rod and piston; carrying the pitman or connecting rod P in its normal position; leaving the engine properly balanced, and avoiding the expense, delay, and damage attendant upon present methods and practices the disconnection of the piston rod and connecting rod being effected without disturbing the alinement and connection of either part.

I do not limit myself to the details of construction illustrated in the drawings and herein specifically described, as these may obviously be varied in many particulars, without departing from my invention.

I claim—

1. A reciprocating engine comprising a cylinder, piston, piston-rod, cross head connecting rod, and a screw coupling located between the cross head and piston-rod for disconnecting the same without disturbing the connections and alinement of either.

2. A reciprocating engine comprising a cylinder, piston, piston-rod, cross head connecting rod and means for disconnecting the

piston rod and connecting rod without disturbing the connections and alinement of either, said means consisting of a screw coupling located between the cross head and piston rod and separable by a longitudinal movement.

3. A reciprocating engine comprising a cylinder, piston, piston-rod, cross head and connecting rod, and means for disconnecting the same without disconnecting or removing the connecting rod, consisting of a separable coupling located between the cross head and piston rod, and means for locking the piston rod to the cylinder when disconnected at the coupling.

4. The combination of a screw-threaded stuffing-gland on the steam cylinder, a piston rod having a threaded end, a lock-nut threaded outside, and inside, the inside threads fitting the threaded piston-rod, and the outside threads fitting the stuffing-gland, whereby the piston and piston-rod are secured in the front end of the cylinder.

5. The combination with a sleeved cross head and a piston rod having a threaded end, of a removable bushing, fitted within the sleeve of the cross-head, and screw-threaded interiorly to fit the threaded end of the piston-rod, and a key inserted transversely throughout the whole, and binding the same securely together.

6. A reciprocating engine, comprising a cylinder, piston, piston-rod, cross-head, connecting rod, and a screw coupling located between the piston-rod and cross-head, whereby the engine may be disconnected at the juncture of the piston-rod and cross-head, without disturbing the connections and alinement of said parts thereby leaving such engine balanced.

7. The combination in a reciprocating engine; of a port-blanking device for the valve, a lock for securing the piston in the forward end of cylinder, a cross head and piston-rod, a bushing fitted into the cross-head, and onto the rear end of piston-rod, and removable from said position, and means for connecting the same.

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Witnesses:

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