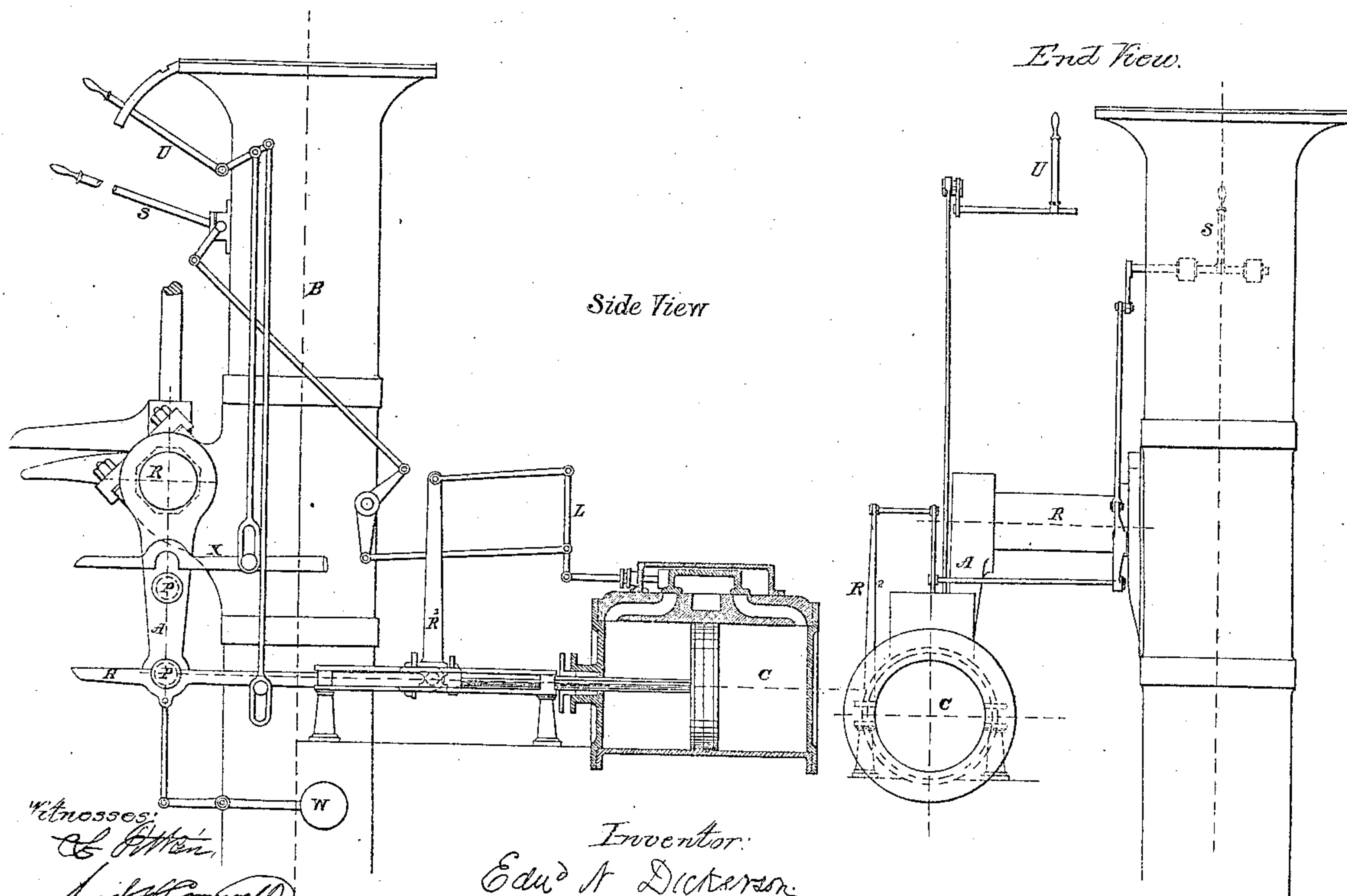
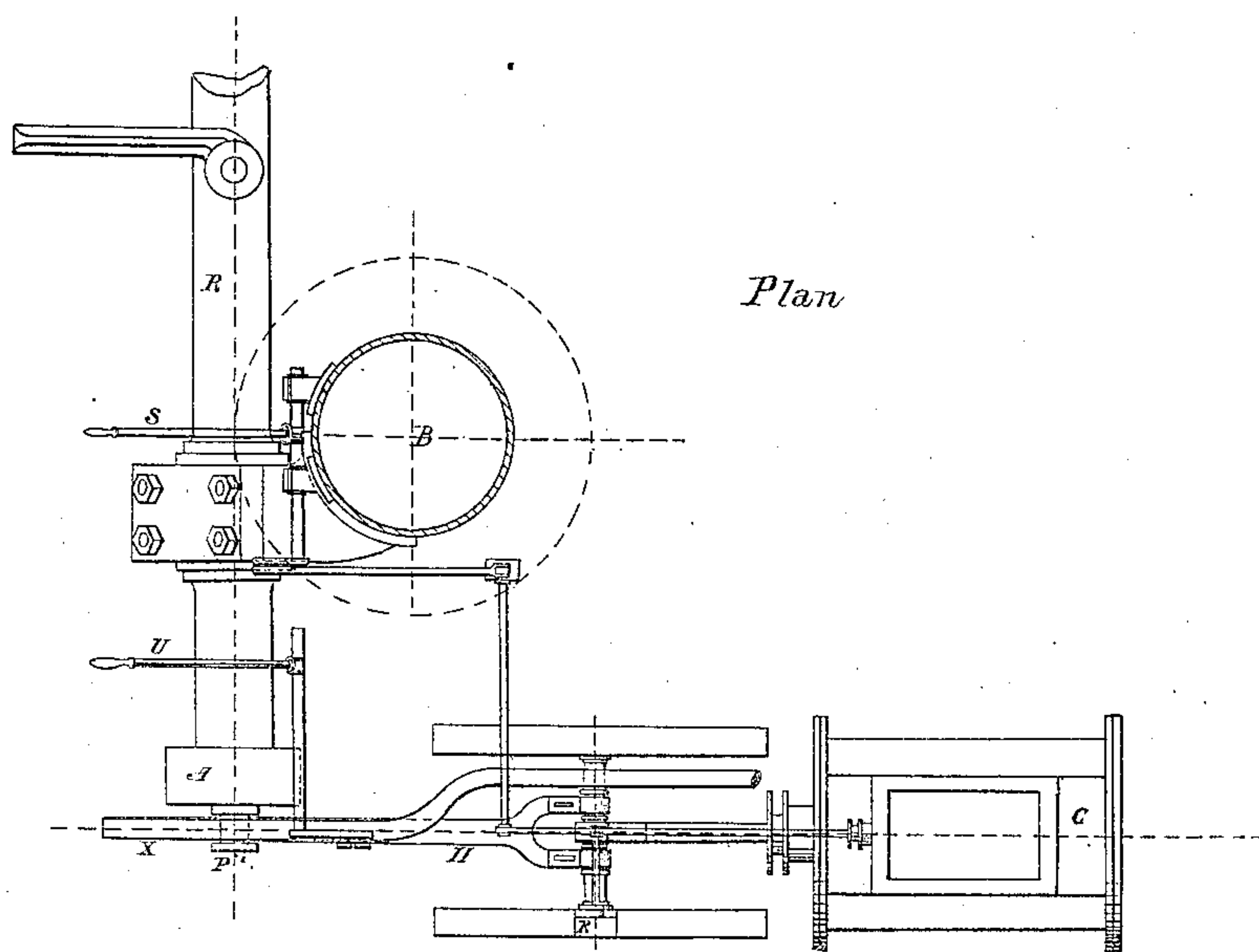


E. N. Dickerson,

Steam Cut-Off.

N^o 39,278.

Patented July 21, 1863.



Witnesses:
E. N. Dickerson
Samuel H. Cornell

Inventor:
Edu^d N. Dickerson

UNITED STATES PATENT OFFICE.

EDWARD N. DICKERSON, OF NEW YORK, N. Y.

IMPROVEMENT IN VALVE-GEAR FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 39,278, dated July 21, 1863.

To all whom it may concern:

Be it known that I, EDWARD N. DICKERSON, of New York city, have invented a new and useful improvement in the means of working the valves of steam-engines by hand; and I do hereby declare the following to be a full and exact description thereof, reference being had to the accompanying drawing and letters of reference thereon.

The object of my improvement is to enable the engine-driver to work the steam-valves of large engines by hand, with much greater ease than otherwise could be done; and the manner of effecting that object is by combining an auxiliary steam-cylinder and piston with a reciprocating rock-shaft in such manner that the power of the steam in the auxiliary cylinder may be controlled by the hand of the engine-driver, to work the rock-shaft of the main engine at pleasure.

The principal value of this improvement is in enabling single puppet-valves to be used, which, when properly applied, will produce a saving of steam, as compared with any balanced puppet-valves I have ever seen, of not less than ten per cent.; but with large balanced valves the same combination may be used with advantage to enable the valves to be opened much wider than can be done by hand with the starting-bar, and so work the engine much more powerfully to back in cases of emergency.

In the accompanying drawing, three views are shown of the combination, and the same letters denote the same parts.

B is the side pipe of an ordinary engine.

R is the rock-shaft.

A is the arm of the rock-shaft.

P is the ordinary pin for the eccentric hook X.

P² is an additional pin to be used for the hook H, which is connected with the piston of a cylinder, C, so placed as to lead to the pin. This cylinder has a slide-valve of the ordinary construction, but may have any other sort of valve desired.

L is a lever, to one end of which the valve-stem is attached, and the other end of which

is connected to the cross-head of the small cylinder by the standard R².

S is the starting-bar, which, when it is moved either way, will open the steam-valve of the auxiliary cylinder at one end, and the auxiliary piston will at once begin to move, and by its motion to vibrate the rock-shaft R, and of course open the valves of the main engine. In moving, however, the auxiliary piston, by means of the standard R, which travels with it, will cause the upper end of the lever L to move at the same rate, and if the starting-bar is held still, the effect will be that the valve of the auxiliary engine will again close by the motion of the auxiliary piston, and if it could move further it would open the steam-valve at the opposite end of the auxiliary cylinder, and so arrest any further motion of the auxiliary piston. Thus the auxiliary piston will follow the hand of the engine-driver, as he moves the starting-bar—moving when it moves and stopping when it stops—just as if the rock-shaft itself were moved by the starting-bar directly in the usual manner; and of course the main engine rock-shaft can be moved to any degree and with any rate of speed required.

U is the unhooking-lever, which is so connected with the two hooks X and H that as it is moved it will force off the hook H before the hook X drops on, so that no damage may be done.

W is a weight arranged to force the hook A onto the pin P.

The method of controlling the small piston here shown is the best one I know; but other methods may be used, as a friction-brake attached to the small piston to prevent too rapid action; driving a piston through a water-cylinder, which piston should be connected with the small piston, and by the friction of the water retard it; lifting a pendulum-weight, which is connected with the small piston, and by raising which the small piston is retarded; and other ways of applying the power of the auxiliary engine to the main valves may be used, as by a separate trip-shaft, &c., and of course the arrangement

here shown may be modified an infinite number of ways to suit different forms of engines having reciprocating rock-shafts which may be used, all of which, however, will comprise this combination.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination of an auxiliary steam-cylinder and piston with the vibrating rock-shaft of a large steam-engine, so arranged that the

piston of the auxiliary engine will, at the pleasure of the engine-driver, vibrate the rock-shaft of the large engine, and thus open and close the main valves which it works, substantially as described.

EDWD. N. DICKERSON.

Witnesses:

L. PITKIN,
SAML. H. CORNWELL.