No. 698,510. Patented Apr. 29, 1902.

W. A. JOHNSON.

STEAM ENGINE.

(Application filed Aug. 13, 1901.)

(No Model.)

Fig. 1.

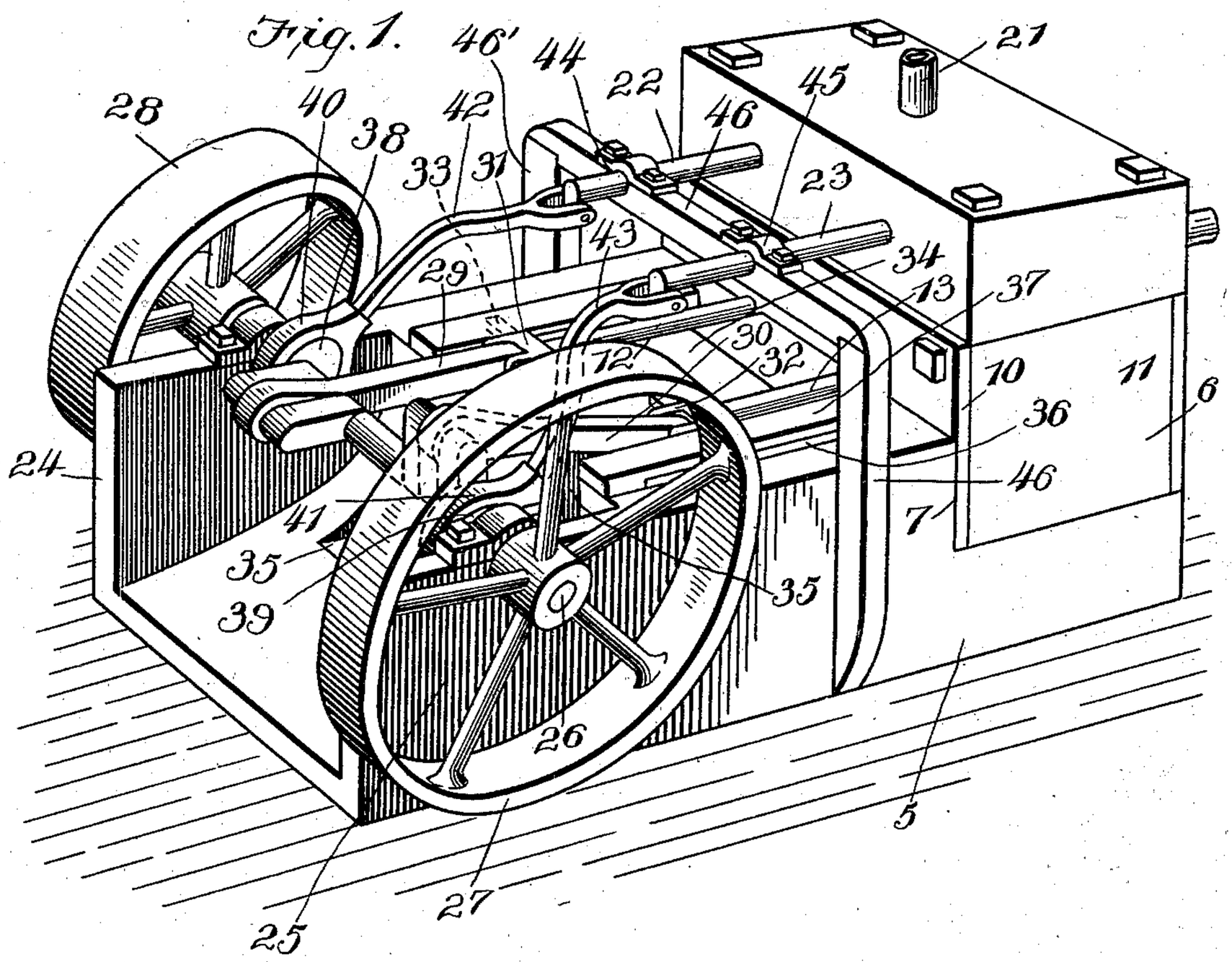


Fig. 2.

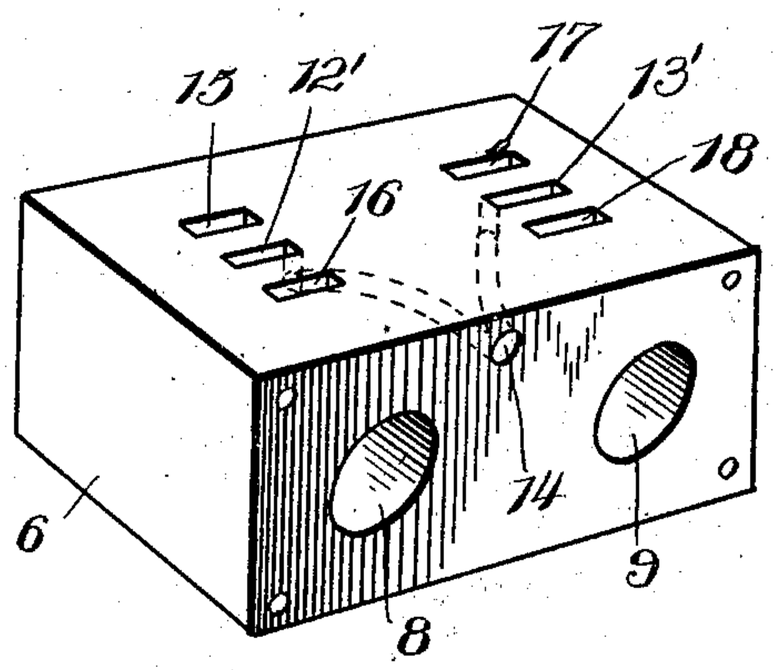
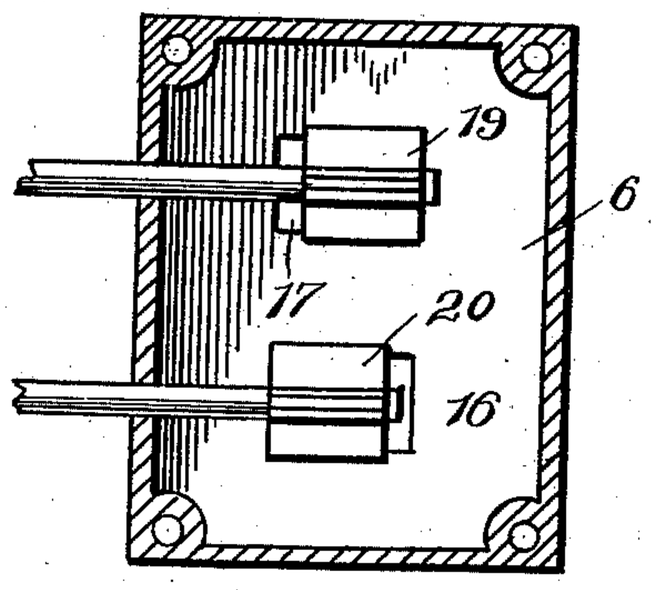


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM A. JOHNSON, OF HEROLD, WEST VIRGINIA.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 698,510, dated April 29, 1902.

Application filed August 13, 1901. Serial No. 71,954. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. JOHNSON, a citizen of the United States, residing at Herold, in the county of Braxton, State of West Virginia, have invented certain new and useful Improvements in Steam-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to steam-engines in general, and more particularly to the class of reciprocatory engines; and it has for its object to provide a simple and cheap construction of engine which will include two cylinders having pistons connected with a common shaft, the form and mounting of the cylinders being such that the construction is most rigid.

Other objects and advantages of the invention will be understood from the following description.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a perspective view showing the engine. Fig. 2 is a detail perspective view showing the two cylinders with the steam-chest and valves removed; and Fig. 3 is a transverse section through the steam-chest, showing the arrangement of the slide-valves.

Referring now to the drawings, the engine comprises a bed or base 5, the rear end of which is reduced in height to receive the rectangular metal block 6, which lies against the shoulder 7, formed by the end of the central thickened portion, and in which position it is firmly bolted. In the block 6 are formed the two cylinders 8 and 9 by boring two parallel passages entirely through the block, the heads for the cylinders being formed by the two plates 10 and 11, which are bolted against the block to cover the ends of the passages. In the cylinders are the usual pistons having the rods 12 and 13 leading therefrom through the plate 10, which has openings therein for the rods, the plate 11 being without perforations opening into the cylinders.

Upon the block 6 is bolted a steam-chest, opening into which are the two outlet-ports 12′ and 13′, which communicate with the exhaust 14, as shown in Fig. 2 of the drawings. Leading to opposite ends of the cylinder 8 are the ports 15 and 16, which lead through the top of the block and into the steam-chest at opposite sides of the port 12′, while leading from opposite ends of the cylinder 9 into the chest at opposite sides of the port 13′ are the ports 17 and 18. The ports 12′, 15, and 16 have a slide-valve, and the ports 13′, 17, and 18 have also a separate slide-valve, these valves being shown at 19 and 20, and they are adapted to connect each end of their respective cylinders alternately with the exhaust-pipe, it being understood that the feed-pipe 21 leads directly into the steam-chest. The valves have separate rods 22 and 23, which are operated in the manner hereinafter described.

At the opposite end of the base from the block 6 are formed the two pillow-blocks 24 and 25, between which the base is cut away, and in these pillow-blocks is journaled the double crank-shaft 26, at one end of which is the fly-wheel 27, while at the opposite end is the belt-pulley 28. Connected with the cranks of the shaft are the pitmen 29 and 30, which are pivoted at their opposite ends to the cross-heads 31 and 32. The cross-heads have laterally-extending flanges 33, which engage the guides at opposite sides of the heads. For the mutually-adjacent flanges of the two heads there is provided a metal plate 34, which is let into the upper surface of the base of the engine, in the central thickened portion thereof, said thickened portion having the parallel longitudinal channels 35, in which the inner ends of the pitmen connected to the cross-heads work, and at the outer sides of these channels are the lower bearing-plates 36 and the upper bearing-plates 37 above them, the outer flanges of the cross-heads being received between these upper and lower bearing-plates.

The crank-shaft has the two eccentrics 38 and 39 fixed thereon and with which are engaged the straps 40 and 41, which are connected by the connecting-rods 42 and 43 with the valve-rods above referred to. These eccentrics are set on the quarter, as are also the cranks of the shaft, and hence the engine can at no time get on a dead-center.

The valve-rods are slidably mounted with their outer end portions in slide-bearings 44

and 45 in the cross-beam 46, supported upon the posts 46′ on the engine-base, so that there is no displacement of the valve-rods due to downward pull of the connecting-rods.

It will be seen that this engine consists of but few parts and that while both cylinders and their pistons operate the common shaft either cylinder may be cut out in time of accident or when for any other reason one cylinder only is to be used. Furthermore, the structure is extremely rigid.

In practice modifications of the specific construction shown may be made and any suitable materials and proportions may be used for the various parts without departing from the spirit of the invention.

What is claimed is—

A steam-engine comprising a base having a cut-away portion at one end, a block secured in the cut-away portion and having parallel passages therethrough forming cylinders, a plate secured to the front end of the block, a plate secured to the rear end of the block, said plates covering both ends of both passages, a bearing-plate set into the base, vertically-spaced bearing-plates spaced outwardly from each side of the first-named plate, cross-heads slidably engaged with the bearing-plates, a crank-shaft mounted upon the base, connections between the cranks of the shaft and the cross-heads, pistons in the cylinders connected with the cross-heads, a steam-chest for the cylinders, separate cut-off mechanisms for the cylinders, and separate connections between the valve mechanisms and the crank-shaft for operating the valve mechanisms.

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

WILLIAM A. JOHNSON.

Witnesses:
W. G. HYER,
JOHN ADAMS.