

J. M. FENNELL.
STEAM ENGINE.
APPLICATION FILED APR. 23, 1910.

970,903.

Patented Sept. 20, 1910.

2 SHEETS-SHEET 1.

Fig. 1.

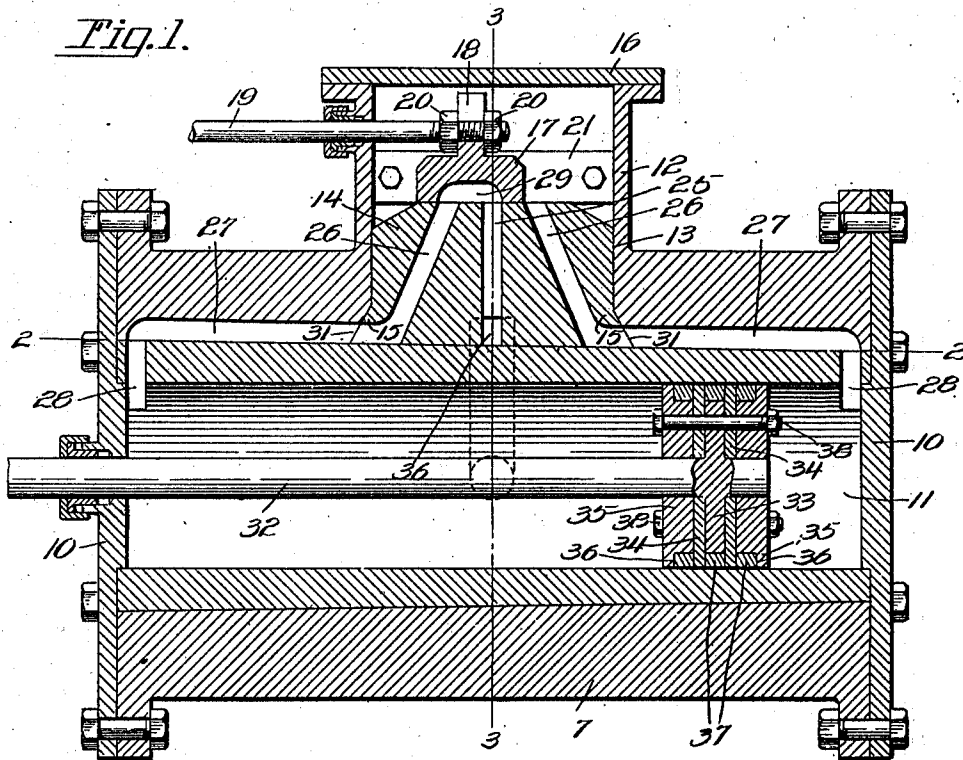
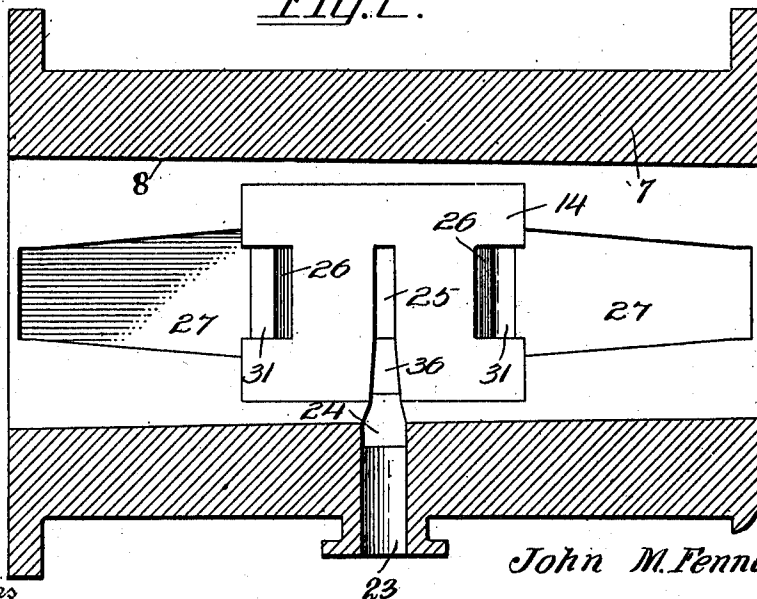


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

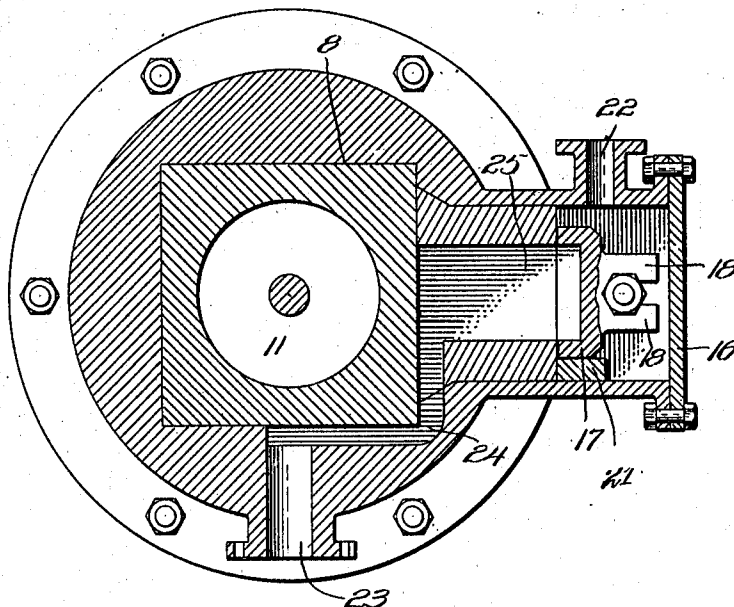


Fig. 4.

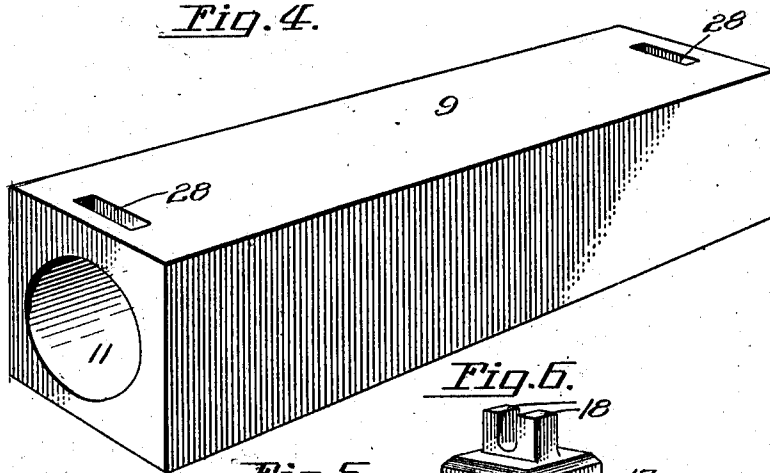
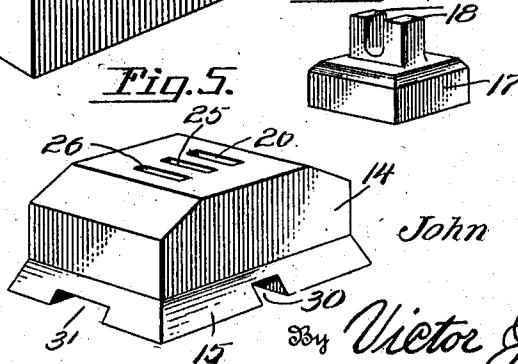


Fig. 5.



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JOHN M. FENNELL, OF QUITMAN, GEORGIA.

STEAM-ENGINE.

970,903.

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Application filed April 23, 1910. Serial No. 557,261.

To all whom it may concern:

Be it known that I, JOHN M. FENNELL, a citizen of the United States, residing at Quitman, in the county of Brooks and State of Georgia, have invented new and useful Improvements in Steam-Engines, of which the following is a specification.

This invention relates to steam engines, and one of its objects is to produce a steam cylinder of simple and improved construction in which the parts mainly exposed to wear may be renewed at will or replaced by new parts.

With this and other ends in view which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement of parts which will be hereinafter fully described and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention; it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the invention may be resorted to when desired.

In the drawings,—Figure 1 is a longitudinal sectional view of a cylinder and steam chest constructed in accordance with the invention. Fig. 2 is a longitudinal sectional view taken through the cylinder after the core has been removed. Fig. 3 is a transverse sectional view taken on the plane indicated by the line 3—3 in Fig. 1. Fig. 4 is a perspective view, showing the cylinder core detached. Fig. 5 is a perspective view, showing the valve seat detached. Fig. 6 is a perspective view, showing the valve detached.

Corresponding parts in the several figures are denoted by like characters of reference.

The cylinder casing 7 is provided with a longitudinal opening 8 of non-circular cross section, preferably approximately square, as shown in Fig. 3. The opening 8 forms a seat for a core 9 which is made slightly tapering to correspond with the formation of the seat which is also tapered toward one end, thus enabling the core to be firmly and securely seated in the bore, where it is retained by the cylinder heads 10. The core has a longitudinal cylindrical bore 11.

12 designates the steam chest which, as shown in the drawings, may be formed in-

tegral with the cylinder, although within the scope of the invention the said steam chest may be formed of a separate casing bolted or otherwise secured upon the cylinder. The wall of the latter adjacent the steam chest is provided with a rectangular opening 13 wherein the valve seat 14 is mounted, said valve seat being composed of a solid block or casting provided adjacent 65 to its lower edges with inclined flanges 15 for the reception of which the walls of the aperture 13 are correspondingly beveled, as will be best seen in Fig. 1 of the drawings. It will be readily seen that when the valve 70 seat is placed in the aperture 13 it will be firmly secured against possibility of displacement or removal by the core 9 which is subsequently placed in position.

The steam chest is provided with a removable lid 16 to admit of convenient access to the valve 17 which slidably engages the valve seat. The valve is provided with upwardly extending lugs 18 between which the inner end of the valve rod 19 is seated, said 80 valve rod being connected with the valve by means of clamp nuts 20.

By the construction just described it is evident that the valve is practically self-seating, or that by loosening the nuts 20 it 85 may be readily seated, thus enabling wear to be compensated for. A wear strip 21 is provided within the steam chest to support the slide valve.

The steam chest is provided at one side 90 thereof with a steam inlet 22. An outlet 23 for the exhaust steam is formed upon the cylinder casing, which latter is provided with an interior passage 24 communicating with the exhaust port 25 which extends vertically through the valve seat. The latter is likewise provided with steam ports or passages 26, the upper or outer portions of which are straight and parallel, while the lower or inner ends of said ports or passages are made to diverge in the direction 100 of the cylinder casing, which latter is formed with passages 27 communicating through ports or openings 28 adjacent to the ends of the core with the ends of the cylindrical bore 11. The valve 17 is provided in its underside with a cavity 29 adapted to connect either of the steam ports 26 with the exhaust port 25.

The channels or passages 24 and 27 are 110 formed interiorly upon the cylinder casing, as will be clearly seen by reference to Fig. 2

of the drawings, and the passages 27 are preferably widened in the direction of the valve seat, which latter is provided upon its underside with grooves or notches 30 and 31 communicating, respectively, with the exhaust port 25 and with the steam ports 26.

The piston rod 32 of the improved engine is provided adjacent to one end with an integral disk 33 which constitutes the core of the piston, as will be best seen in Fig. 1. The piston is made up of the spacing disks 34 which abut upon the sides of the core 33 and of the head disks and end disks 35 which are placed in proximity to the spacing disks, said head disks being provided with annular grooves 36. Packing rings 37 surround the core 33, the head disks 35 being placed in the grooves 36 of the latter and in the space intermediate the spacing disks. The parts are connected by bolts 38 extending longitudinally therethrough. Packing glands of ordinary construction are provided for the piston rod as well as for the valve stem, and the construction in other respects is such as is customarily resorted to in devices of this class.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of this invention will be readily understood by those skilled in the art to which it appertains. Engines frequently have to be stopped for repairs and important and heavy parts thereof have to be sent to shops at distant places in order that the repairs may be made. By the present invention the parts of an engine that are mostly exposed to wear and to injury are made readily removable

by any ordinary workman and by the use of none but the most ordinary tools, enabling the worn or injured parts to be replaced by new ones. It will thus be seen that time may be largely saved in effecting necessary repairs, especially inasmuch as the interchangeable and removable parts may be kept in stock at no great expense.

While the invention has been described as being applicable particularly to steam engines, it is obvious that it may within its spirit and scope be applied to the various kinds of motors, pumps and the like.

Having thus described the invention, what is claimed as new, is:—

1. A cylinder casing having a longitudinal slightly tapering aperture and a transverse opening extending therefrom, a steam chest casing upon the cylinder casing, a valve seat mounted in the transverse opening, and a core seated in the longitudinal aperture and retaining the valve seat against inward displacement.

2. A cylinder casing having a longitudinal aperture and a transverse opening, the side walls of which are beveled at their inner ends, a valve seat mounted in the opening and having beveled flanges engaging the side walls thereof, a steam chest casing connected with the cylinder casing, and a core detachably seated in the longitudinal aperture of the cylinder casing.

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

JOHN M. FENNELL.

Witnesses:

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