W. M. WILKIN.

STEAM ENGINE.

APPLICATION FILED NOV. 19, 1914. RENEWED JULY 7, 1916.

1,214,858. Patented Feb. 6, 1917.

Fig. 1.

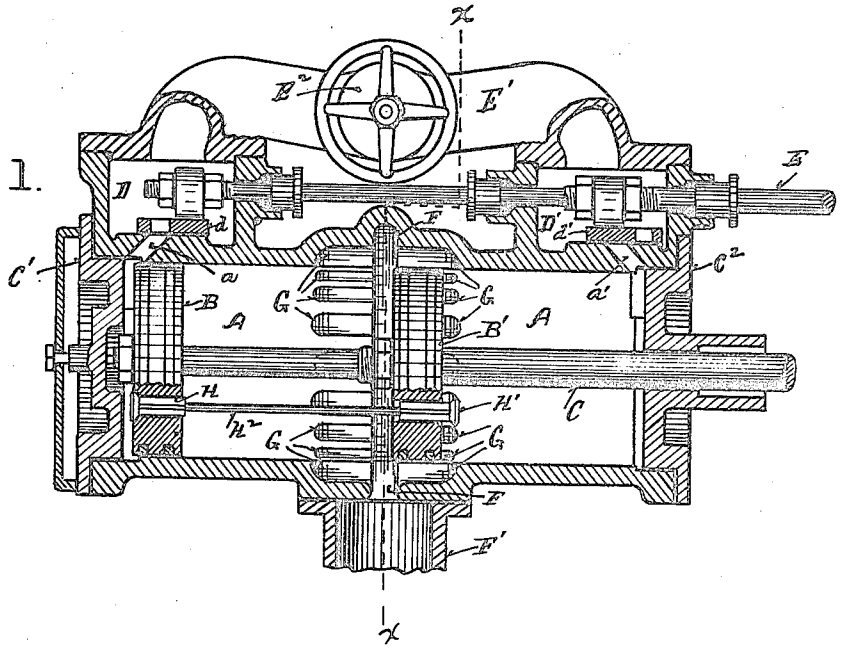
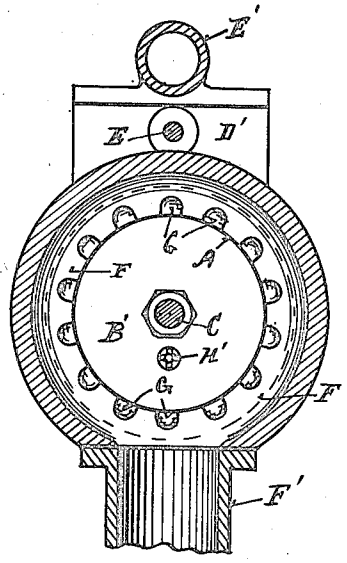


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

WILLIAM M. WILKIN, OF ERIE, PENNSYLVANIA.

STEAM-ENGINE.

1,214,858. Specification of Letters Patent. Patented Feb. 6, 1917.

Application filed November 19, 1914, Serial No. 872,981. Renewed July 7, 1916. Serial No. 108,056.

To all whom it may concern:

Be it known that I, WILLIAM M. WILKIN, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

My invention relates to steam engines and particularly to that type of steam engine known as central exhaust engines.

The object of my invention is to so construct a central exhaust engine with comparatively light piston mechanism, and to provide an exhaust chamber within the cylinder from which the used steam may escape continuously during the operation of the engine.

In carrying out these objects, I provide an engine cylinder with a deep circumferential groove in the central part of the interior wall thereof, and with longitudinal grooves of less depth extending from said circumferential groove toward each end of said cylinder, and with the usual steam inlet ports at each end of said cylinder, and upon the piston-rod I secure two comparatively light pistons each of which in its reciprocations is adapted to travel over the longitudinal grooves and slightly past the edges of said circumferential groove, so that the space between said pistons will at all times open directly into said circumferential groove.

These and other features of my invention will appear hereinafter in the specification and claims, and are illustrated in the accompanying drawings, in which:

Figure 1, is a longitudinal central section of a steam engine embodying my invention.

Fig. 2, is a transverse section of the same on the line *x*—*x* in Fig. 1, looking in the direction of the arrow.

In these drawings A, indicates an engine cylinder, and B B′, indicate pistons therein secured in tandem upon a piston-rod C; C′ and C², indicate cylinder heads closing the ends of the cylinder A; D and D′, indicate valve chests, which communicate with the cylinder A, through the steam-ports *a* and *a′*; and *d* and *d′* indicate valves in said valve-chests adapted to control said steam-ports *a* and *a′*; E, indicates the valve-rod to which the valves *d* and *d′*, are attached, and which is adapted to be actuated by some moving part of the engine in the usual way to operate said valves. E′, indicates a steam-pipe leading from the throttle-valve E², to each valve-chest D and D′.

Around the central part of the cylinder A, I provide an exhaust passage F, which communicates with the exhaust-pipe F′. In the interior surface of the cylinder A, I provide grooves G, in spaced relation to each other and which extend longitudinally from each side of the exhaust-passage F, toward each cylinder-head and are of greater length than the width of the pistons B B′, so that said pistons will, at the end of each stroke thereof, uncover the ends of the grooves G, nearest to that cylinder head which is farthest away from said pistons.

In operation, Fig. 1, shows the piston B′, as having opened the grooves G, on its side of the passage F, to permit steam to exhaust through said grooves into the passage F, and also into the space between the two pistons B and B′, from which space it can continue to flow out through the passage F, and pipe F′, while steam is admitted through the steam-port *a*, and the piston B, is driving both pistons on the return stroke toward the head C². When the piston B, uncovers the grooves G, on its side of the passage F, the exhaust operation is repeated. It will thus be seen that the pistons B and B′, never close communication between the space between the pistons B, and the passage F, and that there will be a continuous flow of exhaust steam therefrom.

To relieve the compression incident to the return of the pistons B B′, toward their respective cylinder-heads C′ and C², I provide valves H H′, in each of said pistons, and connect said valves by a rod H², so that the pressure behind the piston B, either from compression or incoming steam, will close the valve H, in the piston B, and through the rod H², open the valve H′, in the piston B′, in which position said valves will remain until the pressure behind the piston B′, reverses said valves.

It will therefore be seen that by means of the construction hereinbefore described, I am enabled to dispense with a piston of a length sufficient to fill substantially one-half

of the cylinder, and to employ in its stead two comparatively light pistons, thereby saving the power unnecessarily consumed in driving the excess weight; also by utilizing the space between the pistons as an exhaust chamber, I eliminate such back pressure as may be incident to the crowding of the entire volume of the exhaust steam immediately into the chamber F, and pipe F′, the volume of exhaust being continuous from the space between the pistons B B′.

Therefore having fully described the construction and operation of my invention so as to enable others to utilize the same, what I claim as new and desire to secure by Letters-Patent, is:—

1. The combination in a steam engine of a cylinder having its interior wearing surface cut away at a point co-incident with termination of the forward stroke of the piston, and longitudinal grooves in said wearing surface, extending from said point toward the head of said cylinder, and a piston in said cylinder adapted to reciprocate between the head of said cylinder and the point where said wearing surface is cut away, whereby steam may be allowed to exhaust through said longitudinal grooves, substantially as set forth.

2. The combination in a steam engine of a cylinder having its interior wearing surface divided at the central portion by an annular groove therein, and having longitudinal exhaust grooves in said interior surface extending from said annular groove toward the heads thereof, steam ports at the ends of said cylinder, a piston rod in said cylinder, a pair of pistons on said rod so spaced thereon that each will uncover the ends of said exhaust grooves nearest the cylinder heads, but not pass said annular groove, whereby steam will be permitted to exhaust through said longitudinal grooves, a non-return valve in each of said pistons, a rod connecting said valves so that when one of said valves is opened, the other will be closed, whereby compression between said pistons and the cylinder heads may be relieved, and means to control the admission of steam to said cylinder, substantially as set forth.

3. The combination in a steam engine of a cylinder having steam inlet ports at the ends thereof and exhaust passages at the intermediate portion thereof, a piston rod therein, a pair of pistons so spaced on said rod that each will, in turn, uncover said exhaust passages, a non-return valve in each of said pistons seated against the faces thereof toward the inlet ports, and a rod connecting said valves so that when the valve in the piston which is taking steam, is closed, the valve in the other piston will be open whereby compression between the piston and cylinder heads will be relieved, substantially as set forth.

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

WILLIAM M. WILKIN.

Witnesses:
P. V. Bifford,
W. R. Wilkin.