

No. 783,273.

PATENTED FEB. 21, 1905.

C. E. HILTON.
VALVE ACTUATING MEANS.
APPLICATION FILED MAR. 7, 1904.

Fig. 1.

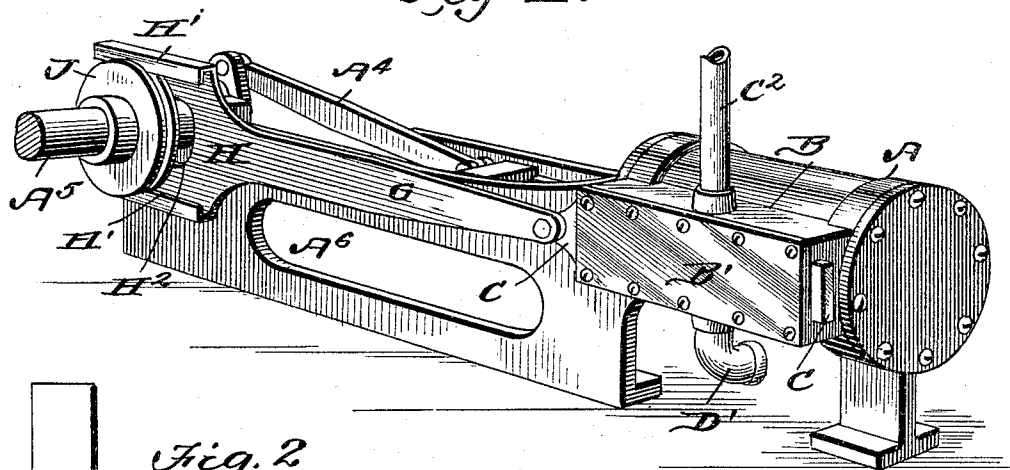


Fig. 2.

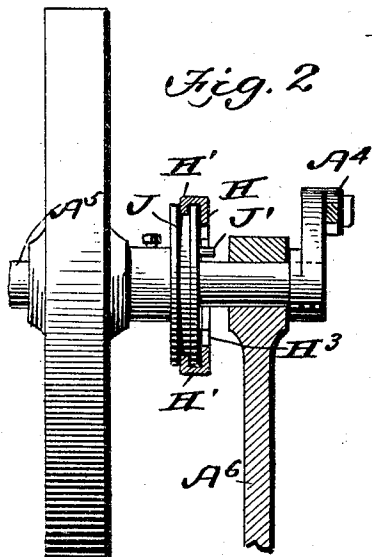


Fig. 3.

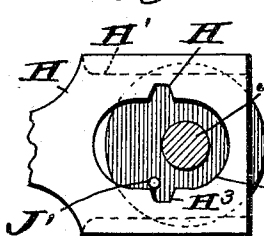


Fig. 4.

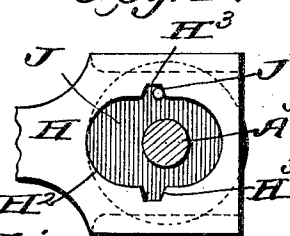


Fig. 5.

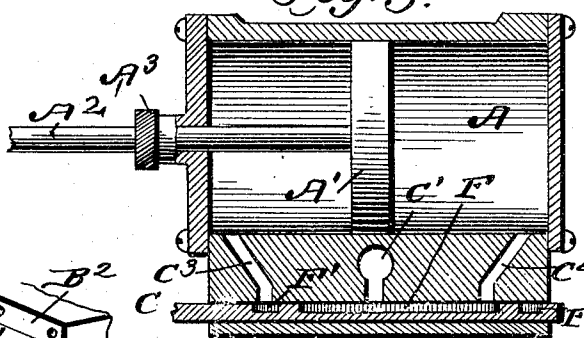


Fig. 6.

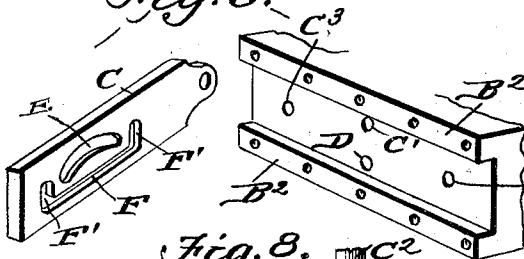


Fig. 8.

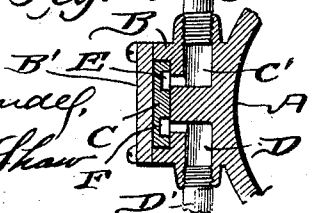
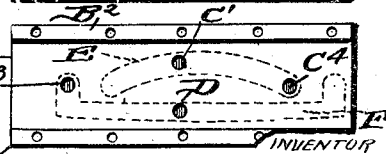


Fig. 7.



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VALVE-ACTUATING MEANS.

SPECIFICATION forming part of Letters Patent No. 783,273, dated February 21, 1905.

Application filed March 7, 1904. Serial No. 197,011.

To all whom it may concern:

Be it known that I, CLYDE E. HILTON, a citizen of the United States, residing at Lumber City, in the county of Telfair and State of Georgia, have invented a new and useful Improvement in Valve-Actuating Means, of which the following is a specification.

My invention is an improvement in means for actuating slide-valves, and is adapted for attachment to any slide-valve engine of ordinary construction.

The object of the invention is to produce a positive and rapid movement of the valve at the proper time, and thus increase the efficiency of the engine.

My invention consists of the novel features of construction and combination of parts hereinafter described, particularly pointed out in the claims, and shown in the accompanying drawings, in which—

Figure 1 is a perspective view of an engine with my device applied thereto. Fig. 2 is a front view, partly in section, showing the valve-actuating means. Fig. 3 is a detail view of my improvement, showing the position occupied by the various parts when steam is admitted on the forward side of the piston and exhausted from the rear side. Fig. 4 is a similar view showing the position of the parts when the valve is approximately on center. Fig. 5 is a horizontal section through the cylinder, valve-casing, and valve. Fig. 6 is a perspective view of the valve-casing, the cover being removed, and the valve, the latter being shown detached from the casing. Fig. 7 is a face view of the casing, the cover being removed and the valve-grooves being shown in dotted lines. Fig. 8 is a central transverse section through the valve-casing and valve.

In the drawings, A represents a cylinder having therein a piston A' and a piston-rod A², which extends through a stuffing-box A³, and to the forward end of the piston is pivoted a crank-shaft rod A⁴, which through the medium of the usual crank-arm rotates the shaft A⁵, the shaft being journaled adjacent one end in the frame A⁶, which may be of any suitable construction.

The various parts above mentioned may

vary in construction somewhat according to the type of engine to which they belong and are not claimed by me as parts of my invention, which is an attachment to be applied to an engine of the type shown and described and which consists of the following essential parts: A valve-casing B is carried by the cylinder A and may be formed integral with one side of the cylinder. The casing has a detachable face-plate B', which is bolted to longitudinal flanges B², formed along the front side edges of the casing. Between the face-plate B' and the casing B slides the valve C, guided by the flanges B². The casing is provided with a steam-inlet C', arranged midway the ends of the casing and communicating at its upper end with the steam-pipe C² and at its lower end opening laterally through the outer face of the casing B. Below the steam-inlet port is an exhaust-port D, leading from the front face of the casing B and communicating at its lower end with an exhaust-pipe D'. Passages C³ and C⁴ lead diagonally from the outer face of the casing B in a horizontal plane and open into the cylinder A at opposite ends of the cylinder. The ports C' and D open on the outer face of the casing B in vertical alinement, and the passage-ways C³ and C⁴ are in a plane midway the ports C' and D. The valve C covers the outer ends of the passage-ways, the lower end opening of the steam-inlet, and the upper end opening of the exhaust-ports. On the inner face of the valve C is formed a curved groove E, and below this groove E is a straight groove F, running lengthwise of the valve, and at the ends of the groove F are intersecting transversely-arranged grooves F'. To the slide-valve C is pivoted a stem G, which at its forward end has an enlargement H, the sides of which are bent over upon the plate H to form flanges H'. An oval-shaped opening H² is formed in the plate H, and on the upper and lower sides of this oval are formed notches H³. The shaft A⁵ passes loosely through the oval opening H², whose smallest diameter is greater than the diameter of the shaft A⁵. Adjacent the plate H a grooved wheel J is rigidly secured to the shaft A⁵, and the flanges H' fit in the groove of the said wheel. A pin J' is carried by the

wheel J and extends into the oval opening H², and as the wheel J rotates the pin J' is adapted to alternately engage the upper and lower notches H³ and shift the plate H backward and forward, sliding the stem G and valve C, as will be obvious from the drawings. It will also be plain from Figs. 3 and 4 that the pin J' is in engagement with the notches H³, or either of them, for but a brief time during the rotation of the wheel J' and that the movement of the valve will be comparatively rapid, and during the time that the pin J' is describing that portion of its path transverse to the oval opening H² the valve will be at rest.

Assuming that the valve is in the position shown in Figs. 5 and 7 and that the piston is ready to commence a forward stroke, steam will enter through the port C', the groove E, and the passage C⁴, and steam will be exhausted from the front end of the cylinder through the passage C³, grooves F' and F, and the exhaust-port D, the valve will remain stationary, and the piston will move forward to approximately the position shown in Fig. 5, and the pin J', engaging the upper notch H³, will move the valve forward, and by the time the piston has made three-fourths of its stroke steam will be cut off from entrance through the passage C⁴ and at the end of the last quarter the forward movement of the valve will stop, the pin being disengaged from the upper notch. Steam will now be exhausted from the rear end of the cylinder through the passage C⁴, rear groove F', groove F, and exhaust-port D and steam will be admitted through the passage C³ into the forward end of the cylinder until the piston again reaches the center of the cylinder, when the pin J' will engage the lower notch H³ and the cut off will be commenced and will be completed by the time three-fourths of the stroke has been made, and at the end of the rearward stroke the pin will have become disengaged from the lower notch and the parts will be in the position described at the commencement of the operation.

The construction herein shown and described gives a very quick valve movement and greatly increases the efficiency of the engine to which it is applied.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with an engine having a slide-valve, of a pivoted valve-stem enlarged at its free end, the sides of the free end being bent upon themselves to form flanges, a grooved wheel arranged on and rotating with the engine-shaft and engaging the flanges of the enlarged end of the valve-stem, and means carried by the said wheel adapted to engage the valve-stem and impart longitudinal movement thereto.

2. The combination with an engine, valve and engine-shaft, of a grooved wheel on the engine-shaft, a pivoted valve-stem enlarged at its forward, free end and having an elliptical opening formed therein, the engine-shaft passing freely through the said opening, the said opening being notched upon opposite sides, flanges formed on the enlarged portion of the valve-stem and engaging the grooved periphery of the wheel, and a pin carried by the wheel and adapted to engage the notches and move the valve-stem alternately forward and rearward.

3. The combination with a cylinder, piston, piston-rod, crank-shaft and valve-casing, of a slide-valve adapted to work in the casing, a valve-stem carrying an enlarged plate having an opening, the crank-shaft passing loosely through the said opening, the opening being notched on opposite sides, a wheel rigidly secured to and rotating with the said shaft, and a pin carried by the wheel and projecting into the opening and adapted to alternately engage the notches and shift the valve-stem and valve.

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Witnesses:

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