

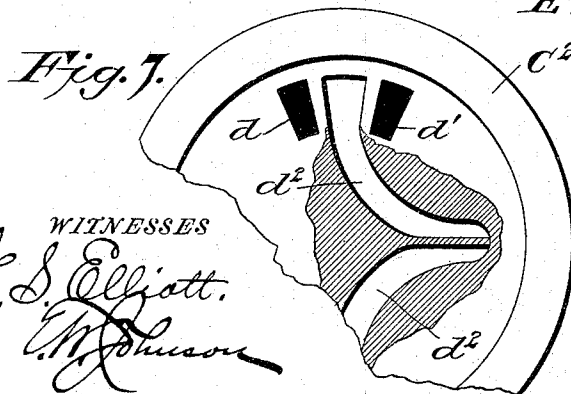
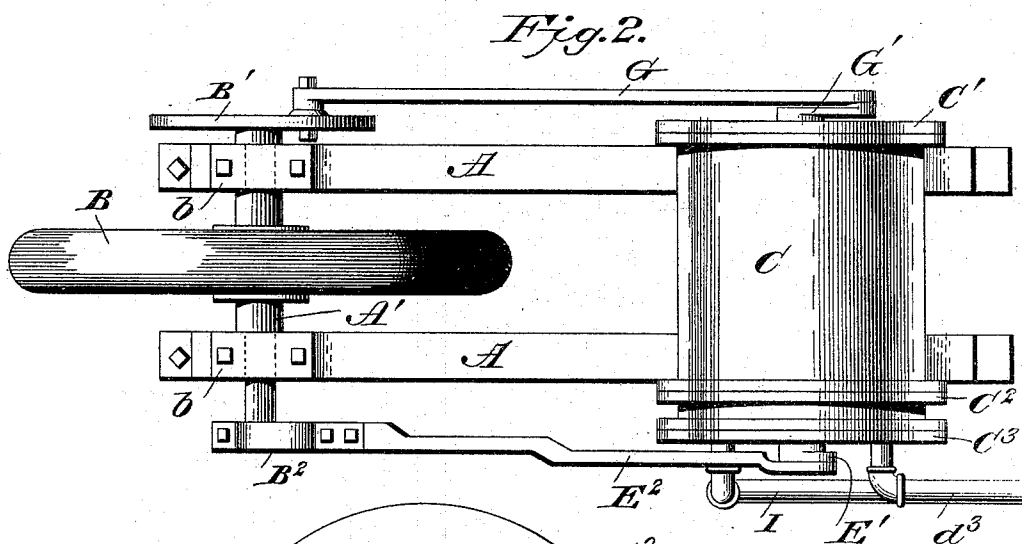
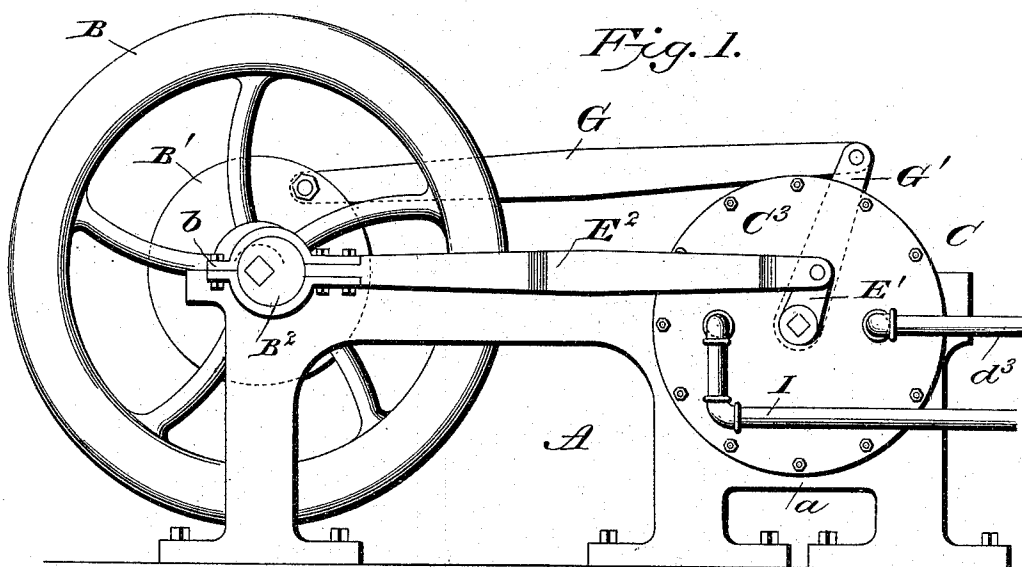
(No Model.)

2 Sheets—Sheet 1.

B. H. TRUCKS.
OSCILLATING PISTON ENGINE.

No. 552,798.

Patented Jan. 7, 1896.



WITNESSES
L. S. Elliott.
C. M. Johnson

Benjamin H. Trucks
INVENTOR
[Signature] Attorney

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

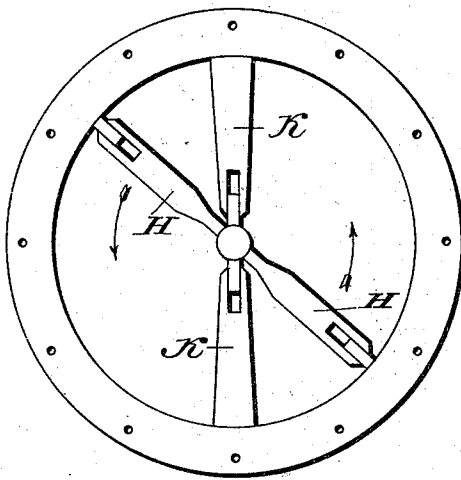


Fig. 4.

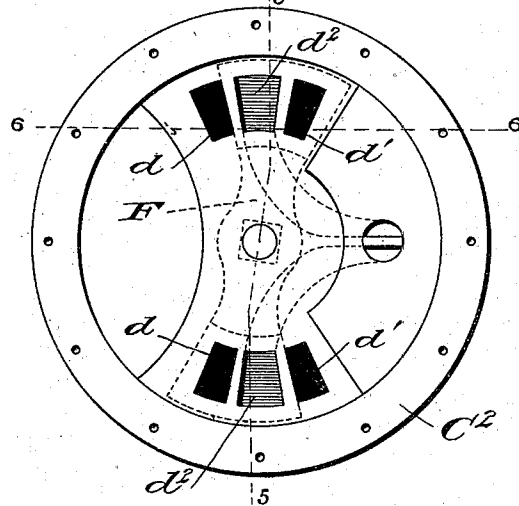


Fig. 5.

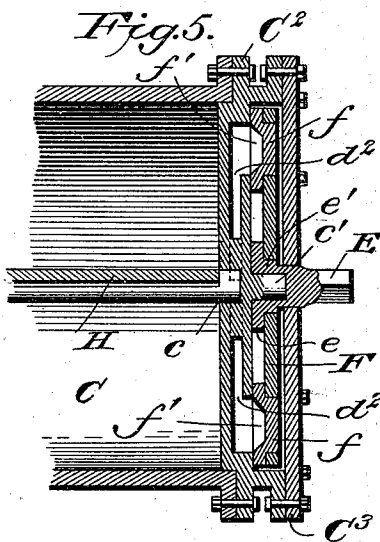


Fig. 6.

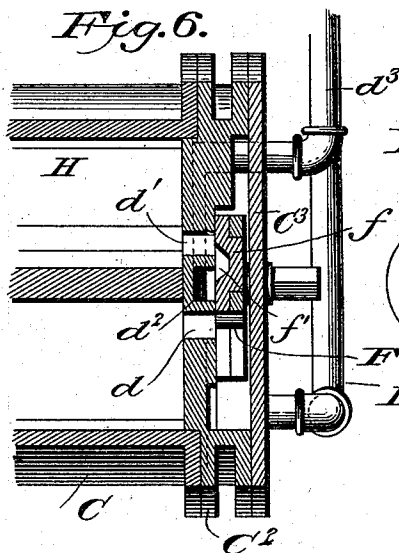
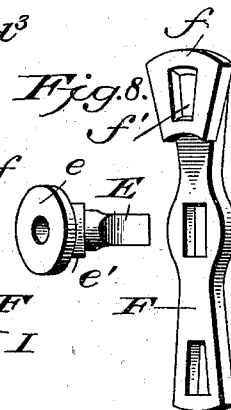
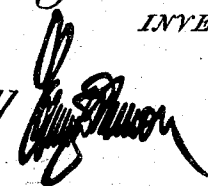


Fig. 8.



WITNESSES
L. S. Elliott.
W. Johnson.

Benjamin H. Trucks
INVENTOR

by  Attorney

UNITED STATES PATENT OFFICE.

BENJAMIN H. TRUCKS, OF CALDWELL, KANSAS, ASSIGNOR OF ONE-HALF
TO WILLIAM G. WILLIAMS, OF MINCO, INDIAN TERRITORY.

OSCILLATING-PISTON ENGINE.

SPECIFICATION forming part of Letters Patent No. 552,798, dated January 7, 1896.

Application filed October 24, 1895. Serial No. 566,738. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN H. TRUCKS, a citizen of the United States of America, residing at Caldwell, in the county of Sumner and State of Kansas, have invented certain new and useful Improvements in Oscillating-Piston 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 letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in oscillating-piston engines; and it consists in the construction and combination of the parts, as will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of an oscillating-piston engine constructed in accordance with my invention. Fig. 2 is a plan view. Fig. 3 is a side elevation of the cylinder with the cylinder-head removed. Fig. 4 is a side elevation of the steam-chest with the covering-plate removed. Fig. 5 is a sectional view on the line 5 5 of Fig. 4, the covering-plate being in position. Fig. 6 is a sectional view on the line 6 6 of Fig. 4. Fig. 7 is a sectional view of the steam-chest, showing the inlet and outlet ports; and Fig. 8 is a detail perspective view of the oscillating bar carrying the slide-valves which operate in the steam-chest.

A designates the frame of the engine, the side pieces of which are of similar construction and of sufficient strength to support the cylinder at one end and a heavy fly-wheel at the other. The side pieces of the frame A are connected to each other at one end by a transverse shaft A', upon which the fly-wheel B is mounted, and at the other end by plates a a, above which the cylinder C of the engine is placed, the side pieces being cut away, as shown, to receive the cylinder. The fly-wheel is mounted upon the shaft A' between the side pieces of the frame, and the shaft is journaled in bearings b bolted to the upper edges of the side pieces. The shaft is provided at one end with a wrist-wheel B' and at the other with an

eccentric B², which are connected to different parts of the engine, as hereinafter described.

The cylinder C is provided at one end with a plain head C', through the center of which passes the shaft of the oscillating piston, the other end of the cylinder being provided with a head C² having on its inner side a central recess c for the end of the shaft of the oscillating piston. The cylinder-head C² is provided at opposite points with steam inlet and outlet ports d and d', and between these ports and within the steam-chest the head is provided with steam outlet or exhaust channels d², which communicate with an exhaust-pipe d³ extending through the steam-chest. The cylinder-head C² is also provided within the steam-chest with a central stud-bearing c', upon which is mounted a stub-shaft E having a socket which fits over said stud-bearing. The stub-shaft is provided at its inner end with an annular flange e and adjacent to said flange with a squared portion e' beyond which it is rounded, the outer end being squared to receive an operating-arm. Over the squared portion e' of the stub-shaft E fits a bar F carrying valves f at its outer ends which slide over the ports d, d' and d² when the bar is oscillated, as hereinafter described.

The rounded portion of the stub-shaft bears in a central aperture in the covering-plate C³ of the steam-chest. To the outer end of the stub-shaft E is attached an arm E', which is connected to the eccentric B² on the driven shaft A' by a connecting rod or pitman E², and by this connection the bar F will be oscillated from the driven shaft to operate the slide-valves f to admit steam through the ports to first one side of the piston and then the other, the exhaust-steam passing through the opposite ports to the channels d² by way of the recesses f' in the slide-valves.

G designates a pitman-rod which is connected at one end to the wrist-wheel B' and at the other to an arm G' attached to the outer end of the shaft of the reciprocating piston H located within the cylinder. The reciprocating piston is provided at its ends with the usual packings which bear against the inner side of the cylinder. Partitions K K are located in the cylinder on each side of the reciprocating piston, the inner ends of the par-

titions having packings which bear against the shaft. The ports d and d' open into the cylinder on opposite sides of the partitions K.

The steam-supply pipe I enters the steam-chest through the covering-plate C³.

I am aware that prior to my invention steam-engines have been constructed with cylinders divided into two compartments in which an oscillating piston works; also, that it is not new to provide an oscillating-piston engine with valve mechanism driven from the shaft upon which the fly-wheel is mounted, and I do not therefore claim such construction broadly. The device hereinbefore described provides a cheap and efficient means of connection, and the parts are readily accessible for repairs, renewing packings, &c.

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

1. The combination in a steam-engine having a cylinder with an oscillating-piston the shaft of which extends through one of the cylinder-heads, the other cylinder-head having a central bearing for the shaft and inlet and outlet ports, a stud-bearing c' formed on the cylinder-head and projecting into the steam-chest, a stub-shaft E bearing at one end upon the stud-bearing and projecting through the covering-plate of the steam-chest, a pitman connected to a driven shaft and to an arm on the outer end of the stub-shaft, and a bar F mounted on the stub-shaft and provided with valves at its ends which slide over the ports in the cylinder-head, substantially as shown and for the purpose set forth.

2. The combination in an oscillating-piston steam-engine, of a frame A consisting of side pieces connected by plates a and a transverse shaft A', a fly-wheel mounted on the shaft between the side pieces of the frame, a wrist-wheel on one end of the shaft and an eccentric on the other end; together with a cylinder mounted upon the side pieces of the frame and having an oscillating-piston the shaft of which is connected to the wrist-wheel by a pitman, and valve operating mechanism consisting of a valve carrying bar mounted on a stub-shaft which is connected to the eccentric by a pitman, the parts being organized substantially as shown and described.

3. In a steam-engine, the combination, of an oscillating piston, a cylinder having heads one of which is centrally apertured for the passage of the shaft of the oscillating piston and the other head having a recess to form a bearing for the other end of the shaft and ports which open into the cylinder and communicate with the steam-chest, and a valve carry-

ing bar mounted on a stub-shaft which is rocked from a driven part of the engine, the cylinder-head having exhaust passages which lead from between the ports to the exhaust pipe.

4. In combination with a steam-engine having an oscillating piston and inlet and outlet ports, of a cylinder-head having a stub-shaft mounted independent of the oscillating piston, a bar F mounted on the stub-shaft and provided with valves f at its ends, an arm attached to the outer end of the stub-shaft and connected to an eccentric carried by the driven-shaft, substantially as shown and for the purpose set forth.

5. In combination with a steam-engine having a cylinder with an oscillating piston therein connected to the shaft of the fly-wheel, one of the heads of the cylinder having inlet and outlet ports d and d' , exhaust passages d^2 and a stud-bearing c' , of a stub-shaft E having a socket which fits over the stud-bearing, an annular flange at its inner end and a squared portion adjoining the flange, a bar F mounted on the squared portion of the stub-shaft and carrying slide valves at its outer ends which operate over the ports in the cylinder-head, an arm E' connected to the outer end of the stub-shaft, and a pitman E² connecting the arm to an eccentric on the shaft of the fly-wheel, the parts being organized substantially as shown and for the purpose set forth.

6. In a steam-engine constructed substantially as shown, the combination, of a cylinder-head having inlet and outlet ports, exhaust passages communicating with the exhaust pipe and a central stud-bearing c' ; a stub-shaft E having a socket which fits over the stud-bearing, said shaft also having an annular flange at its inner end and a squared portion adjoining said flange, the outer end of the stub-shaft projecting through the covering-plate of the steam chest and having an arm attached thereto which is connected to the driven shaft of the engine by a pitman; together with a bar F mounted on the squared portion of the stub-shaft and provided at its outer ends with slide-valves f which operate over the ports and exhaust channels, the parts being organized substantially as shown and for the purpose set forth.

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

BENJAMIN H. TRUCKS.

Witnesses:

I. M. HORTON,
T. H. WICKEY.