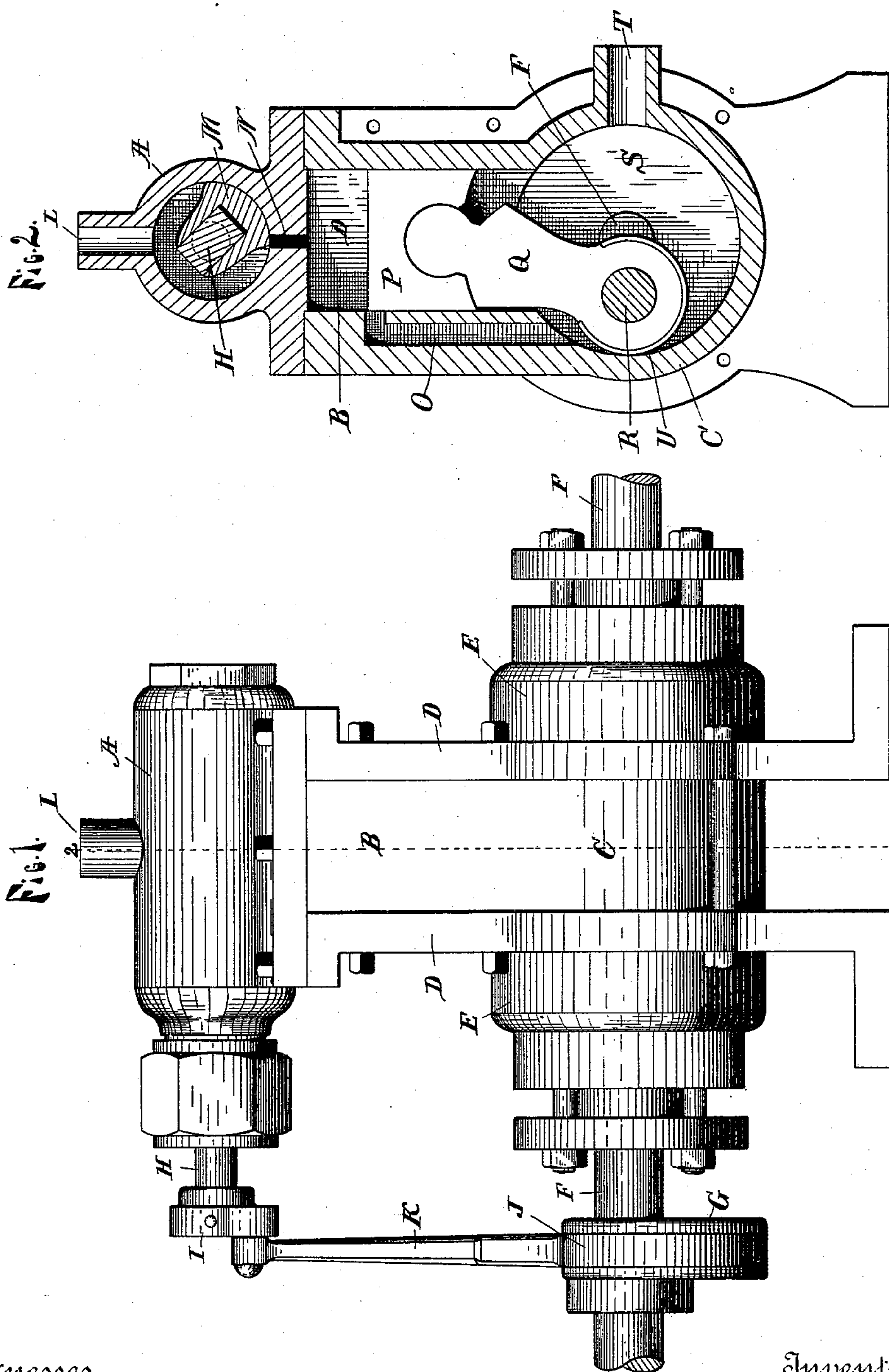


(No Model.)

W. C. KELLY.
STEAM ENGINE.

No. 547,580.

Patented Oct. 8, 1895.



Witnesses
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UNITED STATES PATENT OFFICE.

WALLACE C. KELLY, OF HASTINGS, MICHIGAN.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 547,580, dated October 8, 1895.

Application filed April 22, 1895. Serial No. 546,692. (No model.)

To all whom it may concern:

Be it known that I, WALLACE C. KELLY, a citizen of the United States, residing at Hastings, in the county of Barry and State of Michigan, 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.

My invention relates to an improved steam-engine; and its object is to provide the same with certain new and useful features hereinafter more fully described, and particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a device embodying my invention, and Fig. 2 a vertical section of the same on the line 2 2 of Fig. 1. Like letters refer to like parts in both of the figures.

A represents the steam-chest, to which steam from any convenient source is admitted through the opening L. Within said steam-chest is a valve M, operated by a rock-shaft H, having an arm I, connected by a suitable rod K to the strap J on an eccentric G, mounted upon the main shaft F. Said parts are so adjusted that the valve M will open the port N when the piston P is near the end of the upstroke and close said port when sufficient steam has been allowed to pass into the chamber B. Said chamber B is preferably rectangular in form with parallel plane sides, and the piston P is also rectangular and fits closely and moves longitudinally within said chamber. Beneath the chamber B and opening into the same is a transverse cylindrical crank-chamber C, having chambered heads E E at each side, and within said chambered heads are crank-wheels S, which fill said chambers and have their opposing faces in the plane of the corresponding sides D D of the chamber B. Said wheels S are connected by a crank-pin R and are mounted on the respective adjacent ends of the main shafts F F, arranged in line with each other and in the axis of the heads E E, the shaft F having no eccentric, and its crank-wheel and chambered head may be omitted and the end of the crank-chamber closed with a plain plate in the plane of the side D of the chamber B, and the de-

vice will operate equally as well. A connecting-rod Q is pivoted to the piston P at its upper end by a cylindrical head engaged with a corresponding socket in the said piston, and said rod engages the crank-pin R at its lower end, being provided with a cylindrical end having a suitable packing U to run close to the inner curved surface of the crank-chamber C to prevent the escape of steam between said head and surface. Said connecting-rod is also flattened at its opposite sides and fits closely to the crank-wheels S S and the corresponding sides D D of the chamber B, whereby steam is prevented from passing from one side to the other of the same.

O is a port extending from the chamber B at a point just above the piston P when at the lower point and thence to the crank-chamber at one side of the connecting-rod Q.

T is an exhaust-port suitably located in the side of the crank-chamber and opening into the same opposite the port O.

The operation is as follows: Steam being admitted at L will pass through the port N when opened by the valve M and will press downward on the piston P, operating to turn the crank R in the usual manner. As the valve M closes the port N and cuts off the flow of steam and later on the port O is opened, the steam above the piston flows through the port O and presses laterally on the connecting-rod Q, which rod, fitting closely, as described, does not permit the steam to pass to its other side. This now tends to force the crank-pin around toward the other side of the crank-chamber in the direction of the exhaust-opening T, and thus utilizes the expansive force of steam in said chamber against the side of the rod Q to turn the shafts F. As the end of the connecting-rod eventually passes the port T, the steam escapes through said port. I thus secure a double action of steam, first, at high pressure upon the piston, and, secondly, laterally and expansively on the connecting-rod. I thus get forward pressure on the crank through over three-fourths of the revolution in a single-acting engine.

What I claim is—

1. In a steam engine, in combination with a piston and a crank, and chambers inclosing the same, a connecting rod fitting closely within said chambers, and means for apply-

ing steam pressure to the side of said connecting rod, substantially as described.

2. In a steam engine, a piston chamber, and a crank chamber, a piston and a crank in said chambers, and a connecting rod fitted closely within said chambers to prevent the passage of steam, a port extending from the piston chamber to the crank chamber, and an exhaust port in the side of the crank chamber, substantially as described.

3. In a steam engine, a piston chamber, and a piston reciprocating therein, a crank chamber and a crank revolving therein, a connecting rod fitting closely within said chambers, a port connecting the piston chamber and crank chamber at one side of said connecting rod and opened and closed by the piston and an exhaust port in the side of the crank chamber, at the other side of said connecting rod, and opened and closed by said rod, substantially as described.

4. In a steam engine a rectangular piston chamber, a rectangular piston moving therein, a transverse cylindrical crank chamber, a crank and crank wheels revolving therein, said wheels having their opposing faces in the planes of the opposing walls of said piston chamber, a connecting rod, having flattened opposite sides fitting closely to said wheels and walls of the piston chamber, and mechanism for admitting steam first to the piston and thence to one side of the connecting rod, and exhausting the same from the crank chamber, substantially as described.

5. In a steam engine, a rectangular piston chamber, a rectangular piston moving therein, a transverse cylindrical crank chamber, a crank and crank wheels revolving therein, a connecting rod, having flattened sides closely fitted to said wheels and the sides of said piston chamber, and a head closely fitting the concave side of the crank chamber, a port connecting said piston chamber with one side of said crank chamber and opened and closed by said piston, and a port in the other side of the crank chamber opened and closed by said head, substantially as described.

6. In a steam engine, a steam chest, a piston chamber, and a crank chamber, a port connecting said steam chest and piston chamber, a valve to open and close said port, mechanism to operate said valve, a port connecting said piston chamber with one side of said crank chamber, and an exhaust port in the other side of said crank chamber, a piston moving in said piston chamber, and opening and closing said connecting port, and a connecting rod closely fitting in said crank chamber, and operating to open or close the exhaust port, and to receive lateral pressure of steam, substantially as described.

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

WALLACE C. KELLY.

Witnesses:

T. J. BRASSEAU,

WM. H. STEBBINS.