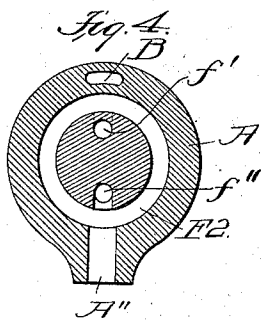
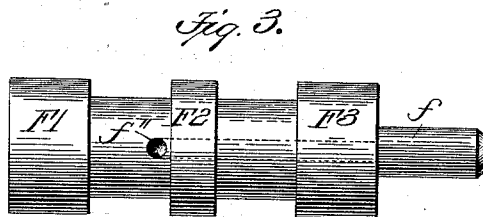
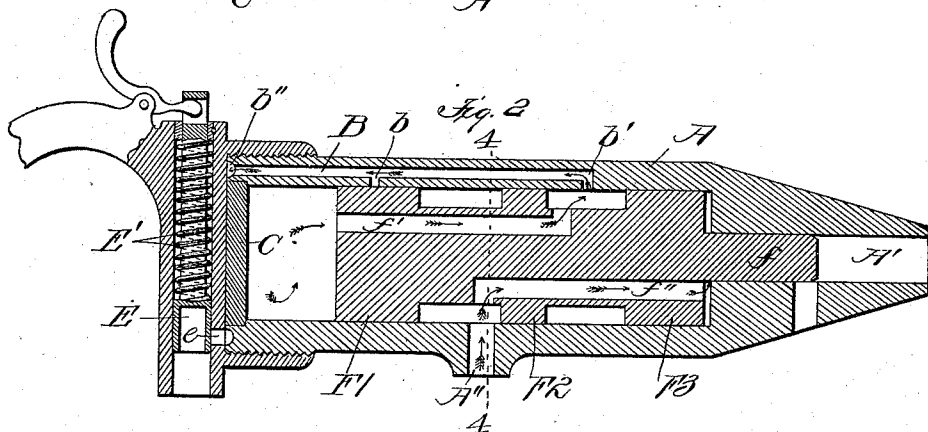
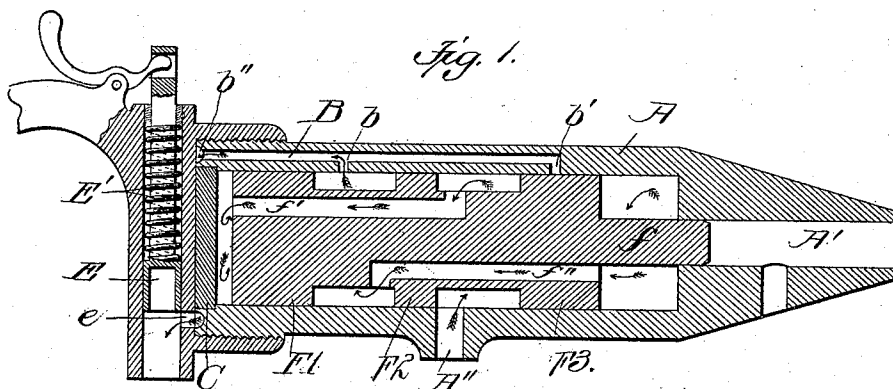


(No Model.)

F. C. RINSCHÉ.
ENGINE.

No. 542,498.

Patented July 9, 1895.



Witnesses:
J. H. Cornwall
Hugh K. Wagner.

Inventor:
Frank C. Rinsch e
By Paul Bakewell
att'y.

UNITED STATES PATENT OFFICE.

FRANK C. RINSCHÉ, OF ST. LOUIS, MISSOURI, ASSIGNOR TO PIERRE CHOUTEAU,
OF SAME PLACE.

ENGINE.

SPECIFICATION forming part of Letters Patent No. 542,498, dated July 9, 1895.

Application filed February 25, 1895. Serial No. 539,625. (No model.)

To all whom it may concern:

Be it known that I, FRANK C. RINSCHÉ, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, wherein—

Figure 1 is a longitudinal sectional view. Fig. 2 is a similar view showing the piston in a different position; Fig. 3, a side elevational view of the piston. Fig. 4 is a cross-sectional view on line 4 4, Fig. 2.

This invention relates to a new and useful improvement in engines of that class which are adapted to be run by compressed air or steam. In the end of the cylinder a tool-shank is inserted, which is operated upon by a stem or piston delivering impacting blows.

The invention contemplates the use of a three-headed piston in which are formed suitable ports, the inlet-port being let into the side of the cylinder, while the exhaust-port leads from the cylinder at different points, said exhaust-port being controlled by a valve or some other suitable means, by which the speed of the engine is regulated.

In the drawings, A indicates the cylinder, which is formed with the tool-shank opening A' in its end, an inlet-port A'' in its side, and an exhaust-port B, which opens into the side of the cylinder at points *b b'*, said exhaust-port leading to one end of the cylinder into an annulus *b''*, which is formed in the end of the cylinder.

The cylinder-head C is seated on a shoulder in the open end of the cylinder, which cylinder-head is held in position by a handle-base, which is screwed or otherwise secured to the cylinder.

Arranged transversely the handle-base is a plunger or valve E, which is forced by a spring E' to normally close an opening *e* in the handle-base, which leads from the exhaust-annulus *b''*. A trigger in the form of a bell-crank lever is pivoted on the handle-shank, one end of which is received in an opening in the end of the plunger-shank. By depressing the free end of the bell-crank lever or trigger, as shown in Fig. 1, the plunger E is raised, so as

to unclose the opening *e* and permit the exhaust to escape. When the trigger is released, as shown in Fig. 2, the spring E' forces the plunger downward and shuts off the escape of the exhaust. This will cause the engine to cease running. By partially unclosing opening *e* the engine will run at a slow speed, its full speed being attained when the plunger is raised to permit the exhaust to escape without interruption.

F indicates the piston, which is provided with a stem *f*, extending down into the tool-shank opening A'. This piston F is formed with heads F', F², and F³, and also provided with ports *f'* and *f''*, leading from the end of the piston and opening through the sides thereof beyond the central head F².

The operation is as follows: Motive fluid being supplied through inlet-port A'', assuming the piston to be in the position as shown in Fig. 1, will enter the cylinder and pass through port *f'* to the upper end of the cylinder, forcing the piston down. The air in the lower end of the cylinder will exhaust through port *f''* and exhaust-opening *b* into the exhaust-port B, annulus *b''*, through opening *e* to the exterior. The downward movement of the piston causes head F² to cross the inlet-port opening A'', which directs the motive fluid through the opening *f''*. Before the head F² admits motive fluid to the lower end of the cylinder head F' closes exhaust-port *b* to prevent the motive fluid blowing through. Head F³ in the same movement uncloses exhaust-port *b'*, permitting the air at the upper end of the cylinder to exhaust through port *f'* into exhaust-port D, annulus *b''*, and opening *e*. The incoming motive fluid passes through port *f''* and beneath head F³, forcing the piston upwardly. This cycle of operations is repeated, the piston controlling the inlet and exhaust.

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

1. In an engine, the combination with a cylinder formed with an annular recess in its ends, into which leads the exhaust, of a handle base which is adapted to be secured to said cylinder and close the annular recess, an opening in the handle base which opens into

said recess, and means on the handle base for controlling said opening, substantially as described.

2. In an engine, the combination with a cylinder formed with a shoulder on one end, of a cylinder head loosely seated on said shoulder, a handle base which is secured to the cylinder and holds the cylinder head in position, the exhaust of the engine passing up the side of the cylinder and through the handle base, and means on the handle base for controlling the exhaust; substantially as described.

3. In an engine, the combination with the cylinder having an inlet port leading to its side, exhaust ports leading from the sides of the cylinder on each side of the inlet port, and a piston provided with three heads for controlling said ports, said piston being formed with passages which lead from the ends thereof to beyond the middle head, which middle head controls the inlet port, whereby, when the fluid is exhausting from one end of the piston-chamber, it returns through the piston passage to the exhaust port farthest from the end exhausting, the head at the exhausting end, closing the nearest exhaust port; substantially as described.

4. In an engine, the combination with the cylinder having an inlet port leading to its side, exhaust ports leading from the sides of the cylinder on each side of the inlet port, a piston provided with three heads for control-

ling said ports, said piston being formed with passages which lead from the ends thereof to beyond the middle head, which middle head controls the inlet port, whereby, when the fluid is exhausting from one end of the piston-chamber, it returns through the piston passage to the exhaust port farthest from the end exhausting the head at the exhausting end, closing the nearest exhaust port, a port B connecting said exhausts, and means located at the end of the cylinder for controlling the escape of the exhaust through port B; substantially as described.

5. In an engine, the combination with the cylinder having an inlet port leading thereinto about midway its length, and an exhaust port B which is arranged at the side of the cylinder into which it opens at points *b* and *b'*, and leads to the end of the cylinder, of a piston provided with three heads co-operating with said inlet and exhaust ports, and means located at the end of the cylinder for controlling the escape of the exhaust through port B; substantially as described.

In testimony whereof I hereunto affix my signature, in presence of two witnesses, this 18th day of February, 1895.

FRANK C. RINSCHÉ.

Witnesses:

F. R. CORNWALL,
HUGH K. WAGNER.