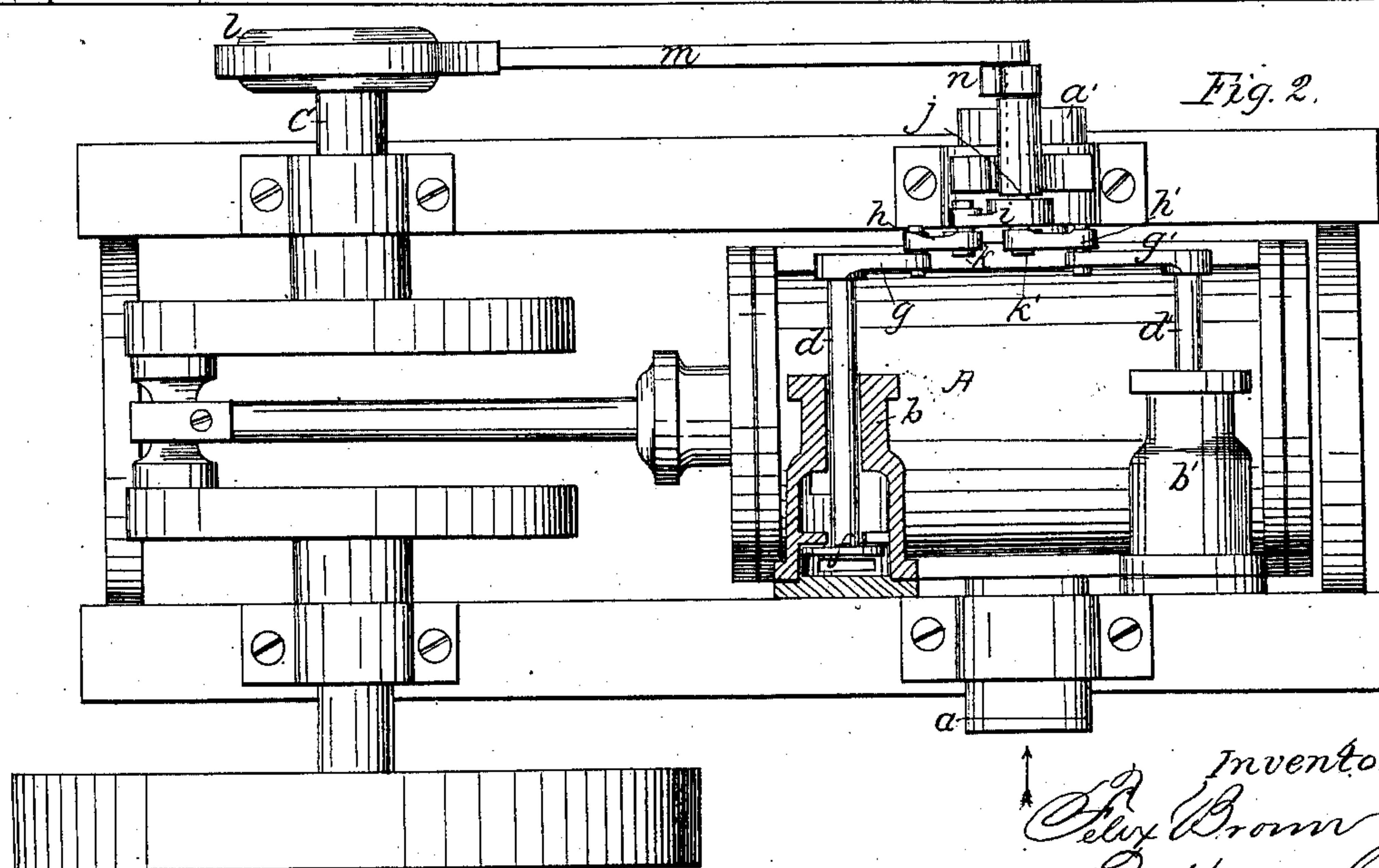
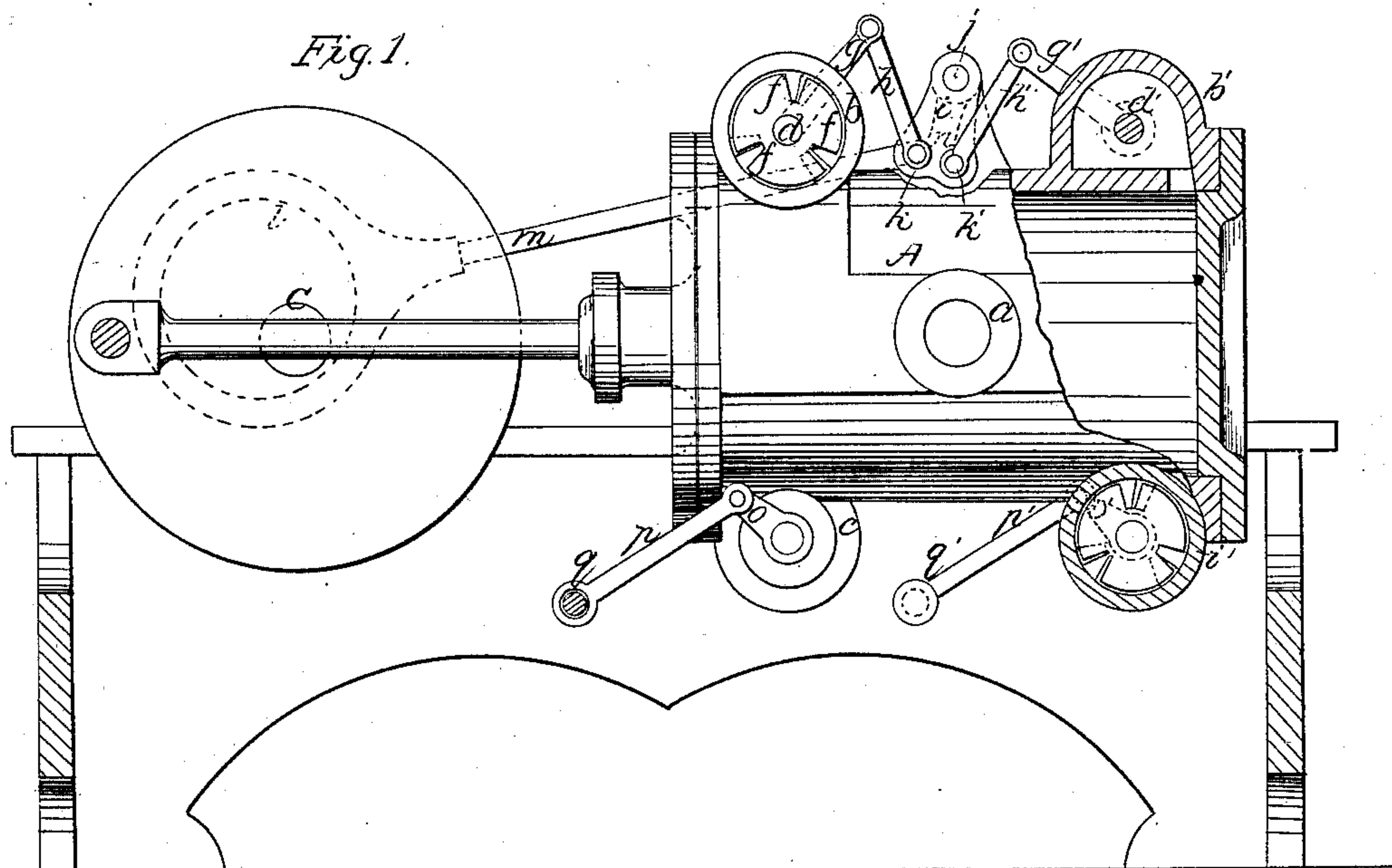


F. Brown,
Oscillating Steam Engine.
N^o 55,575. Patented June 12, 1866.



Witnesses:
J. M. Blount
Jas. A. Service

Inventor:
F. Brown
Per M. M. C.
Attorney

UNITED STATES PATENT OFFICE.

FELIX BROWN, OF NEW YORK, N. Y., ASSIGNOR TO A. & T. BROWN & CO.,
OF SAME PLACE.

IMPROVEMENT IN OSCILLATING ENGINES.

Specification forming part of Letters Patent No. 55,575, dated June 12, 1866.

To all whom it may concern:

Be it known that I, FELIX BROWN, of the city, county, and State of New York, have invented a new and useful Improvement in Oscillating Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a sectional side elevation of this invention. Fig. 2 is a sectional plan of the same.

Similar letters of reference indicate like parts.

This invention relates to an oscillating engine, the steam-supply valves of which connect, by suitable cranks and links, with a rock-shaft, to which an oscillating motion is imparted by an eccentric or other equivalent device on the main shaft in such a manner that by the combined action of the oscillating motion of the cylinder and of the cranks and links on the rock-shaft an intermittent or irregular motion is imparted to the valves, causing the same to open and to close with great rapidity and to cut off the steam at any point to which the eccentric may be adjusted.

The invention consists, also, in the arrangement of a link pivoted to the frame of the engine and extending to an arm mounted on the spindle of the valve in such a manner that by the oscillating motion of the cylinder, together with the action of the arm and link, an irregular motion is imparted to the exhaust-valve, causing the same to open rapidly as the engine passes the dead-centers, and to remain open during the largest portion of the stroke.

A represents the steam-cylinder of an oscillating engine, said cylinder being hung in trunnions *a a'*, which are bored out and communicate, one with the steam-passages and the other with the exhaust-passages.

The steam-passages lead to the opposite ends of the cylinder, and they are alternately opened and closed by the valves *b b'*, whereas the exhaust-passages, which extend from the opposite ends of the cylinder, are opened and

closed by the valves *c c'*, which are situated underneath the cylinder, as clearly shown in Fig. 1.

The steam-valves *b b'* are composed of flat disks seated on corresponding flat seats and provided with stems *d d'*, which extend through the heads of the valve-chambers. Said disk-valves are furnished with segmental apertures *f*, and by turning the valves these apertures can be brought in such a position that they register with similar apertures in the seats, allowing the steam to pass into the cylinder.

The valve-chambers are secured to the opposite ends of the cylinder, and from the valve-stems *d d'* extend arms *g g'*, which connect, by links *h h'*, with a crank, *i*, mounted on the inner end of a rock-shaft, *j*. Said crank is provided with two wrist-pins, *k k'*, one for each of the links *h h'*, as shown in Fig. 1 of the drawings, and an oscillating motion is imparted to the rock-shaft *j* by an eccentric, *l*, which is mounted on the end of the main shaft *C*, and which connects with said rock-shaft by a strap and rod, *m*, and by a crank, *n*.

By this method of connecting the valves with the eccentric an irregular motion is imparted to the valves, causing them to open very rapidly as the engine passes its dead-centers and to close with equal rapidity at any part of the stroke for which the eccentric may be adjusted and remain closed for the required period. An oscillating engine is thus obtained in which the steam can be used expansively, just the same and with equal advantage as in an ordinary reciprocating engine.

It will be noticed that the disk-valves which I use in my engine are so constructed that they are held in contact with their seats by the pressure of the steam, and that they can be readily set so that they work with the least possible friction by bringing a pointed screw to bear on the end of the valve-stem.

I do not wish to confine myself, however, to this precise construction of valves, since it will be easily understood that valves of any other suitable construction might be substituted without materially changing the result.

The exhaust-valves *c c'* are constructed in a similar manner to the steam-valves *b b'*, and from their stems extend arms *o o'*, which are con-

nected by rods *p p'* with studs *q q'*. These studs are rigidly secured in the frame of the engine, and the arms *o o'* and rods *p p'* are so adjusted in relation to the studs *q q'* and valves *c c'* that by the oscillating motion of the cylinder an irregular motion is imparted to said valves, causing them to open rapidly at the proper intervals and to remain open alternately nearly during the entire stroke, one of the exhaust-valves being closed while the other is open, and vice versa.

By this arrangement an unobstructed exhaust is obtained entirely independent of the cut-off mechanism, and an oscillating engine can be built which is provided with an adjustable or variable cut-off.

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

1. The rock-shaft *j* and arm *i*, or other equivalent mechanism, in combination with the links *h h'*, arms *g g'*, valves *b b'*, and oscillating cylinder A, constructed and operating substantially as and for the purpose described.

2. The arms *o*, links *p*, and studs *q*, in combination with the exhaust-valves *c c'* and with the oscillating cylinder A, constructed and operating substantially as and for the purpose set forth.

FELIX BROWN.

Witnesses:

WM. F. MCNAMARA,
ALEX. F. ROBERTS.