

L. MARTIN.
Steam-Boiler Water-Feeder.

No. 18,919.

Patented Dec. 22, 1857.

Fig. 3

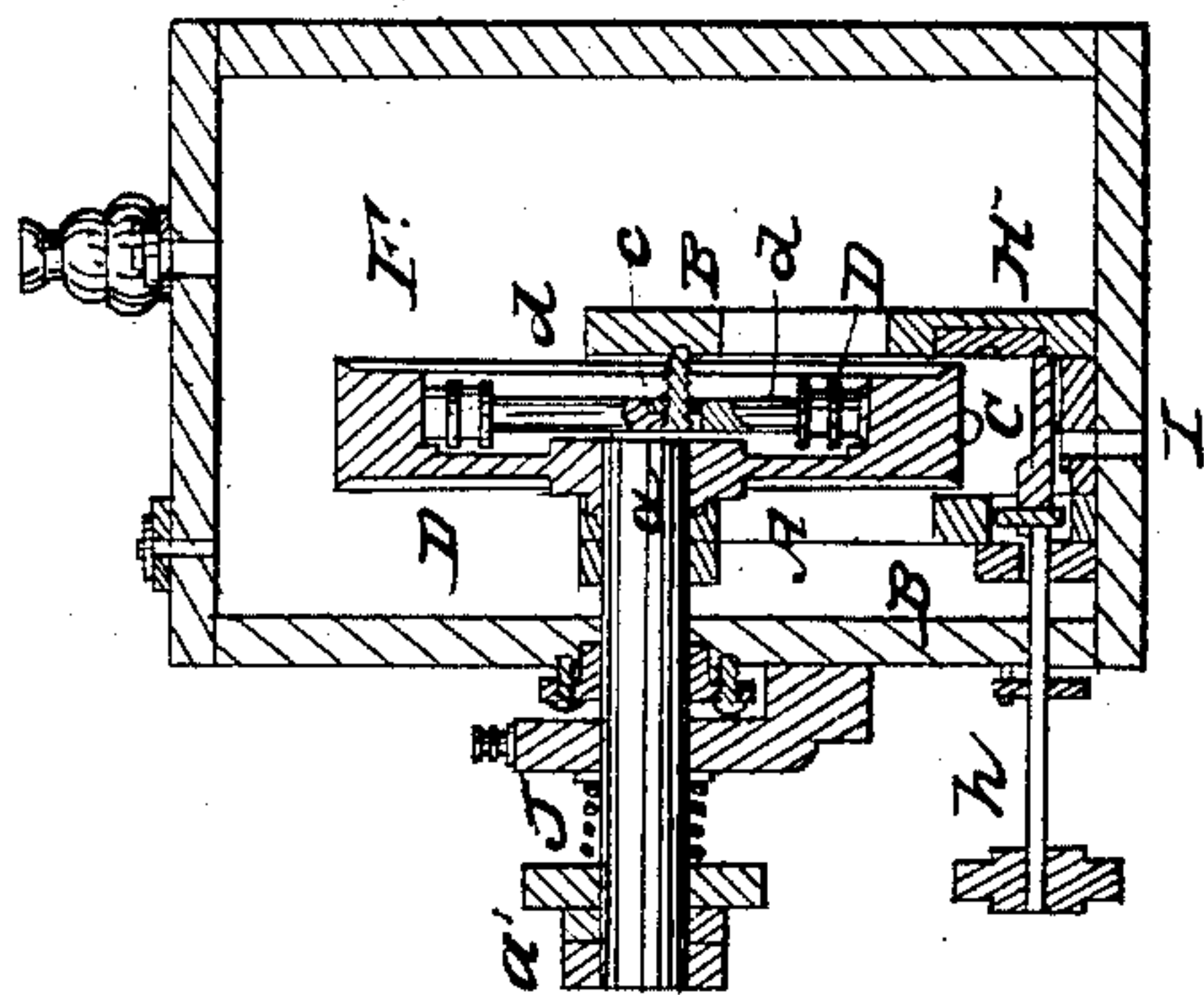


Fig. 4

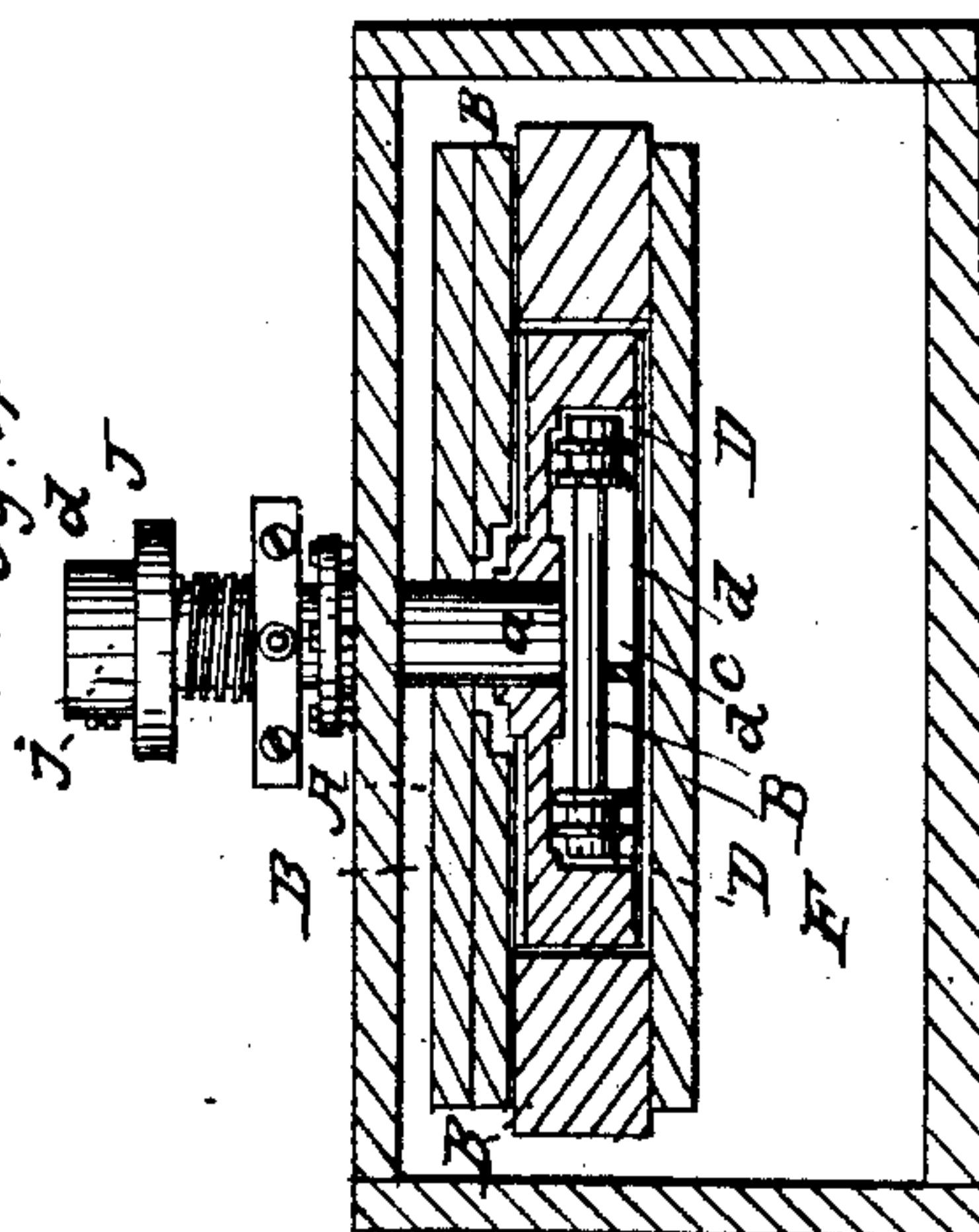


Fig. 1

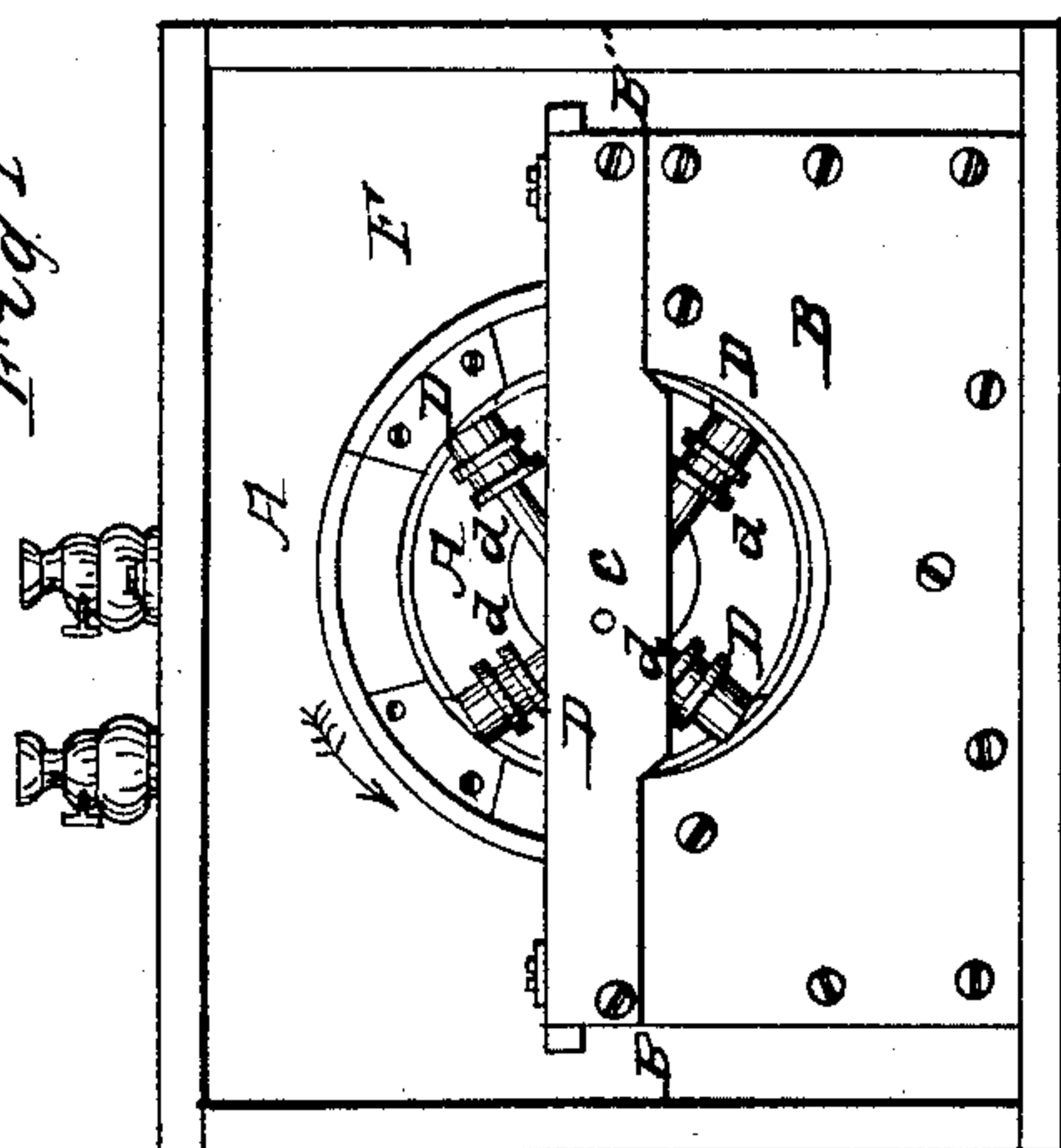
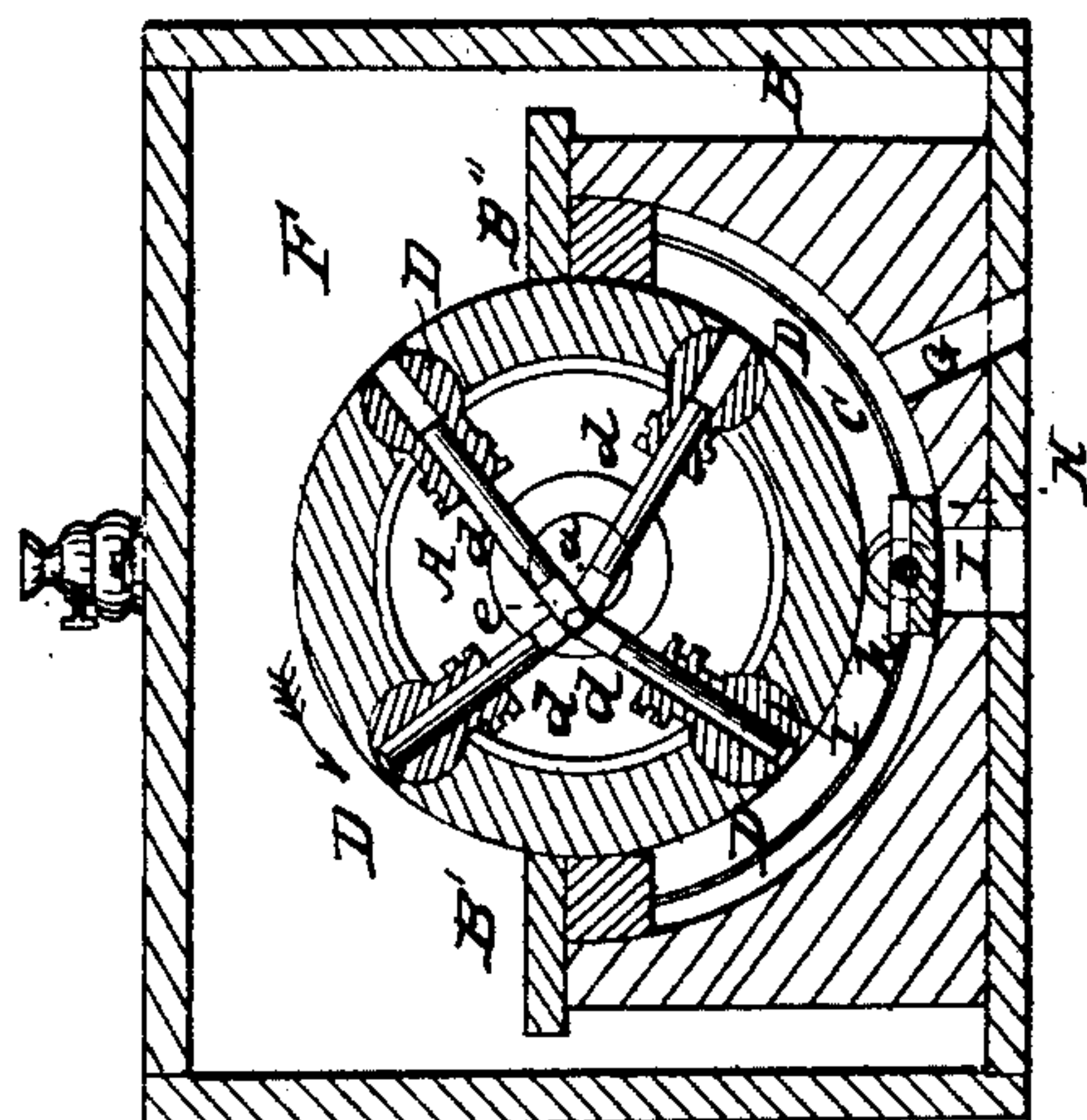


Fig. 2



UNITED STATES PATENT OFFICE.

LEWIS MARTIN, OF NEW YORK, N. Y.

FEED-WATER ATTACHMENT TO STEAM-ENGINES.

Specification of Letters Patent No. 18,919, dated December 22, 1857.

To all whom it may concern:

Be it known that I, LEWIS MARTIN, of the city, county, and State of New York, have invented a new and useful Attachment to Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of my invention with a side removed. Fig. 2 is a longitudinal section, Fig. 3 a vertical section, and Fig. 4, a horizontal section of the same.

Similar letters of reference in each of the several figures indicate corresponding parts.

The object of my invention is to force feed water, oil, spent steam, or other fluid, into the boiler or steam chest, against the pressure of the steam, by means of a cylinder or cylinders arranged so that they are free to oscillate in an annular rim of a disk or wheel which is inclosed in a tight chamber and revolves through an auxiliary feed channel; said cylinders having each a plunger which is connected to a fixed point not coincident with the center of the wheel, so that each plunger is successively drawn inward and made to leave an open chamber in the outer extremity of the corresponding cylinder, during the half of each revolution that it is presented to the feed channel, and is forced outward, and made to discharge the contents against the full pressure of the boiler during the other half of the revolution.

The nature of my invention consists in a peculiar arrangement of the oscillating cylinders and plungers in the annular rim, whereby the plungers, when moving outward are subjected to the full boiler pressure in every direction, or held in perfect equilibrium as will be presently described.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

The wheel A, fixed on the axis *a*, is mounted in casing B, and revolved by the action of the engine in the direction indicated by the arrows. Both faces of A, are ground truly and make a steam tight contact with B, provision being made in any ordinary manner for moving the sides of B, slightly toward A, when necessary to compensate for wear, a similar steam tight contact being made on the periphery at two diametrically opposite points by the em-

ployment of two adjustable packing pieces B', B''. The casing is in contact with the periphery only at the two opposite points B', B'', but is in steam tight contact with both faces of the wheel around the whole lower half as represented, leaving a chamber C, below the wheel A, which chamber is entirely isolated from the space above and within said wheel. A series of cylinders D (preferably four) are fitted in the wheel A, in the manner represented, and within each is fitted a plunger *d*. The four plungers *d*, *d*, *d*, *d*, are all attached directly to the pin *e*, which latter is fixed to the casing at a point not in line with the shaft *a*, but nearer to B', and the plungers *d*, are of such length that they can just extend from the pin *e*, to the face of the said packing piece B'. The cylinders D, are free to oscillate and to assume the various positions which are required by this arrangement in completing each revolution. The chamber C, is the reservoir in which is contained the fluid which is to be urged into the chamber F, the latter being a part of the boiler or steam chest or in free communication with the same.

From the above description of parts it will be seen that when, by the action of the engine, the wheel A, is revolved in the direction indicated by the arrows, the extremity of each of the plungers *d*, presses in close contact with B', but is drawn inward during the passage through the chamber C, and passes the opposite packing piece B'', in such a position that the outer extremity of the corresponding cylinder D, is filled with a portion of the contents of the chamber C. In passing through the upper portion of its revolution each plunger *d*, is forced outward, and thus discharges the said contents contained in the extremity of D, into the chamber F. The plunger being exposed on all sides to the pressure of the boiler during this outward motion the pressure on one end exactly balances that on the other. For this reason it is practicable to make the plungers of very considerable diameter and the extent of their radial motion may also be indefinitely increased.

When this invention is employed for forcing in the feed water for boilers or the oil for cylinders, &c., its capacity may be made considerably greater than is absolutely necessary, and the exhaust steam may be admitted through the passage G, so that as the

supply of denser fluid is shut off from C, the invention will urge a compound of steam and the denser fluid into the chamber F, or it may be used to urge steam alone from C, into F, if it be desirable to do so; the exhaust steam being led into the chamber C, through the passage G, and after being forced by this invention into chamber F, be again used to impel the engine.

10 H, represents a valve located within the chamber C, and controlled by the knob *h*, so that it may be made to cover or uncover the passage I. This passage forms a communication from the chamber C, to the external air. Said passage I, and valve H, may be employed to regulate the induction of water, or other fluid or it may be open to allow the escape of any superfluous steam, when; as I contemplate in some instances 20 employing it, all or nearly all the exhaust steam from the engine is thrown into C, through the passage *g*.

The shaft or axis *a*, receives motion from the engine through the aid of the loose piece or clutch J. The teeth or lugs *j*, on the 25 outer face of this clutch are inclined as represented, and are forced outward into

corresponding cavities on the collar *a'*, by the spring represented. It follows from this inclined form of the projections that while 30 the engine works with its ordinary forward motion, the wheel A, is turned with the result above described, but when the engine is reversed the inclined faces and the spring allow the parts automatically to separate, 35 and no motion of A, ensues. This also allows the invention to be turned by hand when necessary while the engine is either backing or standing still.

What I claim as my invention and desire 40 to secure by Letters Patent, is—

The within described arrangement of the oscillating cylinders D, and plungers *d*, within a wheel A, whereby the plungers, when moving outward are subjected to the 45 full boiler pressure in every direction or held in perfect equilibrium in the manner above described, and for the purposes set forth.

LEWIS MARTIN.

Witnesses:

GOODWIN Y. ATLEE,
R. W. FENWICK.