(No Model.) 2 Sheets—Sheet 1.

W. L. HORNE.

EXPLOSIVE MOTOR OR ENGINE.

No. 387,561. Patented Aug. 7, 1888.

Fig. 1

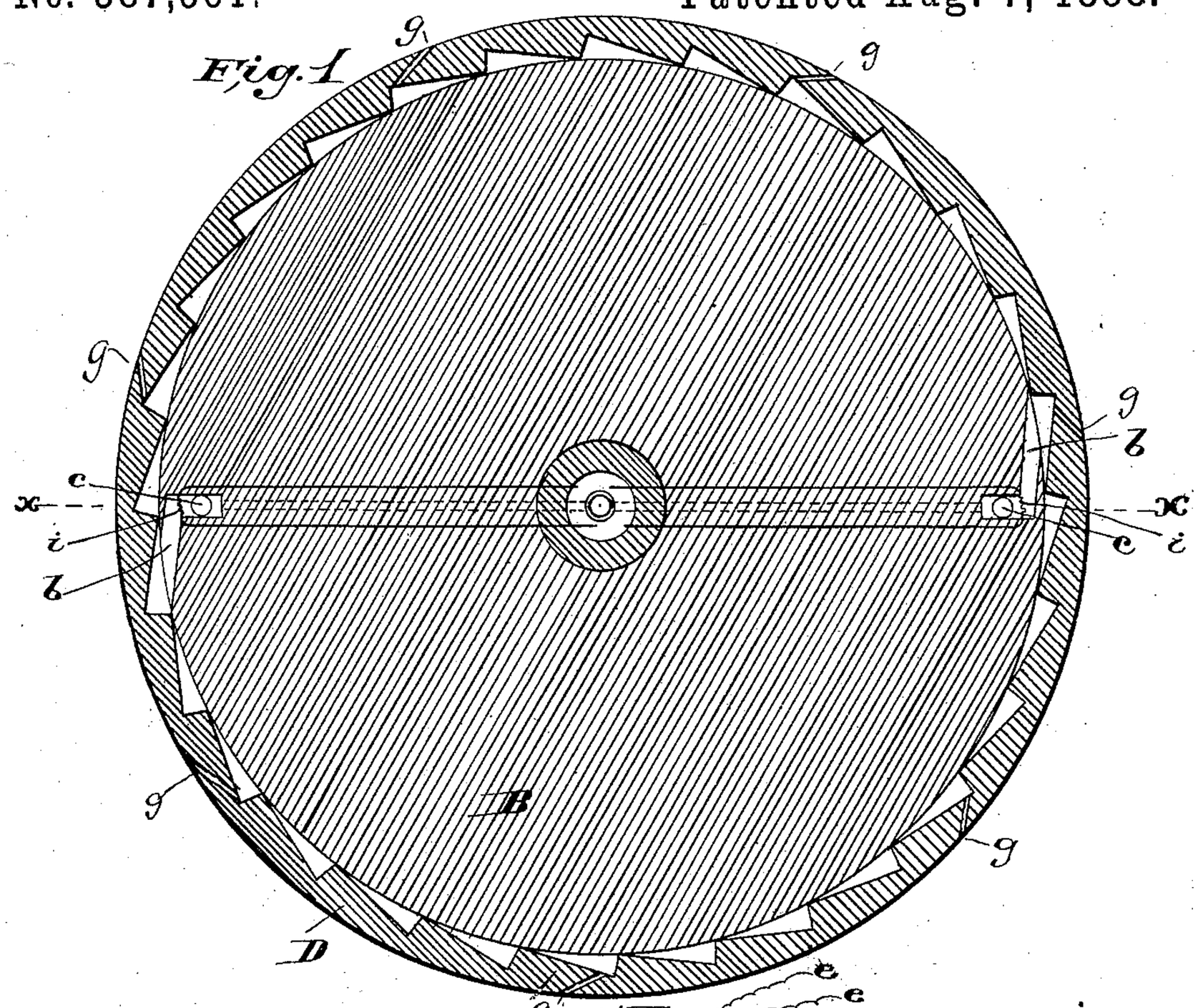

Fig. 4

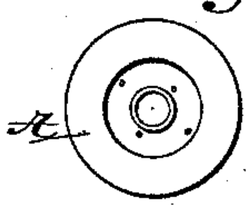

Fig. 2

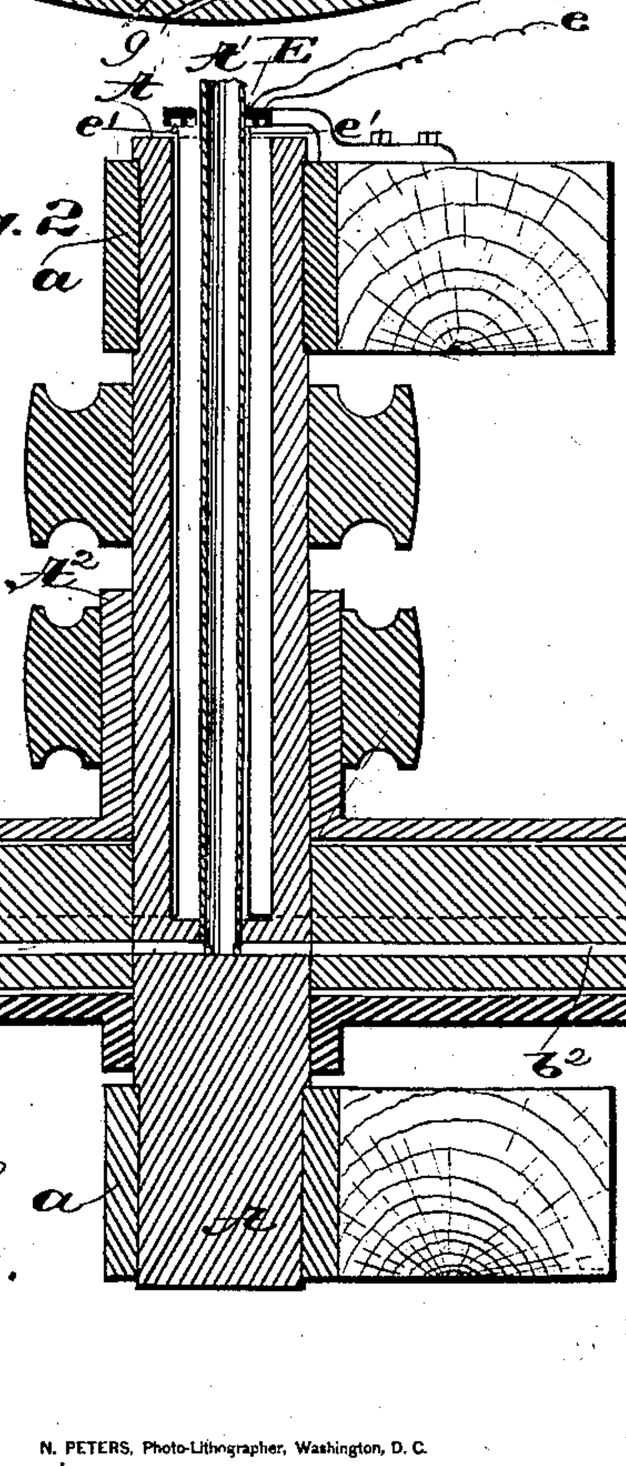

Fig. 5.

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(No Model.) 2 Sheets—Sheet 2.

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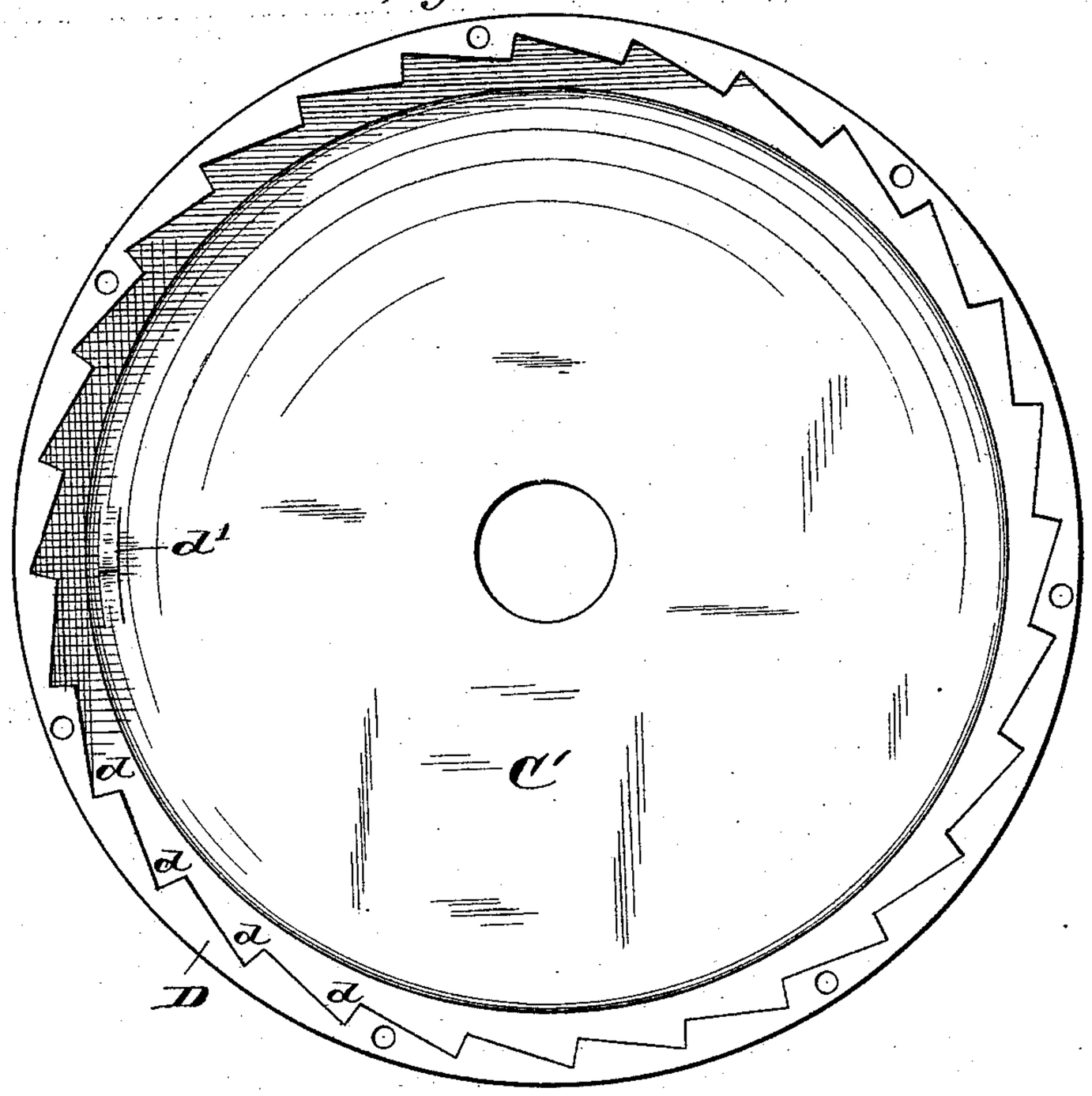
Fig. 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM L. HORNE, OF MERIDEN, CONNECTICUT.

EXPLOSIVE MOTOR OR ENGINE.

SPECIFICATION forming part of Letters Patent No. 387,561, dated August 7, 1888.

Application filed May 14, 1887. Serial No. 238,238. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. HORNE, a citizen of the United States, residing at Meriden, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Explosive Motors or 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 the class of motors or engines in which the power is derived from the expansive force produced by the ignition of explosive compounds, either gaseous or otherwise.

In the accompanying drawings I have shown one form in which I have contemplated embodying the principle of my invention, and such invention is fully described in the following specification and claims.

In the drawings, Figure 1 is a sectional plan view of my improved motor or engine, taken on line *y y*, Fig. 2. Fig. 2 is a sectional view of said motor or engine on line *x x*, Fig. 1. Fig. 3 is a plan view of part of the engine. Fig. 4 is a top view of the disk-shaft, and Fig. 5 is an under side view of the ring E.

A is a shaft mounted to revolve freely in bearings *a a*. B is a disk mounted on said shaft and rigidly secured thereto, so as to revolve with it. In the periphery of the disk I place one or more tangential recesses, *b b*, which are my explosive chambers. The shaft A is of tubular form for a part of its length, and within it I place the tube A′. This pipe is connected with the tangential recesses or explosion-chambers *b* by passages b^2 within the disk. These passages at their outer ends extend below the recesses *b* and then pass upward, opening into the same at *c*. The opening of these passages into said chamber is made to form a valve-seat, and a valve, *c′*, is fitted thereto. This valve has a stem extending on one or both sides of the same, and is kept in contact with its seat by a spring, which is attached to the valve-stem, as shown, or in any other preferred manner. The stem of the valve extends downwardly through the disk and is operated intermittently, as hereinafter explained.

Surrounding the tube A′ is a non-conducting disk, E, supported by an arm attached to the upper bearing *a* at its rigid support. This ring is provided on its lower side with two conducting-rings, b^3 b^4, insulated from each other. To these rings are connected electric conductors *e e*, leading to the poles of some source of electric energy.

Within the tubular portion of the shaft A are two conductors, *e′ e′*, provided at their upper ends with brushes in contact with these two rings in a well-known manner. The lower ends of these conductors are connected with the platinum coils *i* in the explosion-chambers, either in series or multiple arc, as may be preferred, and a sufficient current is employed to keep the coils in a state of incandescence to ignite the explosive in a well-known way.

If it is desired to have the ignition of the explosive take place at intervals or intermittently, instead of rings in the disk E, conducting-segments may be employed and the same located in such position as to secure the ignition of the explosive at the proper interval of time in the revolution of the disk.

If desired, ignition of the explosive may be by a spark instead of the coil.

A sleeve, A^2, is mounted upon the shaft A so as to revolve freely thereon, and to this sleeve is attached a disk, C, forming one side of a casing for the disk. The other part of the casing consists of shallow circular box C′, and the two parts are secured together by screws or bolts. The rim D of this box or casing is provided on its inner face with the stepped notches *d*, the shorter sides of which are at about right angles to the tangential recesses *b* in the disk. The bottom of this portion of the casing is, a short distance from the outer edge thereof, cut away, as shown, or in any other preferred manner, so as to permit the stems of the valves *c′* to project slightly beyond the disk, and it is also provided with one or more inclined projections, *d′*, in the path of such valve-stems of such height that when the stems come in contact therewith the valve will be moved in opposition to its seating-spring and the valve opened.

The explosive is supplied to the engine by the pipe A′ and the passage b^2, connected therewith, and on starting, the electric connections

being properly made, the disk or its casing is moved so as to cause one of the valve-stems to pass the incline on the casing. The valve will be opened thereby and a small amount of the explosive discharged into the recess. The valve will be instantly closed, and the explosive within the recess, coming into contact with the coil *i*, will be ignited and exploded, and the gases resulting from the explosion will be driven against the opposing faces of the casing. The impact and recoil of the explosion and the force of the discharged gases will move the disk and its casing in opposite directions and bring another valve in contact with the incline *d*, which valve will be opened with a further explosion, adding to the speed and power of the moving parts. The continued rotation of the parts produces a repetition of these results until the highest possible speed is obtained. The rim of the casing may, if found desirable, be provided with discharge-openings *g g*. The shaft A and sleeve A^2 are each provided with a band wheel or pulley, from which the power generated by the motor or engine may be transmitted to the mechanism to be driven thereby.

The explosive which I propose to use is gas mixed with air in the usual proportions for explosive gas-engines; but I may use any other explosive which can be utilized therein or made available by such changes as to adapt the motor or engine to its use.

It will be obvious that instead of forming the explosion-chambers in the disk they may be formed in the rim of the casing and the disk be provided on its edges with the stepped notches or buckets, as this would be a mere reversal of the construction shown. It may also at times be desirable to admit air into the explosion-chambers with the gas. This can be done by a passage communicating with the interior of the tubular shaft A and discharging beneath the valve, so that the movement of the latter will open and close both the air and gas passages.

I have shown the explosion-chambers as consisting of an angled recess having a tangential discharge; but these chambers may be made wholly in a tangential position. The coil *i* should be placed at a little distance from the opening of the valve, so as to ignite the outer portion of the explosive charge.

It will be observed that while I have shown the shaft of my engine as vertical and have described it as being used in that position, it may be horizontal and the disk rotate in a vertical plane. In many instances this will be the more desirable position for the engine. I have also proposed to use the disk as a motor alone without the casing by providing means for operating the valves, and very good results may be obtained by such a form of construction; and I have also proposed to use the disk and casing together by having one stationary and the other capable of rotation.

I am aware that steam-engines have been constructed on the principle of the hydraulic tourniquet or Barker's mill, and that rotary and piston explosive gas-engines are old; but I am not aware that any one has heretofore caused the explosion to take place in a moving part of such engine.

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

1. The combination, with a disk, of a body lying adjacent or in close proximity to the edge of the same, the said disk and body being the one provided with inclined notches or buckets and the other with an explosion-chamber having a discharge-opening tangential to the edge of the disk, and one of said parts being revoluble, substantially as described.

2. The combination, with a revoluble disk provided with an explosion-chamber in the periphery thereof having a tangential discharge, of a revoluble casing having a rim in close proximity to the periphery of the disk and provided with buckets, substantially as and for the purpose set forth.

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

WM. L. HORNE.

Witnesses:
E. T. WALKER,
O. H. WHITAKER.