

J. M. WELBOURN.
Explosive Engines.

No. 142,880.

Patented September 16, 1873.

Fig. 1

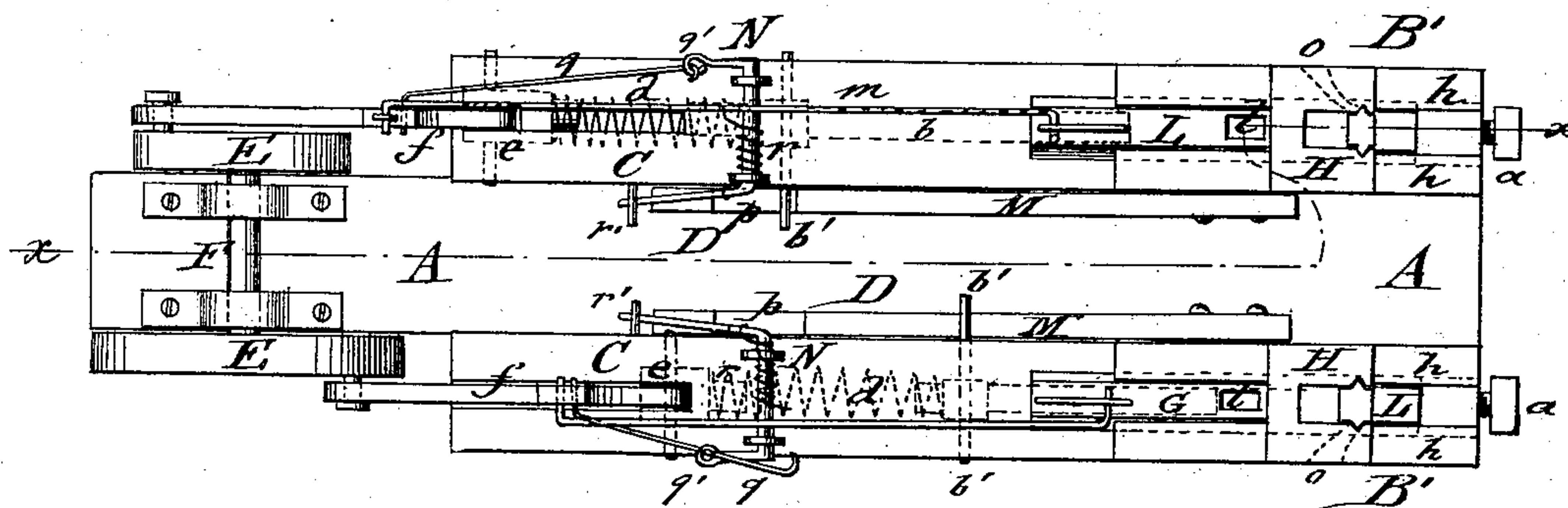
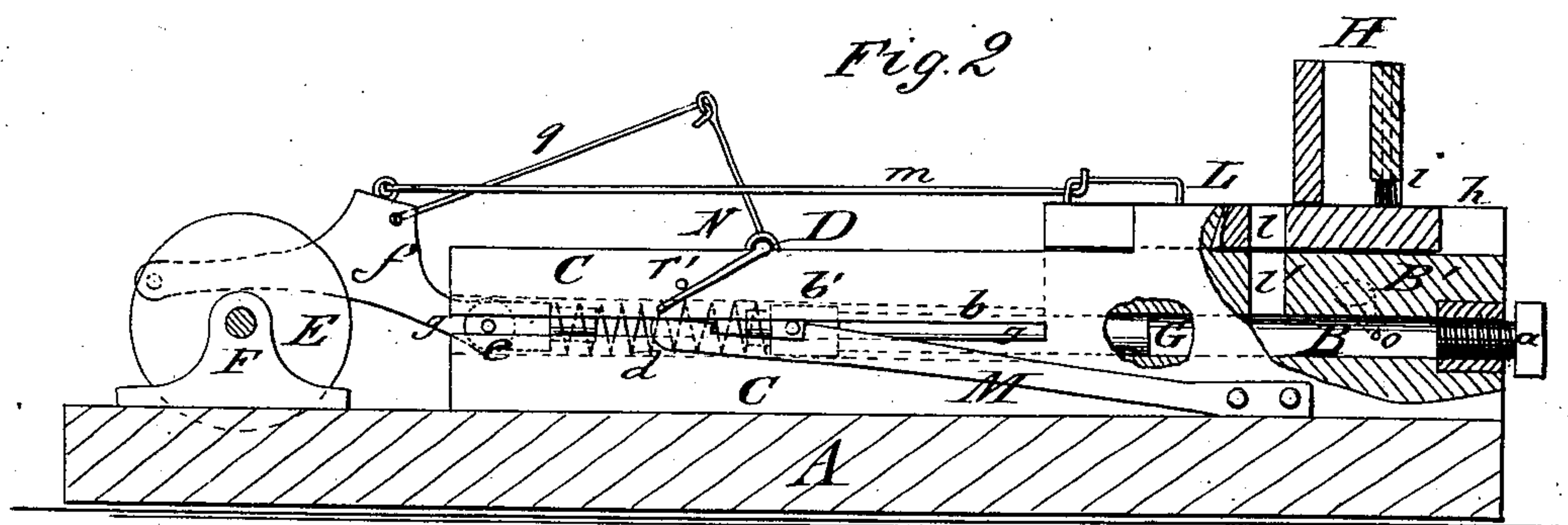


Fig. 2



Witnesses:

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JOSIAH M. WELBOURN, OF CALEDONIA, OHIO.

IMPROVEMENT IN EXPLOSIVE ENGINES.

Specification forming part of Letters Patent No. 142,880, dated September 16, 1873; application filed August 9, 1873.

To all whom it may concern:

Be it known that I, JOSIAH M. WELBOURN, of Caledonia, in the county of Marion and State of Ohio, have invented a new and Improved Explosive Engine, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a top view of my explosive engine; and Fig. 2, a vertical longitudinal section of the same on the line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts.

The object of my invention is to construct an engine which is driven by the explosive force of powder charges. My invention consists in the introduction and explosion of powder charges into chambers, which are alternately discharged to act on pistons, which turn the driving-wheels, and are regulated by suitable mechanism.

In the drawing, A represents the base-frame or other structure, on which the engine is placed, of oblong shape and suitable material. Two powder-chambers, B, together with the guide-frames C and regulating mechanisms D, are arranged parallel to each other in longitudinal direction at both sides of base A. The driving-wheels E are arranged on shaft F at the end of frame A, and produce, by alternately completing one-half of a revolution on each wheel, rotary motion of shaft F from the reciprocating motion of the pistons G. Each powder-chamber B is closed by an adjustable breech-piece, *a*, which may be detached for cleaning out the chamber. The closely-fitting piston G moves in chamber B, its piston-rod *b* connecting, by a cross-pin, *b'*, with strong spiral spring *d*, which is also applied, by cross-head *e*, to pitman *f*, whose end is eccentrically pivoted to the side of wheel E. The cross-pin *b* and cross-head *e* slide in horizontal slots *g* of guide-frame C, which forms the extension of the casing B' of the powder-chamber B.

The required quantity of powder is introduced, in cartridge form, into chamber B by means of a vertical casing, H, which is arranged on guide-rails *h*, placed on the top of chamber B. A brush, *i*, of casing H serves to secure the cartridge in recess *l* of sliding piece

L, which is connected by rod *m* to the pitman *f*, and carried forward and backward in guide-rails *h*. On the forward motion of slide L the cartridge drops, by aperture *l'* of the casing B', into chamber B, to be carried back toward breech-piece *a* by the returning piston G, and be discharged by the concussion against breech-block *a*. The piston G is, by the explosion, forced forward again, and causes, by its action on pitman *f*, the rotation of wheel E. The smoke and gases escape through side apertures O, admitting the immediate recharging of the chambers B. To insure regularity in the working of the engine, spring-rods M are applied to one side of each guide-frame D, and provided with grooves *p*, into which cross-pins *b'* lock on each forward stroke of pistons G. A double bent rod, N, which is secured by staples to the top of frame D, presses with its downward-extending arm on the end of spring-rod M, when its upward-projecting arm is carried forward by rod *q*. Rod *q* slides in a ring or loop, *q'*, at upper end of rod N, and acts with its hook-shaped rear end on ring *q'* when its fore end, which is pivoted to pitman *f*, arrives at the foremost position of the latter. The cross-pin *b*, with spring *d*, is instantly released by the pressure of arm N on spring-rod M, carrying thereby piston G and the charge back for a new explosion. A spring, *r*, is coiled around rod N, and forces the downward arm toward a pin, *r'*, till its action is overcome by rod *q*.

The alternating charging and exploding of both parts of the engine, regulated in connection with the pitman-rods, secure a uniform motion of the engine, with variable speed, according to the rapidity with which the charges are introduced.

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

1. The combination of frame A, powder-chambers B, guide-frame C, pistons G, wheels E with the charging mechanisms H L and regulating mechanisms D, substantially as and for the purpose described.

2. The charging mechanism consisting of casing H with brush *i*, slide L having recess

l, and chamber B with aperture *l'*; operated by rod *m*, pitman *f*, and piston G, as set forth.

3. The regulating mechanism D, produced by spring-rod M, having groove *p* for cross-head *b'*, pivoted double rod N, with rod *q*, and spring *r*, for arresting and releasing piston G, for the purpose described.

4. The guide-frame O, having pin *r'*, for retaining double rod N till ready to strike rod M, as described.

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Witnesses:

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