

(No Model.)

G. C. GILLESPIE.

MACHINE OR ENGINE FOR THE APPLICATION OF EXPLOSIVE ENERGY
TO MECHANICAL POWER.

No. 396,739.

Patented Jan. 29, 1889.

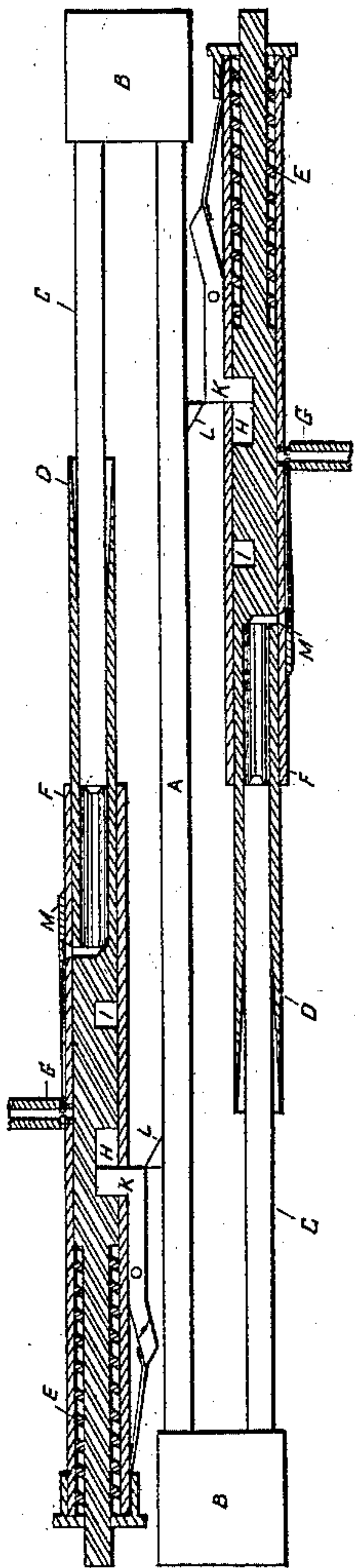


Fig. 1.

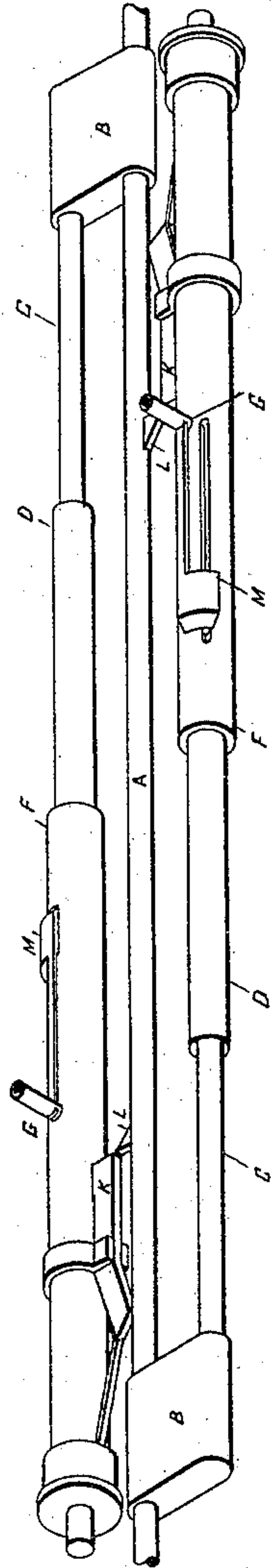


Fig. 2.

WITNESSES:

Lapham & Co.
Frank L. Brooks
Comte Georges de Kappelle

George Carter Gillespie INVENTOR.

BY

Maple — ATTORNEY.

UNITED STATES PATENT OFFICE.

GEORGE CURTIS GILLESPIE, OF BROOKLYN, NEW YORK.

MACHINE OR ENGINE FOR THE APPLICATION OF EXPLOSIVE ENERGY TO MECHANICAL POWER.

SPECIFICATION forming part of Letters Patent No. 396,739, dated January 29, 1889.

Application filed October 21, 1887. Serial No. 252,957. (No model.)

To all whom it may concern:

Be it known that I, GEORGE CURTIS GILLESPIE, a citizen of the United States, and a resident of the city of Brooklyn, in the county

5 of Kings and State of New York, have invented a certain new and useful Machine or Engine for the Application of Explosive Energy to Mechanical Power, of which the following is a specification.

10 The primary object to be attained in the construction of any machine operated by the sudden generation of high-pressure gas—as, for example, when gun-cotton is exploded—is to provide a means of controlling the power

15 at the outset, and thus preserve the apparatus from any destructive shock. This object I accomplish by the use of a cylinder and plunger, both of which are movable, instead of one being fixed, as in the case of ordinary

20 steam or gas engines. Another important point to be provided for is the prevention of overheating, and this I accomplish by the use of single-action cylinders, which are drawn completely away from

25 the plungers at each outward stroke, thereby enabling the gaseous products of the explosion to escape freely, and thus exert a cooling effect by their expansion. The general construction of my machine

30 will be understood by reference to the accompanying drawings, of which—

Figure 1 is a longitudinal section, and Fig. 2 is a perspective view, of a form of my machine or engine suitable for light work, such

35 as, for example, the propulsion of a tricycle. Similar letters indicate similar parts in both figures. A is the working-shaft, connected by the shoulders or cross-heads B B to the plungers

40 C C. These plungers work in the explosion-cylinders D D, the bores of which are gradually enlarged toward the open ends, so that the exhaust-gas may commence to escape before the plungers are entirely withdrawn.

45 The solid ends of the explosion-cylinders are extended and shouldered, so as to rest against spiral springs E E, which are contained in outer cylinders, F F, fixed to the frame-work or bed-plate of the engine. These outer cyl-

50 inders are provided with charging-tubes G G, in which supplies of explosive material (pref-

erably in the form of spherical masses) are placed, (the charging-tubes communicate with the interiors of the outer cylinders,) and can thus fall into the bases of the explosion-cyl- 55 inders, as hereinafter described.

The solid extensions of the explosion-cylinders are, furthermore, provided with two slots, H H and I I, into which triggers K K can fall for the purpose of holding the explosion-cyl- 60 inders fast at certain points of action, and these triggers are released by the cams L L, attached to the working-shaft.

Lip-pieces M M are attached to explosion-cylinders and work through slots in the outer 65 cylinders and in the charging-tubes in such a way as at each inward stroke to cut off and feed downward any desired quantity of the explosive material.

The operation of the machine is as follows: 70 The outward stroke of one plunger causes the other plunger to move inward and press against the bottom of its explosion-cylinder, which is thus forced back until the aperture communicating with the bottom of its base is 75 underneath the charging-tube, when it receives a charge of explosive material. At the same moment the trigger engages in the slot I, and thus prevents the return of the explosion-cylinder. The plunger, however, being at- 80 tached to the working-shaft, commences a return-stroke, and when the trigger is released by the cam on the working-shaft it is overtaken by the base or bottom of the explosion-cylinder shot forward by the spiral spring in 85 the rear. The charge of explosive material is fired by such percussion and generates a volume of gas, which impels the plunger onward and the explosion-cylinder backward to the limit of the slot H, in which the trigger has 90 now become engaged. The plunger continues moving until its end has escaped altogether from the explosion-cylinder, when the gases make their escape, and so free the explosion-cylinder for the return-stroke of the 95 plunger.

It will be understood that whenever desirable, by reason of space, or otherwise, the two cylinders may be placed side by side or end 100 to end, and may have their plungers connected directly with the apparatus to be driven, instead of with an intermediate working-shaft,

as shown in the drawings; also, if desired, the engine may consist of but one explosion-cylinder and its accessories, in which case the entire return-stroke would be performed under the influence of a fly-wheel or other analogous contrivance.

Having now described my said machine or engine for the application of explosive energy to mechanical power, what I claim as my invention, and desire to secure by United States Letters Patent, is—

1. In a machine or engine for the application of explosive energy to mechanical power, the combination of a movable explosion-cylinder acting against an abutment-spring and working in an outer cylinder provided with a trigger for holding the working-cylinder at any desired point or points of the stroke, substantially as and for the purpose described.

2. In a machine or engine for the application of explosive energy to mechanical power, the combination of an explosion-cylinder unattached to the working-rod of the engine and working in an outer cylinder provided with a charging-tube for the introduction of explosive material, substantially as described.

3. In a machine or engine for the application of explosive energy to mechanical power, the combination of an explosion-cylinder working in an outer cylinder provided with a charging-tube, as aforesaid, such working-cylinder carrying an imperforated projecting lip or blade traveling through slots in the outer cylinder and charging-tube for the purpose of cutting off and feeding inward a charge of explosive material at each inward stroke of the working-cylinder, substantially as described.

4. The combination of the working-shaft A, cross-heads B, plungers C, reacting explosion-cylinders D, spiral springs E, outer cylinders, F, charging-tubes G, slots H and I, with charging mechanism M, and firing mechanism K and L, substantially as and for the purposes described.

Signed at Brooklyn, in the county of Kings and State of New York, this 15th day of October, A. D. 1887.

GEORGE CURTIS GILLESPIE.

Witnesses:

STEPHEN H. EMMEN,
FRANK L. BROOKS.