

No. 653,353.

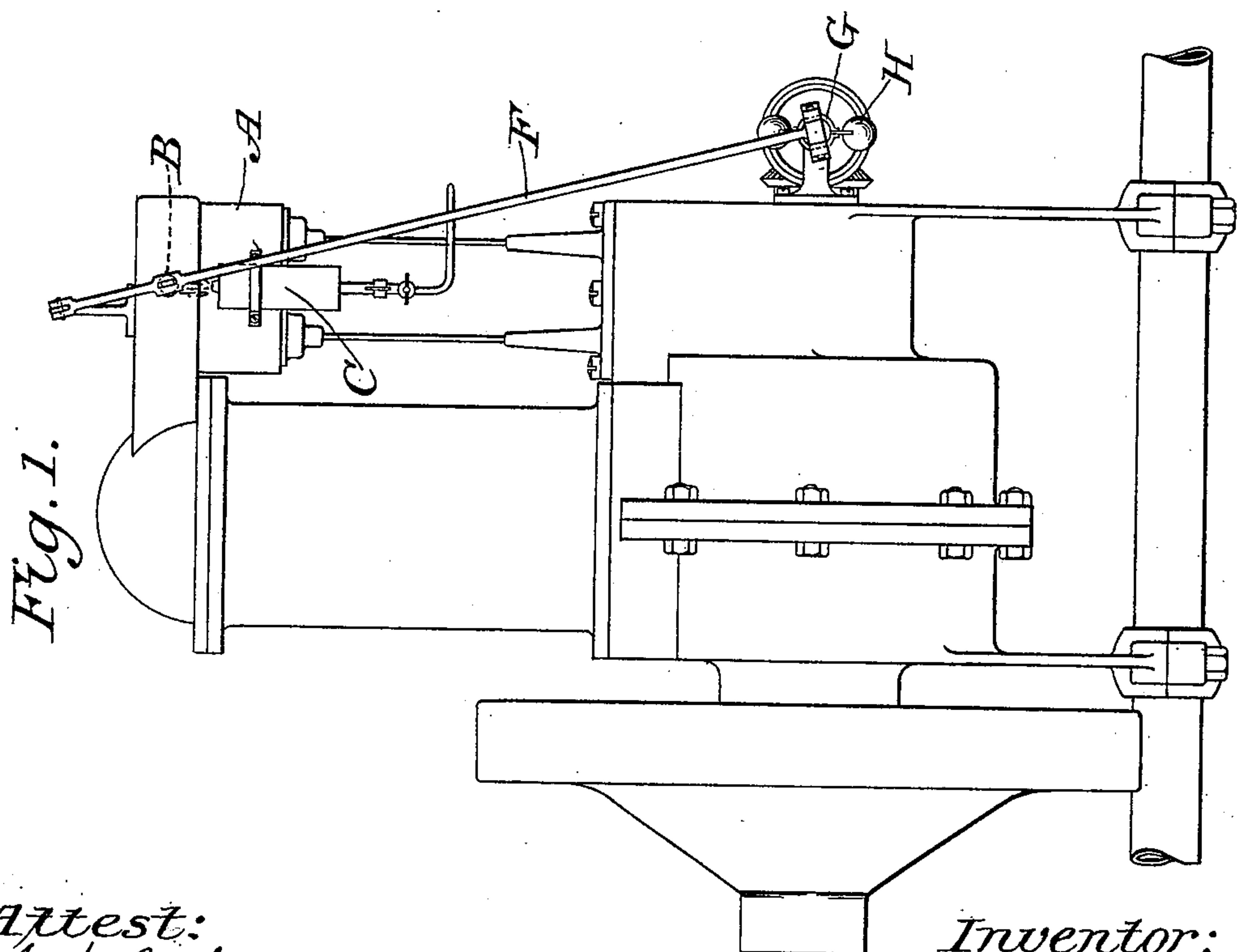
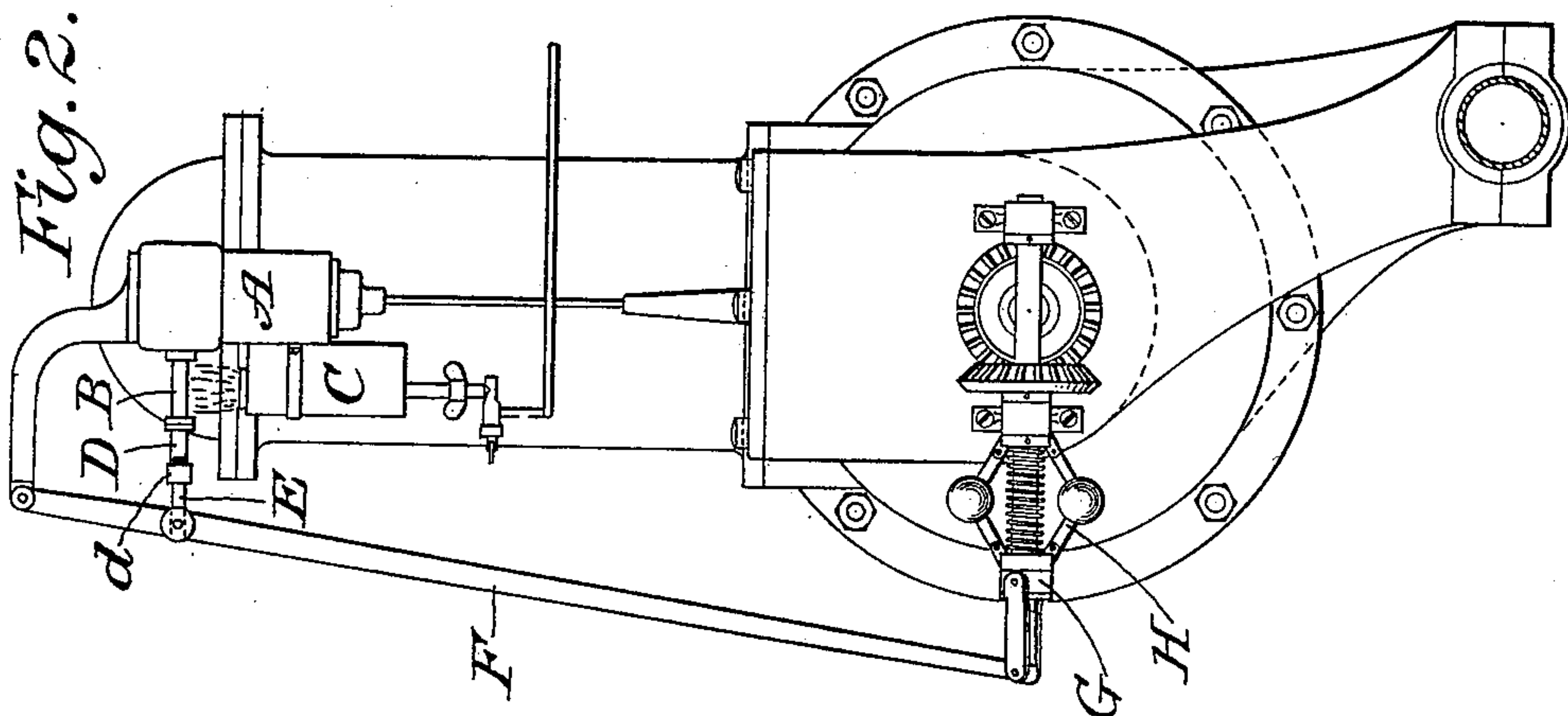
Patented July 10, 1900.

F. A. LAW.
IGNITER FOR EXPLOSIVE ENGINES.

(Application filed July 26, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Attest:
A. N. Jespersen
E. M. Taylor

Inventor:
Fred A. Law
by *Redding, Kiddle & Freedy*
Attys.

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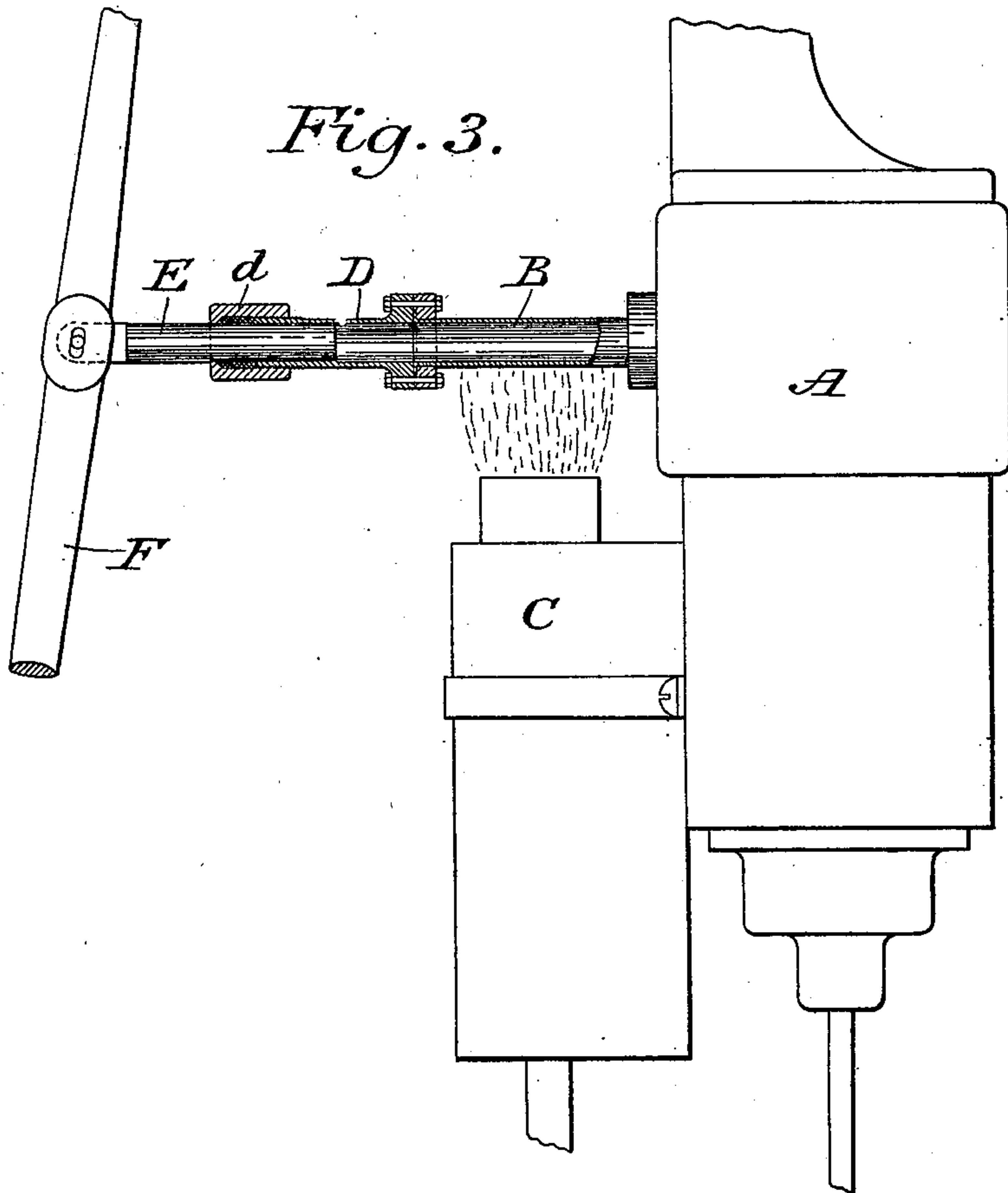
F. A. LAW.

IGNITER FOR EXPLOSIVE ENGINES.

(Application filed July 26, 1898.)

(No Model.)

2 Sheets—Sheet 2.



Attest:
A. H. Jester
E. M. Taylor

Inventor.
Fred A. Law
by Redding, Kiddle & Peck
Attys.

UNITED STATES PATENT OFFICE.

FRED A. LAW, OF HARTFORD, CONNECTICUT, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE COLUMBIA AND ELECTRIC VEHICLE COMPANY, OF JERSEY CITY, NEW JERSEY.

IGNITER FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 653,353, dated July 10, 1900.

Application filed July 26, 1898. Serial No. 686,891. (No model.)

To all whom it may concern:

Be it known that I, FRED A. LAW, a citizen of the United States, residing in the city and county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Igniters for Explosive-Engines, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

This invention relates in general to engines in which a gaseous fluid is exploded or ignited within the working cylinder or explosion-chamber, and is more particularly concerned with the igniters by which the explosion of a charge is effected.

The improvement hereinafter to be described is most conveniently employed in engines with incandescent-tube igniters, in which a portion of the charge is forced into a tube which is maintained in a condition of incandescence; and the object is to provide means for regulating the time of the ignition, and therefore the time of the explosion. To accomplish this, there is connected with the igniter a chamber the capacity of which is adjustable automatically. The igniter immediately after an explosion is filled with inert gas; but during the compression of the fresh charge the inert gas is driven back into the chamber, the ignition taking place when the fresh gas reaches the igniter, driving the inert gas before it. The larger the chamber the more quickly will the inert gas be driven out of the igniter and the fresh gas brought into contact therewith, and vice versa.

It will be evident, especially as this description proceeds, that the result desired can be accomplished by a variety of means, and it will therefore be understood that the particular means herein shown and described are intended merely to illustrate and explain the nature of the invention.

In the accompanying drawings, Figures 1 and 2 are side and end elevations of an engine to which one form of the present invention is applied. Fig. 3 is a view, on a larger scale, partly in side elevation and partly in section or broken out, of a portion of the en-

gine, the device being represented as automatic in its action.

The cylinder A, igniter B, and heater C may be of any usual or suitable form or kind, the igniter being represented as an incandescent-tube igniter maintained at the proper temperature by a heater C. On the opposite side of the igniter B from the cylinder A and communicating therewith is a chamber or space into which the gas, either explosive or dead, can be compressed during the compression of the charge in the cylinder, such gas as is compressed therein entering such space or chamber through the igniter and passing out again when the pressure is relieved through the same. As represented in the drawings, the space or chamber is formed by a short tube D, secured directly to the igniter-tube, and the space within the same is made adjustable by a plunger E, which passes through a suitable packing-box *d*. It is obvious that by pushing in or withdrawing the plunger more or less the capacity of the chamber within the tube D will be varied accordingly. It is desirable to make the engine itself control automatically the time of ignition of the charge, and the movements of the plunger may be effected by the engine itself or by a suitable governor therewith. In Figs. 1 and 2 the stem of the plunger is represented as engaged by a lever F, which is controlled by a movable sleeve G under control of an ordinary governor H.

The operation of the device will be readily understood without further description or explanation herein, and it will also be evident that various means other than those shown and described herein may be employed to effect the desired purpose and that the invention, therefore, is not to be limited to the precise construction and arrangement shown and described.

I claim as my invention—

1. The combination in an explosive-engine with a cylinder or explosion-chamber and an igniter, of a chamber connected with the cylinder or explosion-chamber through said igniter, a governor operated by the engine and

means controlled by said governor to vary the capacity of said last-named chamber.

2. The combination in an explosive-engine with a cylinder or explosion-chamber and an igniter, of a chamber connected to said cylinder or explosion-chamber through said igniter, a plunger movable in said last-named chamber, a governor operated by the engine,

and a connection between said governor and said plunger.

This specification signed and witnessed this 28th day of June, A. D. 1898.

FRED A. LAW.

In presence of—

H. E. HART,

W. B. GREELEY.