

(No Model.)

J. F. BARKER.
SIGNALING APPARATUS.

No. 560,675.

Patented May 26, 1896.

Fig. 1

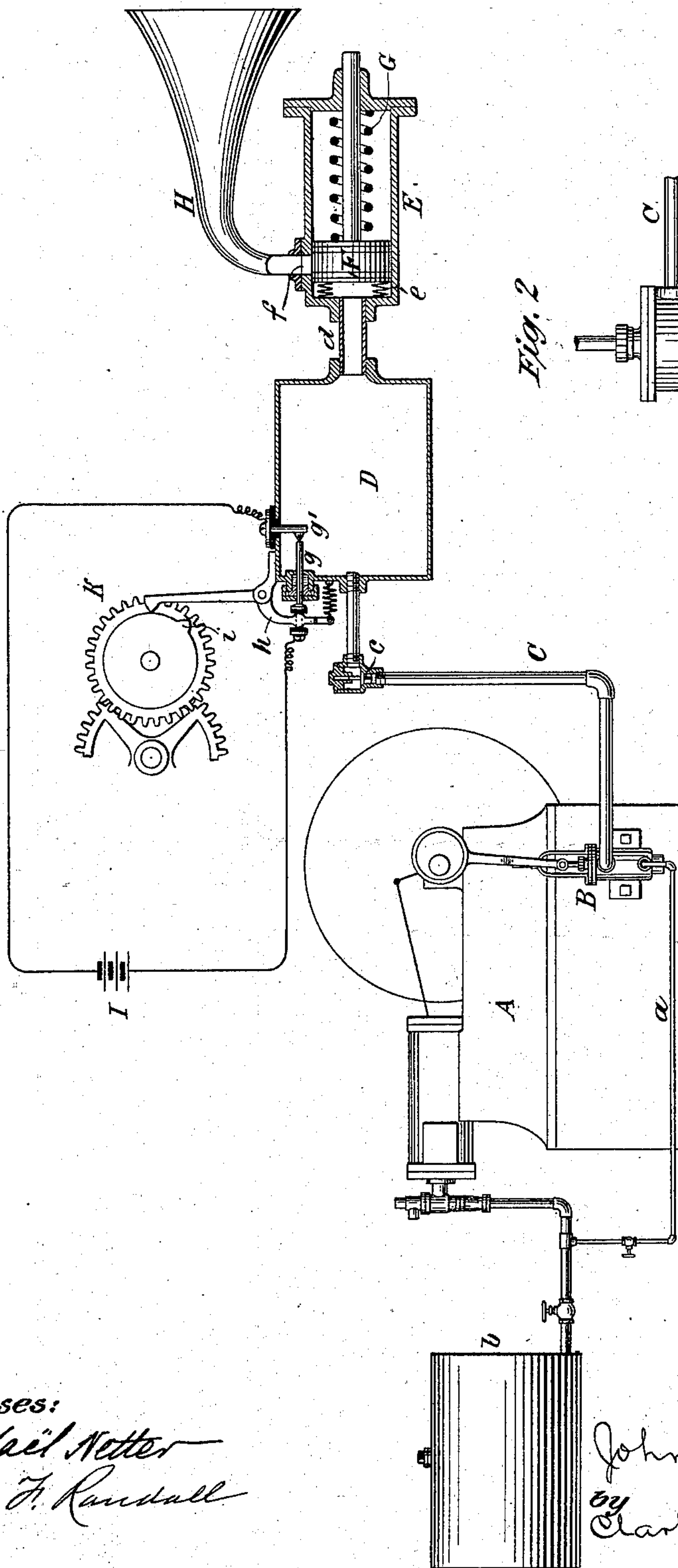
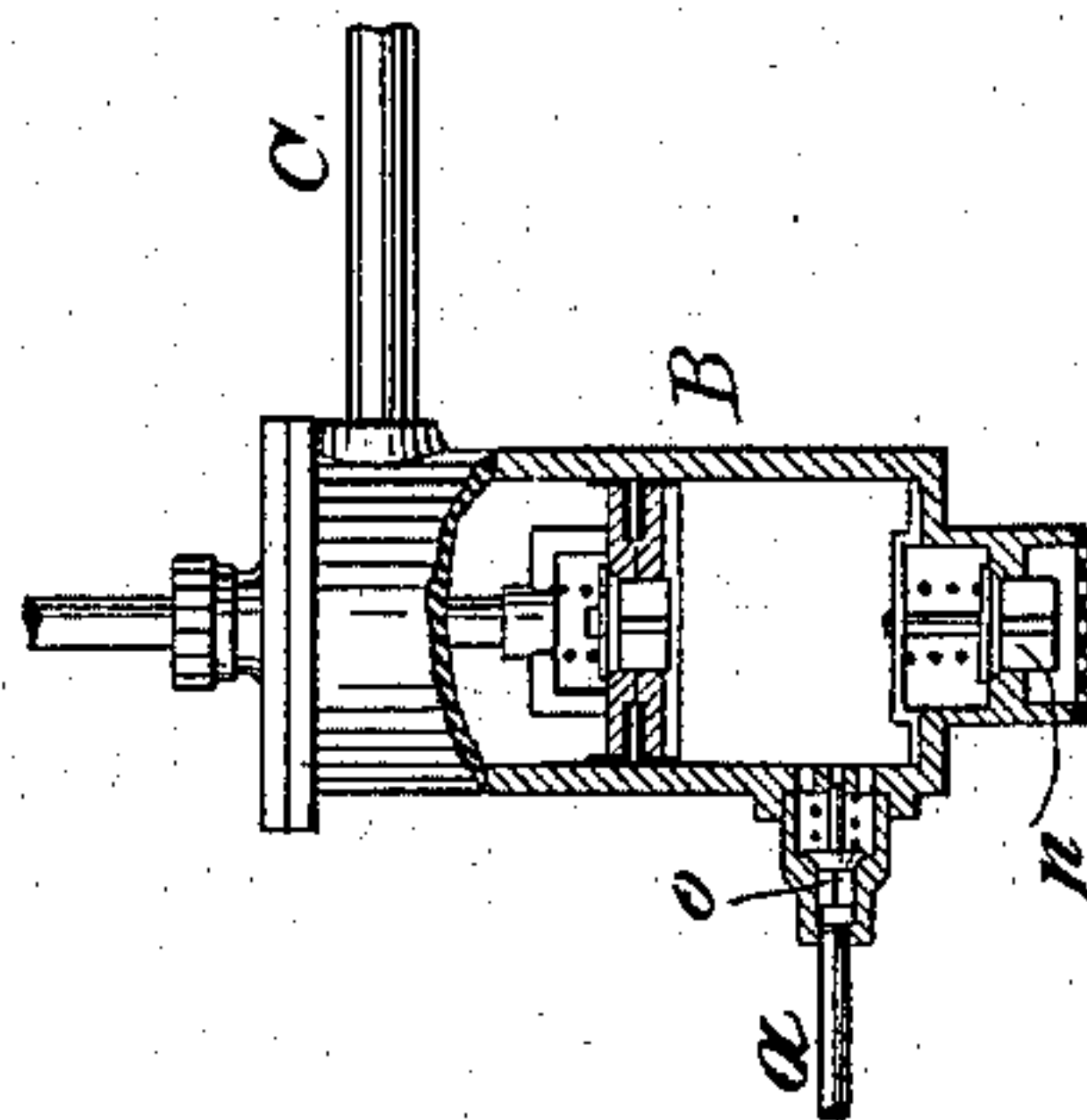


Fig. 2



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UNITED STATES PATENT OFFICE.

JOHN F. BARKER, OF SPRINGFIELD, MASSACHUSETTS.

SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 560,675, dated May 26, 1896.

Application filed February 16, 1895. Serial No. 538,717. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. BARKER, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented a new and Improved Apparatus for Producing Audible Signals, of which the following is a specification.

My invention relates generally to the operation of that class of signaling devices used in lighthouses and similar situations known as "fog-horns" or "sirens." The means heretofore employed for operating such signals have been expensive to construct and operate and require constant attention while in operation; and the object of my improvements is to provide an apparatus which, while capable of giving a sound of sufficient volume, shall be inexpensive, simple, and automatic in operation.

The apparatus is illustrated in the drawings, in which—

Figure 1 shows a vertical elevation, partly in section, thereof; and Fig. 2 shows the details of a force-pump employed therein.

Referring to the drawings, A indicates an engine, such as a gasolene-engine, of any usual or suitable form of construction, by means of which is operated a pump B. The pump B is connected by a small pipe *a* with a receptacle containing gasolene, which may be the same tank *b* from which gasolene is supplied to the engine in case a gasolene-engine is used, and is also provided with an air-port *p*, through which air is drawn into the pump B at the same time with the gasolene from the pipe *a*. From the pump B a pipe C, in which is a check-valve *c*, closing toward the pump, leads to a chamber D, which I call the "explosion-chamber," and which is provided with walls of sufficient strength to resist the effects of the explosions which take place therein.

The explosion-chamber D is connected by a pipe *d* with a cylinder E, within which is a piston and piston-head F. Normally the piston-head is held at the end of the cylinder E nearest to the chamber D by a spring G, which also operates to drive the piston-head back into its normal position when it is driven away therefrom by gas-pressure or the force of an explosion. An elastic buffer, such as the springs *e e*, may be interposed between

the piston-head and the end of the cylinder to prevent shock from impact when the piston-head is driven back into position by the spring G. From such a point in the cylinder E, that it is shut off from the chamber D by the piston-head F when in its normal position, an opening *f* leads to a vibratory sounding device, such as an ordinary siren or fog-horn H. Into the explosion-chamber D project two contact-points *g g'*, of carbon or other suitable material, which are normally in contact with each other and are respectively connected with the terminals of an electric battery indicated at I. One of the contact-points *g g'* is connected with a lever *h*, from which it is insulated in any suitable manner, and which is arranged to be moved by a cam *i*, operated by a train of clockwork K, so as to separate the contact-points *g g'*.

The operation of the device is as follows: On operating the pump B by means of the engine A liquid gasolene is drawn into the pump-barrel through the pipe *a*, (its return being prevented by a check-valve *o*,) and at the same time air is drawn in through the port *p*. The relative capacities of the pipe *a* and the air-port should be such that about ten thousand parts of atmospheric air will be drawn into the pump-barrel for each part of liquid gasolene. This, when the gasolene is vaporized, will give a mixture of about ninety-eight parts of atmospheric air to two parts of gasolene vapor, which is a highly-explosive mixture. The gasolene vaporizes as it is drawn into the chamber of the pump B and with the return stroke of the pump is forced, together with the air, through the pipe C into the chamber D. The return of the gas through the pipe C is prevented by the check-valve *c*, and its escape through the cylinder E and opening *f* is prevented by the piston-head F, so that it accumulates under pressure in the chamber D. An excess of pressure at any time is relieved by the forcing back of the piston-head F and the escape of the gas through the opening *f*. The speeds of the pump B and clockwork K are so regulated that at such times as it is desired to sound the signal a sufficient quantity of gas is accumulated in the chamber D, and the electrodes or contact-points *g g'* are separated by the action of the clockwork, so that a spark passes be-

tween them. The gas in the chamber D is thus ignited and exploded and the piston-head F is driven backward in the cylinder E, leaving the opening *f* free, through which the
 5 products of combustion pass with much force, causing the signaling device to be loudly sounded. As the pressure decreases the piston-head F is driven back to its original position by means of the spring G, thus forcing
 10 out more of the products of combustion through the opening *f* and prolonging the sound given by the sounding device. By varying the length of the cylinder E or the length of the throw of the piston-head in the
 15 cylinder the length of the sound produced may be varied, so that different specimens of the apparatus can be made to produce notes or sounds of different lengths. So long as the pump B and the clockwork K continue to operate the chamber D will be filled with gas,
 20 which will be exploded and the signal sounded at regular intervals.

It will be evident that an explosive gas or mixture of gases other than a mixture of
 25 gasolene vapor and atmospheric air may be employed with the same result, and I do not limit my invention in this respect to any particular explosive material.

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

1. In an apparatus for producing audible signals the combination of an exploding-chamber and means for admitting explosive material thereto, a source of electricity, and
 35 electrodes connected therewith and projecting into such exploding-chamber, means for automatically separating the electrodes, a cylinder connected with such exploding-chamber, a spring-actuated piston in such
 40 cylinder, an opening from such cylinder nor-

mally closed from the exploding-chamber by said piston and a sounding device connected with such opening, substantially as and for the purposes set forth.

2. In an apparatus for producing audible
 45 signals, the combination with an exploding-chamber of a cylinder connected therewith, an opening in the cylinder, leading to a sounding device, a piston-head in the cylinder, normally closing such opening from the
 50 exploding-chamber, and adapted to be driven backward past such opening by the force of an explosion in said chamber, and a spring operating to drive such piston-head in the opposite direction, substantially as and for
 55 the purposes set forth.

3. In an apparatus for producing audible signals, the combination of a gasolene-engine, a pump operated thereby, pipes connecting such pump with a gasolene-supply tank and
 60 with an exploding-chamber, a check-valve in the pipe connecting the pump with such tank and an opening from the pump-barrel to the outer air, provided with an outwardly-closing valve, whereby liquid gasolene is drawn into
 65 the pump-barrel and therein vaporized and mixed with atmospheric air and the gaseous product forced into the exploding-chamber, means for igniting the vapor in the exploding-chamber and a sounding device adapted to
 70 be opened to the exploding-chamber by the force of the explosion therein, substantially as and for the purposes set forth.

In testimony whereof I have hereunto subscribed my name this 9th day of February,
 75 A. D. 1895.

JOHN F. BARKER.

Witnesses:

W. T. RAYNER,
 O. F. ALLEN.