

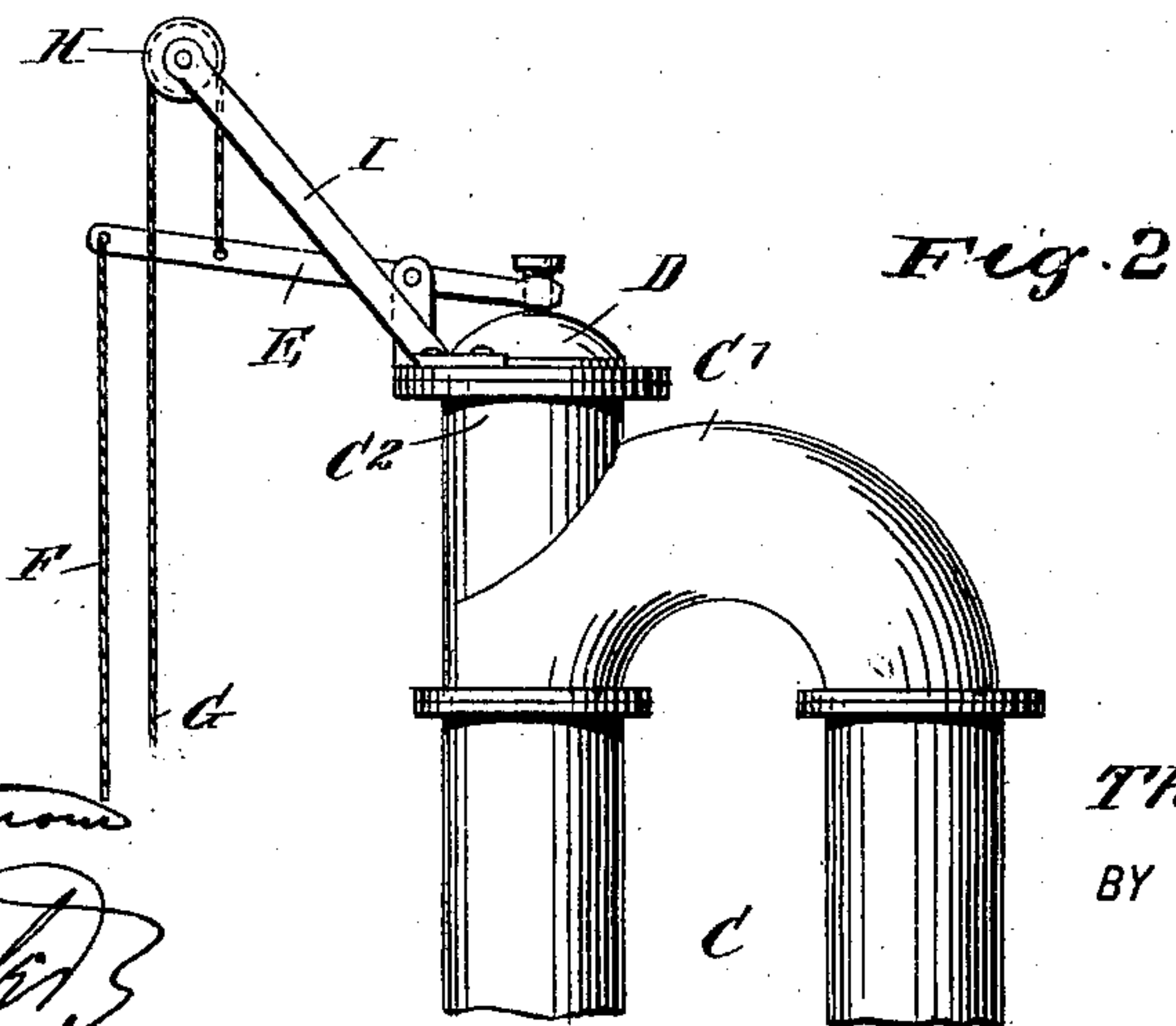
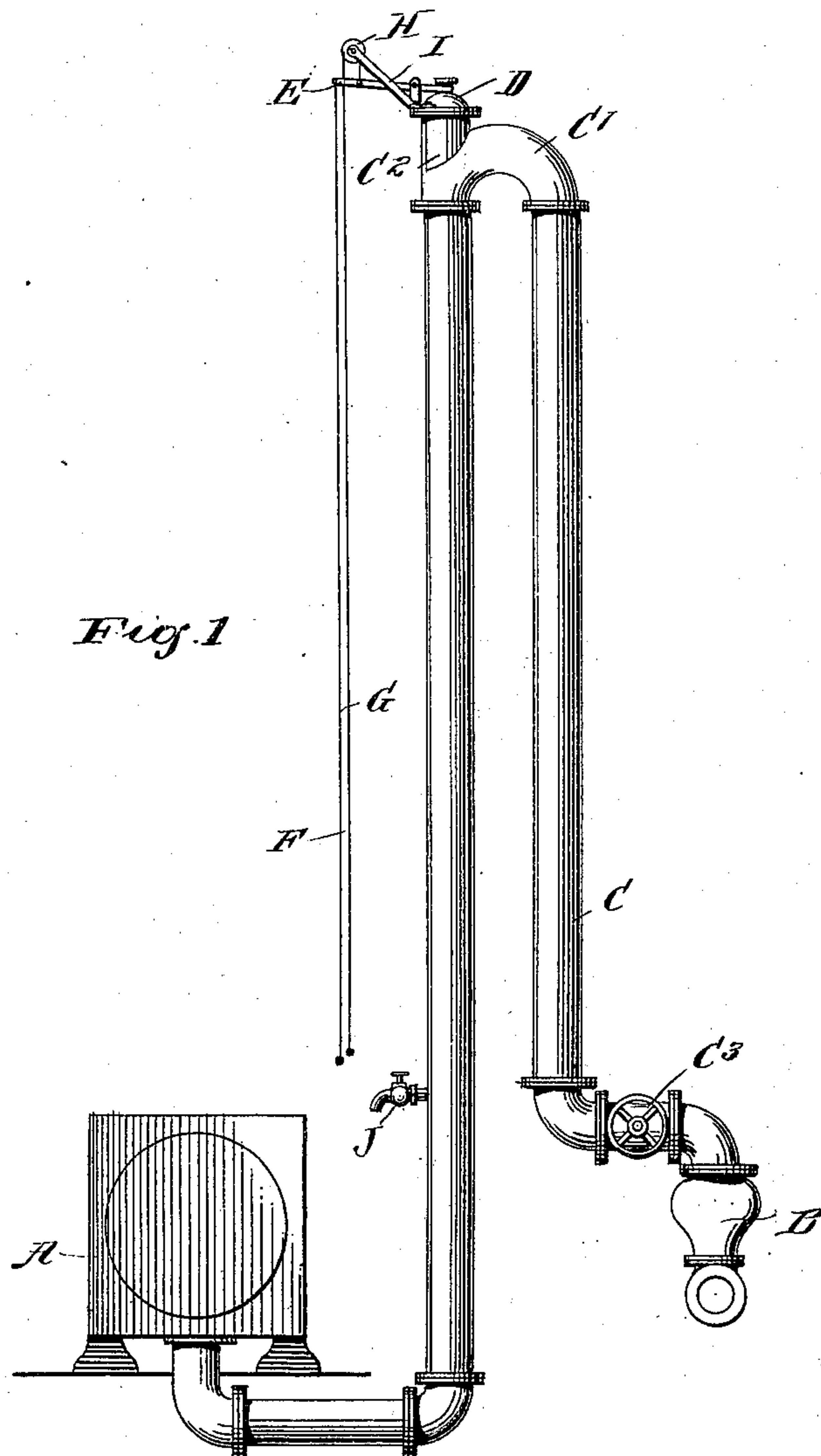
No. 687,017.

Patented Nov. 19, 1901.

**T. GRIEVE.**  
**SAFETY DEVICE FOR ENGINES AND CONDENSERS.**

(Application filed Apr. 12, 1901.)

(No Model.)



WITNESSES:

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# UNITED STATES PATENT OFFICE.

THOMAS GRIEVE, OF PERTH AMBOY, NEW JERSEY.

## SAFETY DEVICE FOR ENGINES AND CONDENSERS.

SPECIFICATION forming part of Letters Patent No. 687,017, dated November 19, 1901.

Application filed April 12, 1901. Serial No. 55,493. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS GRIEVE, a citizen of the United States, and a resident of Perth Amboy, in the county of Middlesex and State of New Jersey, have invented a new and Improved Safety Device for Engines and Condensers, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved safety device for engines and condensers arranged to keep the engine-cylinder completely free from water in case the engine acts as a pump and the condenser-pump is at a standstill.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both the views.

Figure 1 is a side elevation of the improvement as applied, and Fig. 2 is an enlarged side elevation of the upper end of the improvement.

The exhaust of the engine A passes to a condenser B by means of an inverted-U-shaped pipe C rising, with its upper connecting portion C', to a height of about thirty-four feet or more above the level of the water in the condensing-chamber B, so that when the steam is shut off in the engine and the piston therein moves for a time, owing to the momentum of the fly-wheel, and the engine now acts as a pump then the water contained in the condensing-chamber B is not drawn into the engine by way of the pipe C, as the upper end of the pipe is above the suction height of the pump. The condensing-chamber B receives a jet of water for condensing the exhaust-steam, and said chamber is connected with a pump for taking charge of the water, instantly condensing the steam and producing a vacuum in the pipe C at the same time. Now if at any time the pump stops and a vacuum is produced by the engine the water contained in the condensing-chamber B cannot be drawn by way of the pipe C into the engine and the latter be wrecked thereby, for the reason above given.

In the connecting end C' of the pipe C is arranged an outlet C<sup>2</sup>, normally closed by a valve D, engaged by a lever E, fulcrumed on the outlet C<sup>2</sup>, and from the free end of which lever extends downward a rope F under the control of the engineer, so that when the latter pulls said rope the lever E swings the valve D off its seat, and the exhaust-steam can now freely escape through the upper end of the pipe C without passing to the condenser. This is done when the steam is not to be condensed and the valve C<sup>3</sup> in the pipe C is closed. When, however, the steam is to be condensed, the valve D is closed, and in order to firmly hold the valve to its seat until the desired vacuum is established in the pipe C by the action of the circulating-pump, as previously mentioned, I provide a rope G, arranged alongside the rope F and extending over a pulley H, held on a bracket I, secured to the outlet C<sup>2</sup>, the upper end of the rope G being connected with the lever E, so that when the engineer pulls on the rope G the lever E is caused to swing upward, thus pressing the valve D firmly to its seat. A valve or plug-cock J, easily reached by the engineer, may be placed in the pipe C to break the vacuum quickly whenever it is desired to do so.

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

1. A safety device for engines and condensers, consisting of an inverted-U-shaped pipe connected at one end with the exhaust of the engine and at its other end with the condenser, the connecting or upper portion of said pipe extending above the suction height of the engine, as set forth.

2. A safety device for engines and condensers, consisting of an inverted-U-shaped pipe connected at one end with the exhaust of the engine and at its other end with the condenser, the connecting or upper portion of said pipe extending above the suction height of the engine, and a normally closed escape-valve on the upper end of the said pipe and under the control of the engineer, to allow the latter to open the said escape-valve when the condenser is not to be used, as set forth.

3. A safety device for engines and condensers, consisting of an inverted-U-shaped



pipe connected at one end with the exhaust of the engine and at its other end with the condenser, the connecting or upper portion of said pipe extending above the suction height of the engine, an escape-valve on the upper end of the said pipe, and means under the control of the engineer for holding the said valve securely to its seat until the vacuum is formed, as set forth.

10 4. The combination with an engine, and condenser, of an inverted-U-shaped pipe having one end connected with the engine to receive the exhaust therefrom and its other end with the condenser, the upper portion of the pipe being above the suction height of the engine and provided with an outlet, a valve for closing said outlet, and a lever fulcrumed on the pipe and engaging the valve, said lever being under the control of the engineer, as set forth.

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5. The combination with an engine, and condenser, of an inverted-U-shaped pipe having one end connected with the engine to receive the exhaust therefrom, and its other end with the condenser, the upper end of the pipe being above the suction height of the engine and provided with an outlet, a valve for closing the said outlet, a lever fulcrumed on the pipe and engaging the valve, a rope attached to the said lever, a pulley carried by a support on the pipe, and a rope secured to the valve-operating lever and passed over said pulley, as set forth.

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In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

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THOMAS GRIEVE.

Witnesses:

GEORGE H. COATES,  
WILLIAM E. WARNOCK.