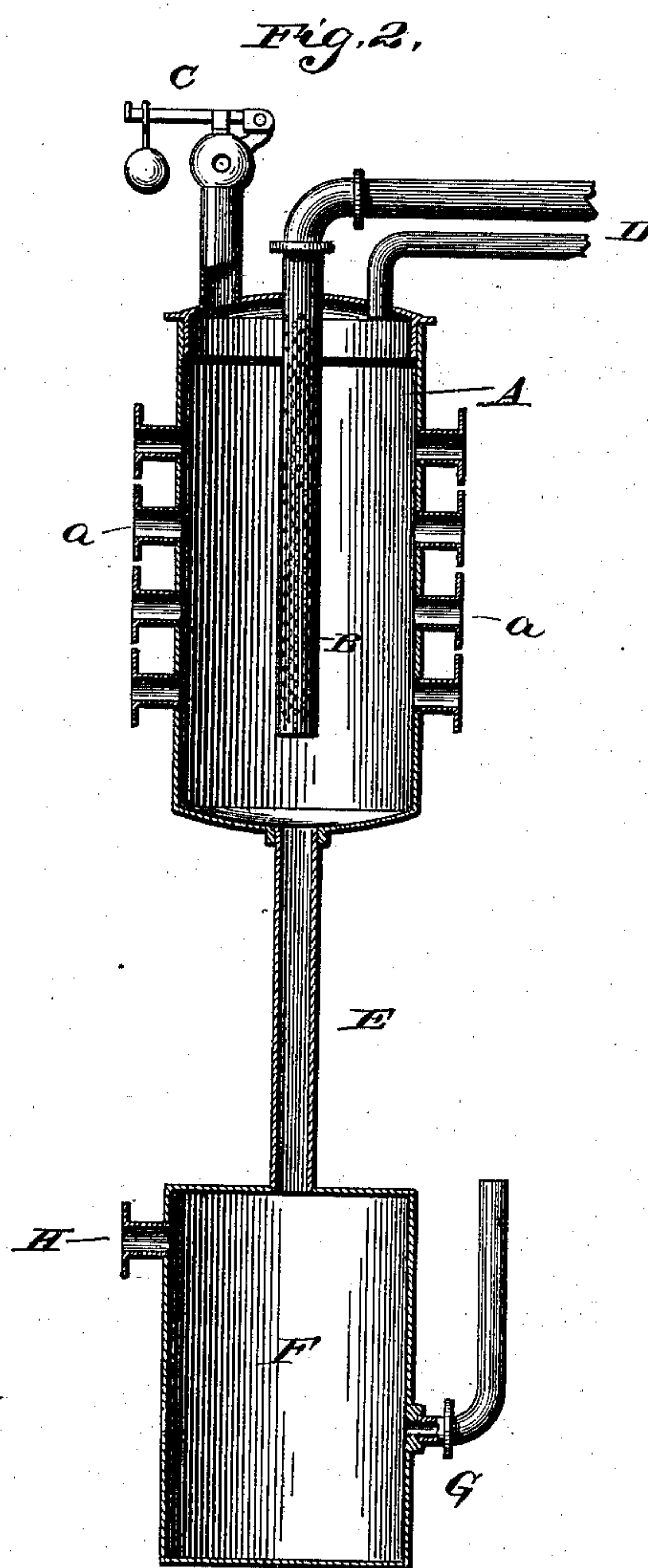
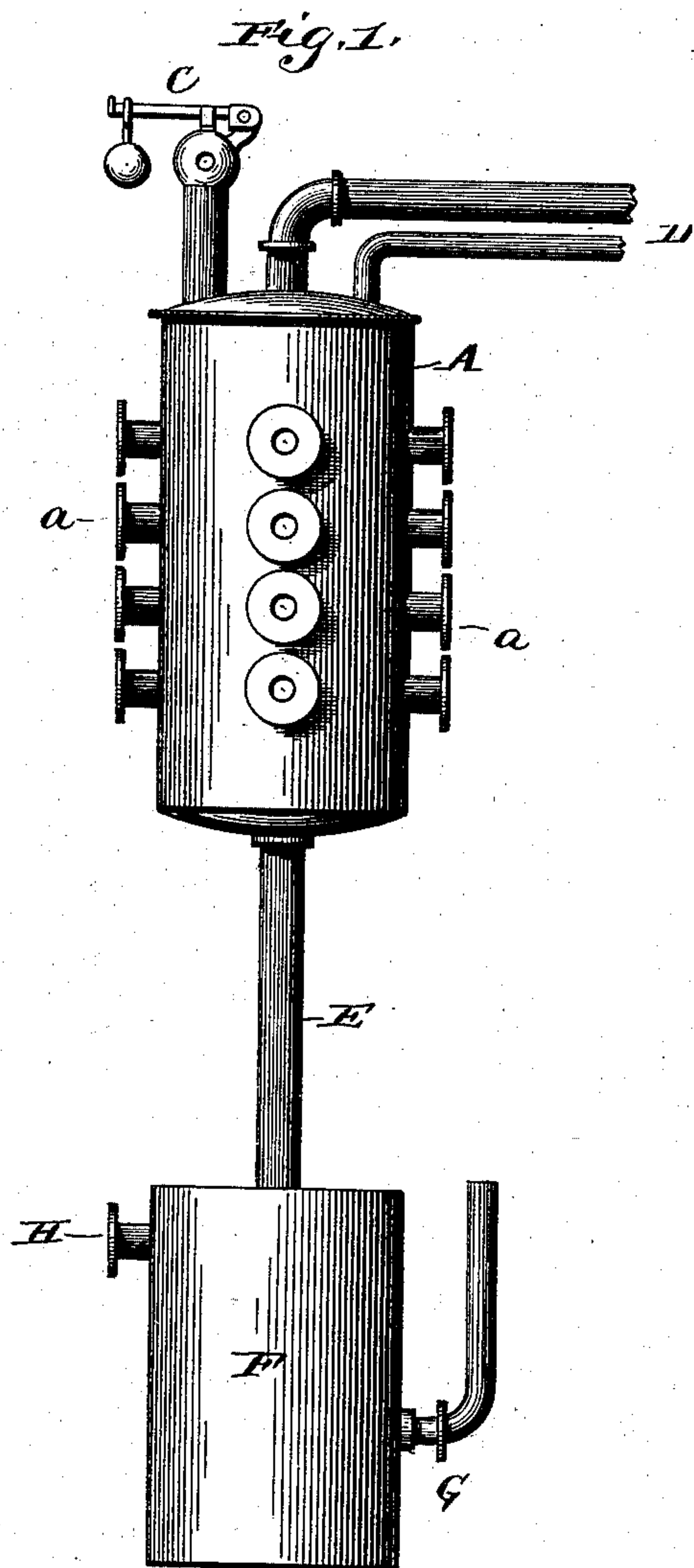


G. A. JASPER.
CONDENSER FOR STEAM ENGINES.

No. 43,413.

Patented July 5, 1864.



UNITED STATES PATENT OFFICE.

GUSTAVUS A. JASPER, OF CHARLESTOWN, MASSACHUSETTS.

IMPROVED CONDENSER.

Specification forming part of Letters Patent No. 43,413, dated July 5, 1864.

To all whom it may concern:

Be it known that I, GUSTAVUS A. JASPER, a resident of Charlestown, in the county of Middlesex and State of Massachusetts, have invented a new and useful Condensing Apparatus for Steam-Engines, and particularly those worked by steam at high pressure; and I do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is a side elevation, and Fig. 2 a vertical section, of it.

My invention consists in an improved combination, composed of a condenser, a water-jet pipe, an atmospheric counterbalance-pipe, and an overflow-cistern, arranged and constructed substantially in manner and so as to operate together as hereinafter explained.

The purpose of my improved condensing apparatus is to dispense with a pump for relieving a condenser from water, and to effect the abstraction of water at little or no expense comparatively, and by the action of gravity and a column of water upheld in a pipe by atmospheric pressure. My improved condenser is specially useful in sugar-refineries and other works which require numerous small steam-engines for the performance of various operations, and which need much hot water for manufacturing or other purposes. The exhaust-pipe of such engines may lead to and open into such condenser, so as to discharge their steam into it. In this way there will be much water and heat saved which under other circumstances would be lost, all or most of which may be utilized to advantage. By dispensing with a pump for freeing the condenser of water there results a great saving of expense, as in most condensing-engines the pump for removing the water from the condenser has to be of large dimensions, and requires an expenditure of much power to put and maintain it in operation.

In the drawings, A represents a condensing-vessel or closed hollow drum, provided with a cold-water-jet pipe, B, which enters the top of and extends down within the vessel, and is perforated or foraminous where within the vessel, as shown in Fig. 2. The said vessel, if desirable, may be provided with a weighted safety-valve, as represented at C. It may also have an air-pump conduit, D, leading out

of its top and to an air-pump, for the purpose of enabling air to be extracted from and in order to produce a vacuum within it. Out of the bottom of the vessel A a pipe, E, leads and extends downward into a closed cistern, F, and nearly to the bottom of the same, the lower as well as the upper extremity of the said pipe E being open. The induction-tube of the feed pump of a steam-boiler may enter the vessel F at G at a distance from the bottom of the vessel equal to or about equal to one-third of the altitude of the cistern. At or near the top of the cistern F there should be an overflow opening or pipe, H, leading out of such cistern. In practice, the bottom of the A should be situated thirty-two feet or more above the entrance G of the induction-pipe of the steam-boiler feeding-pump, when such may be used, or at or about at that distance above the overflow when such pump may be dispensed with. It is intended that the exhaust pipe or pipes of one or more steam-engines shall lead directly into the condenser A, which may have one or more connections, *a a*, for applying such pipe or pipes to it.

In the operation of this apparatus, the exhaust-steam from the engine or engines will flow into the condenser A and be condensed therein by the currents of cold water or the spray which may be led into it through the pipe B, the air introduced within the condenser being extracted through the pipe D and by an air-pump. The steam so condensed, as well as the water employed to effect its condensation, will flow into and down the pipe E and into the cistern F, and so long as there may be a vacuum within the condenser A water will stand in the pipe E or in the same and the vessel A at about thirty-two feet above the level of the water within the cistern F, the said water being forced up the pipe E or maintained within the same by atmospheric pressure exerted on the surface of the water which may be within the vessel.

Such of the heated water of the cistern F as it may be desirable to return the boiler of or boilers of the engines may be drawn from it through the pipe G. The balance will rise within the cistern and escape through the overflow opening or pipe H, and may be either suffered to run to waste or be utilized, as circumstances may require.

From the above it will be seen that the pipe E and the cistern F, when there is a vacuum in the condenser A, not only afford a mean of discharging water therefrom by its own gravity, but they maintain within them a column of water which counterbalances the pressure of the atmosphere. The surplus water beyond this counterbalancing column will escape from the condenser and flow down the pipe E and into the cistern F.

With my improved condensing apparatus nearly all the water used in condensing the steam will by its own gravity be caused to flow away from the condenser, the remainder or condensed steam being returned to the boiler by a pump or other suitable means.

I am aware of the invention of Rennie, as

described in the English Patent No. 2,380 for year 1856, and therefore do not claim the same so far as my said condensing apparatus may embody it.

What I do claim is—

My improved condensing apparatus, made as hereinbefore described—viz., with the close vessel F, provided with the eductions G H, or either of them, and combined with the stand-pipe E and the condenser A, having the spray-pipe and other appliances, substantially as specified.

GUSTAVUS A. JASPER.

Witnesses:

R. H. EDDY,

F. P. HALE, Jr.