

No. 624,094.

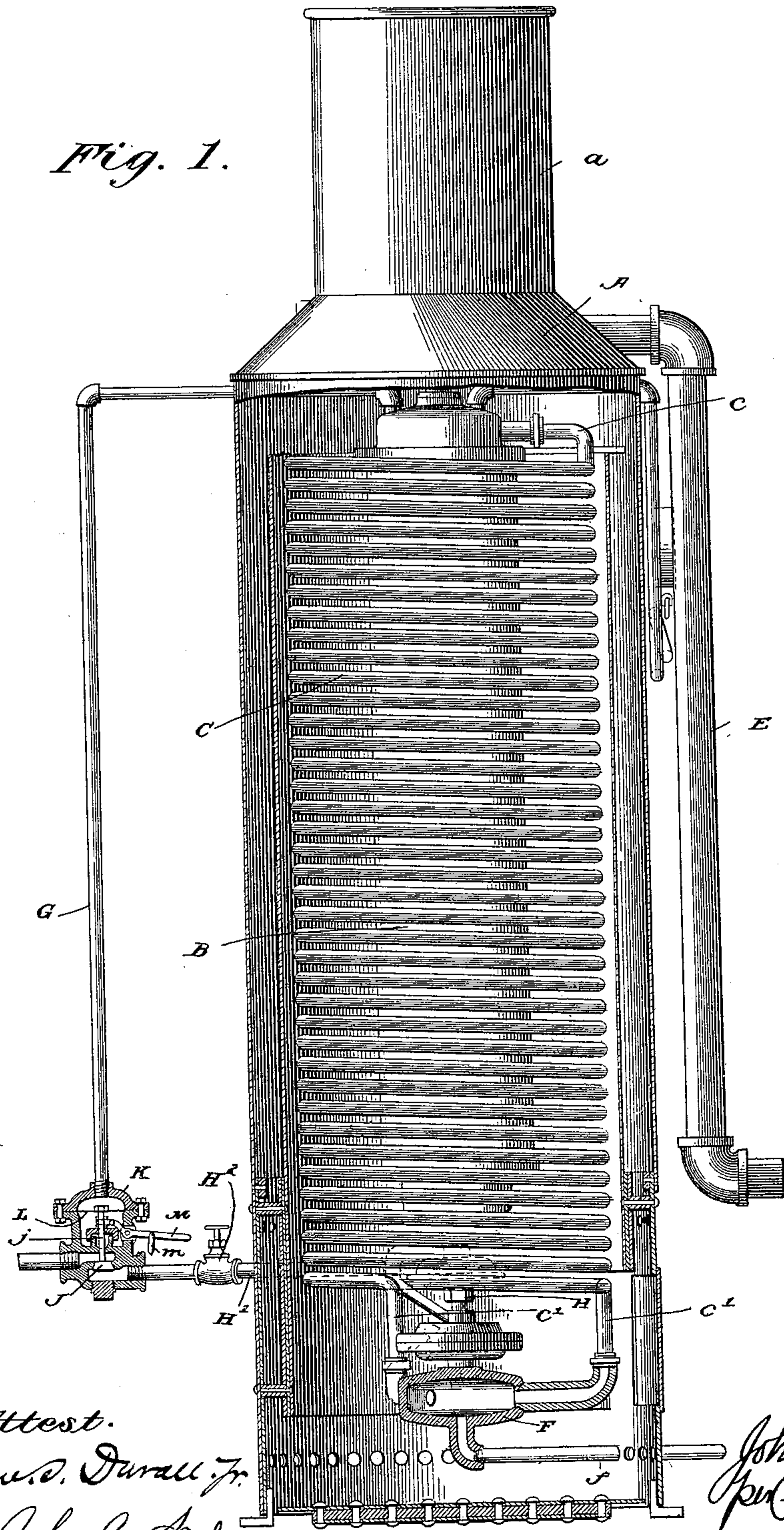
Patented May 2, 1899.

J. V. RICE, JR.
SAFETY DEVICE FOR NAPHTHA RETORTS.

(Application filed Apr. 7, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Attest.
Edw. S. Durall Jr.
John A. Schul.

Inventor:
John V. Rice Jr.
per Fred Wacker,
Att'y.

No. 624,094.

Patented May 2, 1899.

J. V. RICE, JR.

SAFETY DEVICE FOR NAPHTHA RETORTS.

(Application filed Apr. 7, 1898.)

(No Model.)

2 Sheets—Sheet 2.

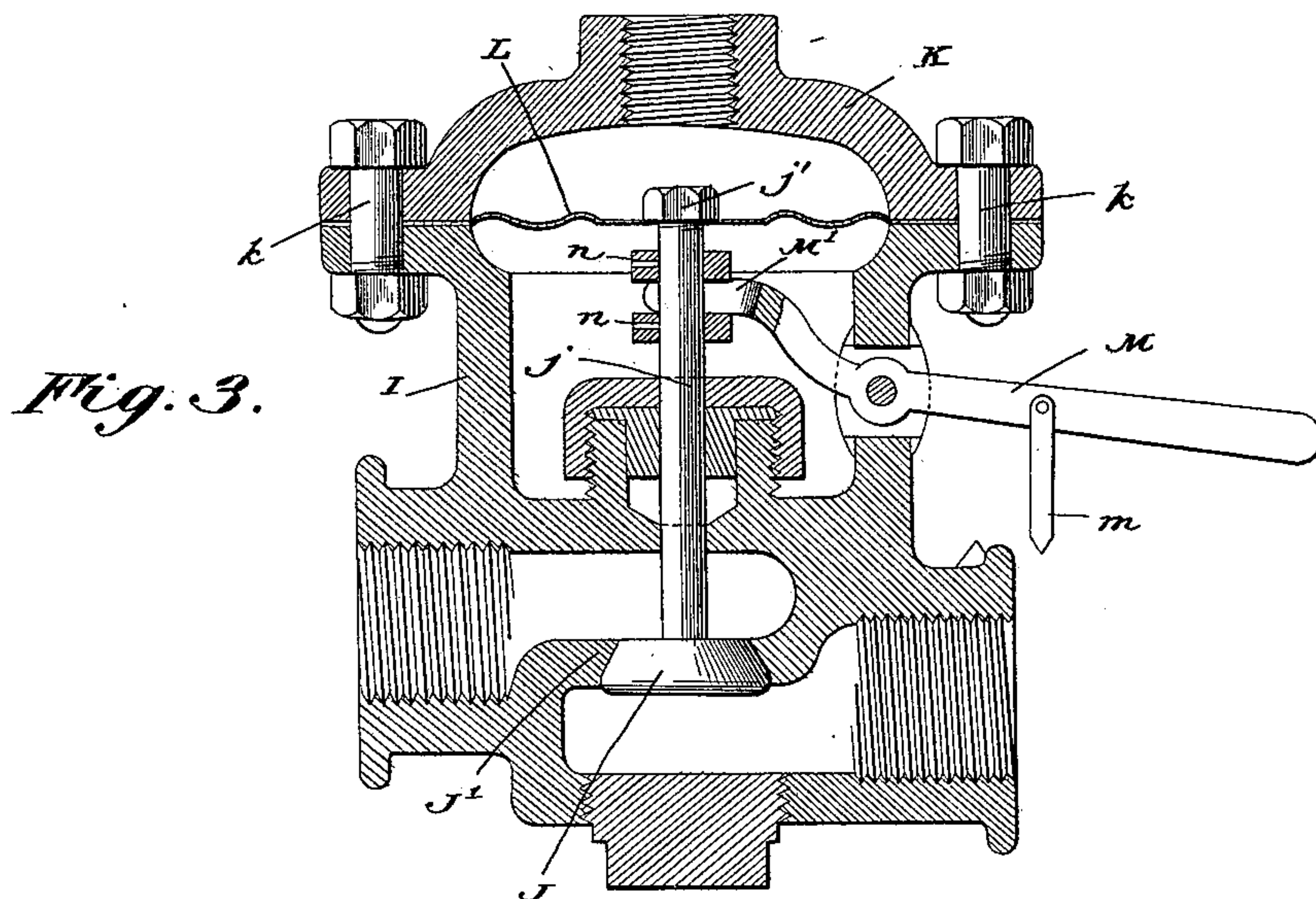
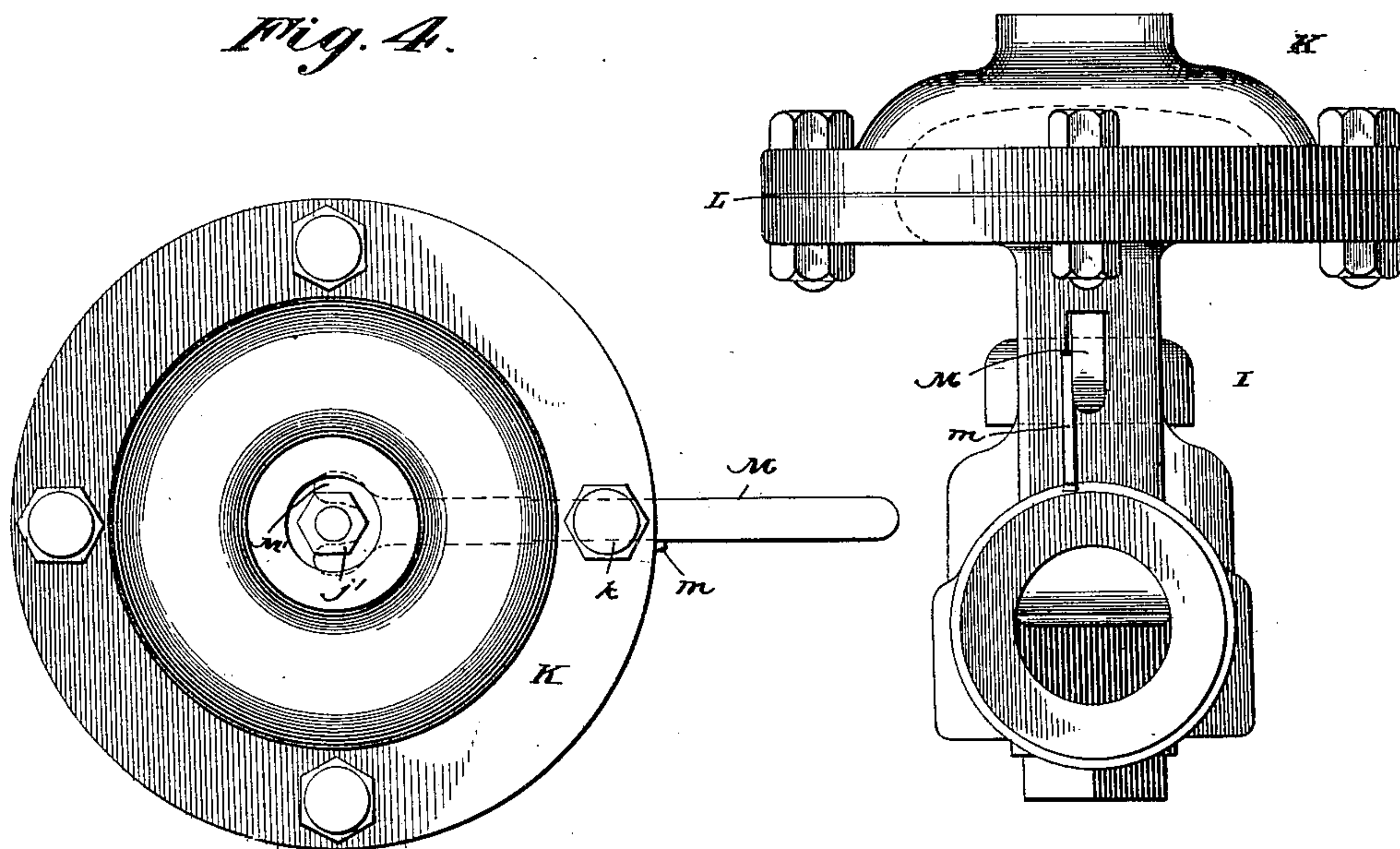


Fig. 2.



Witnesses
Edw. C. Durall Jr.
John A. Saul.

Inventor
John V. Rice Jr.
per Fred E. Wasker.
Attorney

UNITED STATES PATENT OFFICE.

JOHN V. RICE, JR., OF EDGEWATER PARK, NEW JERSEY, ASSIGNOR TO THE
JOHN V. RICE, JUNIOR, COMPANY, OF SAME PLACE.

SAFETY DEVICE FOR NAPHTHA-RETORTS.

SPECIFICATION forming part of Letters Patent No. 624,094, dated May 2, 1899.

Application filed April 7, 1898. Serial No. 676,795. (No model.)

To all whom it may concern:

Be it known that I, JOHN V. RICE, Jr., a citizen of the United States, residing at Edgewater Park, in the county of Burlington and State of New Jersey, have invented certain new and useful Improvements in Safety Devices for Naphtha-Retorts; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention has reference to an improved automatic hydrocarbon-generator in which a liquefiable gas is used expansively, then condensed, then returned, and by heating again converted into gas, and thus used over and over again without loss of the fluid. The fluid employed is naphtha, sulfid of carbon, or some other similar substance.

My present improvements relate more particularly to a safety mechanism or appliance whereby the supply of the coal-oil or other liquid fuel is regulated for the purpose of preventing accidents, which in the absence of a safety device of this kind might take place on account of a burning out of the retort in consequence of a diminution of pressure therein resulting from a diminution or cessation of the naphtha-supply.

The object of the invention is to avoid danger by the provision of a simple and effective controlling device for the fuel-supply pipe, which device will be automatically operative.

The invention therefore consists, essentially, in the construction, arrangement, and combination of parts, substantially as will be hereinafter described and claimed.

In the annexed drawings, illustrating my invention, Figure 1 is a vertical sectional side elevation of my improved gas-retort or pressure-generator. Fig. 2 is an enlarged detail side elevation of the casing of the safety-valve. Fig. 3 is a similarly-enlarged vertical sectional view of said safety-valve. Fig. 4 is a top plan view of the same.

Similar letters of reference designate corresponding parts throughout the different figures of the drawings.

A denotes the combustion-chamber of my improved pressure-generator. This may be of any suitable size or shape and is preferably provided at its upper end with a smoke-outlet

a. In the example of the embodiment of the invention shown in the drawings I have also preferably constructed the combustion-chamber with double walls, as indicated in Fig. 1. The double walls may, if desired, be filled with asbestos, and the inner wall may also be lined on the inside with the same material. This is not essential, and a single wall may be used instead, if desired.

Within the combustion-chamber A is situated the vertical cylindrical retort B, extending substantially from top to bottom of the combustion-chamber, there being sufficient room below the retort to suit the arrangement at that point of the burner mechanism. The retort B may be constructed in any desired manner, and I reserve the liberty of varying its construction as much as I may desire. The internal mechanism of the retort is preferably similar to that shown and described in my other pending application for Letters Patent, filed June 8, 1895, Serial No. 552,161.

E denotes a conduit or tube which leads from the retort to an engine or other mechanism where the gas generated in the retort is to be employed.

In the annular space between the retort B and the wall of the combustion-chamber A is arranged one or more pipe-coils C. Pipe-coil C connects to the retort, at the upper end of the latter, by means of the connection c, and at its lower end said pipe coil or coils connect with the hollow casting F below the retort by means of the branch pipes c' c'. The hollow casting F is entered by the naphtha-supply pipe f.

H denotes the burner proper, which is supplied with coal-oil or other liquid fuel by means of the supply-pipe H', which is provided with the valve H². It is unnecessary to explain these parts more particularly or definitely in this case, inasmuch as they have been fully described and set forth in my other pending application for Letters Patent, and I will therefore proceed to describe now in detail the specific mechanism to be covered by the present application.

From the upper end of the pressure-generator B there leads a pipe G, which extends downwardly to a point near the burner supply-pipe H'.

I denotes a valve-casing with which the

pipe G connects and which is likewise entered by the fuel-supply pipe H'. Within the casing I is a valve J, which controls the passage through the supply-pipe H' and is adapted to be closed upon or removed from a seat J'. This valve J has a vertical valve-stem *j*, which works vertically through suitable bearings provided in the casing which forms a part of the casing I. The upper part of casing I is closed by means of a cover-plate K, which is secured upon the casing I by means of bolts and nuts *k k*. Between the cover-plate K and the casing I is interposed the horizontal flexible diaphragm L, which is preferably somewhat corrugated in order to increase its flexibility, and to the center point of diaphragm L is connected the upper end of the stem *j*, there being a nut *j'* on the screw-threaded extremity of the valve-rod *j*, whereby a tight connection is made between the rod and the diaphragm L. The pipe G, that contains gas under the pressure from which it comes from the top of the retort, enters the central point of the cover K, and consequently delivers gas at a high, low, or medium pressure below the cover K and upon the diaphragm L. The yielding character of the diaphragm L permits the valve J to be removed from its seat or replaced thereon in consequence of the variations of pressure upon said diaphragm.

M designates a pivoted lever whose fulcrum is on the wall of the casing I and which has a forked end M', that embraces the stem *j* at a point a short distance below the diaphragm L and between the two collars *n n*, that are fixed on the valve-stem *j*. The portion of the lever M on that side of the fulcrum that is opposite the valve-stem *j* is preferably made heavy, so as to possess some considerable weight, and it is provided with the pivoted brace or prop *m*, which is adapted to engage with its lower end a notch in the casing I, as shown in Fig. 3, so that the weighted lever may thereby be held propped up when desired. When the weighted lever is so propped up, the valve J will be depressed away from its seat and will consequently be open. When it is not propped up as stated, then the valve J will be opened or closed, accordingly as the gas-pressure on the diaphragm L may be great or small.

The operation of my safety device is therefore as follows: The operator will first lift the lever M and cause the arm *m* to rest in engagement with the notch therefor provided, as already described, the result of which will be to place the valve J in an open condition, although not fully open, only partially so, perhaps, so that the liquid fuel can flow through the pipe H' to the burner H. When the pressure within the retort B increases sufficiently to act forcibly against the diaphragm L, it will depress the latter, and a very slight deflection of said diaphragm below its normally horizontal position will be sufficient to disengage the arm *m* from the valve-casing, and the result will be that thereafter the valve

J will be controlled by the variation of pressure on the diaphragm. When the pressure is considerable, the valve will of course be open, and oil fuel will be supplied to the burner. When the pressure is slight, there being but little gas generated on account of a deficiency in the naphtha-supply, then the valve will be closed, or nearly so, and hence the flame will be cut off or diminished at just the time when to leave it at its full power would probably be to burn out and greatly damage the retort. In this way, therefore, the retort is protected. The diminution of pressure on the diaphragm allows the flexibility of the latter to restore it to its normally horizontal position, or nearly so, according to the degree of pressure, and in this movement the diaphragm is assisted by the weighted lever.

Many minor changes may be made in the precise details and exact arrangement of the various parts of my invention herein illustrated and described, and I do not intend to be in any way restricted to these specific embodiments of the invention as herein given, the same being presented merely for illustrative purposes.

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

1. In a safety device, the combination with a retort, of a fuel-supply pipe leading thereto, a pipe leading from the retort and containing the same pressure as said retort, a safety-valve in the fuel-supply pipe and controlling the passage of fuel through said pipe, a stem on said valve, a diaphragm exposed to the pressure within the pressure-containing pipe, to which diaphragm the valve-stem is attached, a lever pivoted on the valve-casing and having one end engaging the valve-stem, and an automatically-disengageable detent pivoted to the other part of said lever and acting to temporarily keep the valve open, substantially as described.

2. In a safety device, the combination with the fuel-supply pipe, a retort, and a pipe leading from the retort and containing the same pressure as said retort, of a safety-valve in the fuel-supply pipe, a casing for said valve, a diaphragm exposed to the pressure within the pressure-containing pipe, to which diaphragm the valve-stem is attached, a lever pivoted on the valve-casing and having one end loosely connected to the valve-stem below the diaphragm, and the depending prop pivoted to the outer portion of the lever and adapted to engage the valve-casing for temporarily upholding the outer end of the lever and keeping the valve open, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN V. RICE, JR.

Witnesses:

JOSHUA TAYLOR,
HENRY B. FORT.