

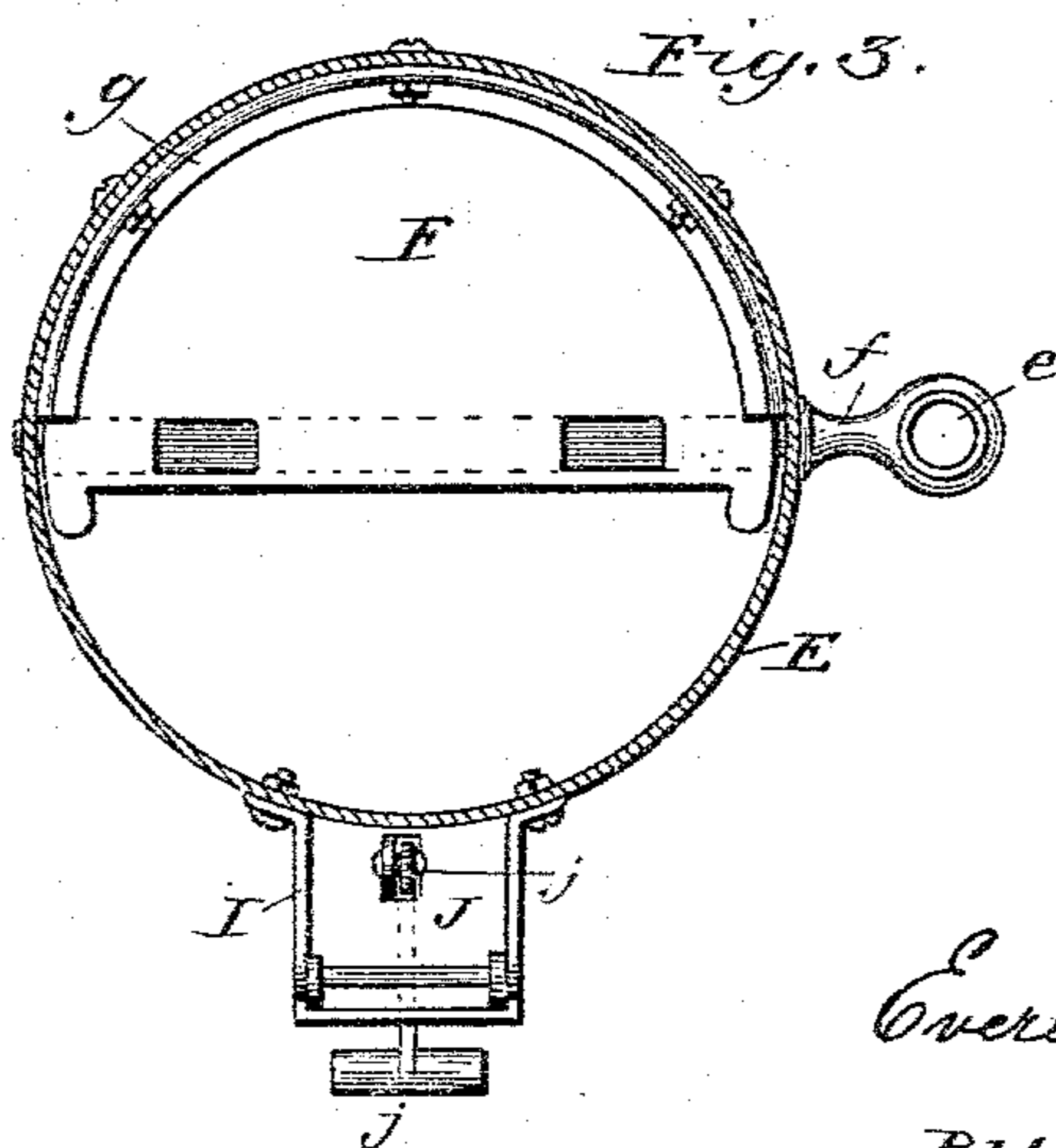
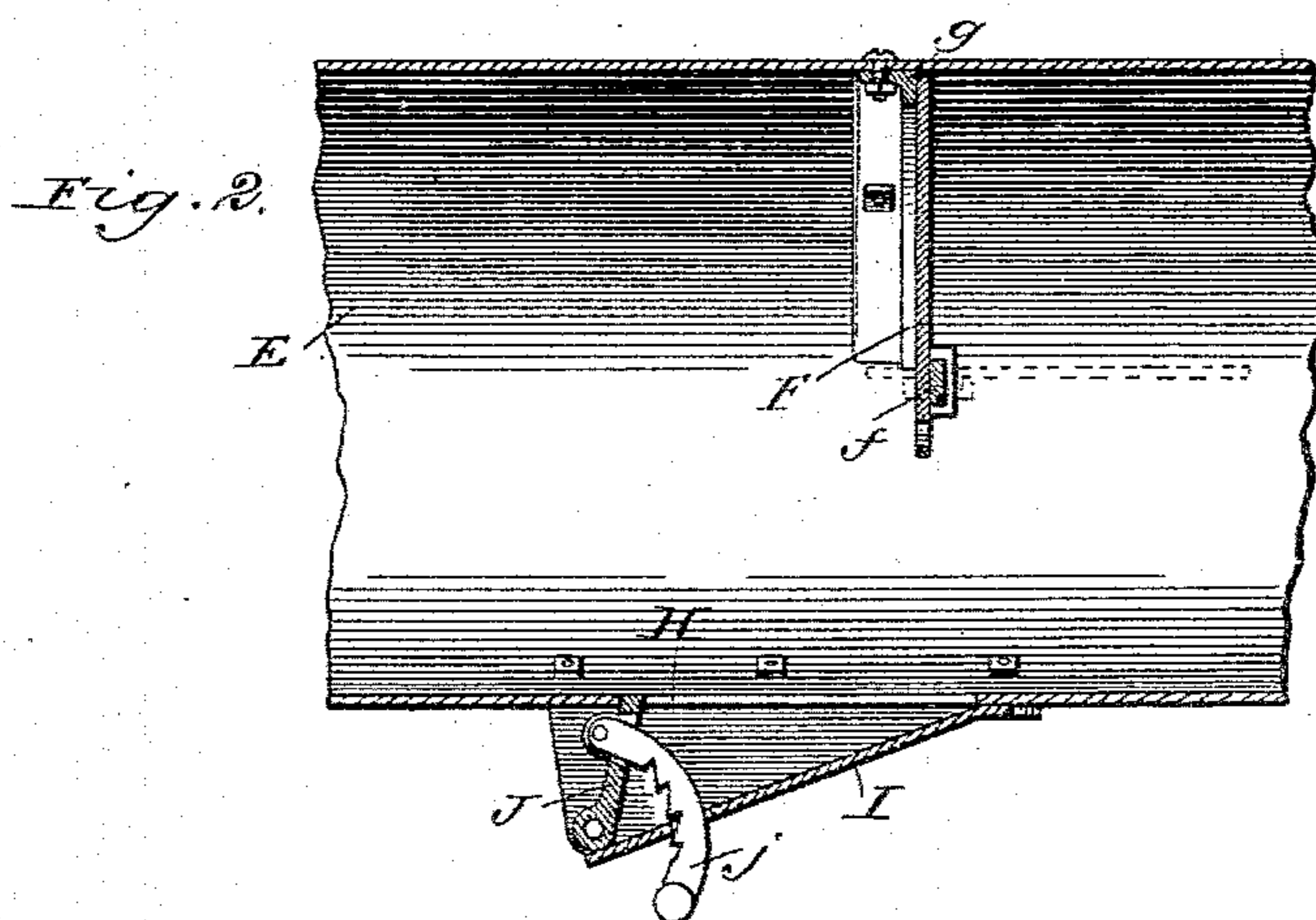
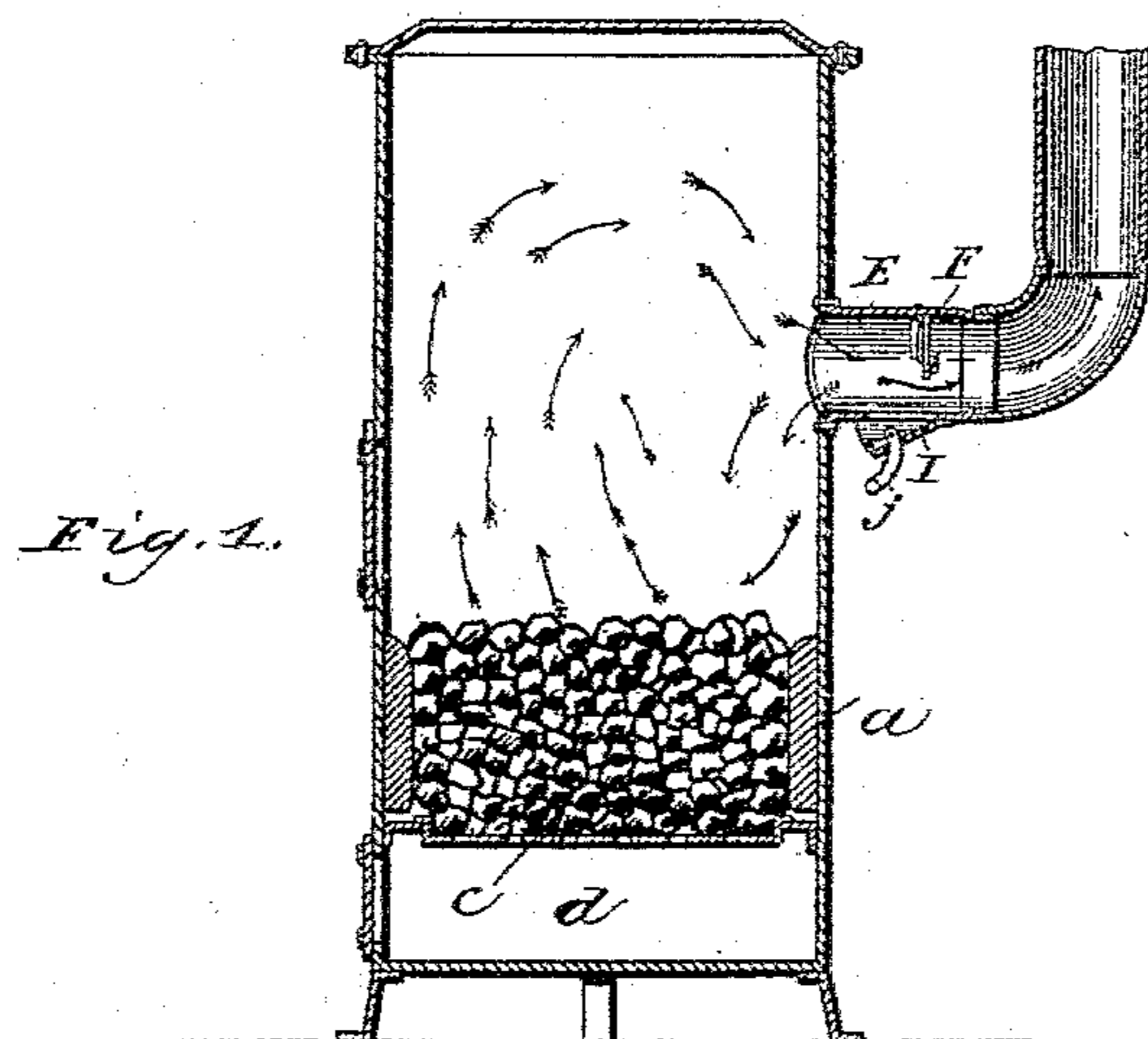
(No Model.)

E. R. HOWARD.

SMOKE AND GAS CONSUMING ATTACHMENT FOR STOVES OR FURNACES.

No. 356,837.

Patented Feb. 1, 1887.



Witnesses.
W. Rossiter.
Otho Luckert.

Inventor,
Everett R. Howard
By, Wm H Lotz
Atty.

UNITED STATES PATENT OFFICE.

EVERETT R. HOWARD, OF AURORA, ILLINOIS, ASSIGNOR OF ONE-HALF TO
ROSWELL W. GATES, OF SAME PLACE.

SMOKE AND GAS CONSUMING ATTACHMENT FOR STOVES OR FURNACES.

SPECIFICATION forming part of Letters Patent No. 356,837, dated February 1, 1887.

Application filed June 15, 1886. Serial No. 205,277. (No model.)

To all whom it may concern:

Be it known that I, EVERETT R. HOWARD, a citizen of the United States of America, residing at Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Smoke and Gas Consuming Attachments for Stoves or Furnaces, of which the following is a specification, reference being had therein to the accompanying drawings.

The nature of my invention relates to attachments to stoves or furnaces with the object in view of consuming the smoke and gases generated from the combustion of the fuel upon the grate; and it consists of the novel devices and combinations of devices hereinafter described and specifically claimed.

In the accompanying drawings, Figure 1 represents a vertical section of an ordinary stove having my attachment, and Figs. 2 and 3 longitudinal and transverse sections of such part of the stove or pipe more particularly pertaining to the improvements.

Corresponding letters in the several figures of the drawings designate like parts.

A denotes a stove of any usual construction, in which *a* is the fire-pot; *b*, the fuel-door; *c*, the grate; *d*, the ash-pit, and *E* the smoke or gas escape nozzle or pipe leading to the chimney. Inside of this smoke nozzle or pipe *E* is placed a partial partition or diaphragm, *F*, closing about one-half of such nozzle or pipe, and being secured upon a pivotal stem, *f*, projected through the walls of the nozzle or pipe and provided at one end with a T-handle, *e*, by which to be rotated a quarter of a revolution. This partial partition or diaphragm is to be placed perpendicularly in a horizontal nozzle or pipe or horizontally in a vertical pipe, and is shouldered against a semicircular flange, *g*, fixed into such pipe or nozzle.

H is an opening in the nozzle or pipe located opposite, or nearly so, to the partition or diaphragm *F*, for the admission of atmospheric air, which opening is to be provided with a suitable valve for adjusting its size or for closing such opening entirely, and such valve may be of any well-known construction; or, as shown in the drawings, the opening *H* may be inclosed in an angular casing, *I*, having an opening in its end, so as to form an angular

channel that leads into opening *H*, and this casing *I* may be provided with a pivotal valve, *J*, that again has pivotally secured a curved arm, *j*, passed through a slot of casing *I* and having notches for holding such valve *J* on any desired position which will admit the requisite amount of atmospheric air.

While a fire is being started upon the grate the partition or diaphragm *F* is turned to leave the full opening of the nozzle or pipe and the valve *J* is closed, so that a strong draft is produced; but as soon as such fire has been sufficiently started the partition or diaphragm *F* is turned against flange *g*, and at the same time the fuel and ash-pit doors, as well as all air-inlet openings in or around such doors, are closed, so that very little or no air is admitted to the burning fuel from below the grate or at the fuel-door. The valve *J* now being opened to admit atmospheric air through opening *H*, the partial vacuum created in the interior of the stove over grate *c* by the combustion of the fuel and the highly-heated hydrocarbon and carbonic-oxide gases generated from the fuel rising into the chamber above, in the direction of the arrows, cold air will be drawn in through opening *H* underneath such heated gases in a counter-current, to supply the partial vacuum thus produced; but such air being cold and heavier than the gases, it is not in a condition to intermingle with the gases, but will pass along below the gases toward the fuel until the air is heated to the proper degree, when the oxygen of the atmospheric air will mix and unite with the heated gases, making them highly combustible and causing them to burst into flame. This process will now continue until the fuel on the grate is nearly consumed, or until combustible gases cease to be generated therefrom. In this manner no gases or smoke can leave the fuel-chamber and pass the pending partition or diaphragm *F* without utilizing fully their combustible qualities, and the carbon gases, that by condensation forms soot on the walls of the pipe and chimney, are entirely consumed, and therefore a great saving of fuel is the result of my device and arrangement.

What I claim is—

1. As an attachment to stoves and furnaces, the gas and smoke exit flue *E*, provided with

an air-opening, H, in combination with a pivotal diaphragm, F, closing about one-half of the area of such flue, and being in line with and in the side opposite to air-opening H, all
5 substantially as and for the purpose set forth.

2. As an attachment to stoves and furnaces, the gas and smoke exit flue E, provided with air-opening H, and with a suitable valve for regulating such opening, in combination with

the pivotal semi-partition F opposite and in line with air-opening H, all substantially as and for the purpose set forth.

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

EVERETT R. HOWARD.

Witnesses:

LYMAN BALDWIN,
GEO. S. MCCOLLUM.