

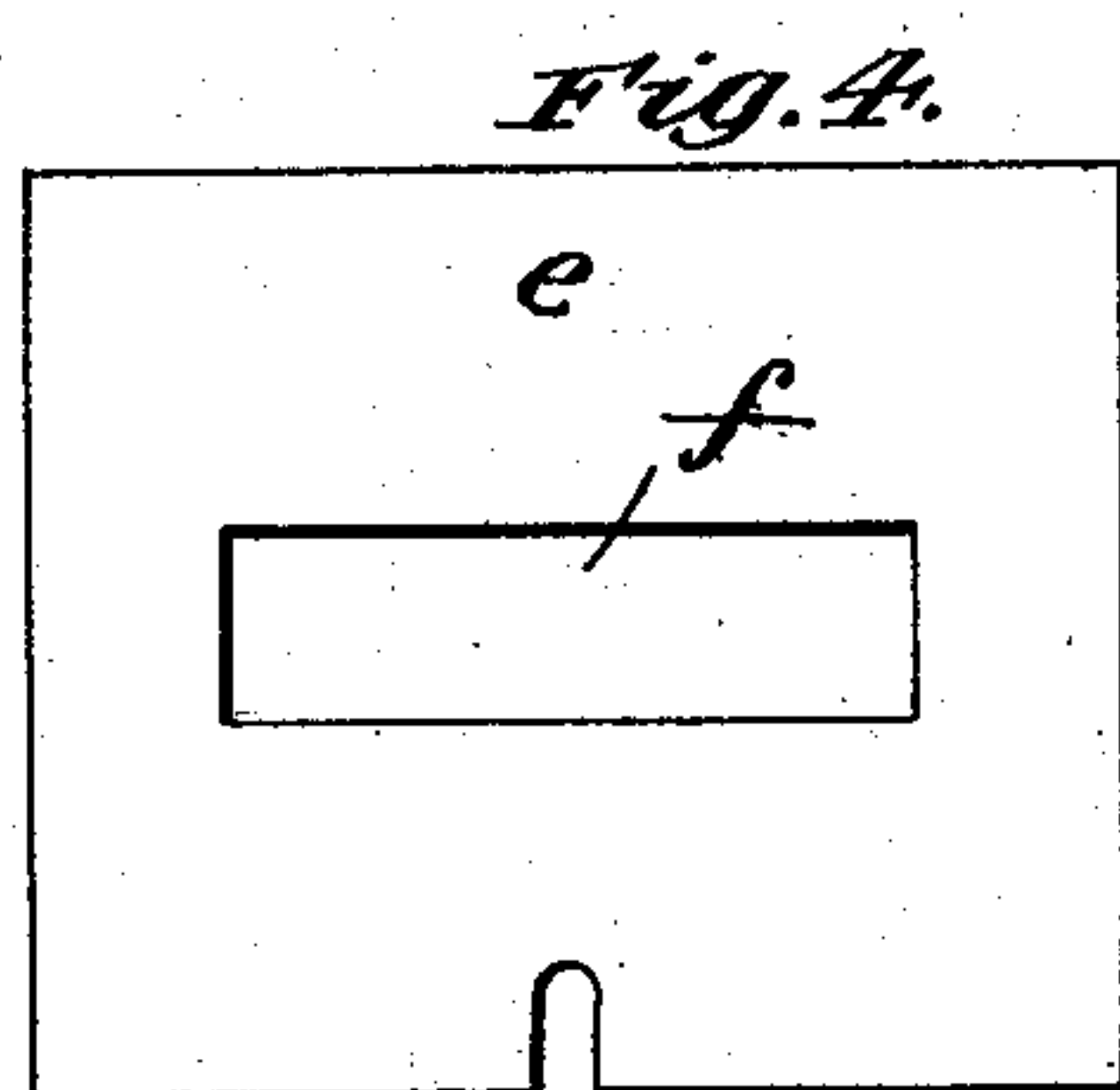
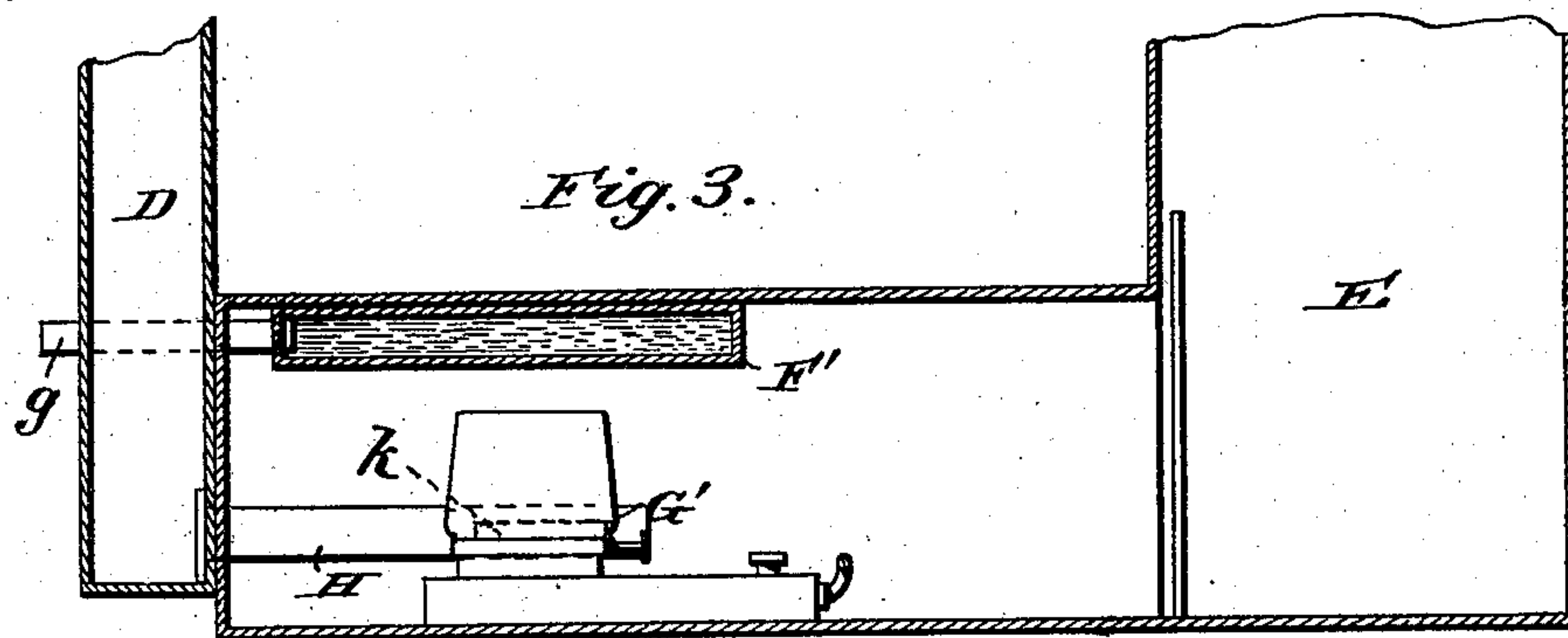
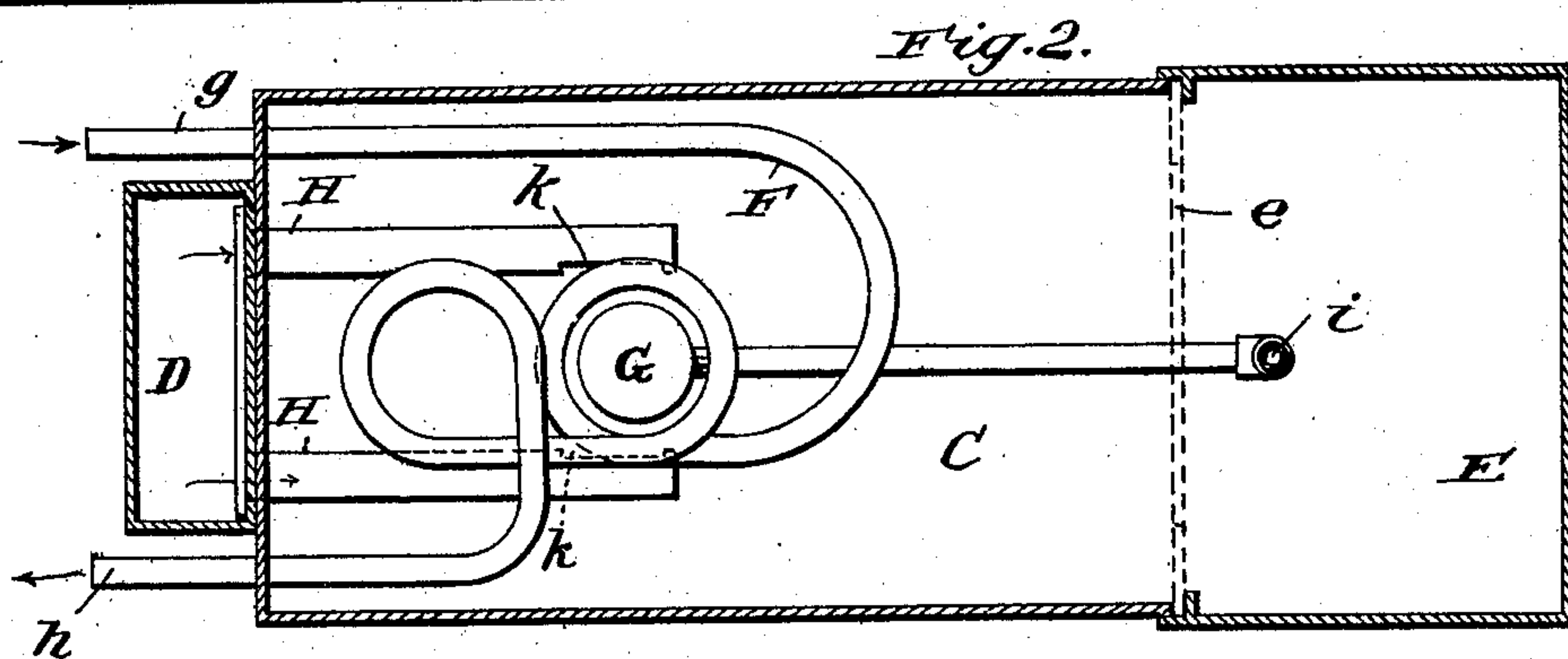
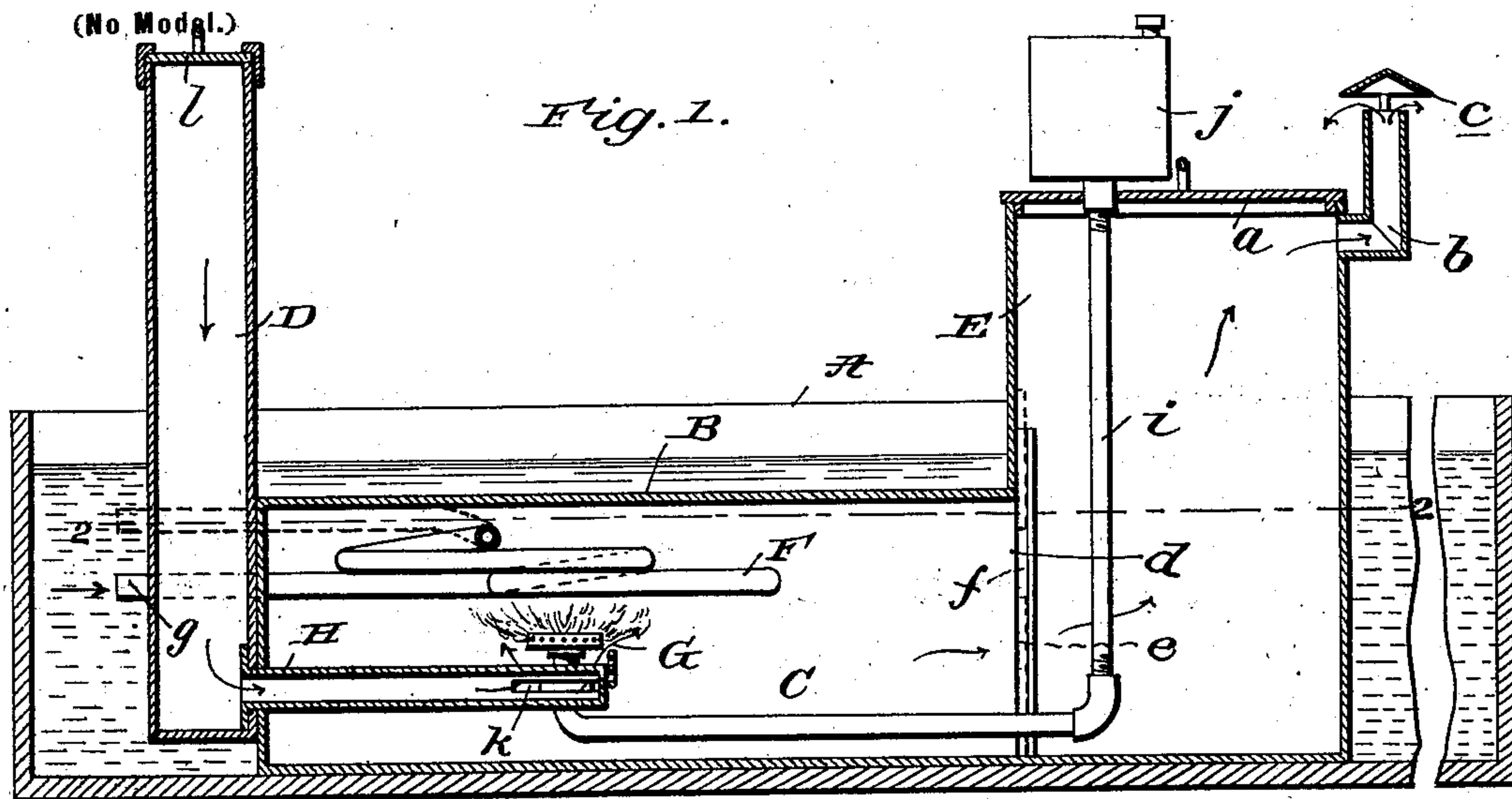
No. 700,294.

Patented May 20, 1902.

H. H. BEERS & A. L. GRIFFIN.

TANK HEATER.

(Application filed Feb. 17, 1902.)



Witnesses
E. J. Baeder
N. C. Healy

Inventors
H. H. Beers &
A. L. Griffin.
 By *James J. Sheehy* Attorney

UNITED STATES PATENT OFFICE.

HENRY H. BEERS, OF MIDDLEBURY, AND ARTHUR L. GRIFFIN, OF TOPEKA,
INDIANA.

TANK-HEATER.

SPECIFICATION forming part of Letters Patent No. 700,294, dated May 20, 1902.

Application filed February 17, 1902. Serial No. 94,490. (No model.)

To all whom it may concern:

Be it known that we, HENRY H. BEERS, residing at Middlebury, in the county of Elkhart, and ARTHUR L. GRIFFIN, residing at Topeka, in the county of Lagrange, State of Indiana, citizens of the United States, have invented new and useful Improvements in Tank-Heaters, of which the following is a specification.

Our invention relates to tank-heaters—i. e., devices for heating and preventing freezing of water in tanks; and it has for its general object to provide a tank-heater of such construction that the continuous supply of an ample quantity of fresh air to the burner is insured, with the result that a high heat is maintained and freezing of the water in the tank in which the heater is placed precluded.

With the foregoing in mind the invention will be fully understood from the following description and claims when taken in conjunction with the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of our improved heater in its proper operative position in a tank; Fig. 2, a horizontal section taken in the plane indicated by the line 2 2 of Fig. 1; Fig. 3, a detail longitudinal section illustrating a modification, and Fig. 4 a perspective view of the damper employed by preference in both constructions removed.

Referring by letter to the said drawings, and more particularly to Figs. 1, 2, and 4 thereof, A is a water-tank of the ordinary or any other suitable construction, and B the body of our improved heater, which is designed to be placed on the bottom of the tank and in the water contained therein after the manner shown in Fig. 1. The heater-body B is preferably of sheet metal and comprises a combustion-chamber C, an air-inlet flue D, rising from one end of the chamber and designed to extend above the surface of the water in the tank, and an air-outlet flue rising from the opposite end of the chamber C and likewise designed to extend above the surface of the water in the tank.

The flue E is preferably larger in cross-section than the flue D in about the proportion

shown in order to increase the strength of the draft of air through the combustion-chamber C and is provided at its upper end with a preferably removable cover *a* and adjacent to its upper end with an uptake *b*, having a cap *c*. Said flue E is connected with one end of the combustion-chamber C by an opening *d*, which corresponds in width and height with the combustion-chamber. This opening *d* in the preferred embodiment of the invention is normally occupied by a vertically-movable damper *e*, Figs. 1 and 4, having an opening *f* preferably disposed in a plane above that of the burner, presently described, and designed for the escape of products of combustion from the chamber C.

F is a worm or coil of pipe disposed in the combustion-chamber C and having arms *g* *h* extending through one end wall thereof. The arm *g* is designed to receive water from the tank, while the arm *h*, which is preferably disposed in a plane above that of the arm *g*, has for its purpose to convey the water from the worm or coil back into the tank.

G is a burner disposed in the chamber C below the worm or coil F and connected by a pipe *i* with a tank *j*, disposed above the cover *a*. The said burner is designed to be lighted and introduced to its position in the chamber C through the flue E and the opening *d*. It is obvious, however, that said burner might be permanently secured in the chamber C and lighted and extinguished by any suitable means without departing from the scope of our invention.

In the preferred embodiment of the invention the interiors of the flue D and combustion-chamber C are connected by horizontally-disposed flues H. These extend from the flue D to points at opposite sides of and in the same transverse vertical plane as the burner G and are provided in their inner sides at such points with discharge-apertures *k*. By virtue of this arrangement it will be observed that the tubes H will convey the fresh air to and discharge it below and at opposite sides of the burner, with the result that combustion of the hydrocarbon supplied to the burner will be thoroughly supported and a high degree of heat maintained. This, in conjunc-

tion with the circulation of water through the worm or coil F, will preclude freezing of the water in the tank A.

The air-inlet flue D is shown as provided with a slide-cap I; but this of course is opened to a greater or less extent when the heater is in use.

The modified construction shown in Fig. 3 is similar to that in Figs. 1 and 2, except that a shallow water-receptacle F' is employed in lieu of the worm or coil F, and lamps G', having burners and chimneys, are employed in lieu of the burner G. The receptacle F' of the modified construction is connected with the interior of the tank in the same manner as the worm or coil F, and consequently it will be observed that when the modified construction is in use freezing of the water in the tank will be prevented quite as effectually as when the construction shown in Figs. 1 and 2 is employed.

We have entered into a detailed description of the construction and relative arrangement of parts embraced in the present and preferred embodiments of our invention in order to impart a full, clear, and exact understanding of the same. We do not desire, however, to be understood as confining ourselves to such specific construction and arrangement of parts, as such changes or modifications may be made in practice as fairly fall within the scope of our claims.

Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In the tank-heater described, the combination with the body comprising the combustion-chamber, the air-inlet flue rising from one end of the combustion-chamber, the air-outlet flue of larger size in cross-section than the inlet-flue rising from the opposite end of the combustion-chamber and connected by the opening *d* with the interior thereof, and

the horizontal flues communicating with the air-inlet flue and extending therefrom into the combustion-chamber and having discharge-apertures in their inner sides adjacent to their free ends; of the water-receptacle disposed in the combustion-chamber, pipes leading from said receptacle through the body and designed for the passage of water to and from the receptacle, a burner disposed in the combustion-chamber, below the water-chamber and in a plane between the discharge-apertures of the horizontal air-supply tubes, and the damper normally occupying the opening *d* and having the aperture *f* in its upper portion.

2. In the tank-heater described, the combination with the body comprising the combustion-chamber, the air-outlet flue communicating with the interior of and rising from one end of the combustion-chamber, the air-inlet flue rising from the opposite end of the combustion-chamber, and the horizontal flues communicating with the air-inlet flue and extending therefrom into the combustion-chamber and having discharge-apertures in their inner sides adjacent to their free ends; of the water-receptacle disposed in the combustion-chamber, pipes leading from said receptacle through the body and designed for the passage of water to and from the receptacle, and a burner disposed in the combustion-chamber below the water-chamber and in a plane between the discharge-apertures of the horizontal flues.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

HENRY H. BEERS.
ARTHUR L. GRIFFIN.

Witnesses:

A. DE AHL,
B. F. DE AHL.