

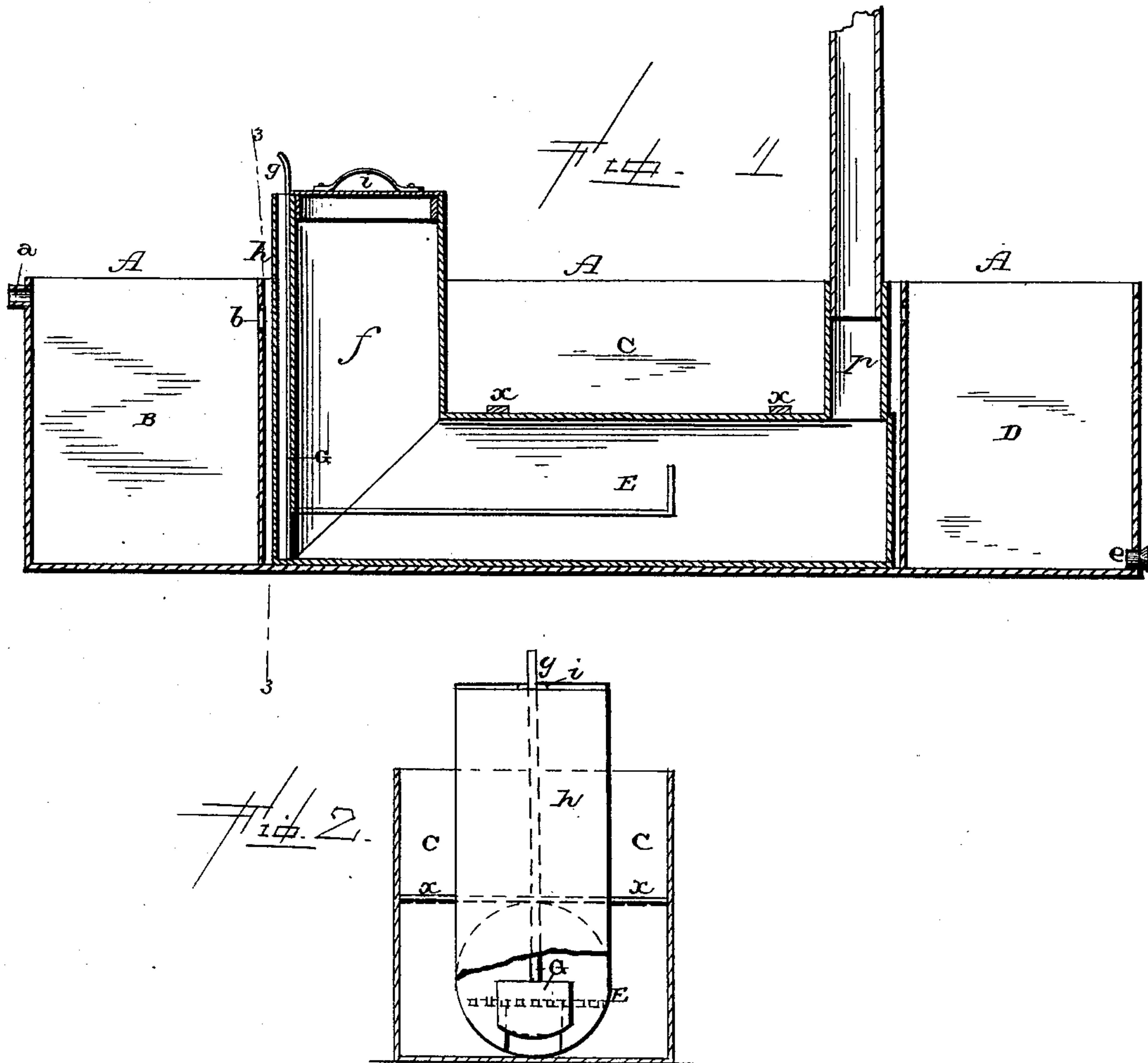
(No Model.)

J. F. FERGUSON.

WATER TROUGH WITH SUBMERGED HEATER.

No. 386,873.

Patented July 31, 1888.



Witnesses.

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UNITED STATES PATENT OFFICE.

JAMES F. FERGUSON, OF BURLINGTON, VERMONT.

WATER-TROUGH WITH SUBMERGED HEATER.

SPECIFICATION forming part of Letters Patent No. 386,873, dated July 31, 1888.

Application filed September 2, 1887. Serial No. 248,601. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. FERGUSON, a citizen of the United States, residing at Burlington, in the county of Chittenden and State of Vermont, have invented certain new and useful Improvements in Water-Troughs with Submerged Heaters, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in heating apparatus especially adapted to watering-troughs; and the objects of my improvements are, first, to provide a trough so arranged that stock shall be conveniently supplied with water whose temperature shall not fall below an average of 65° in the coldest weather, and, second, to afford facilities for the convenient heating of the water in the trough by means of a submerged heater, which can be easily and economically used. I attain these objects by means of the arrangement illustrated in the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of a trough which embodies my invention. Fig. 2 is a vertical cross section taken on the dotted line 3 3 of Fig. 1.

Similar letters refer to similar parts throughout the different views.

A is a water-trough of suitable size and shape constructed of wood or metal—preferably of galvanized iron. This trough I divide by partitions into two or more sections, the central division being designed to contain my heater. One of the end divisions, as B, is intended to receive the water, when three divisions are required, either through a pipe from a living spring, a reservoir, or a tank. It is provided with an outlet, *a*, at its top for purposes of overflow.

Near the top of the partition adjoining the central or heating division, C, is an opening, *b*, through which the water from the supply-section B readily passes and fills the section C. This opening is somewhat lower than the overflow *a*, to allow the division C to be filled before the water shall overflow from the division B.

A corresponding opening is placed near the top of the partition, which separates the central division, C, from the drinking-section D, at the other extremity of the trough, for the

purpose of supplying the latter section with water heated by the heater in the section C. In the outer end of the section D, near the bottom of the trough, is an outlet, *e*, for the purpose of emptying the section when desired. By this arrangement of adjoining sections and openings for the passage of water the drinking-section D is continually supplied with water from section B, the temperature of which has been modified, as desired, by the heater in the section C, through which section it flows into the drinking-section D, inasmuch as it runs through section C as rapidly only as it is taken by the animals from section D, the overflow *a* carrying off any excess of cold water in the supply-section.

If the water is supplied by pumping, it is evident that the water tank or reservoir which temporarily contains it may be so arranged as to empty directly into the division C, and thus perform the part of division B.

The apparatus which is employed to raise the temperature of the water consists of a metal pipe, E, preferably made of galvanized iron and of such length as will allow it to rest upon the bottom of the trough within the section C, where it is securely held in place by suitable cross-bars, *x*, or otherwise. One end of this pipe *f* is turned upward sufficiently high to extend above the top of the trough A when in position, its top being covered with a removable cap, *i*. On the outer side of the vertical end *f* is attached a smaller section or division, *h*, which extends to the bottom of the heater E, and communicates with the interior of the heater through an opening at the bottom controlled by the slide or damper G, which is operated vertically by means of the handle *g*, which extends to the top of the draft-passage *h*. At the other extremity of the heater E is a smoke-flue, *p*, which rises vertically to such height above the trough as may be found necessary. By this simple and effective arrangement the fuel—of whatever character used, whether it be charcoal, wood, or a kerosene-lamp—can be placed on a grating within the horizontal portion of the heater through the pipe *f* by removing the cap *i*; and when the fuel is ignited combustion is readily maintained by means of the current of air through the draft-passage *h*, and thence beneath the grating on which the fuel rests, the

passage *h* being always under control by means of the slide or valve *G*. The smoke passes out through the smoke flue or pipe *p*.

5 The apparatus being constructed of metal and made water tight, with only the openings in the top of the vertical pipes *f* and *p*, which project above the top of the trough, it is adapted to rest on the bottom of the trough within the section *C* below the water-supply opening
10 *b*, and therefore is at all times covered with the water which fills the section *C*. It cannot therefore be injured in any way by the fire within it, and it supplies with a minimum quantity of fuel all the heat required to warm
15 the water surrounding it to the degree required.

It is proposed to cover the sections *B* and *C*, so that the animal is unable to draw any water except from the drinking-section *D*,

which has passed from the supply-section *B* 20 slowly through the heating-section *C*, and fills the drinking-section only as fast as it becomes exhausted by the animal.

What I claim is—

The combination of a drinking-trough, *A*, 25 divided by perforated partitions into the compartments *B C D*, with a heater which is placed in the central compartment, *C*, and submerged in water, and from which compartment the heated water flows into the compartment *D*, 30 substantially as shown.

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

J. F. FERGUSON.

Witnesses:

E. W. HOPKINS,
CHARLES E. ALLEN.