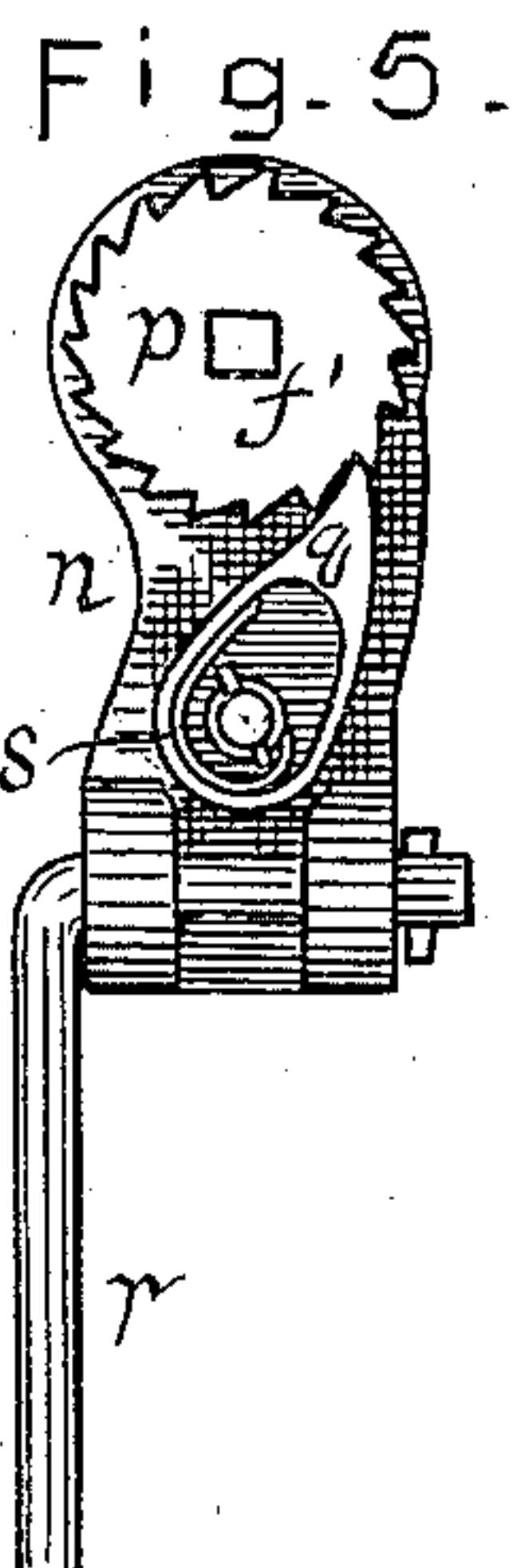
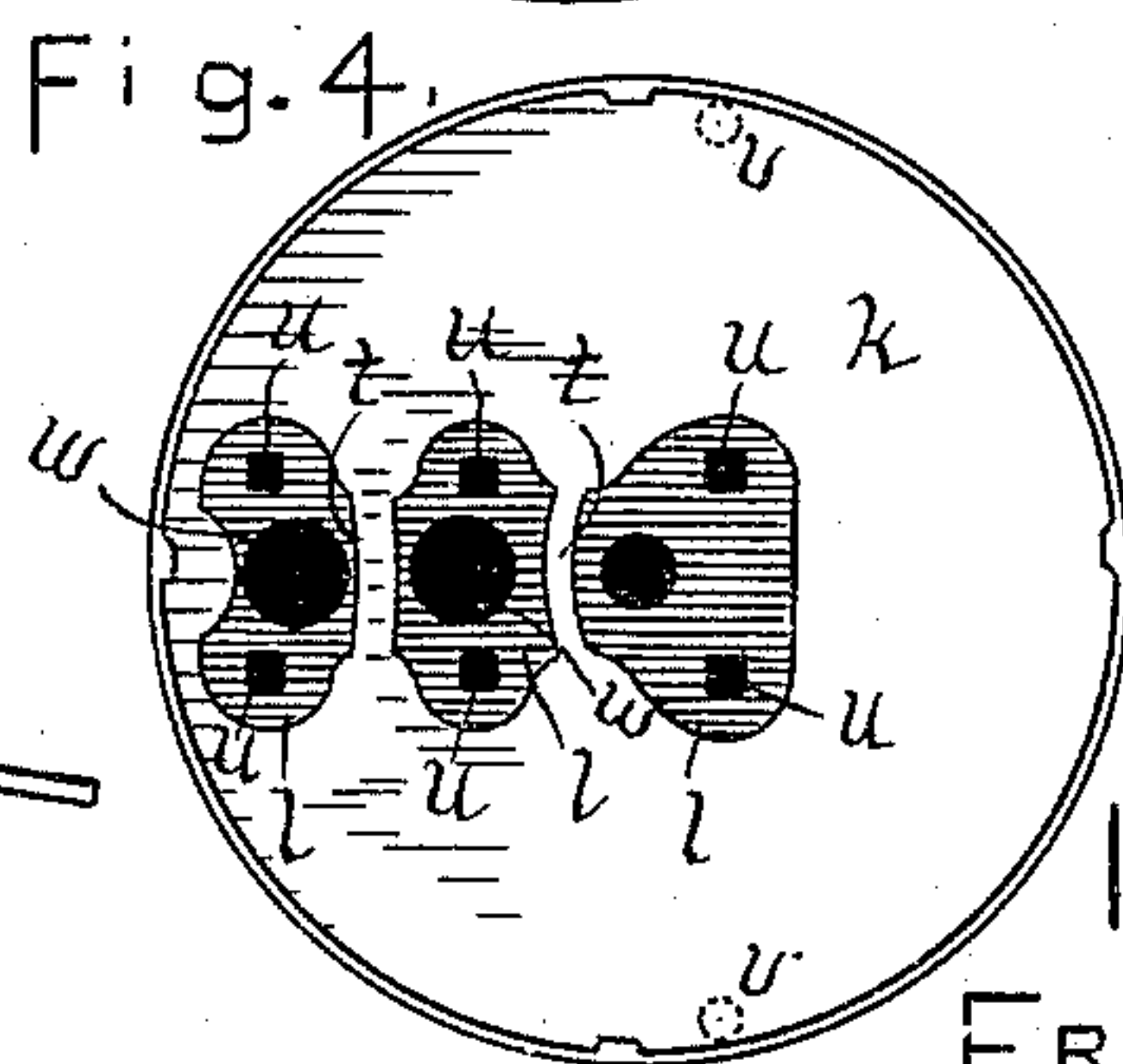
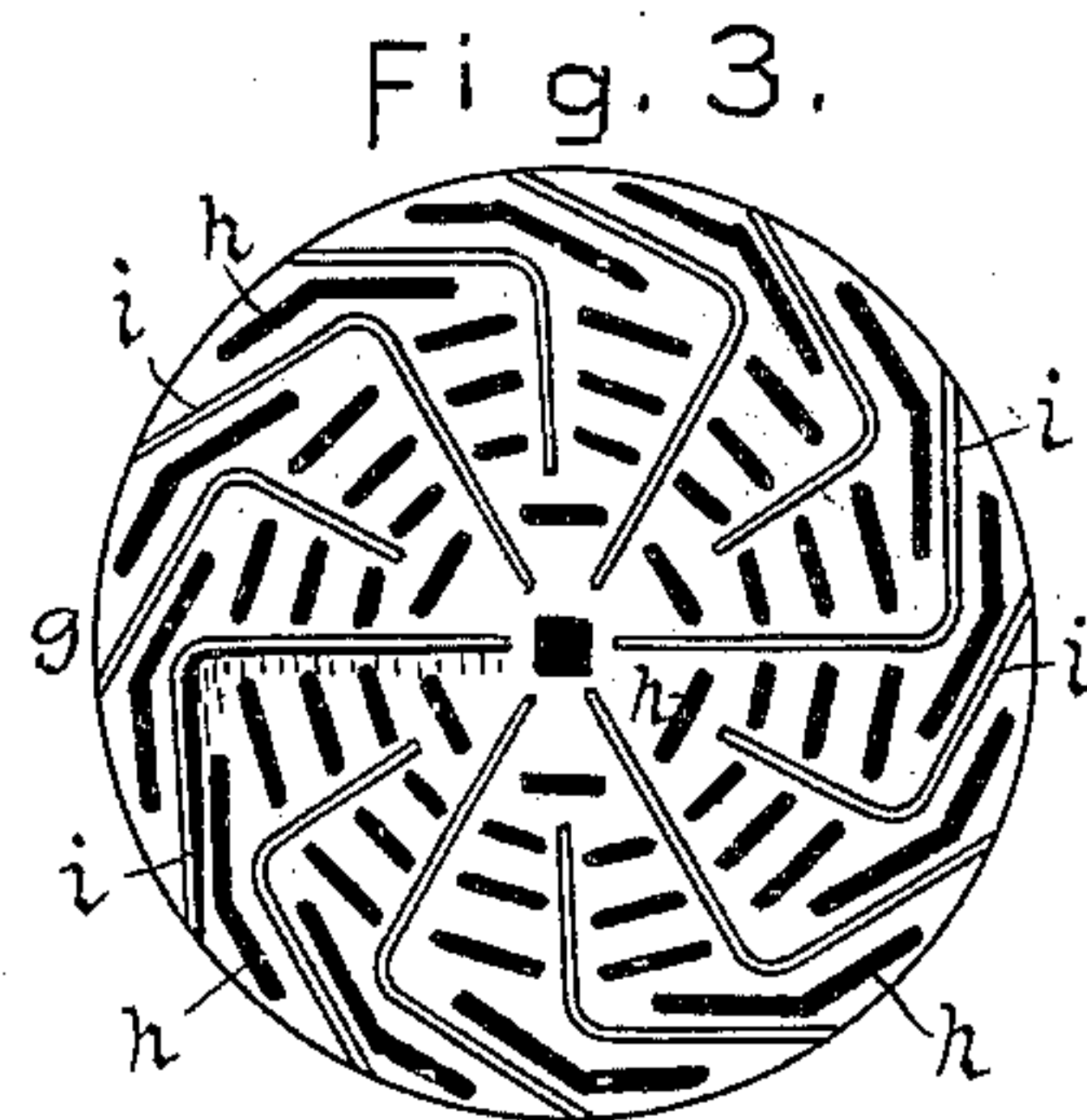
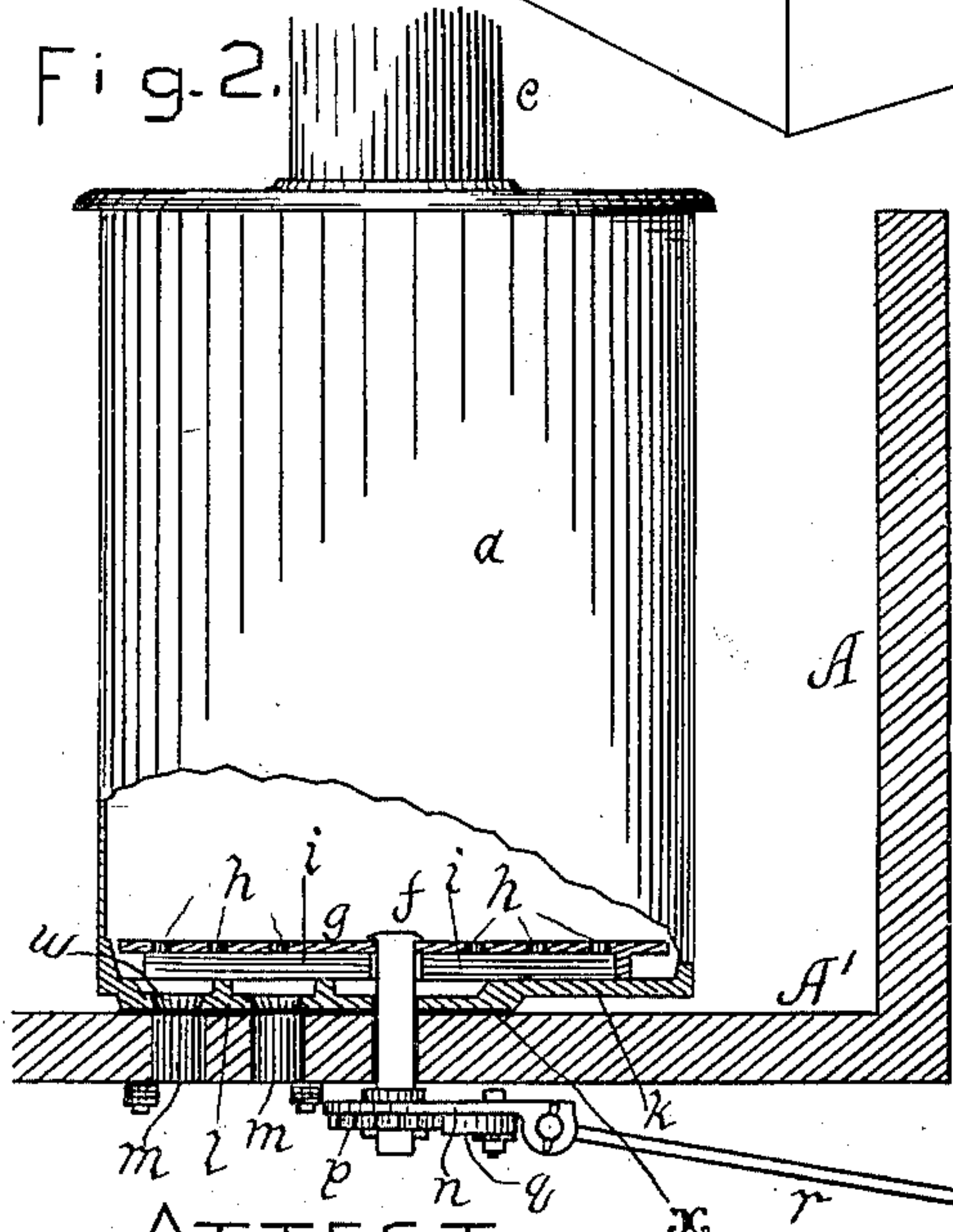
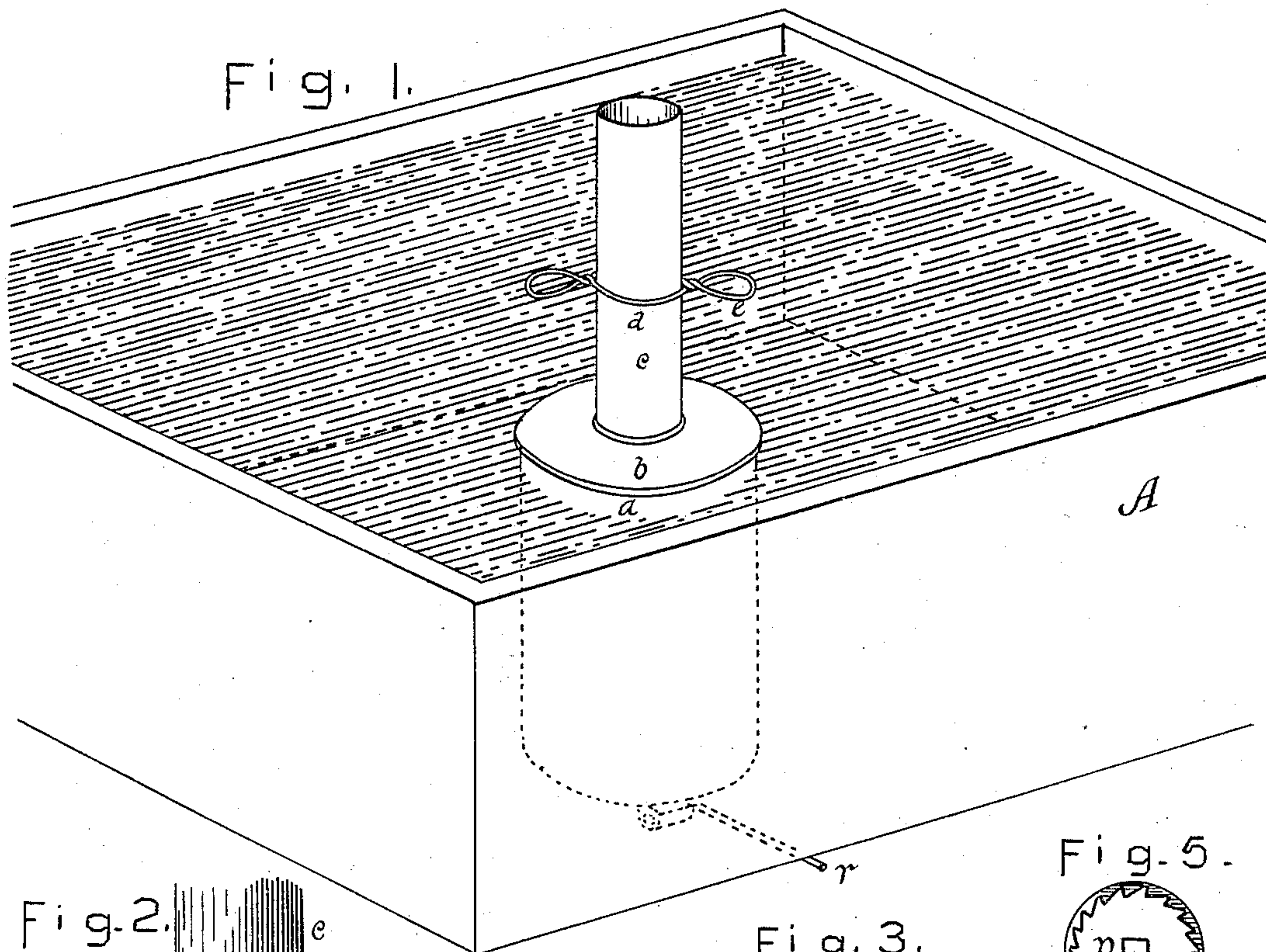


(No Model.)

F. FUNK.  
TANK HEATER.

No. 401,698.

Patented Apr. 16, 1889.



ATTEST

W. W. Graham  
Helen Graham

INVENTOR

By FRANK FUNK  
L. P. Graham  
his attorney.



# UNITED STATES PATENT OFFICE.

FRANK FUNK, OF DECATUR, ILLINOIS.

## TANK-HEATER.

SPECIFICATION forming part of Letters Patent No. 401,698, dated April 16, 1889.

Application filed July 6, 1888. Serial No. 279,202. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK FUNK, of the city of Decatur, county of Macon, and State of Illinois, have invented certain new and useful Improvements in Tank-Heaters, of which the following is a specification.

My invention is designed to prevent water from freezing in tanks or troughs where stock is watered; and it consists in certain details of construction and combinations of parts, as hereinafter set forth and claimed, whereby the fire may be continuously maintained.

In the drawings accompanying and forming a part of this specification, Figure 1 represents my device in perspective. Fig. 2 shows the same in elevation with the lower portion broken away to expose in central cross-section the grate and bottom of the heater in their relation to the bottom of the tank, also shown in cross-section. Fig. 3 is a plan of the bottom or under side of the grate. Fig. 4 is a plan of the upper side of the bottom of the heater. Fig. 5 is a plan of the under side of the grate-actuating device.

The tank A has the bottom A'. The heater a is slightly higher than the tank and preferably cylindrical. The lid b is removable. The pipe c is fixed to the lid and has handles e, formed, preferably, of the encircling band d. The bottom k of the heater has a depression, l, that rests on the bottom of the tank. Bolts passed through holes u secure the heater to the tank, and interposed packing x makes the joint water-tight. Holes w in the bottom of the heater and coinciding holes m in the bottom of the tank provide air-inlets and ash-discharge vents. The grate g has slots h and downwardly-projecting ribs i. The ribs i extend radially from the center of the grate and deflect in the same direction near the periphery of the same. A square shaft, f, carries the grate and extends loosely through the heater and tank. On the lower end of the shaft is a ratchet-wheel, p. Loosely mounted on the hub of the ratchet-wheel is a plate, n, that carries a pawl, q. A lever, r, connects pivotally with plate n, and provides readily accessible means for oscillating the same. The spring s (shown in Fig. 5) holds pawl q in contact with the ratchet-wheel. The ribs of the grate rest on the bottom of the heater, and ledges t (shown

in Fig. 4) traverse the depressions in the bottoms of large heaters to form continuous bearings for the ribs of the grates.

The depressed portion of the bottom of the heater is only large enough to provide for the holes w, the grate-shaft, and the securing-bolts, and the water passes freely under other parts of the heater. To insure stability of connection, bosses in plane with the depression l are placed as indicated by dotted lines at v in Fig. 4, and wedges may be placed under them to level the heater when the bottom of the tank is not true.

The lid of the heater is removed by means of handles e, and fuel is fed into the heater through the open top. Ashes are removed by shaking lever r, the reciprocating motion so developed being converted into intermittent rotary motion in one direction by means of the pawl and ratchet-wheel. The grate rotates in the direction that the outer ends of the ribs tend, and consequently the ashes are carried around and drawn inward to the discharge-vents.

By permitting water to pass under the heater to the greatest possible extent the bottom of the heater is kept cool, and the heat is utilized in the water.

Water-tanks for stock are easily built and in common use, and it is therefore desirable that heaters should be constructed separately and furnished in condition to be readily applied to the tanks; also, as it is necessary to heat the water during a portion of the year only it is desirable that the heaters should be connected with the tanks in a manner permitting their ready removal and replacement; also, when wet fuel was used the water would be retained and extinguish the fire. As I am able to keep up a continuous fire and to discharge ashes and water without disturbing the heater, I overcome the objections above named and enable the user to burn all kinds of fuel, wet or dry, and to make a slow fire burn brisk whenever desired.

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

1. In tank-heaters, in combination, a tank, a heater secured to the bottom of the tank, the heater and the tank having coincident openings, a grate in the heater having ribs on



its under surface, and a shaft for the grate extending through the heater and the tank, as and for the purpose set forth.

2. In tank-heaters, in combination, a tank, 5 a heater secured to the bottom of the tank, the heater and the tank having coincident openings, a grate in the heater having deflected ribs on its under surface, and means for rotating the grate, as and for the purpose 10 set forth.

3. In tank-heaters, in combination, a tank, a heater having a portion of its bottom depressed and secured to the bottom of the tank, coinciding vents in the depression of the bot- 15 tom of the heater and in the bottom of the tank, a grate in the heater, a shaft for the grate extending through the heater and through the tank, and a lever to actuate the shaft, as and for the purpose set forth.

20 4. In tank-heaters, in combination, a tank, a heater secured to the bottom of the tank,

the heater and the tank having coincident openings, a grate in the heater, a shaft for the grate extending through the heater and the tank, a ratchet-wheel on the lower end of the 25 shaft, and a lever carrying a pawl adapted to actuate the ratchet, as and for the purpose set forth.

5. In tank-heaters, in combination, a tank, a heater in the tank secured to the bottom 30 thereof, the heater and tank having coincident openings, a removable lid for the heater, a smoke-stack fixed to the lid and provided with handles, a grate in the heater, a shaft for the grate extended through the heater 35 and the tank, and means below the tank for rotating the shaft, as set forth.

FRANK FUNK.

Attest:

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