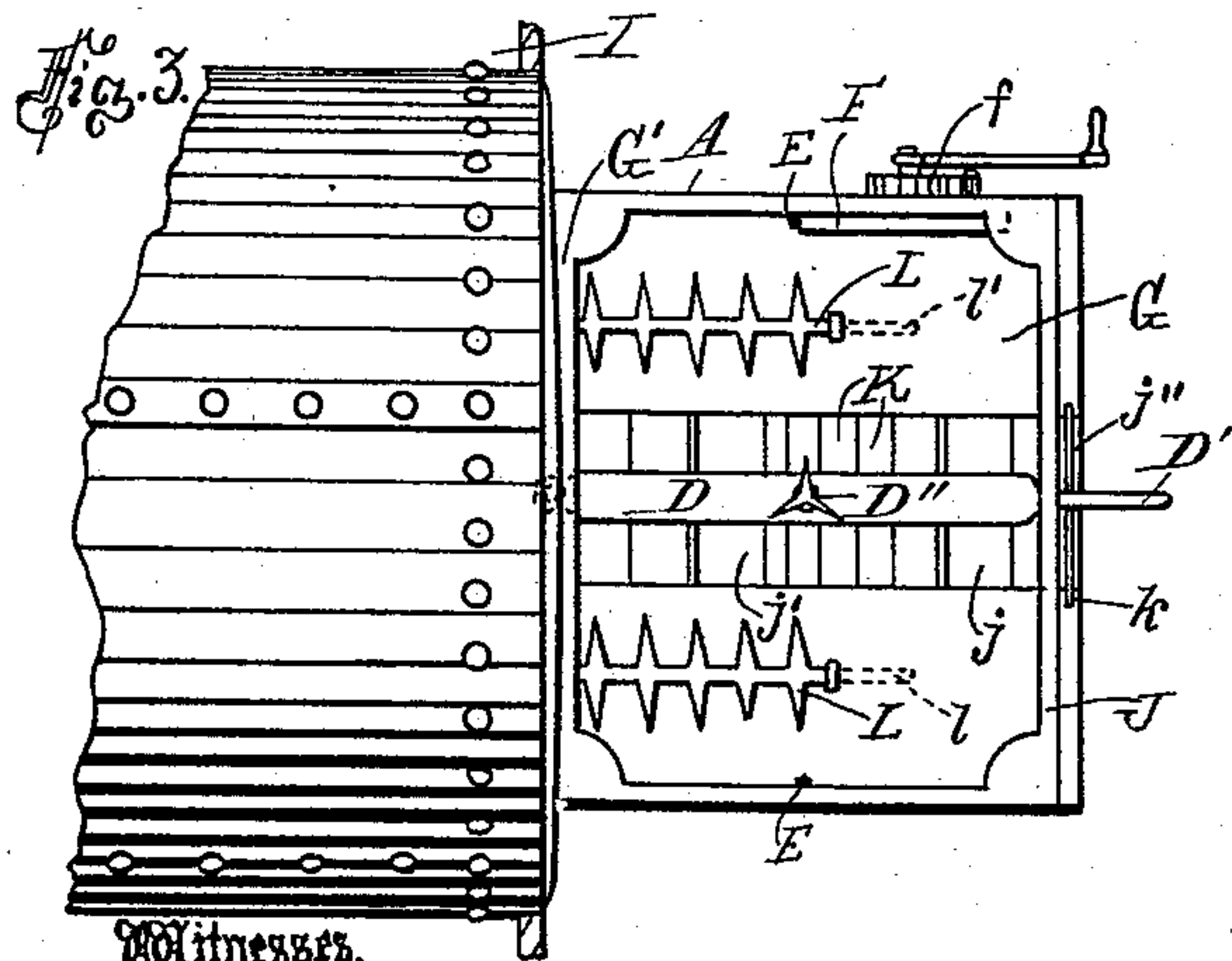
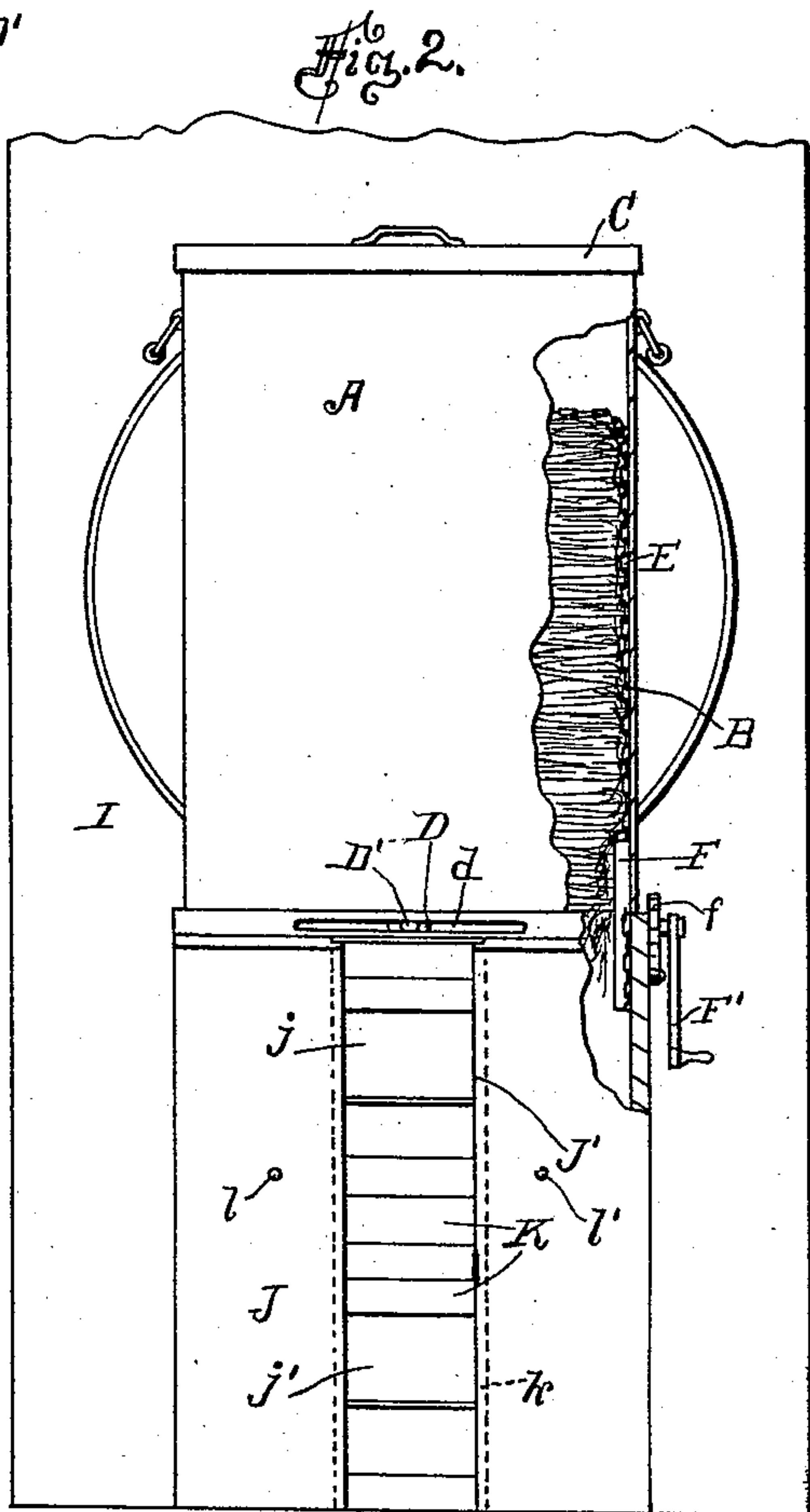
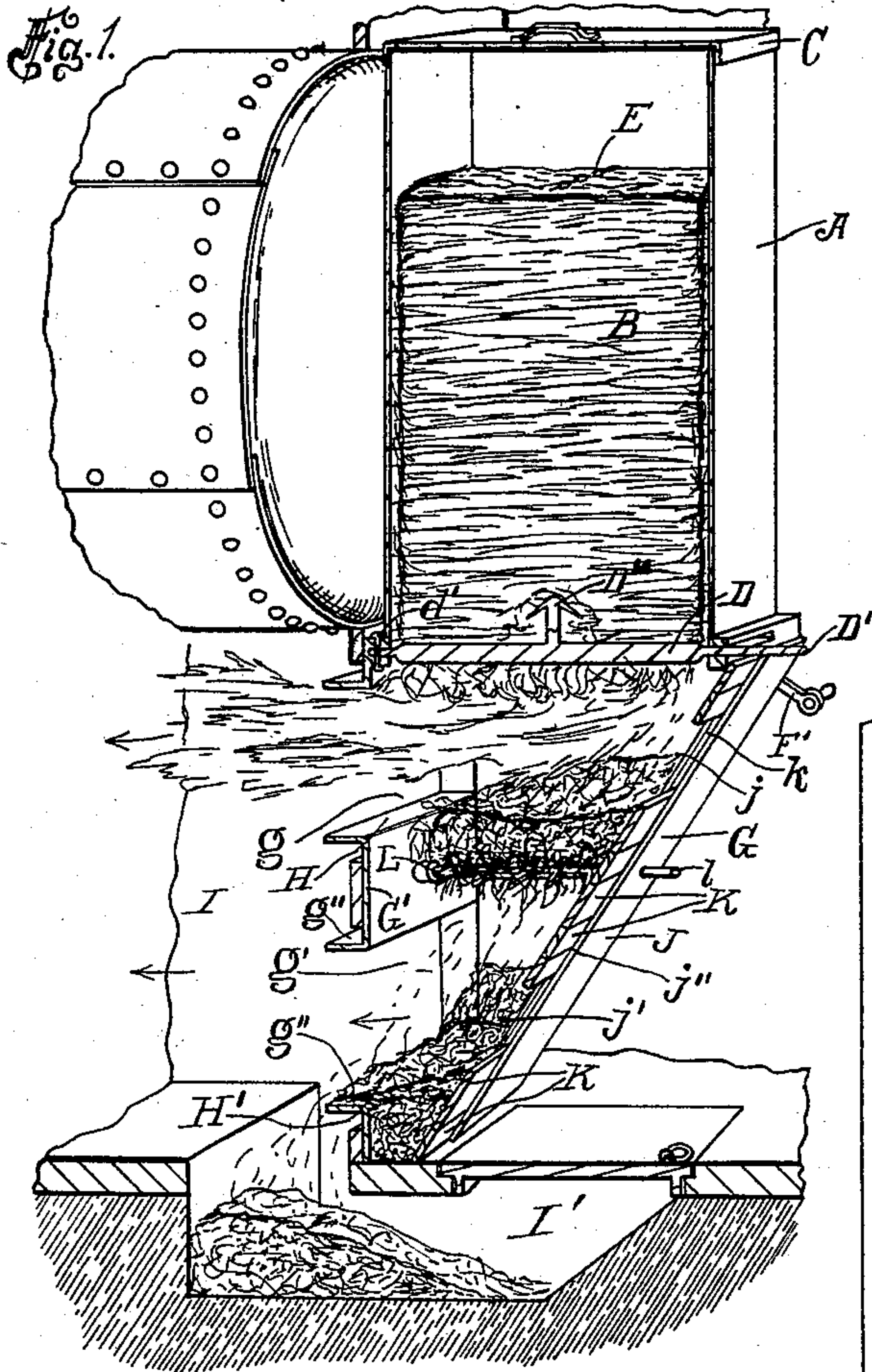


(No Model.)

F. GIRTANNER.
STRAW BURNER.

No. 533,886.

Patented Feb. 12, 1895.



Witnesses.

O. W. Harbison
H. M. Townsend.

Inventor.

Fred Girtanner

By

Hazard & Townsend,
His Attys.

UNITED STATES PATENT OFFICE.

FRED GIRTANNER, OF LOS ANGELES, CALIFORNIA.

STRAW-BURNER.

SPECIFICATION forming part of Letters Patent No. 533,886, dated February 12, 1895.

Application filed April 17, 1894. Serial No. 807,840. (No model.)

To all whom it may concern:

Be it known that I, FRED GIRTANNER, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Straw-Burners, of which the following is a specification.

My invention relates particularly to that class of appliances which are designed to utilize as fuel all kinds of straw or other loose fibrous material.

The principal difficulty with straw burners heretofore has arisen from the fact that straw produces a large quantity of charred and partially burned material which falls downward into the ash box and accumulates therein and is wasted. By my improved device I am enabled to consume all of this heretofore waste material and thus to utilize practically all the heat producing properties of the straw. This I accomplish by the peculiar arrangement of the combustion chamber. A further disadvantage has been that the operation of feeding the straw into the combustion chamber has been difficult of accomplishment. I entirely overcome this objection by my improved device.

The object of my invention is to provide a device of this class which shall be more economical and convenient in its use than any heretofore known.

The accompanying drawings illustrate my invention.

Figure 1 is a sectional fragmental perspective side elevation of my improved device arranged to heat a steam boiler. Fig. 2 is a front elevation of the same. Fig. 3 is a plan view of my device with the fuel magazine removed therefrom to expose the arrangement of parts.

In the drawings A represents the downwardly opening fuel magazine which is adapted to receive a bale B of straw or other material.

C is a cap which is arranged to close the top of this fuel magazine, or the magazine may be made integral at the top if desired. In any case the top should fit practically air tight in order to prevent a draft upward through the magazine which would cause the combustion of the material within the magazine.

D is a narrow horizontally movable bar which is provided with an upwardly projecting prong D'' and is arranged at the bottom of the magazine to support the main body of fuel therein; but leaving the bottom of the magazine open on each side of the bar to allow the fuel to feed downward. This bar is pivoted to the rear wall of the combustion chamber by a pivot d' and its front end is provided with a projecting handle D' and is adapted to slide horizontally back and forth in the slot d which is provided in the front wall of the combustion chamber.

E is a chain or other suitable flexible device which is attached near the bottom of one side of the magazine and is passed upward over and around the bale of material B, and has its other end attached to and wound upon a suitable drum F which is arranged at the bottom of the magazine and is journaled to revolve. A suitable crank F' is provided whereby the drum can be rotated to wind the chain and to draw the bale of fuel downward to cause it to feed into the combustion chamber. A ratchet f is arranged to prevent the drum from unwinding.

G is a downwardly converging combustion chamber, which as shown in the drawings, is provided with a substantially vertical rear wall G' which is provided with two draft openings g and g' which are arranged respectively to correspond to the fuel and ash door openings H and H' which lead into the furnace I. These openings g g', when the device is designed for an attachment to furnaces already constructed, are each preferably surrounded with an outwardly projecting neck or flange g'' which is adapted to project into its respective fire or ash door opening, whereby the draft is concentrated and caused to pass through such openings into the furnace and to also prevent the entrance of air into the furnace between the rear wall of the appliance and the wall of the furnace. The front wall J of this combustion chamber inclines downward toward the rear wall and is provided with two draft openings j and j' arranged respectively near the top and the bottom of such chamber. These draft openings are formed by providing an opening j'' extending from near the top of the front wall of the combustion chamber to near the bottom thereof. A series of slides

K of different widths are arranged to slide in the grooves *k* which are provided upon each side of the opening *J'* and to fit snugly therein so that they will retain their position by friction, so that by adjusting the slides the position of the draft openings *J*, and *J'*, can be regulated to suit the requirements of the fuel which is being burned. If an opening is too low, a slide can be pushed down to close such opening, thus leaving the draft opening in the place previously occupied by such slide. If the opening is too high the operation is reversed.

L L' are rotatable supporting bars which are arranged in the combustion chamber to support the fuel which drops from the bale *B* during the process of combustion and when the accumulation thereupon becomes too great, they may be partially rotated by means of the handles *l l'* thus to discharge the accumulation of partially burned fuel downward into the bottom of the combustion chamber.

The operation is as follows: The bale *B* is placed in the fuel magazine either by removing such magazine from the top of the combustion chamber and placing the bale therein, or by removing the top from the fuel magazine and placing the bale in from the top thereof. The chain *E* is passed around the bale and attached to the drum *F* and the cover *C* is then placed in position on the top of the magazine. The bale is then supported by the supporting bar *D*, and the bar is moved horizontally back and forth thus to allow a portion of the straw from the bale to hang down into the combustion chamber where it is then set on fire. The draft through the upper opening *j* drives the flame from the combustion chamber forward into the furnace *I* and the partially charred straw drops downward and lodges upon the supporting bars *L* and *L'* and accumulates thereupon. Whenever it is required to feed more fuel into the combustion chamber the bar *D* is moved back and forth horizontally. When the bar is moved to one side the unsupported straw drops downward into the combustion chamber, and by shifting the bar from side to side of the bale, the point of support is thus constantly changed so that the feeding is readily accomplished. The prong *D''* assists in loosening the straw, and materially assists in the feeding when the bale is tightly packed. If the bale *B* should not feed freely, the crank *F'* is rotated to wind upon the chain *E* and to draw the bale of fuel downward so that it will feed properly into the combustion chamber. The partially burned material which falls past the bars *L* and *L'* drops into the bottom of the combustion chamber and owing to the converging shape of such combustion chamber is brought into compact form at the bottom thereof so that the draft through the lower draft opening will cause combustion of the charred material and as fast as it is burned away and reduced to ashes more material falls into place

to be burned. The ashes are drawn forward by the draft into the furnace *I* and are removed through a suitable opening *I'*.

The bars *L* and *L'* may be arranged to move horizontally if desired, but I prefer to arrange them to rotate for the reason that they will more readily clear themselves of the accumulations thereupon.

The fuel magazine may be inclined from the perpendicular without departing from the spirit of my invention, and details of construction may be changed without avoiding my claim, which is broadly made to the horizontally movable supporting bar, and the arrangement whereby the hitherto waste material is completely consumed.

I am aware that straw burners have been provided with a series of fixed cross-bars arranged at the top of the combustion chamber to support the straw or other fuel; and with a series of oscillating rakes arranged beneath such fixed fuel-supporting bars to be operated to scratch the under side of the bale and thus facilitating the feeding. My fuel supporting bar is to be distinguished from the fixed fuel supporting bars heretofore employed, and also from the oscillating rakes in that in my device the single horizontal movable bar performs the service of the previous device including both the series of fixed bars and the series of oscillating rakes. This simple and improved construction invented by me gives superior facility for feeding over the former more complex contrivance in that it is arranged to be shifted and as the bar is moved laterally the fuel which rested on it is released and allowed to drop by its own weight; while in the former contrivance the weight of the bale rested upon the straws which were in contact with the support and the rakes simply operated to scratch out the straw from between these bars. By my improved device the clogging which was liable in burners of the former construction is wholly avoided.

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

1. A straw-burner having a horizontally movable fuel supporting bar arranged at the bottom of the downwardly opening magazine to support the fuel and to be shifted to release the fuel.

2. A straw burner having a downwardly opening fuel magazine, and having a horizontally movable bar provided with an upwardly projecting prong and arranged to support the fuel in such magazine.

3. A straw burner having a downwardly opening fuel magazine and also having a downwardly converging combustion chamber arranged below such magazine and provided in its front and in its rear walls respectively with two draft openings, arranged one near the top of such chamber and the other arranged near the bottom of such chamber.

4. A straw burner having a downwardly

opening fuel magazine and having a horizontally movable bar arranged at the bottom of such magazine to support the fuel, and also having a downwardly converging combustion chamber arranged below such magazine and provided in its front and in its rear walls respectively with two draft openings, one arranged near the top of such chamber and the other arranged near the bottom thereof.

5. A straw burner having a downwardly opening fuel magazine and a horizontally movable bar arranged at the bottom of such magazine to support the fuel, and also having a downwardly converging combustion chamber arranged below such magazine and provided in its front and in its rear walls respectively with two draft openings, one arranged near the top of such chamber, and one arranged near the bottom thereof, and the movable supporting bars arranged in such combustion chamber between the upper and the lower draft openings.

6. A straw burner having a downwardly opening fuel magazine and a horizontally movable bar provided with an upwardly projecting prong and arranged at the bottom of such magazine to support the fuel, and also having a downwardly converging combustion chamber arranged below such magazine and provided in its front and in its rear walls respectively with two draft openings, one arranged near the top of such chamber and one arranged near the bottom thereof, and the two rotatable supporting bars arranged in such combustion chamber between the upper and the lower draft openings and upon opposite sides of the horizontally movable supporting bar.

7. A straw burner having a downwardly opening fuel magazine and a horizontally

movable bar arranged at the bottom of such magazine to support the fuel, and also provided with the drum having the crank, and the chain or other flexible device secured near the bottom of one side of the magazine and arranged to pass upward over and around the fuel in the magazine and to be wound around the drum upon the other side of such magazine.

8. The straw burning attachment for furnaces set forth comprising the downwardly opening fuel magazine and the horizontally movable bar arranged at the bottom of such magazine to support the fuel; the combustion chamber having the perpendicular rear wall provided with the necks adapted to project respectively into the fuel door opening and the ash door opening of the furnace, and having its front wall inclined downward toward such rear wall and provided with the upper and the lower draft openings, substantially as described.

9. The straw burning attachment set forth comprising the downwardly opening fuel magazine; the horizontally arranged supporting bar provided with the upwardly projecting prong; the combustion chamber provided with the vertical rear wall having openings adapted to correspond with the fuel and ash door openings of the furnace, and having its front wall inclined downward toward the rear wall and provided with the upper and the lower draft openings, and the two rotatable bars arranged in the combustion chamber, one upon each side thereof, and between the upper and the lower draft openings.

FRED GIRTANNER.

Witnesses:

ALFRED I. TOWNSEND,
ALFRED COOPER.