

No. 848,219.

PATENTED MAR. 26, 1907.

R. WOERNER.  
WASHING MACHINE.

APPLICATION FILED FEB. 28, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

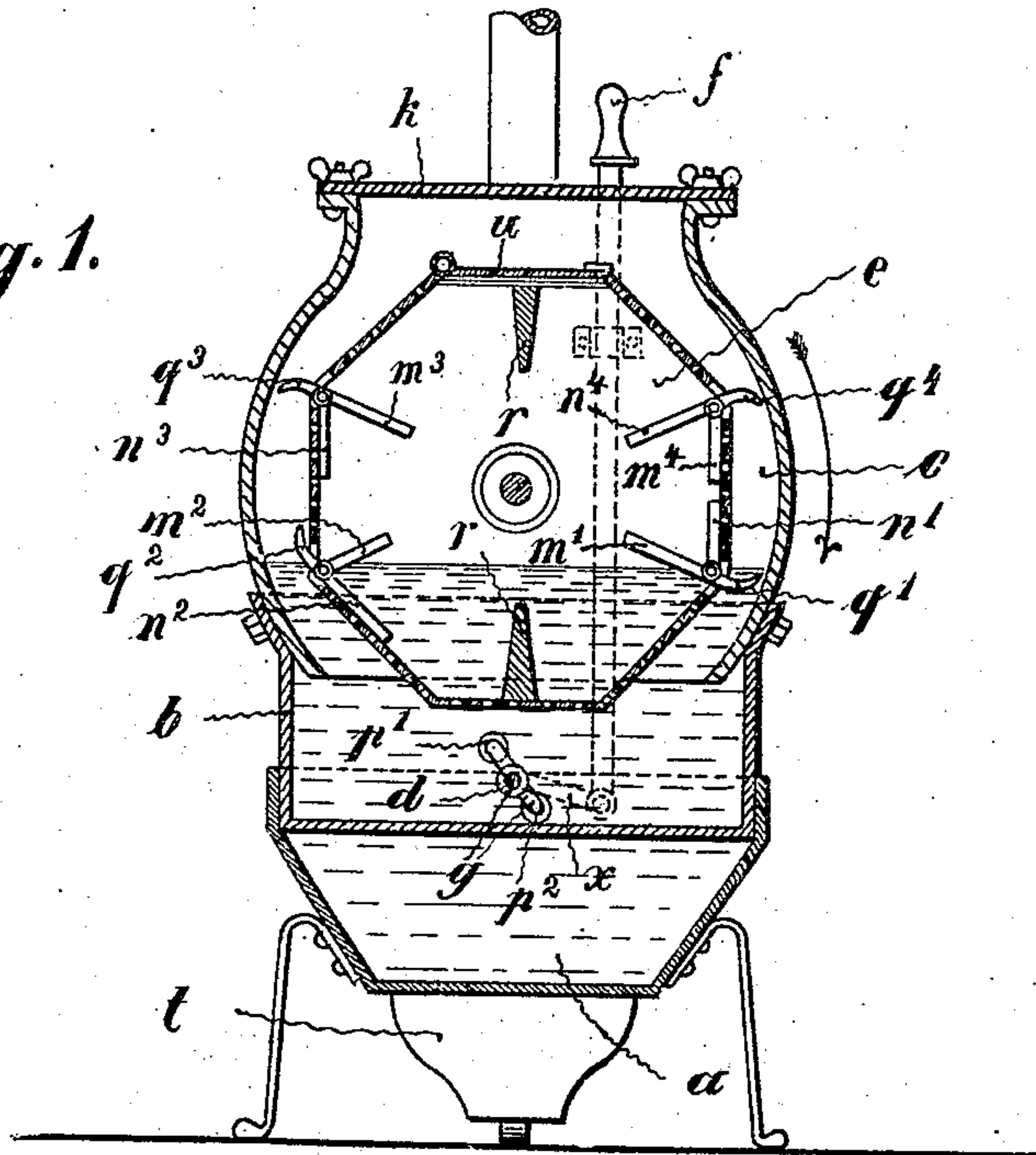
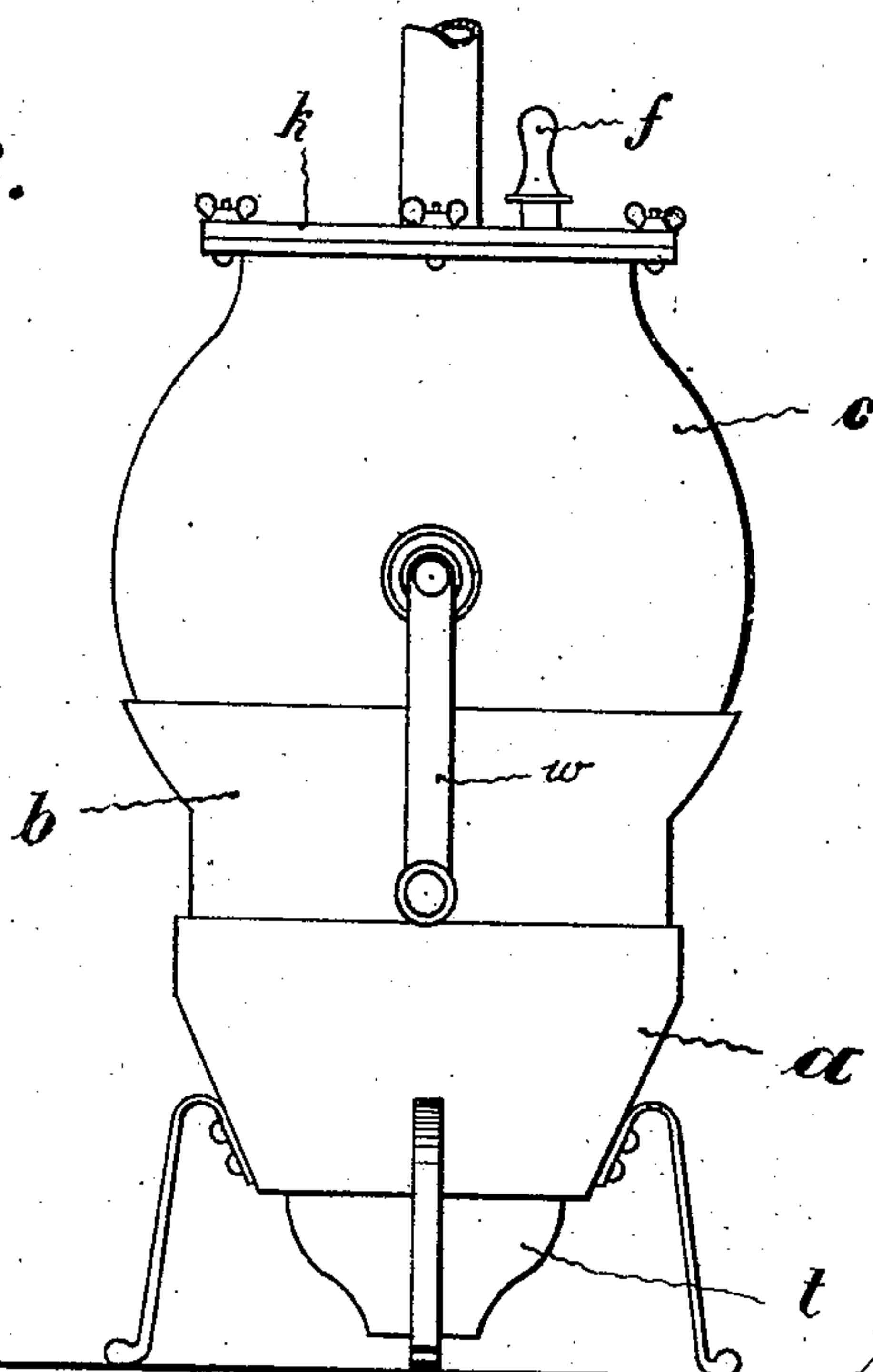


Fig. 2.



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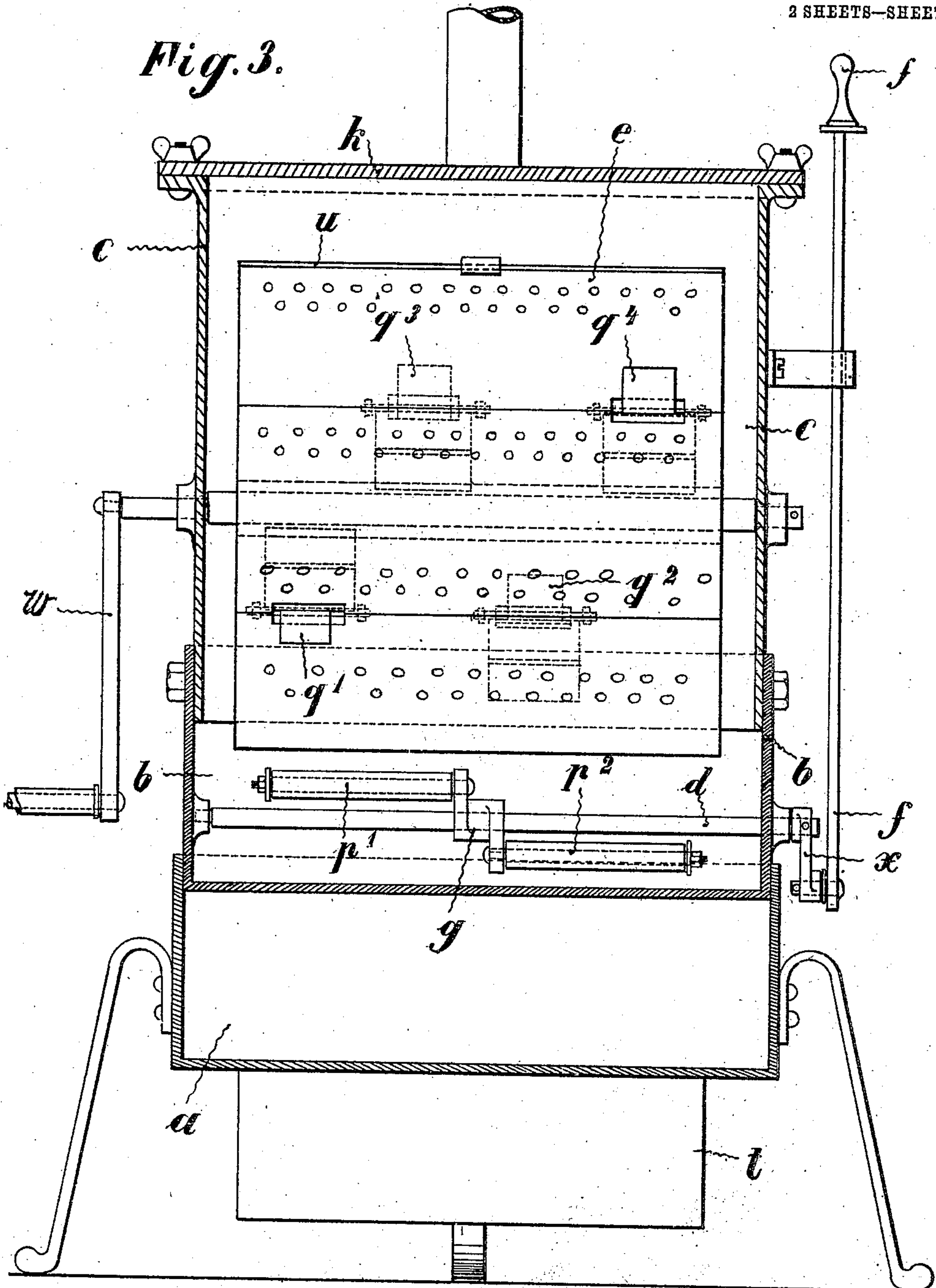
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# UNITED STATES PATENT OFFICE.

ROBERT WOERNER, OF MANNHEIM, GERMANY.

## WASHING-MACHINE.

No. 848,219.

Specification of Letters Patent.

Patented March 26, 1907.

Application filed February 28, 1906. Serial No. 303,400.

*To all whom it may concern:*

Be it known that I, ROBERT WOERNER, a citizen of the Empire of Germany, residing at Mannheim, in the Empire of Germany, have  
5 invented a new and useful Washing-Machine, of which the following is a specification.

There are known washing-machines with drums internally provided with turnable wringing-flaps, which latter are automatic-  
10 ally actuated; but these drums are turned in one direction only, so that the clothes or linen are not thoroughly worked.

My invention relates to a washing-machine the drum of which is to be repeatedly turned  
15 in both directions, so that the clothes or linen may be thoroughly worked. For this purpose according to my invention some of the wringing-flaps are adapted to be actuated during the rotation of the drum in the one  
20 direction only, while the other wringing-flaps are adapted to be actuated during the rotation of the drum in the other direction only. Those flaps which are not actuated serve simply for lifting the clothes and for allowing  
25 them to drop. In the known washing-machines, on the contrary, the clothes are lifted not by the wringing-flaps themselves, but by special radial boards fastened on the inside of the drum. In opposition to the flaps of  
30 known washing-machines according to my invention the flaps are made double—that is to say, they are each formed of two adjoining plates, which are set at an angle to each other and are made to rock around their  
35 crossing-line. They are provided with fingers which project without through the walls of the drum and are adapted to be actuated, respectively, by either of two rollers. A device is provided for bringing either of the  
40 two rollers into the right position in accordance with the direction in which the drum is to be turned. The new flaps are capable of lifting the clothes and of dropping them nearly through the full height or diameter of  
45 the drum, whereby of course the cleaning effect of the machine is enlarged.

I will now proceed to describe my invention with reference to the accompanying drawings, in which—

50 Figure 1 is a vertical cross-section through a washing-machine, and Fig. 2 is an elevation of the same on an enlarged scale. Fig. 3 is a side view of the machine, the side wall of the casing being broken away.

Similar letters of reference refer to similar  
55 parts in all figures.

An octagonal perforated drum *e* is mounted in a casing *c* to turn and can be put into rotation by means of a hand-crank *w*. The casing *c* is shown as connected with a water-  
60 box *b*, which in turn is inserted in a second water-box *a* and may be put in communication therewith by any suitable and known means, readily understood. The lower water-box *a* may be arranged to be heated by  
65 means of any known and approved heating device *t*. I do not further describe this heating device nor the two water-boxes *a* and *b* or the connections, as these parts are immaterial to my invention.

70 The drum *e* is arranged to partly dip in the water, as is indicated at Fig. 1. In four opposite corners of the drum *e* four flaps are mounted to rock, which flaps are formed each of two adjoining boards *m'* and *n'*, *m*<sup>2</sup> and *n*<sup>2</sup>,  
75 *m*<sup>3</sup> and *n*<sup>3</sup>, *m*<sup>4</sup> and *n*<sup>4</sup>, respectively. As is clearly shown at Fig. 1, these pairs of boards are set at an angle to each other, so that either of the two boards is placed radially if  
80 the other bears on the wall of the drum. Two opposite flaps, formed of the boards *m'* *n'* and *m*<sup>3</sup> *n*<sup>3</sup>, are to work together, while the remaining two opposite flaps, formed of the boards *m*<sup>4</sup> *n*<sup>4</sup> and *m*<sup>2</sup> *n*<sup>2</sup>, are to work together.  
85 The two former flaps *m'* *n'* and *m*<sup>3</sup> *n*<sup>3</sup> are provided with fingers *q'* and *q*<sup>3</sup>, which are placed in the plane of the roller *p'* at right angles to the drum *e*. The other two flaps *m*<sup>4</sup> *n*<sup>4</sup> and *m*<sup>2</sup> *n*<sup>2</sup> are provided with fingers *q*<sup>4</sup> and *q*<sup>2</sup> in  
90 another plane at right angles to the drum, in the plane of the roller *p*<sup>2</sup>. The drum *e* may be provided with two rigid radial plates *r r* for lifting the clothes, and it is preferably provided with a door *u* for the introduction  
95 or withdrawal of the clothes. The two rollers *p'* *p*<sup>2</sup> are mounted to turn on two pins at the ends of a two-armed lever *g*, which are fastened on a shaft *d*. The shaft *d* is mounted in the water-box *b* to rock through an angle of about ninety degrees and can be turned  
100 from without by means of a handle *f* and crank *x* or the like. The casing *c* may be provided with a cover *k*. Sufficient space is left within the casing *c* to the four fingers *q'*, *q*<sup>2</sup>, *q*<sup>3</sup>, and *q*<sup>4</sup>, of which *q'* and *q*<sup>3</sup> are adapted to  
105 strike one after the other the roller *p'*, while *q*<sup>2</sup> and *q*<sup>4</sup> are adapted to strike the roller *p*<sup>2</sup>. The two opposite fingers *q'* and *q*<sup>3</sup> are shown



in Fig. 1 as bent in the one direction, and the two other opposite fingers  $q^2$  and  $q^4$  are bent in the other direction.

The washing-machine is operated as follows: The water is introduced and heated in any known manner. After removing the cover  $k$  and opening the door  $u$  the drum  $e$  is charged with clothes or linen, and then the door  $u$  is closed and the cover  $k$  is put on.

The handle  $f$  is adjusted for bringing the lever or arms  $g$  with the two rollers  $p'$   $p^2$  into the respective position, and the drum  $e$  is turned, by means of the hand-crank  $w$ , in one direction—say that of the arrow in Fig. 1. The flap  $m' n'$  will bear with its board  $m'$  on the wall of the drum  $e$  by reason of its own weight. The moment, however, it dips in the water it will be turned upward by reason of its buoyancy and of the resistance of the clothes lying on the bottom of the drum, and it will push forward the clothes. When its finger  $q'$  strikes the upper roller  $p'$ , which is in the position shown in Figs. 1 and 3, it will be thereby turned to the left, so that it will wring the clothes. On the finger  $q'$  leaving the roller  $p$  the flap will be turned back to the right by the elasticity and gravity of the clothes lying thereon and henceforward the flaps  $m' n'$  will lift the clothes. These clothes then slide off and drop down, if the flap  $m' n'$  is arrived above. The next following flap  $m^4 n^4$ , bearing with its board  $m^4$  on the wall of the drum by reason of its own weight, will be turned upward on dipping in the water by reason of its buoyancy, so that it will push with its board  $m^4$  the clothes forward without wringing them, since its finger  $q^4$  does not strike the roller  $p^2$ , this latter being in the position shown in Figs. 1 and 3. The clothes lifted slide off the radially-placed board of the respective flap and drop into the lower space of the drum  $e$ , if such flap is arrived above. The radial plate  $r$ , following the flap  $m^4 n^4$ , not only takes along with it the clothes upward, but also prevents them from adhering to the uppermost wall of the drum  $e$ . The board  $m^3$  of the flap  $m^3 n^3$ , following the radial plate  $r$ , will fall on the wall of the drum and bear on the same until the flap turns upward on dipping in the water, when its board  $m^3$  will push forward the clothes before it and will wring the same under the action of its finger  $q^3$  and the roller  $p'$  exactly the same as the flap  $m' n'$  had previously done, as described above. Thus the clothes are wringed, lifted, and dropped repeatedly. When the operator thinks it right, he stops the machine, reverses the two rollers  $p' p^2$  by means of the handle  $f$ , crank  $x$ , shaft  $d$ , and lever  $g$ , and turns the drum  $e$  by means of the hand-crank  $n$  in the opposite direction.

The washing-machine may be varied in many respects without departing from the principle of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a washing-machine, the combination with a casing, of a horizontal drum perforated and mounted in said casing to turn, means for driving said horizontal drum alternately in two directions, a plurality of flaps mounted in corners of said horizontal drum to rock and each composed of two adjoining boards, of which the one is placed approximately radially, if the other rests on a wall of the drum, a plurality of fingers secured alternately on said plurality of flaps in two planes at right angles to said drum and projecting to without, a horizontal shaft mounted to turn in said casing without said horizontal drum, two arms fastened on said horizontal shaft and carrying two pins, two rollers disposed in the two planes of said plurality of fingers and mounted to turn on the pins of said two arms respectively, they being adapted to alternately strike the fingers and thereby to turn the flaps for wringing the clothes, and means for reversing said horizontal shaft.

2. In a washing-machine, the combination with a casing, of a horizontal drum polygonal in section and perforated and mounted in said casing to turn, means for driving said horizontal drum alternately in two directions, said drum being adapted to dip water in said casing, a plurality of flaps mounted in corners of said horizontal drum to rock and each composed of two adjoining boards, of which the one is placed approximately radially, if the other rests on a wall of the drum, a plurality of radial plates on the inside of said horizontal drum between said plurality of flaps and adapted for lifting the clothes, a plurality of fingers secured alternately on said plurality of flaps in two planes at right angles to said drum and projecting to without, a horizontal shaft mounted to turn in said casing beneath said horizontal drum, two arms fastened on said horizontal shaft and carrying two pins, two rollers disposed in the two planes of said plurality of fingers and mounted to turn on the pins of said two arms respectively, they being adapted to alternately strike the fingers and thereby to turn the flaps for wringing the clothes, and means for reversing said horizontal shaft.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT WOERNER.

Witnesses:

N. C. SCHLEMMER,  
Jos. H. LEUTE.