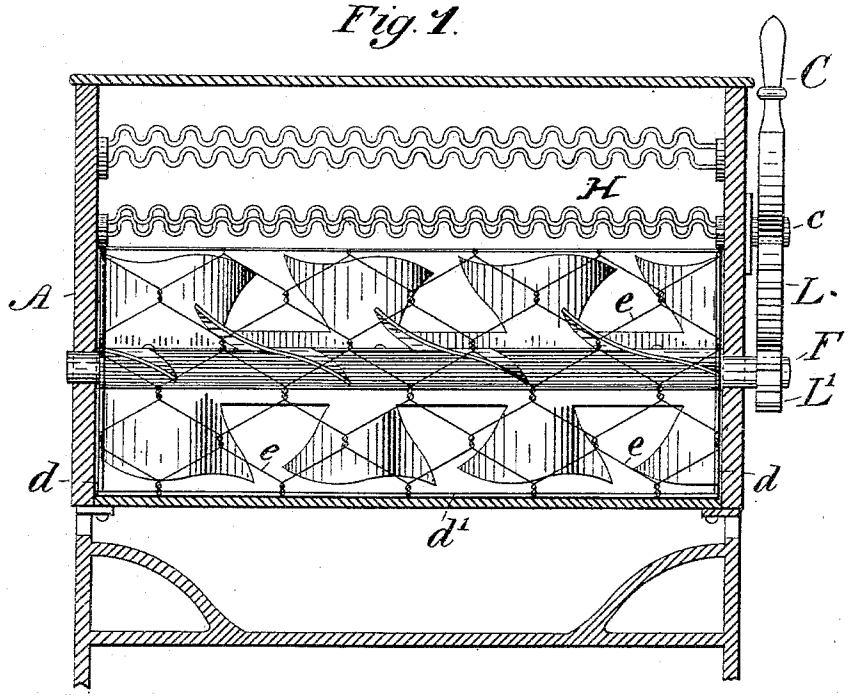
(No Model.) 3 Sheets—Sheet 1.

J. S. STEVENS & G. CAUNTER.

DISH WASHER.

No. 378,152. Patented Feb. 21, 1888.

Fig. 1.



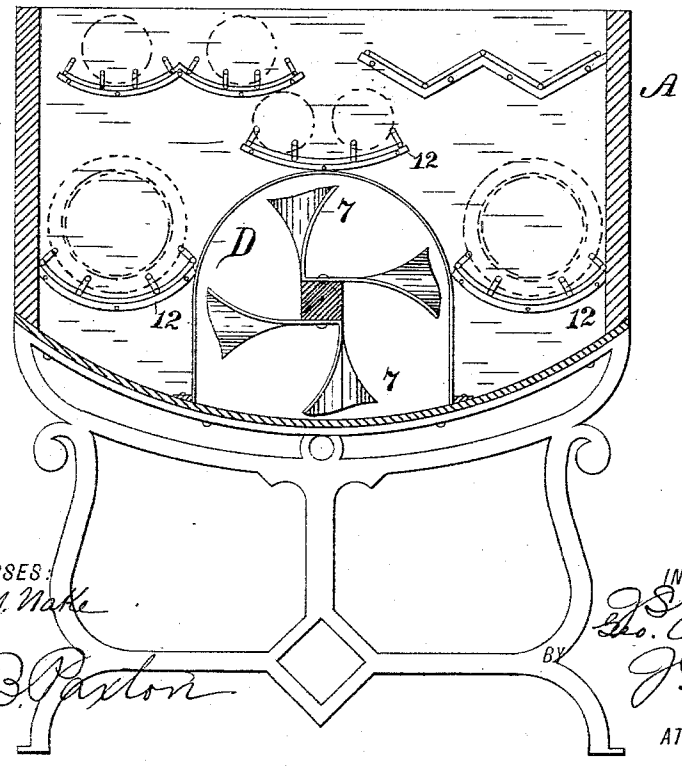


Fig. 2.

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(No Model.) 3 Sheets—Sheet 2.

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DISH WASHER.

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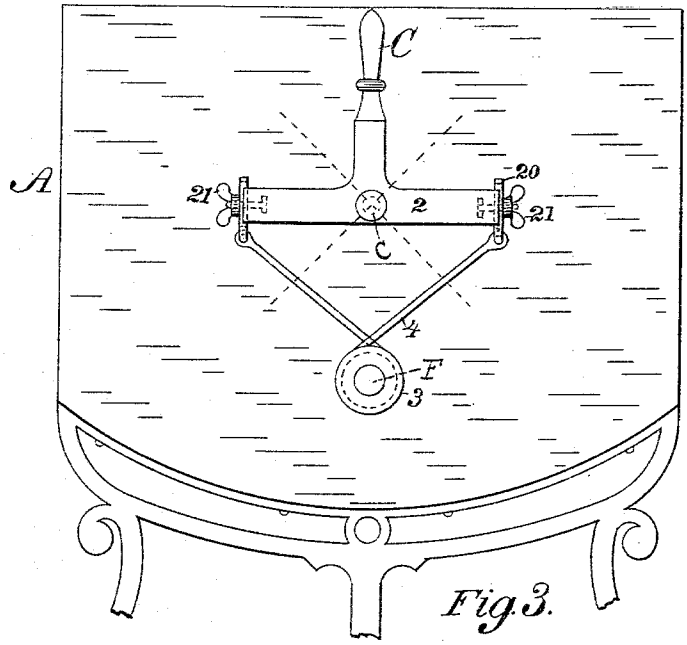

Fig. 3.

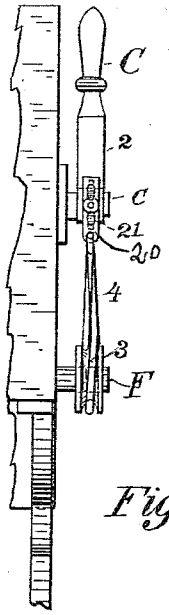

Fig. 4.

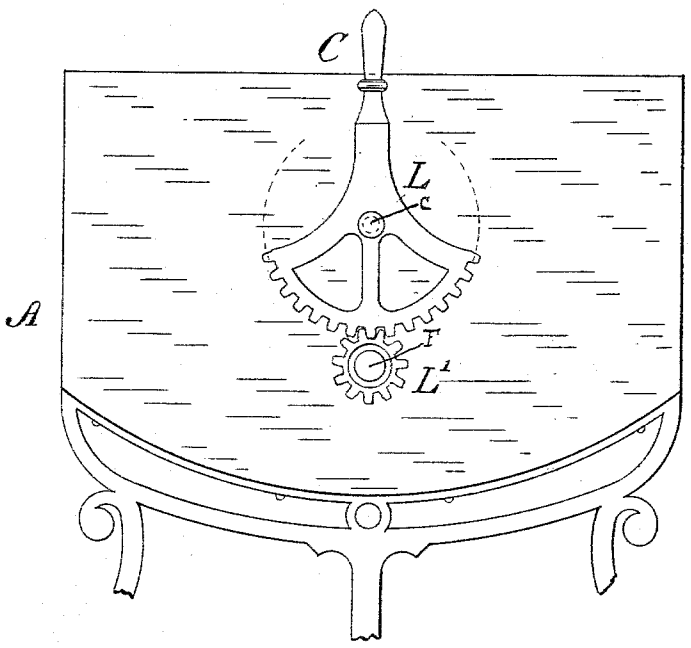

Fig. 5.

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(No Model.) 3 Sheets—Sheet 3.

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DISH WASHER.

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Fig. 6.

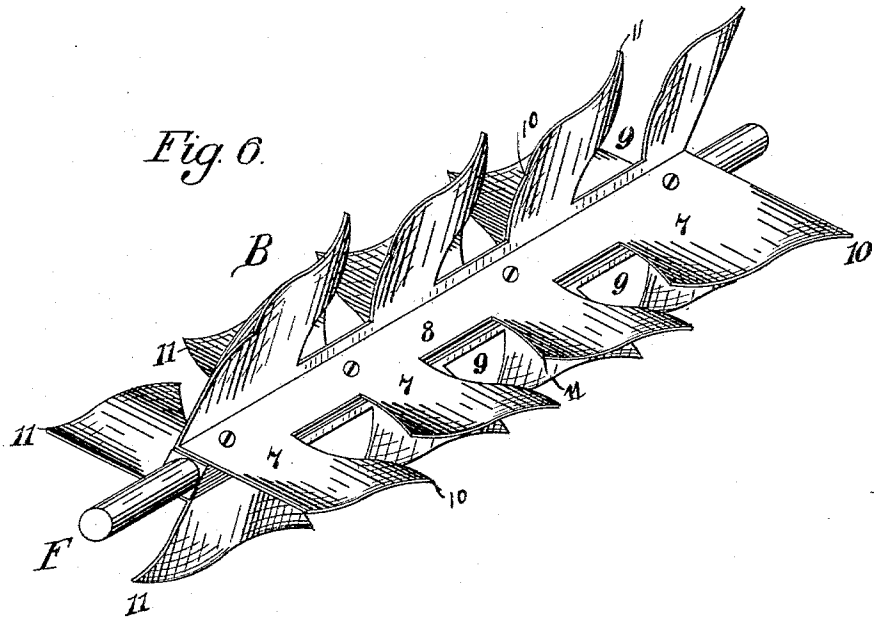
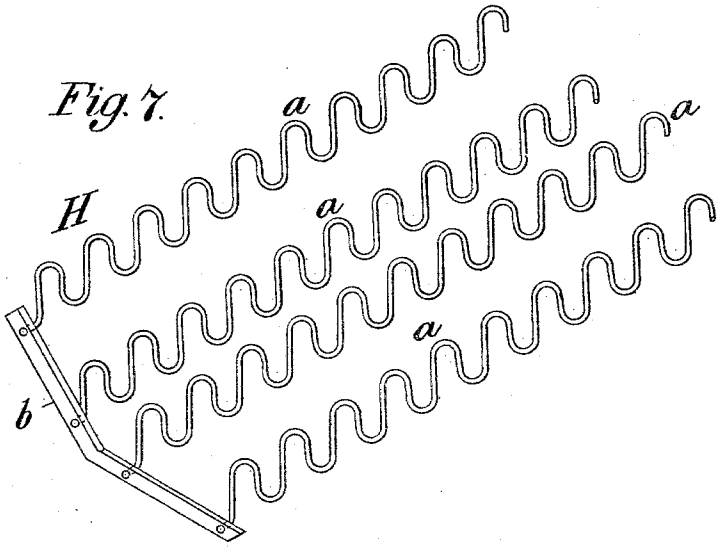


Fig. 7.



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UNITED STATES PATENT OFFICE.

JAMES S. STEVENS AND GEORGE CAUNTER, OF CLEVELAND, OHIO.

DISH-WASHER.

SPECIFICATION forming part of Letters Patent No. 378,152, dated February 21, 1888.

Application filed January 22, 1887. Serial No. 225,093. (No model.)

To all whom it may concern:

Be it known that we, JAMES S. STEVENS and GEORGE CAUNTER, of Cleveland, Cuyahoga county, State of Ohio, have invented certain new and useful Improvements in Dish-Washing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

This invention consists, particularly, in a novel combination and arrangement of the driving-gearing, the paddles composing the agitating-wheel, and the dish-supporting devices, substantially as hereinafter set forth, and pointed out in the claim.

In the drawings, which illustrate the manner of carrying out our invention, Figure 1 is a sectional elevation of the machine, the section being taken on a line that is parallel with the paddle-shaft. Fig. 2 is a like view of the machine, the section being taken on a line that is at right angles to the paddle shaft. Fig. 3 is an end elevation of the machine, showing our preferred arrangement of paddle-driving gearing. Fig. 4 is a view of said driving-gearing at right angles to that shown in the next preceding figure. Fig. 5 is an end elevation of the machine having a varied form of paddle-driving gearing attached thereto. Fig. 6 is a perspective view of the improved agitating-wheel detached from the other parts of the machine, and Fig. 7 represents a detail view of one of our improved dish-supporting devices.

The tank A is constructed with a bottom which slopes toward the center of the machine and is provided with a removable stopper or a faucet of some kind that will permit the water in the tank to be drawn off after use, and all of which may be done in any desired manner.

For the driving-gearing of the machine we may make use of either the belt-gearing shown in Figs. 3 and 4, or the sector and pinion-gearing shown in Figs. 1 and 5, as may be required in practice.

In the belt-gearing, 2 is a beam or lever provided with a handle, C, and mounted on a stud, *c*, projecting from the outer surface of the tank, and adapted to be oscillated backward and forward during the washing operation.

3 is a small wheel having a groove in its periphery for the reception of a round or a V-shaped belt, 4, and it is mounted on the end of the paddle-shaft F, which projects outside of the tank, as shown. The belt 4 passes around the wheel 3 and is crossed, and its respective ends are fastened to small plates or hooks 20, adjustably located on the opposite ends of the oscillating beam 2. Thumb-screws 21 hold said plates in position upon the ends of said beam, and by manipulating them the said belt can be tightened from time to time, as may be required.

In the sector-and-pinion gearing L is the sector provided with a series of teeth and with handle C, and also mounted on stud *c* and adapted to be oscillated, as before described.

L′ is a small pinion mounted on the end of paddle-shaft F, which projects outside of the tank. The teeth of the sector engage with the teeth of the pinion to rotate the said shaft first in one direction and then in the other.

The operation of both forms of gearing is quite similar, and is as follows: Upon imparting a backward and forward movement to the handle C the paddle-shaft will be revolved several times in, first, one direction and then reversed to the opposite direction, and the water in the tank will thereby be thrown in almost every conceivable direction among the dishes. This forward-and-backward motion is, we find, much easier than turning a crank, and by its use in either of the forms here shown we can produce a noiseless machine at small cost. The wheel for agitating the water in the tank and for throwing it over the dishes is composed of the shaft or journal F, which extends across the lower part of the tank, and curved sheet-metal paddles 7, which are attached thereto in any desired way. Said paddles are preferably formed in a series from an integral sheet, 8, to do which we proceed as follows: We take a suitable sheet of metal and remove angular portions from its body, as shown, to form the paddles and to form the spaces 9 between them. Then we curve one side or edge, 10, of the paddles thus formed in one direction and turn their opposite edge, 11, in an opposite direction, as shown.

The sheets of metal 8, carrying the paddles 7, are set on the paddle-shaft in such a way that the paddles carried by one sheet will be located in a line that is diametrically opposite

the spaces between the paddles carried by the sheet next preceding it, "thus breaking joints," as it may be termed; and it will be noticed that the said paddles are located at an angle to the main body of the sheet which carries them, thus tending to push the water in a direction that is parallel to the paddle-shaft; but the paddles of all the sheets are not inclined, twisted, or bent in the same direction. On the other hand, the paddles carried by one sheet are twisted so as to throw or push the water toward one end of the paddle-shaft, and the ones carried by the sheet next preceding or following it are so twisted as to urge the water in an opposite direction, as shown more clearly in Fig. 6. By having the paddles bent or twisted in this way we have found that they will throw a greater body of water than they would if their bodies were in line with the paddle-shaft. In fact, we have found that paddles having their bodies in line with the shaft upon which they are mounted cause much of the power that is applied to them to be lost by striking the water in such a direct manner as they do.

We find that if there is a little too much water placed in the tank the machine will be too hard for some people to work when constructed with the last-mentioned form of paddles. By using our improved paddles, however, the machine will run quite easily, as they catch the water and throw it with more force than the ordinary paddle. To hold the dishes in a proper position while being washed, we locate a number of racks, such as H, at different points within the tank A. Their location within the tank is immaterial, our invention consisting, as regards racks, in the details of construction which we will now describe.

Our improved form of rack is composed of an end bar, *b*, which may be either of wire or of wood, and longitudinal bars or wires *a*. The longitudinal bars *a* are formed of wire having suitable strength, by crimping or corrugating them along their entire length, as shown. This may be done by a specially-constructed machine, or it may be done by hand, as may be preferred.

In use the edges of the dishes are placed within the concavities or depressions of the bars *a*, which retain them securely in place while being washed, as indicated by dotted lines in Fig. 2. We find that dish-supporting racks made in this way will hold the dishes more effectually, and will hold more of a variety of them, than racks having coiled wires.

Among other advantages that the crimped or corrugated wires possess are: They do not obstruct the force of the water, except in a small measure; have no place to catch sediment; are quite easy to keep clean, and are simple in construction.

To prevent the dishes from coming in contact with the paddles during the washing operation, should any get displaced or fall from the racks, (which will sometimes happen, especially with inexperienced operators,) we provide a semi-cylindrical screen, D, and set it over the paddles, as shown. The screen D is composed of end bars, *d*, bent to semicircular form, and oppositely-located side bars, *d'*, which engage the end bars and extend the full length of the paddles. The frame thus formed is covered with small wires *e*, which are interlaced or twisted together so as to form a sort of coarse net-work that will prevent the passage of a dish to the revolving paddles, but which will not offer great obstruction to the flying water in the tank. Of course the framing of the said screen may be simply covered with wire-cloth having an open mesh, if so desired. Said screen is removable from the tank, and it is set therein with its open side resting upon the bottom thereof. The dish-supporting racks H are also made removable, their end bars resting upon supports, such as 12, which conform to the particular shape of said end bars. Still, any other form of device can be used to support the racks that will permit them to be removed when required.

The tank A is provided with a suitable cover, which can be opened and shut down during use of the machine.

Any desired style of supporting-legs may be affixed to the body of the machine, though we prefer to make use of cast or wrought iron legs that are similar in form to those we show in the drawings.

Having thus described our invention, what we claim is—

In a dish-washer, the rotary agitating-wheel, composed of shaft F, and metallic sheets 8, having paddles 7, formed integral therewith, one side or edge of said paddles being curved in one direction and their opposite edges being curved in an opposite direction, substantially as herein set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

JAMES S. STEVENS.
GEORGE CAUNTER.

Witnesses:
FRANK C. FRIEND,
H. M. BULL.