

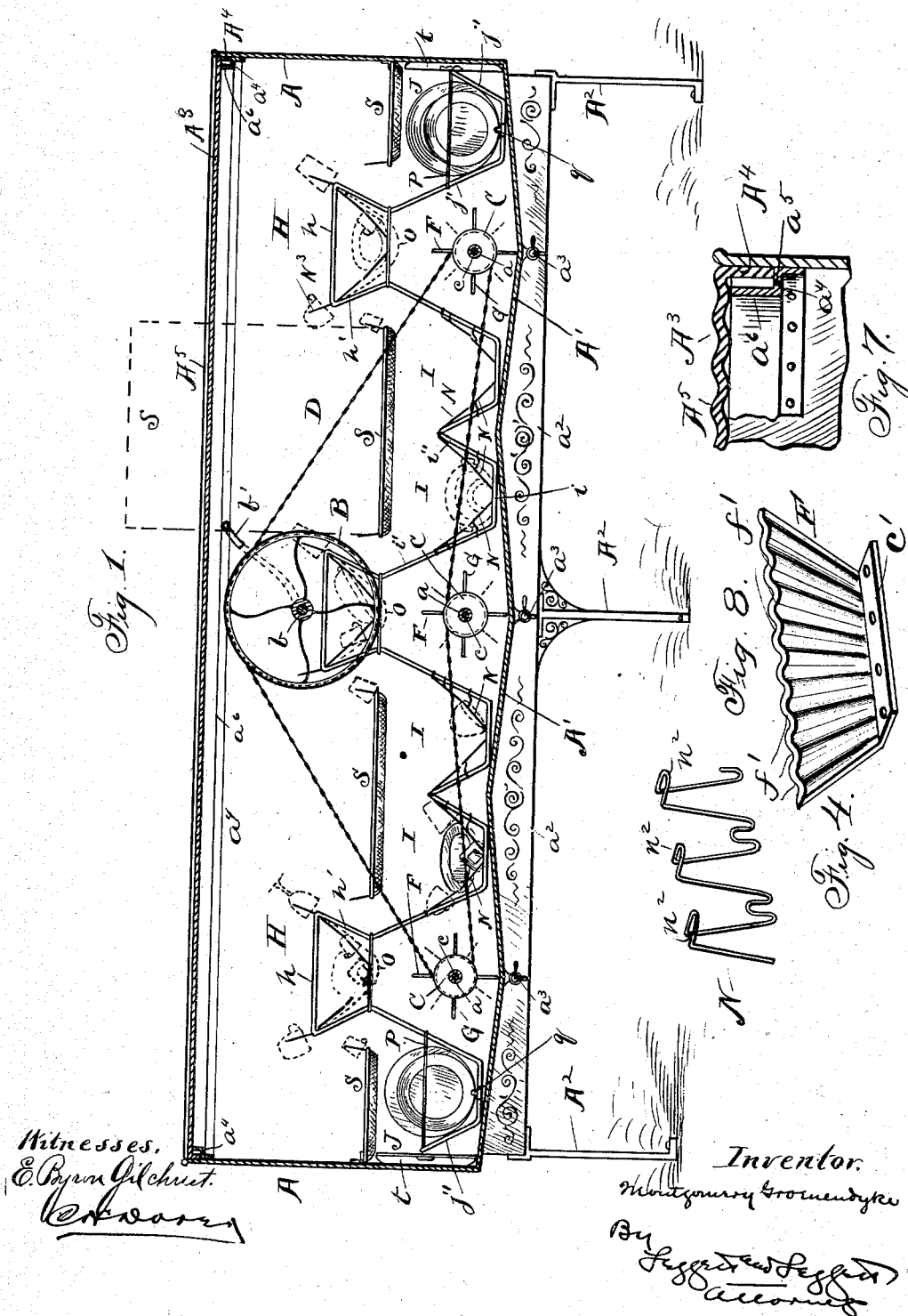
(No Model.)

2 Sheets—Sheet 1.

M. GROENENDYKE.
DISH WASHING MACHINE.

No. 489,190.

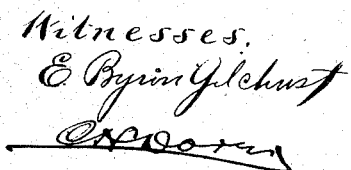
Patented Jan. 3, 1893.



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Inventor
Montgomery Groenendyke
By Leggett and Leggett
Attorneys

UNITED STATES PATENT OFFICE.

MONTGOMERY GROENENDYKE, OF CLEVELAND, OHIO.

DISH-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 489,190, dated January 3, 1893.

Application filed November 11, 1891. Serial No. 411,573. (No model.)

To all whom it may concern:

Be it known that I, MONTGOMERY GROENENDYKE, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain
5 new and useful Improvements in Dish-Washing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to
10 make and use the same.

My invention relates to improvements in dish-washing machines; and it consists in certain features of construction and in combination of parts, hereinafter described, and pointed
15 out in the claims, the object being to provide a machine that will wash dishes of all kinds, shapes and sizes, with greater facility and more thoroughly and effectually, than machines of this class heretofore devised, and
20 without liability of breaking or mutilating the dishes; a machine that is exceedingly simple in construction, and comparatively noiseless in its operation.

In the accompanying drawings, Figure 1 is
25 a front side elevation of my improved machine with the front side of the tank or casing removed. Fig. 2 is a view in perspective of an improved construction of dish-holding rack employed in my machine, and Figs. 3,
30 4, and 5 are views in detail of the same. Fig. 6 is a perspective view of an improved paddle-wheel. Fig. 7 is a detail in section hereinafter more fully described, and Fig. 8 is an enlarged perspective of a section of one of
35 the paddles showing the transverse corrugations.

A represents the tank or casing of the machine. The front and rear sides of tank A afford bearing for a shaft, *b*, that is located
40 preferably directly above the center inside the tank, as shown; and near the bottom, and preferably equidistant apart, the front and rear walls of tank A have inwardly-projecting studs or lugs, *a*, that afford bearing for
45 the respective ends of shafts *c* of the paddle-wheels hereinafter described. Shafts *b* *c*, just inside the front wall of the tank, having rigidly mounted thereon, respectively, sprocket-wheels, B C, connected by an endless chain,
50 D, sprocket-wheel B being quite large in diameter as compared with the size of sprocket-wheels C, shaft *b* extending out at either side of the machine, having a crank, *b'*, at-

tached at the forward end for operating the machine, and having preferably a fly-wheel, 55 (not shown) rigidly mounted thereon, at the rear end, to facilitate the operation.

The paddle-wheels comprise paddles F mounted on diametrically opposite sides of shafts *c*, and the latter, midway paddles F, 60 have mounted thereon similar paddles, G, there being preferably three paddles F to every pair of paddles G, the transverse edges *g* of paddles G being coincident, or approximately so, with the adjacent transverse edges 65 *f* of paddles F. Paddles F G are made of sheet metal and are secured to shafts *c*, (the body or central section of the latter being preferably square as shown,) preferably by bending the lower or securing end of the pad- 70 dles flat with the surface of the shaft and riveting the end thus bent to the shaft, as at *c'*. Paddles F G are corrugated transversely, as at *f' g'*, the corrugations increasing in depth toward the outer longitudinal edge of 75 the paddles, and the paddles are substantially fan-shaped, flaring outward from the paddle-shafts; adjacent paddles on the same side of the shaft approximately making contact as at *f² g²* and thus forming substan- 80 tially V-shaped spaces, *f³ g³*, between said paddles, but the relative size and arrangement of paddles F G are substantially such that a space *g³* between adjacent paddles G is located between two spaces *f³*. With such construction, by operating the driving-mechanism 85 aforesaid by manipulating crank *b'*, to revolve the paddle-wheels the water is agitated and thrown, from the grooves of the corrugations in the paddle wheels in numerous streams 90 and projected against the dishes or articles to be washed with such force that they are thoroughly cleansed.

H and I J represent racks for supporting the dishes or articles to be washed, racks H 95 being located directly above the respective paddle-wheels, and racks I J being located at the sides of the paddle-wheels, and resting on the bottom A' of tank A. These racks all comprise a rectangular frame of wire, the top 100 and side members, *h* *h'*, respectively, of the respective ends of the frame of elevated racks H and the side and bottom members, *i* *i'* and *j* *j'*, respectively, of the ends of the frame of lower racks I, J, at the same side of the machine, being preferably integral, that is, made 105

of a single piece of wire, and the ends of the racks, at the top, are connected by longitudinal wires, *k*, respectively, members *h' h'* at either end of the upper racks being connected, at the bottom of said racks, by a cross-wire, *l*. The sides and bottom of racks H, I, respectively, are substantially the same and comprise two lengths of sinuously-bent wire, N, at either side of the rack, and suspended one above the other, for instance, from members *h' i'*, respectively, between the ends of the respective racks, and in a plane inclined toward the central portion of the bottom of the respective racks, the sides of the respective folds of said sinuously-bent wires being more or less inclined to each other, the folds, at the ends, being arched, and at the lower end, reversely curved, as shown at N', the upper arched ends of the folds of lower members N being located approximately midway between the lower reversely-curved arched ends of the adjacent upper members N. The construction of members N of racks H I is more clearly shown in Fig. 3. Members N are held in the inclined position shown by means of reticulated wire-work, or netting, O, that is suspended from longitudinal wires *k*. With such construction racks H I are adapted to support almost any conceivable kind, size and shape of dish,—cups, saucers, plates, creameries, or what not,—and are exceedingly simple in construction and hence comparatively inexpensive.

A somewhat modified, but exceedingly practical construction of members N, is shown in Fig. 4, where the upper ends of the folds are bent inward as at *n*².

End-racks J are adapted for supporting plates edgewise, longitudinal wires *k* at the top and either side of these racks supporting parallel cross-wires *p*, and members *j* at the bottom and ends of the racks being centrally connected by longitudinal wires *q*, the latter being in turn connected by transverse wires *r*. Wires *r* are bent upward, as at *r'*, and wires *p* are bent laterally, as at *p'*, to conform to the shape of plates, and a plate is thus effectively supported edgewise between a pair of wires *r* and a pair of wires *p*.

Longitudinal wires *k* of racks H, have rigidly secured thereto, preferably by means of fine wire, *n*³, coiled around said longitudinal wires, upwardly and outwardly-inclined members N³ substantially the same in construction as members N, as shown more clearly in Fig. 5, and being more especially adapted for supporting goblets and the like.

To the ends and rear wall of tank A, are secured racks S for supporting knives, forks and the like, said racks, when in a horizontal position, approximately covering the respective racks I J. Racks S, are like the upper portion of racks H they also have a member, at one or either side to support goblets, substantially like that shown in Fig. 5 hereinbefore referred to.

Racks J do not make contact with the end walls of tank, A, but a sufficiently large interval is provided between said racks and the end walls of the tank for receiving and supporting large platters, as at *t*.

Tank A is preferably mounted on a rim, as at *a*², that is supported upon legs A² in any suitable manner.

The bottom of tank A is preferably of a zigzag form in longitudinal section, being provided, at the lowest points, (that are preferably directly under the paddle-wheels, and at the front side,) with drain-cocks *a*³, whereby the tank can be rapidly drained.

Tank A at the upper end, all round, has an inwardly-projecting flange, as at *a*⁴, provided with numerous perforations, *a*⁵, and flange *a*⁴ has an upwardly-extending rim, as at *a*⁶. Cover or lid A³ of the tank has a depending rim A⁴, all round, said rim being adapted to rest upon flange *a*⁴ and rim *a*⁶ and adapted to fit snugly against the surrounding walls of the tank. With such construction, it will be observed, that it is impossible for water to be thrown outside the tank at the edge of the lid or cover, and should any water find its way over rim *a*⁶, it will readily be returned, by means of perforations *a*⁵, to the interior of the tank.

The top of the lid or cover is corrugated, longitudinally, as shown at A⁵, Fig. 7, that exhibits a transverse-section of a portion of the *sa. l. e.* By means of such corrugations, the water as it is dashed against the under surface of the lid or cover, is redistributed about the tank, such corrugations directing the water in different directions and greatly aiding in facilitating the work of the machine.

What I claim is:—

1. In a dish washing machine, a tank, and means for supporting dishes in combination with a paddle wheel having paddles provided with transverse corrugations which increase in depth from the shaft to the outer edge of the paddles.

2. In a dish washing machine, the combination with a tank, of a plurality of racks provided with dish receptacles arranged substantially as shown, a paddle wheel within each rack, a main drive wheel and an endless belt engaging the several paddle wheels and the drive wheel.

3. In a dish washing machine a tank, a dish supporting rack, and an agitator crossing the tank transversely, in combination with a lid or cover for the tank provided with longitudinal corrugations to redistribute water dashed against its lower surface by the agitator.

In testimony whereof I sign this specification, in the presence of two witnesses, this 29th day of October, 1891.

MONTGOMERY GROENENDYKE.

Witnesses:

C. H. DORER,
WARD HOOVER.