

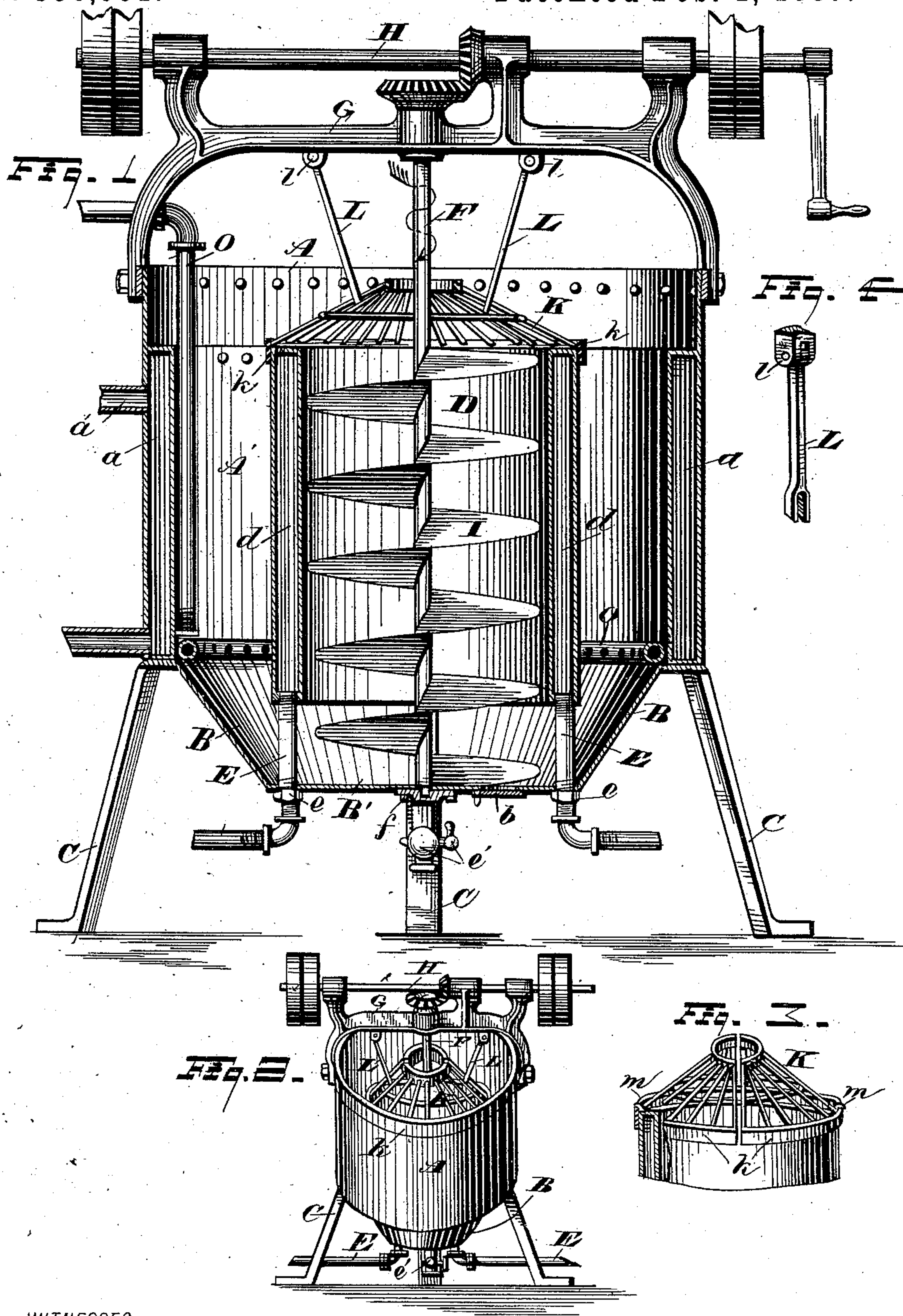
(No Model.)

A. DOLL.

MACHINE FOR MIXING SOAP AND OTHER SUBSTANCES.

No. 356,991.

Patented Feb. 1, 1887.



WITNESSES

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# UNITED STATES PATENT OFFICE.

ARNOLD DOLL, OF CLEVELAND, OHIO.

## MACHINE FOR MIXING SOAP AND OTHER SUBSTANCES.

SPECIFICATION forming part of Letters Patent No. 356,991, dated February 1, 1887.

Application filed October 23, 1884. Serial No 146,299. (No model.)

*To all whom it may concern:*

Be it known that I, ARNOLD DOLL, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful

5 Improvements in Mixing-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 make and use the same.

10 My invention relates to improvements in mixing-machines adapted more especially to the manufacture of soap, and is designed as an improvement on a machine for which Letters Patent of the United States were granted to

15 Charles Elling, Reissue No. 4,854, dated April 9, 1872, the object being to provide the inner cylinder and preferably the container with steam-chambers for heating, and to arrange a grating or equivalent device over the inner

20 cylinder to the end that, as the mass is forced upward through the said cylinder by the action of the screw, the grating will gather the lumps and pieces that have not been reduced and retain them in the hottest part of the ap-

25 paratus and subject to the action of the heated fluid until the refractory parts are melted, dissolved, or worn away by attrition, and are united with the mass.

30 With these objects in view my invention consists in certain features of construction and in combination of parts hereinafter described, and pointed out in the claims.

35 In the accompanying drawings, Figure 1 is an elevation, partly in section, of my improved mixing-machine. Fig. 2 is a reduced view, in perspective, of the machine. Fig. 3 is a view, in perspective, with portions broken away to show more clearly one of the hooks that hold the grating onto the cylinder. Fig. 4 is an

40 enlarged view, in perspective, of one of the clamps.

A represents a container, made usually of sheet metal and cylindrical in form, and has an inner part or lining, A', joined to the outer

45 part so as to leave a steam-chamber, *a*, with which are connected the induction and education pipes, respectively, *a'* and *a''*. The bottom consists of the conical part B and the central part, B', the latter being usually flat, or

nearly so, and may have a discharging-orifice 50 covered with the slide *b*, and the whole structure is mounted on the legs C.

D is an inside upright hollow cylindrical structure open at the top and bottom and provided with double walls, as shown, inclosing 55 the steam-chamber *d*. This cylinder is mounted on the legs E, that are also tubes and lead from the chamber *d* down through the bottom plate B', where they are provided with jam-nuts *e*, or other appliances for making a tight joint 60 with the plate B'. One of these tubes is used as an induction and another as an education pipe, and the third may have a valve, *e'*, and be utilized as a discharge-pipe to relieve the chamber *d* of condensed water. 65

F is an upright shaft centrally located in the cylinder D, and supported below in a suitable stepping, *f*, and is journaled above in the frame G, and is intergeared with the driving-shaft H, that is supported by the same frame. 70 The shaft F has attached and is usually integral with the spiral blade or worm I, that is about as broad as will revolve in the cylinder without contact.

O is a steam-pipe provided with a suitable 75 valve (not shown) and leads down inside of the container, where it is bent around in a coil more or less, and provided with small holes for discharging live steam into the body of the container, as is sometimes necessary in temper- 80 ing the mass.

When the ingredients of which the soap is to be made are in the container and, in the main, are in a suitable liquid condition to com- 85 mence the mixing process, the machine is set in motion and the shaft F is caused to revolve with considerable speed in the direction of the arrow. The spiral forces the liquid up through the cylinder D, from whence it overflows back into the body of the tank, and causes a strong 90 current down on the outside of the cylinder, resulting in a thorough and speedy mixing of the liquids.

By reason of the sloping part B there is no waste room where portions of the material 95 may remain unmixed; but instead there is a continuous concentration of the mass at the bottom of the cylinder D in a position which



it cannot escape the action of the spiral, and hence the mixing is quickly and thoroughly done.

The materials used in making soap are not usually select, and almost anything is offered the opportunity of uniting with this useful commodity.

In the heterogeneous assemblage of things that are sought to be compounded some refractory elements are usually found—such, for instance, as old bars of soap—that are not readily reduced to a liquid state, and to aid in such reduction heat is required. To furnish the necessary heat, steam is admitted to the chamber *d*, and also to the chamber *a*, when required. The hottest part is inside of the cylinder *D*, at the upper end thereof, and at this point is secured the conical grating *K*, that arrests the floating pieces and retains them where they are subject not only to the highest degree of heat had in the apparatus, but where the pieces are subject to the action of the hot liquid that is constantly being forced up through them by the action of the spiral, so that by the aid of heat and attrition the refractory elements are speedily reduced and united with the mass. The gratings are usually made in halves, so that they are easily placed in position around the shaft *F*.

*L* are clamping-braces pivoted at *l* to the frame *G* above and forked at the lower end, as shown in Fig. 4. The parts are so arranged that when the clamping-braces *L* are swung into position to hold the gratings down, as shown in Fig. 1, the forked ends thereof embrace the outside bars on each half-set and hold the two parts of the grating together.

Hooks *m* are secured to the top of the cylinder *D*, and facing outward in such position that as the two parts of the grating are set on the cylinder and slide together to embrace the shaft *F*, the said hooks extend over the outer rim or band, *k*, of the grating, and hold the latter down on the end of the cylinder, as shown more clearly in Fig. 3. I have shown a convenient and preferable manner of arranging these grates; but do not wish to limit my-

self to this construction. Any device that would act as a strainer or colander and retain the pieces of soap or other material in the position required would accomplish the same object and be evidently within the spirit and scope of my invention.

I am aware that it is not new to employ a cylinder constructed of a series of pipes separated slightly from one another and resting on a steam-jacket, and a screw located within said cylinder for elevating the mass, and hence I make no claim thereto. In this device the lumps of soap or other material are caught between two of the pipes composing the cylinder and are sheared or cut in two by the screw. The lumps after they are divided fall back into the mass and again go through the same process until they are reduced. In my device the sides of the cylinder are made continuous, and the upward movement of the lumps of soap or other material is retarded by the grating and held in the hottest part of the device until they are completely ground or cut up, and hence only pass through the cylinder once. By this construction considerable time is saved in the remelting of scraps.

What I claim is—

1. In a mixing-machine, the combination, with a container, an upright cylinder open at both ends and suspended within the container, and a screw located within the cylinder, of a conical grating located over and secured to the top of said cylinder, substantially as set forth.
2. In a mixing-machine, the combination, with a container, the cylinder having hollow walls located within said container, and a screw located within the cylinder, of a conical grating located over and secured to the top of said cylinder, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 15th day of October, 1884.

ARNOLD DOLL.

Witnesses:

CHAS. H. DORER,  
ALBERT E. LYNCH.