

(No Model.)

2 Sheets—Sheet 1.

M. B. SHERWOOD, Jr., & G. C. FARNSWORTH.
PROCESS OF AND APPARATUS FOR MANUFACTURING SOAP.
No. 271,281. Patented Jan. 30, 1883.

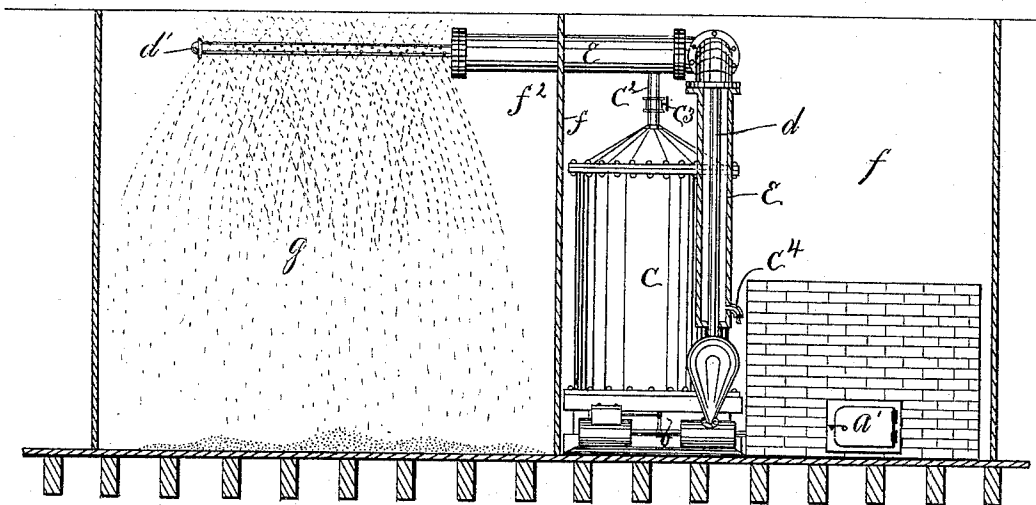


Fig 1

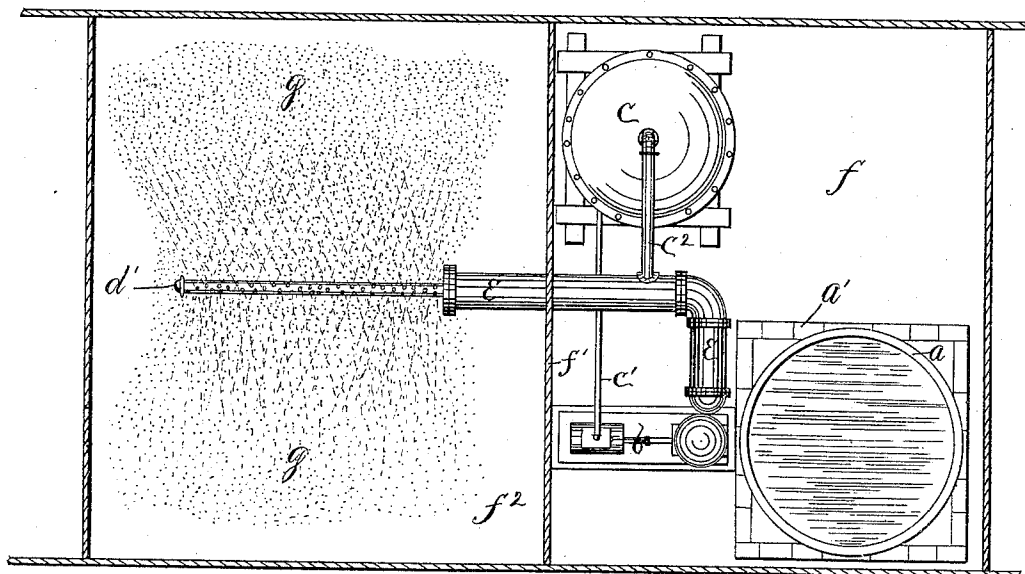


Fig 2

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Atty

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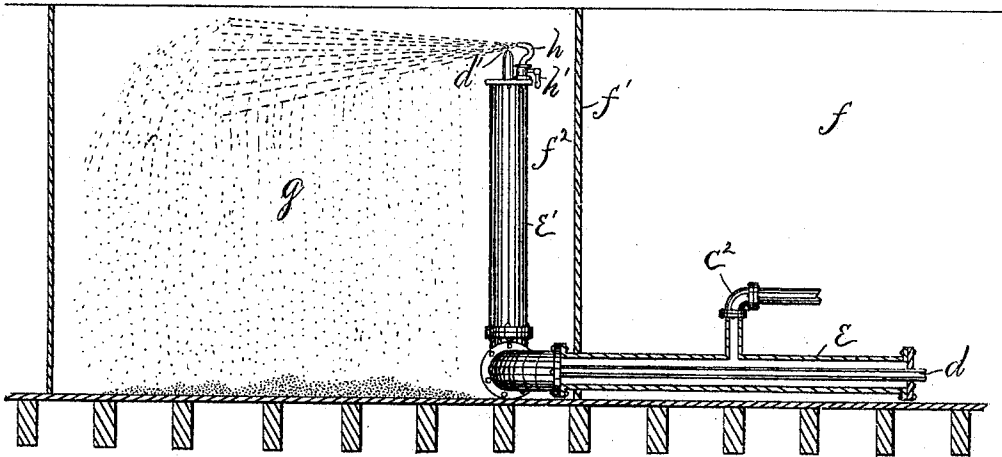


Fig 3

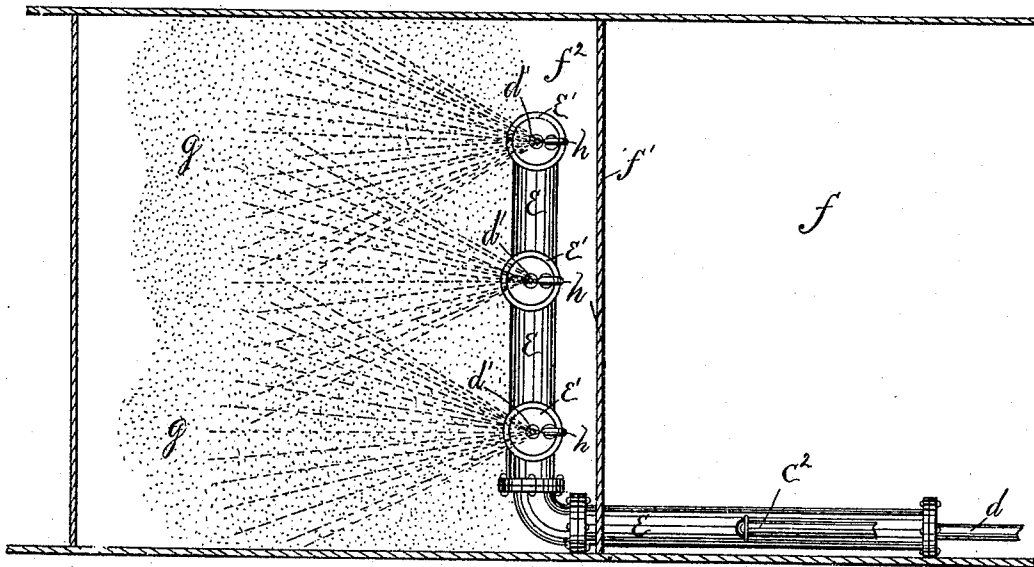


Fig 4

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UNITED STATES PATENT OFFICE.

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PROCESS OF AND APPARATUS FOR MANUFACTURING SOAP.

SPECIFICATION forming part of Letters Patent No. 271,281, dated January 30, 1883.

Application filed September 29, 1882. (No model.)

To all whom it may concern:

Be it known that we, MERRILL B. SHERWOOD, Jr., and GEORGE C. FARNSWORTH, citizens of the United States, both residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Processes of and Apparatus for Manufacturing Soap; and we 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 appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Our invention relates more particularly to the process of and apparatus for manipulating the previously-prepared soap-liquor in the operation of converting it into bars or cakes.

It is a well-known fact that soap made in the ordinary way, taken from the kettle and cooled in frames, and then cut into bars or cakes will while drying warp out of shape. This is owing to the formation of a shell of hard soap of variable thickness on the outside of the bar or cake, while the inside remains soft and pliable. To obviate this difficulty it is now common to take the soap, when it has been allowed to harden after boiling, and cut it into thin shavings. These shavings are thoroughly dried and then pulverized, producing a dry powder of soap. This powder is then moistened sufficiently to enable it to be manipulated into lumps of the required quantity, from which the bars or cakes are pressed in suitable apparatus for the purpose.

It will clearly be seen from the foregoing description that much valuable time and labor are consumed in the preparation of this dry powder from which the bars or cakes of soap are to be formed, and the employment of heavy and expensive machinery is also involved.

The object of our invention is to produce this dry powder of soap with much less time and labor than are now employed, and with a great saving in machinery and tools; and to that end it consists broadly in the process of taking the previously-prepared soap, in the hot liquid state as it comes from the kettle, and converting it into a fine spray and allowing such

sprayed or atomized soap-liquor to pass through and in contact with the atmosphere a distance sufficient to convert it into a powder before reaching the surface, from which it is to be collected for conversion into bars or cakes by any of the well-known processes.

We will now proceed to describe the apparatus which we have devised for carrying out our improved process, which apparatus also forms a part of our invention, it being understood that such apparatus is susceptible of considerable variation without departing from the spirit of our invention.

In the drawings, Figure 1 is an elevation partly in section of one form of our improved apparatus. Fig. 2 is a plan view of the same. Fig. 3 is an elevation, partly in section, of a modification of our improved apparatus; and Fig. 4 is a plan view of the same.

Referring to the drawings, *a* is the kettle in which the soap-liquor is boiled by means of heat from the furnace *a'*. A pipe leads from this kettle to the pump *b*.

c is a steam-boiler, which supplies the steam for the pump through the pipe *c'*.

d is the discharge-pipe leading from the pump, through which the soap-liquor passes.

e is a steam-jacket, which surrounds the discharge-pipe *d* and serves to keep the soap-liquor at the proper temperature and consistency until it leaves the pipe *d*, as will be hereinafter more fully described. This jacket is supplied with steam from the boiler *c* through the pipe *c''*. *c'''* is the stop-cock to regulate the supply of steam, and *c''''* is an opening in the lower end of the jacket *e*, through which the condensed steam is discharged.

The apparatus thus far described is located in the compartment *f*. Through the partition *f'*, separating the compartment *f* from the adjoining compartment *f''*, passes the jacket *e* and its inclosed discharge-pipe *d* in a horizontal direction at a suitable distance from the floor of the compartment. The discharge-pipe *d* is continued beyond the jacket *e*, as clearly shown at *d'* in Figs. 1 and 2, and is perforated with fine holes on the top and sides of the pipe.

The operation of the apparatus just described is as follows: The pump *b* being set in motion, the soap-liquor is forced from the kettle *a*

through the pump and into the discharge-pipe *d*, the soap-liquor, in its passage through the pipe *d*, being kept at the proper temperature and consistency by the steam in the jacket

5 *e*. When the soap-liquor reaches the perforated end *d'* of pipe *d* it is forced therefrom upward and outward in the form of a fine spray, as clearly shown at *g*. This spray, in falling, is cooled by the air through which it
10 passes, and hardens, forming when it reaches the floor what is known as a "dry powder of soap."

It is to be clearly understood that the perforated pipe *d'* is to be placed at such a distance from the floor as will enable the atomized soap-liquor to harden and form into a
15 powder before it settles upon the floor of the compartment. The compartment *f*² should be kept as dry and clear of dust as possible, and, if necessary, the air may be heated to a high
20 temperature by steam-pipes, or in any other suitable manner, in order to facilitate the formation of the soap-powder. The powder thus produced is then collected and moistened sufficiently to enable it to be formed into bars
25 or cakes by molding under pressure in any well-known manner.

In Figs. 3 and 4 we have shown a modified form of apparatus for spraying or atomizing
30 the soap-liquor, in which the jacket *e* and its inclosed discharge-pipe *d*, after entering the compartment *f*², pass along the floor at one side of the compartment, and have one or more vertical branches, *e'*, rising from the floor to
35 a suitable height. The discharge-pipe *d* is extended a short distance in a vertical direction beyond the cap at the end of the jacket, and is formed at its end into a small tapering opening, *d'*. A small pipe, *h*, is located upon the
40 cap at the top of the steam-jacket, and communicates with the interior thereof. This pipe *h* is provided with a stop-cock, *h'*, to turn the steam from the jacket *e* on or off. The pipe *h* is constructed as shown, so that when the
45 steam is turned on it blows across the top of the opening *d'* in the pipe *d*.

The operation is briefly as follows: The soap-liquor is forced through the pipe *d* in the same manner as shown in Figs. 1 and 2, and just
50 as it reaches the opening *d'* the steam from the jacket *e* is turned on by means of the stop-cock *h'*, which serves to blow the escaping soap-liquor in the form of a spray, which is converted into soap-powder in the manner hereinbefore
55 described. Where steam is employed in spray-

ing or atomizing the soap-liquor proper means should be taken to remove from the compartment as much as possible of the steam, in order that the atmosphere through which the spray falls may be kept practically free from
60 moisture. This could be done by providing a proper suction through openings in the compartment.

We claim—

1. In the manufacture of soap, the process
65 of converting the previously-prepared soap-liquor into a powder, from which it is to be molded into bars or cakes, consisting substantially as follows: taking the previously-prepared soap in the hot liquid state and converting
70 it into a fine spray, and allowing such sprayed or atomized soap-liquor to pass through and in contact with the atmosphere a distance sufficient to convert it into a powder before
75 reaching the surface from which it is to be collected for conversion into bars or cakes, substantially as shown and described.

2. In the manufacture of soap, the apparatus for converting the previously-prepared soap-liquor into a powder, from which it is to be
80 molded into bars or cakes, consisting substantially as follows: the pump for forcing the soap-liquor, the pipe or other conduit for conveying the forced soap-liquor to the proper height, and having at its end or ends means
85 for spraying the soap-liquor, and the steam-tight jacket surrounding such pipe or conduit for keeping the soap-liquor at a proper temperature and consistency, substantially as
90 shown and described.

3. In the manufacture of soap, the apparatus for converting the previously-prepared soap-liquor into a powder, from which it is to be molded into bars or cakes, consisting of the following instrumentalities, viz: the kettle *a*,
95 the pump *b*, the discharge-pipe *d*, with its perforated end *d'*, the steam-jacket *e*, surrounding the pipe *d*, and the steam-boiler *c*, all arranged, as shown, in the compartments *f* and *f'*, and combined and operating substantially
100 as shown described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

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GEORGE C. FARNSWORTH.

Witnesses:

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