(No Model.) 2 Sheets—Sheet 1.

J. C. RALSTON.

APPARATUS FOR REMELTING SOAP.

No. 328,714. Patented Oct. 20, 1885.

Fig. 1.

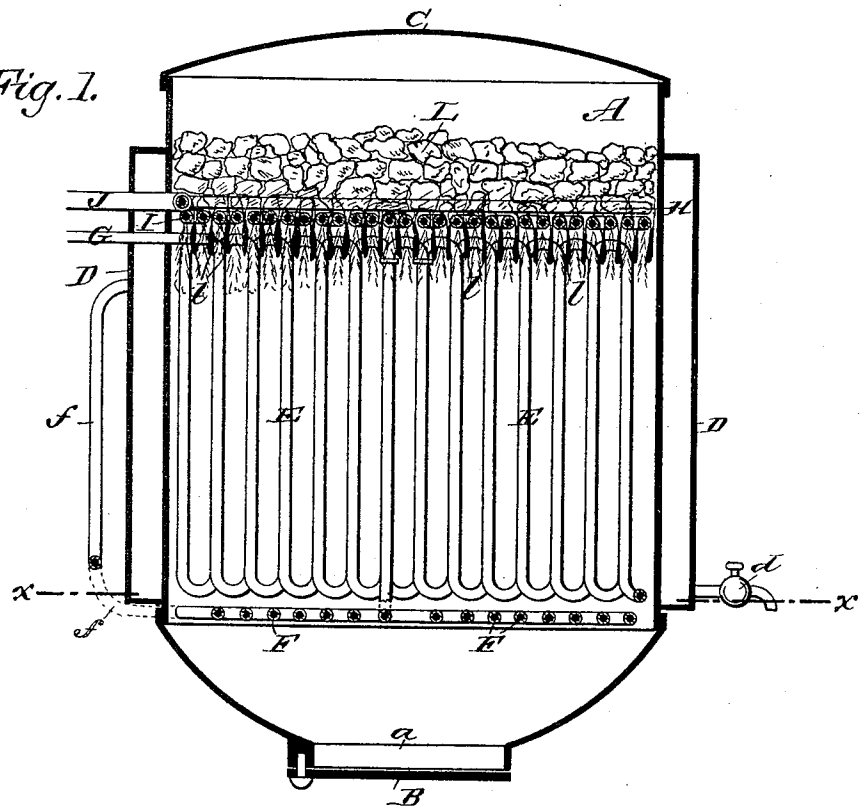
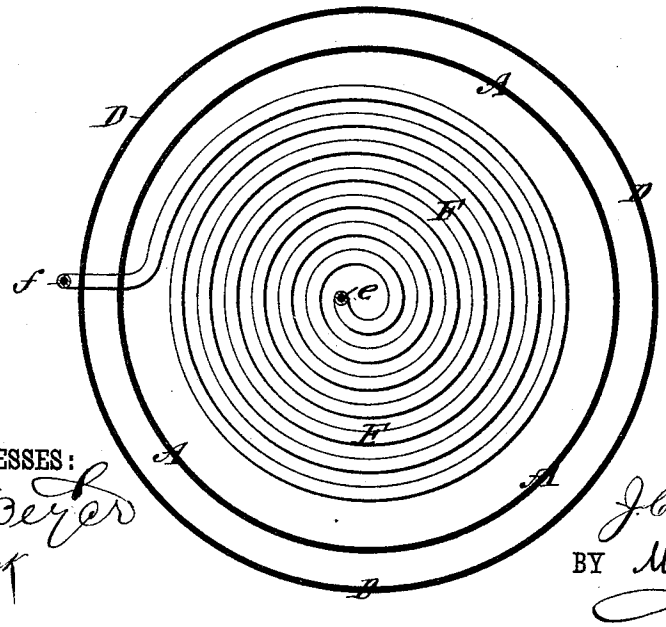


Fig. 2.



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(No Model.)

2 Sheets—Sheet 2.

J. C. RALSTON.

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No. 328,714. Patented Oct. 20, 1885.

Fig. 3.

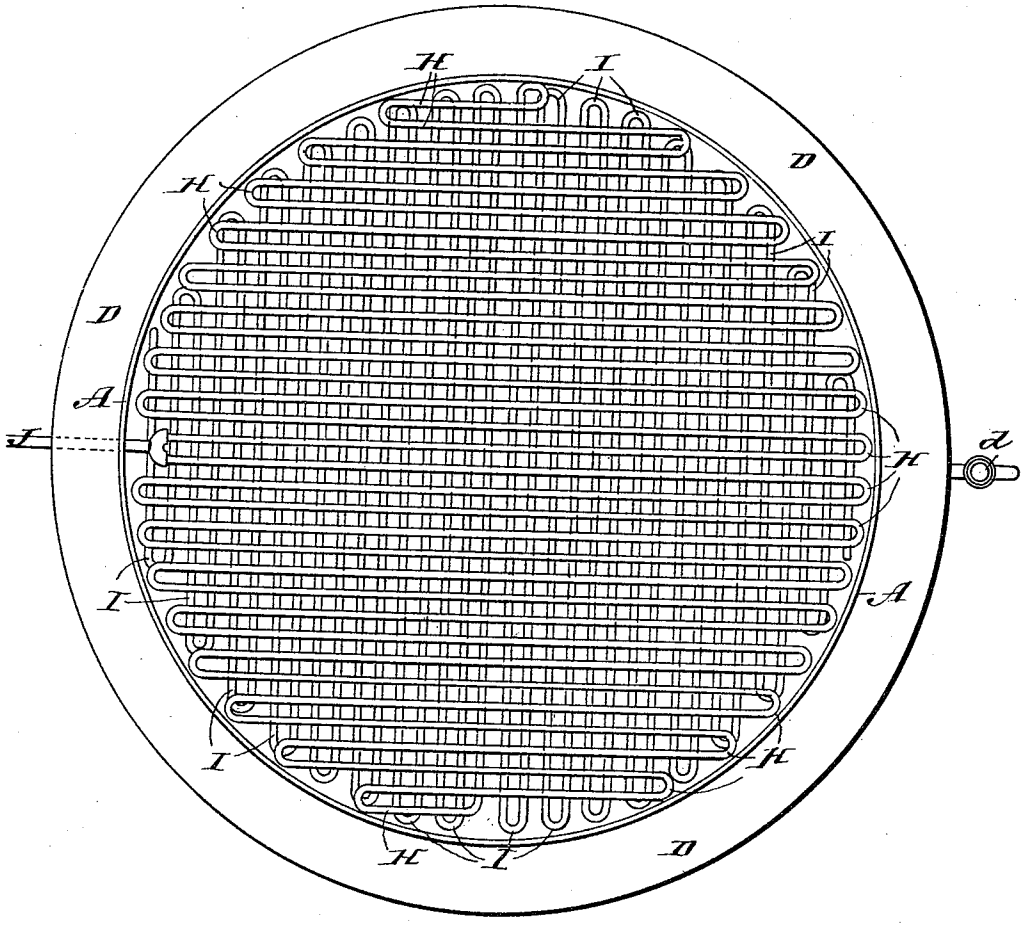


Fig. 4.

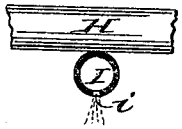
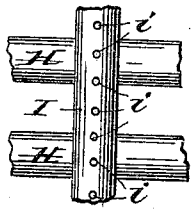


Fig. 5.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR REMELTING SOAP.

SPECIFICATION forming part of Letters Patent No. 328,714, dated October 20, 1885.

Application filed April 3, 1885. Serial No. 161,149. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. RALSTON, of Toledo, in the county of Lucas and State of Ohio, have invented a new and Improved Apparatus for Remelting Soap, of which the following is a full, clear, and exact description.

The object of my invention is to provide for the much more rapid remelting of soap-scrap or broken soap than can be done with processes and apparatus heretofore used, and to avoid all danger of injuring the soap by preventing the excessive condensation therein of the steam used as a remelting agent, and to provide an apparatus adapted to be worked by unskilled labor, and by use of which the melted soap will be discharged in as good or better condition as when placed therein to be melted.

The invention will first be described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a central vertical sectional elevation of a soap-remelting apparatus constructed in accordance with my invention. Fig. 2 is a sectional plan view taken on the line *x x*, Fig. 1. Fig. 3 is an enlarged plan view with the cover of the melting-vessel removed. Fig. 4 is a sectional elevation of part of the upper compound soap supporting and heating coil and steam-jet of the vessel, and Fig. 5 is an under side view of the same.

The chief disadvantages in the practical operation of apparatus heretofore constructed for remelting the scraps or broken soap, produced by cutting blocks or masses of soap into bars or shaping the soap into cakes, have been their slowness of operation and the danger of spoiling the soap, which frequently occurs by allowing the discharge of steam for too long a time into the melted soap, which condenses therein to such an extent as to require the soap to be returned to the kettles to be remade. An apparatus of this class which is extensively used, but is open to the above-named objections, is shown in a United States Patent granted to Daniel Whitaker on the 1st day of August, 1876, and numbered 180,688.

My invention is an improvement on the said invention described in aforesaid Letters Patent.

The Whitaker apparatus consists of a melting-vessel with a bottom outlet closed by a valve, and provided with a steam-pipe in the form of a ring, perforated to discharge the steam, and held horizontally at or near the bottom of the vessel, and above the ring is placed a spiral horizontally-arranged imperforate pipe-coil, which connects with a vertical coil rising some distance into the melting-vessel, and between the perforated lower ring and the upper heating-coils is placed a diaphragm in the form of a sieve. The soap-scrap to be melted is thrown into the upper part of the vessel, and is partially melted by sliding down and between the vertical and upper horizontal coils, through which large unmelted pieces of soap fall onto the sieve-diaphragm, which holds them until melted, the melted soap flowing through the diaphragm, and from the bottom of the vessel when the valve is opened. The sieve-diaphragm is necessary in this apparatus, and greatly retards the passage of the melted soap therefrom, and it is evident that the steam discharges into the melted soap where it is not needed, and the steam issuing from the ring can only reach the cold hard soap by boiling the fluid or melted soap, which damages the soap by condensing into it a considerable amount of water, which can be removed only by remaking the soap, thus rendering the remelter useless.

The drawings represent a preferred construction of apparatus by which I carry out my invention, and which I will describe briefly, as follows:

The letter A indicates a vessel or caldron of suitable capacity, and having a bottom tapering toward an outlet, *a*, which may be closed by a valve or cut-off, B, of any approved construction. The vessel has a removable cover, C, and a jacket, D.

Inside of the vessel A are set quite closely a series of vertically ranging and communicating coils, E, of pipe, which connect by a pipe, *e*, with a horizontally-disposed pipe-coil, F, placed below the coils E, and a pipe, *f*, at the

end of coil F connects it in turn with the jacket D, which may have any suitable valved or other outlet, *d*, for the escape of the heating medium when desired. Steam is admitted to the coil E through the pipe G.

As thus far described, there is nothing new in the construction.

Above the vertical coils E, I support in any suitable manner the horizontally-arranged tubular coils H I, which consist each of a series of pipes having connecting-bends of short radius, and the pipes of both coils are connected, so that steam admitted to the coil H through a connecting-pipe, J, will pass through said coil H and thence to and through the lower coil, I. The pipes of the compound coil H I are so crossed or disposed relatively to each other that they together form a tubular grating having interstices too small to allow the hard soap-scrap placed on it to pass through, but permitting free passage of the melted soap through the grating upon the heating-coils below.

The pipes of the compound coil-grating, preferably the lower pipes, I, have formed in them a series of orifices, as at *i*, at the under side, (see Figs. 4 and 5,) and these orifices are of such number and area that the steam will pass through them in jets and with considerable force to impinge on the pipe-coils E or E F below.

The operation is as follows: The soap-scrap and broken soap to be melted are placed in the vessel A upon the compound tubular grating H I, as at L in Fig. 1. The cover C is put on the vessel, and its outlet *a* is closed by the cut-off B. Steam now is admitted under full pressure to the upper soap-supporting tubular grating, H I, and to the lower coils, E F, and the open steam rushing downward from the orifices *i* of the grating H I quickly fills the lower part of the melting-vessel A and ascends to the soap-scrap on the grating, which latter also gives off its heat to the scrap, which at once is softened and melts and forces its way through the grating by its own gravity, aided by the weight of the mass above, and the melted soap falls in streams, as at *l l*, upon the lower coils, E, toward the outlet *a*, which now is opened, and the jets of steam from the grating impinging on the surface of the downwardly-flowing streams of melted soap force the melted soap rapidly down the vertical coils E, and through the coil F, the steam-jets acting to prevent the formation of a hard, dry, soapy crust on the lower coils and keeping them clear, so that their full heat-radiating effect may be utilized in drying out of the downflowing melted soap any moisture it may have absorbed by contact with the open steam by which it was melted, and a continuous stream of remelted soap issues from the outlet *a*, and with it the steam, which reaches the air in an uncondensed state, and the steam does not condense to any hurtful degree in the soap, which is discharged at the proper consistency and in fit condition to produce, when formed into bars or cakes, a soap of the highest market value for the materials employed in making it, and some kinds of soap are materially improved by the remelting process.

It is evident that the soap-melting is practically continuous, and the apparatus needs no further attention than to keep the vessel full of scrap above the grating H I, and to handle the melted soap in the usual manner as it passes from the melting-vessel, which may easily be done by unskilled labor.

The distinguishing features of my invention may briefly be stated as follows: The continuous use of open steam to melt the soap, and between the cold soap-scrap and the melted soap, and yet not in the body of the melted soap; the use of steam-jets blowing downward upon the lower coils to keep them at all times clear and free from incrustations to get the full benefit of their heat for drying and evaporating the moisture from the melted soap, and to rapidly force the melted soap from the vessel; the escape of the steam, after doing its work, along with the melted soap, but not condensed in it as water, and the superior quality of the finished soap, which is free from excess of water, the soap being dried by the lower coils, instead of being melted thereby, as formerly was done.

It is evident that other arrangements of apparatus than that above described may be employed in carrying out my invention—as, for instance, the jets of steam may be caused to issue from pipes arranged separate from the tubular grating H I, and so as to direct the steam-jets on the lower coils, E, or E F, substantially in the manner above described; but the grating as shown combines in a very simple arrangement a support for the soap-scrap, a heater to help melt the scrap, and the nozzles through which the steam-jets issue upon the lower coils and the melted soap.

When the work of melting the soap-scrap is finished, the vessel A and its interior pipe-coils may quickly and thoroughly be cleaned by continuing for a time the steam-discharge from the orifices *i*, as will readily be understood.

Although I have herein more particularly described my apparatus as operated by the use of steam, it is evident that hot air might be substituted for steam without departing from my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A soap-remelting apparatus containing the following elements, namely: a suitable vessel containing in its upper part a suitable support or holder for the soap-scrap, a system of steam-jet pipes under the support or holder, and a steam-heating coil below the jet-pipes, said parts being constructed to operate substantially as described.

2. In a soap-remelting apparatus, a support or holder for the soap-scrap, consisting of horizontal tubular coils crossing each other to form a grating, as set forth.

3. In a soap-remelting apparatus, a soap support or holder and a series of steam-jet pipes constructed and combined substantially as described, consisting of a continuous double or compound grating made of tubes with suitable interstices and orifices, as set forth.

4. In a soap-remelting apparatus, a soap-scrap support or holder consisting of the horizontal tubular coils H I, crossing each other to form a grating, and the lower coil, I, being perforated, as at *i*, substantially as shown and described.

5. In a soap-remelting vessel, the combination, with a heating-coil in the lower part of the vessel, of steam-jet pipes above the heating-coil, substantially as described, whereby the soap will be melted by contact with open steam and then delivered to the heating-coil for further treatment, and at the same time jets of steam will impinge upon the heating-coil to clear the same, as set forth.

6. In a soap-remelting vessel, the combination, with a heating-coil in the lower part of the vessel, of a soap-holder and steam-jet pipes above the heating-coil, substantially as and for the purposes shown and described.

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ELISHA B. SOUTHARD.