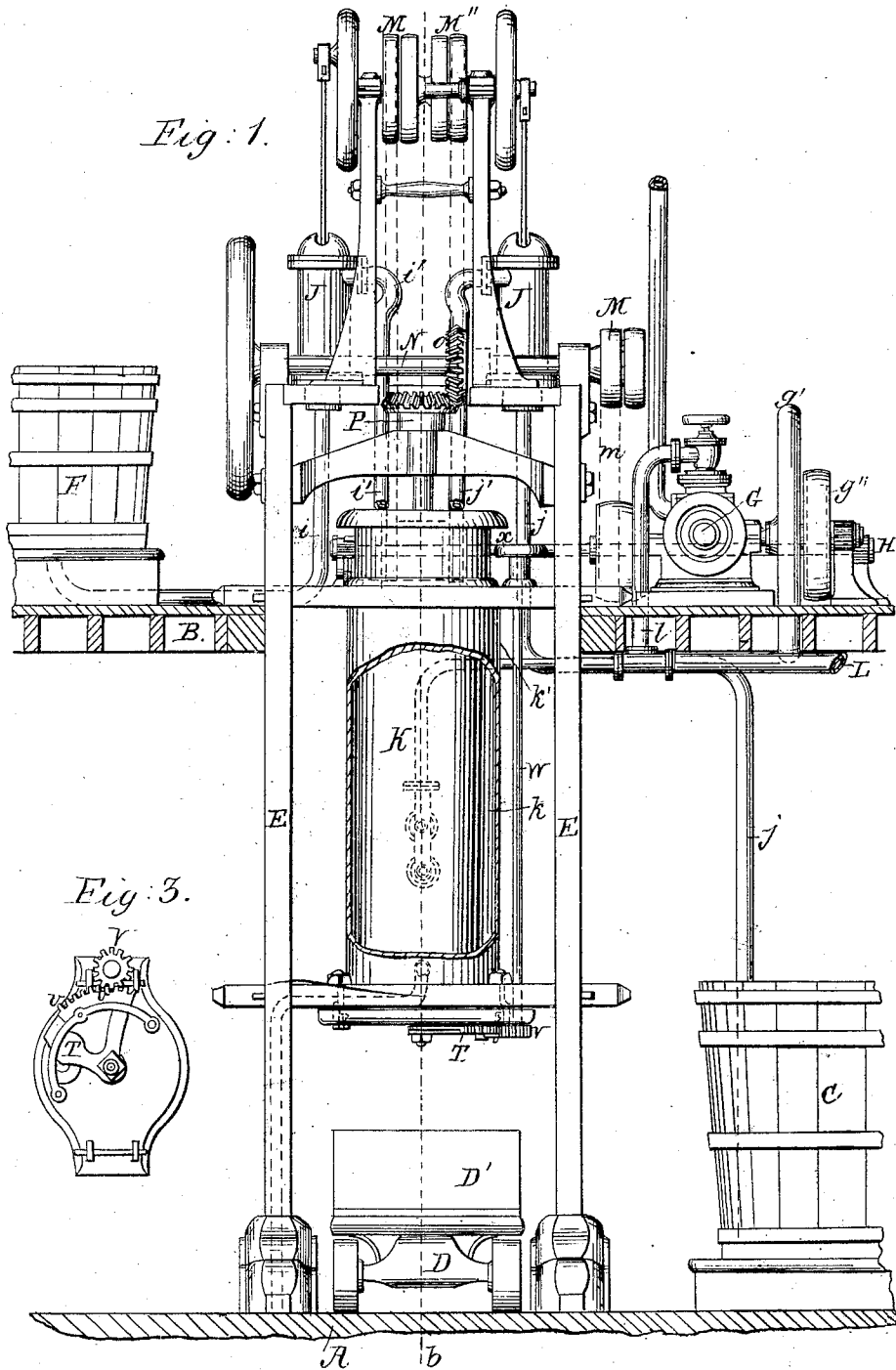


M. & F. HYDE.

Making Soap.

No. 104,739.

Patented June 28, 1870.



Witnesses.

Jas. L. Erwin,  
J. Schmitt

Inventors

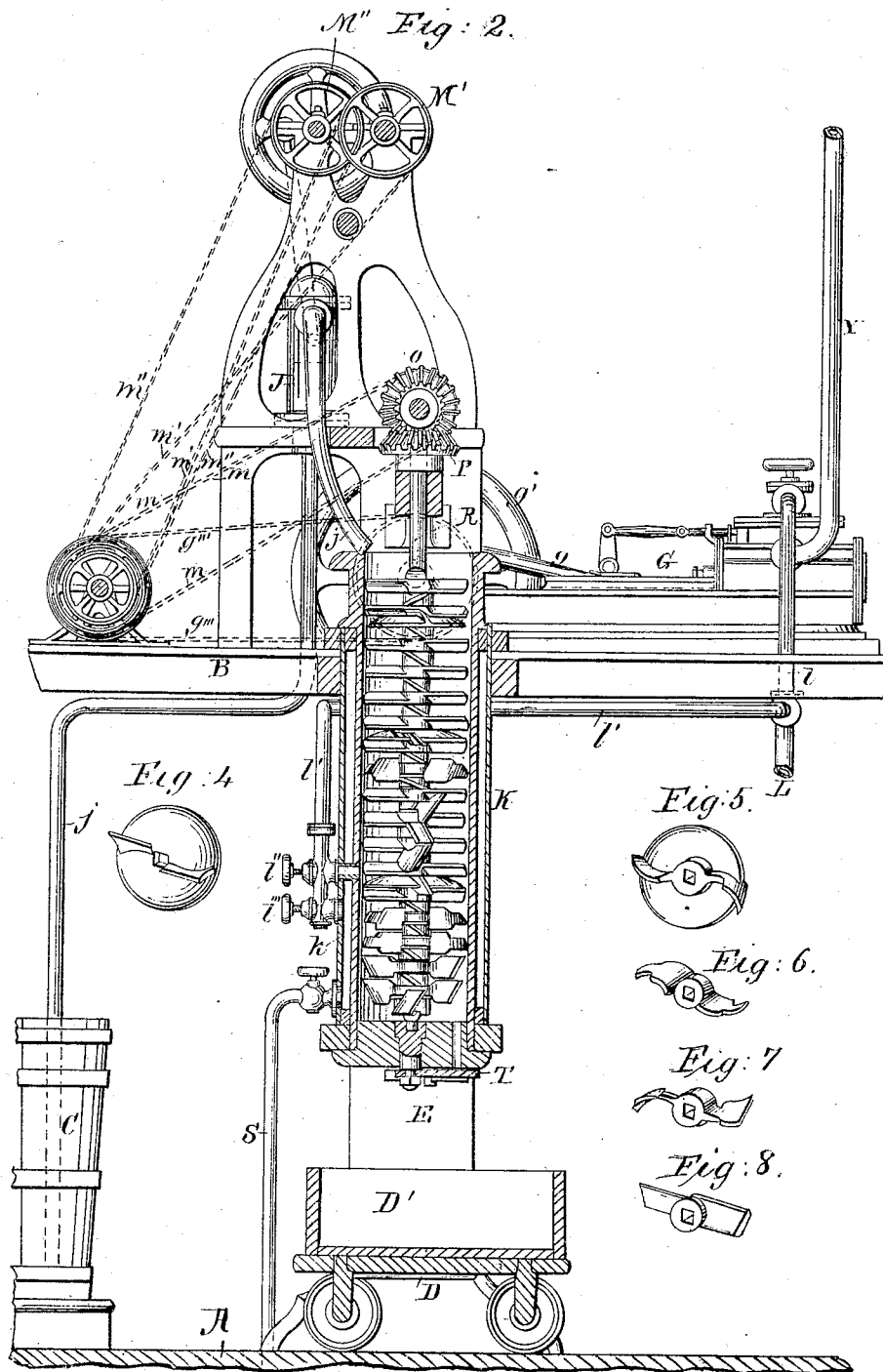
Moses Hyde,  
Francis Hyde,  
By Augustus H. Atlas

M. & F. HYDE.

Making Soap.

No. 104,739.

Patented June 28, 1870.



Witnesses

Jas. L. Brown,  
Ch. Scheirlin

Inventors

Moses Hyde  
Francis Hyde  
By *Wm. H. Smith*  
Attorneys

# UNITED STATES PATENT OFFICE.

MOSES HYDE AND FRANCIS HYDE, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN APPARATUS AND PROCESS FOR THE MANUFACTURE OF SOAPS.

Specification forming part of Letters Patent No. 104,739, dated June 28, 1870.

We, MOSES HYDE and FRANCIS HYDE, both of Baltimore, in the State of Maryland, have invented an Improved Soap-Manufacturing Apparatus, of which the following is a specification:

### *Nature and Objects of the Invention.*

Our apparatus consists, in part, of a cylinder, into which the various ingredients are supplied by pumps or other suitable means, and in which the said ingredients are intimately mixed by an arrangement of stirrers on a rotary shaft. Preferably, the cylinder is constructed of iron or other metal, and is steam-heated, and the wings or spokes of the mixer of such shapes as to divide the magma, forcing it up, down, in, and out, so as to insure a very thorough kneading and ultimate homogeneous condition.

### *Description of the Accompanying Drawing.*

Figure 1 is an elevation of the apparatus, a part of the outer cylinder being removed. Fig. 2 is a vertical section on the line *a b*, Fig. 1. Fig. 3 is a view of the bottom of the cylinder, showing the mode of operating the slide-plate of the discharge opening. Figs. 4, 5, 6, 7, and 8 are detached views of several of the forms of stirrers and mixers on the rotating shaft. These differ in their form, and perform peculiar functions, with one general result.

### *General Description.*

Soaps vary, to some extent, in consistence and attributes, and in the following description any statements as to material and proportion must be understood as applicable to the manufacture of one kind of soap.

A is the lower floor of a soap-factory. B is an upper floor. C is a vat containing a solution of alkali. On the same floor is the soap-frame D, which is mounted on wheels, and receives the soap as it flows in a continuous stream from the machine. The upper floor supports the grease-vat F and the engine G. E E are the side posts of the frame supporting the operative machinery, which consists, in general terms, of two pumps, I J, and a mixer, K. The pump I draws grease from the vat F, by means of the pipe *i*, and discharges, by pipe *i'*, into the mixing-cylinder K. The pump J draws lye from the vat C, by means of the

pipe *j*, and discharges it, by means of the pipe *j'*, into the mixing-cylinder K. The pumps are shown as single-acting, with but a single induction and eduction pipe, each and have nothing peculiar about them. As represented, each would have a valve-bucket and lower valve. The pumps are driven by bands and pulleys from the engine G. The engine is driven by steam from the boiler, (not shown,) the steam-pipe L being branched at *l l'*, the former branch, *l*, passing to the steam-cylinder, and the latter, *l'*, to the steam-jacket *k* of the mixing-cylinder, and to the cylinder itself at the posts *l'' l'''*, respectively. The outer cylinder is of boiler-iron, and the inner cylinder of cast-iron. The pitman *g* connects with a crank-shaft, on which is a fly-wheel, *g'*, and a band-wheel, *g''*. From the band-wheel proceeds a band, *g'''*, to the band-wheel on shaft H. On this shaft are pulleys leading, by bands *m m' m''*, to three points: First, the pulley M on the shaft, which drives the mixer; second, the pulleys M' M'', which drive the pumps I J, respectively. The horizontal shaft N rests in bearings on the frame E, and has a bevel-pinion, O, which meshes with a similar pinion, P, on the summit of the vertical shaft R, on which are diaphragm-plates Z Z<sup>1</sup> Z<sup>2</sup>, about two inches less in diameter than the interior of the cylinder, serving to divide the space into four successive compartments or chambers, and the wings or mixer-arms, shown in Fig. 2, and exhibited in the detached Figs. Nos. 4, 5, 6, 7, and 8. These will be particularly described in the next section, which treats of the operation of the machine. S is a pipe, which carries off the water of condensation from the jacket of the mixing-cylinder. T is a gate, which forms a valve for the aperture in the bottom of the mixing-cylinder. The gate T is moved by a segment-rack, U, and pinion V, the latter on the lower end of a vertical shaft, W, operated by a hand-wheel, X, which rises above the upper floor B. Y is the escape-pipe of the steam-engine.

### *Operation.*

The tub C being supplied with lye, and the tub F with grease and rosin, maintained at a heat of about 220° Fahrenheit, more or less, the engine G is set in motion to impel the vertical shaft R, (which carries the wings or wiper-

arms,) and the pumps I J, which transfer the contents of the vats F C into the mixing-cylinder K, the grease being discharged at pipe  $i'$ , and lye at pipe  $j'$ , in the proportion of about five ounces of the former to three of the latter, or in other suitable proportion. The cylinder of an operative machine forty inches deep and ten inches in diameter may be filled in from two and a half to three minutes, and the mixing commences simultaneously with the entrance of the materials into the cylinder. The plates Z Z<sup>1</sup> Z<sup>2</sup> are used to obstruct the material in its downward course, turning it from the shaft to the sides of the cylinder, where, there being an inch space all around, more or less, according to the size of the machine, it passes into the second chamber of the cylinder, and, in like manner, through each chamber to bottom of machine, whence it passes out through the valve T in the form of soap, the radial wings in each successive chamber serving to stir and knead the materials until they form a homogeneous compound. For this purpose, the said stirrers, represented in their position on the shaft in Fig. 2, and in the detached Figs. 4 to 8, inclusive, are made of various forms, some to press the stuff down, others to raise it; some to draw it toward the axis; some to drive it outward toward the inner surface of the cylinder. By the successive treatment of the series of stirrers, aided by its own gravity, the materials are brought into intimate mixture, and the soap, which begins to form at the sides and bottom of the cylinder, gradually increases as the cylinder fills up, until the material covers the upper plate Z. The operator then turns the wheel X, opening the valve T gradually until the quantity of soap flowing through the valve T

into the frame D' beneath is equal to the quantity of material flowing in at top through the pumps I and J, when the operation becomes continuous so long as the supply is kept up. If the grease and lye-vats should be placed at a suitable distance above the mixer, the pumps may be dispensed with, and the ingredients be allowed to flow to the cylinder through spigots, graduated to discharge the necessary quantities of the respective materials used in the manufacture of soap.

*Claims.*

What we claim as new is—

1. The continuous process of soap-making, substantially as herein set forth.
2. An apparatus for making soap, consisting of reservoirs and conductors for supplying the necessary ingredients, a mixing-vessel, an appliance for stirring and mixing the ingredients therein, and a suitable discharge pipe or aperture.
3. The deflecting-disks, for directing the ingredients toward and from the center of the cylinder, alternately, in a soap-making apparatus, substantially as described.
4. The peculiarly-constructed stirrers represented in Figs. 4, 5, 6, 7, 8, or any combination of them, to be used upon a rotating shaft in a mixing-cylinder, for the purpose stated.
5. The steam-jacket and steam and water pipes, each in combination with a mechanical soap-making apparatus, substantially as set forth.

MOSES HYDE.  
FRANCIS HYDE.

Witnesses:

JOHN T. GORSUCH,  
ROBERT. W. HAYS.