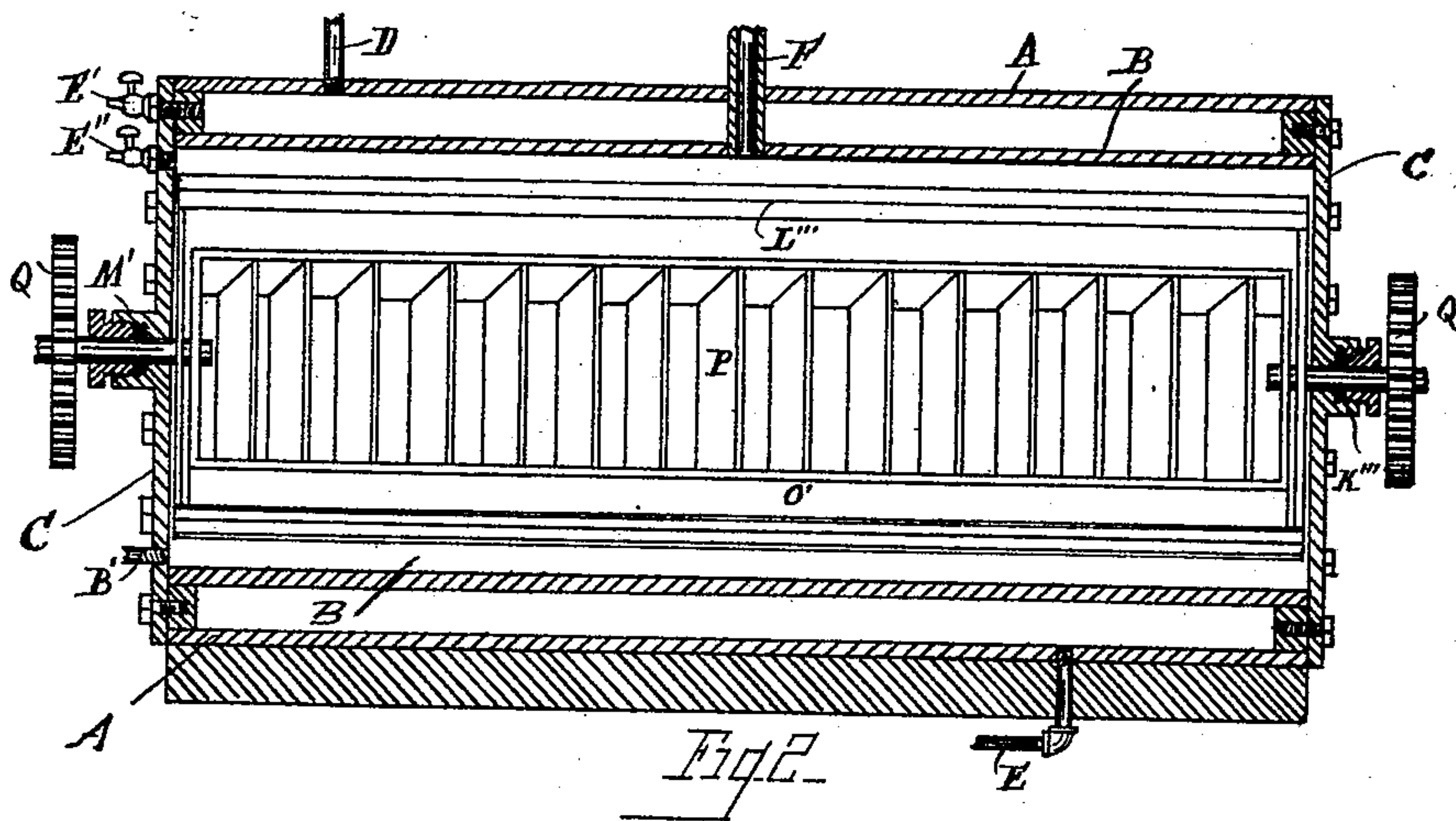
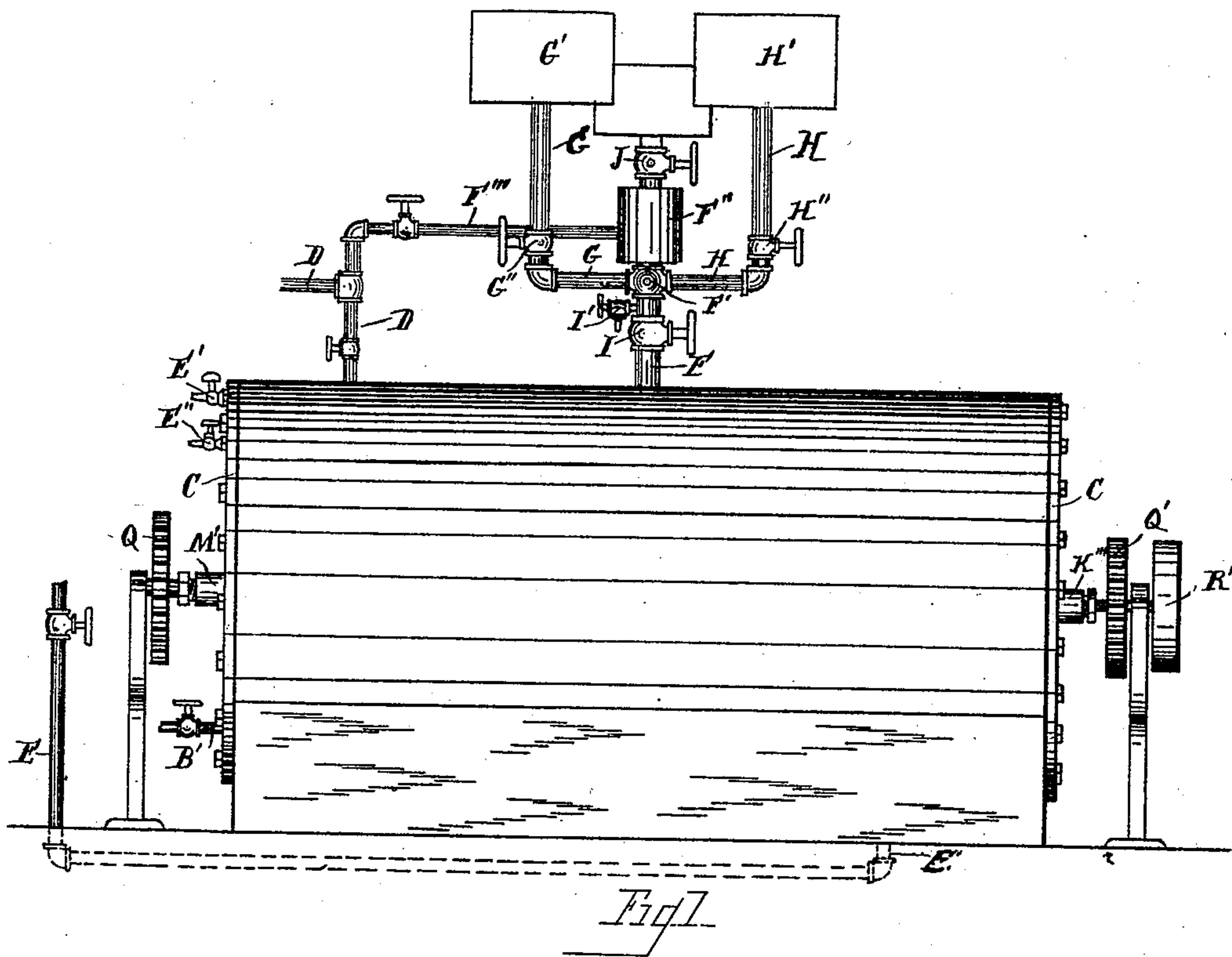


2 Sheets—Sheet 1.

No. 437,448.

Patented Sept. 30, 1890.



*WITNESSES*

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(No Model.)

2 Sheets—Sheet 2.

M. J. PALMER.  
APPARATUS FOR MAKING SOAP.

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Patented Sept. 30, 1890.

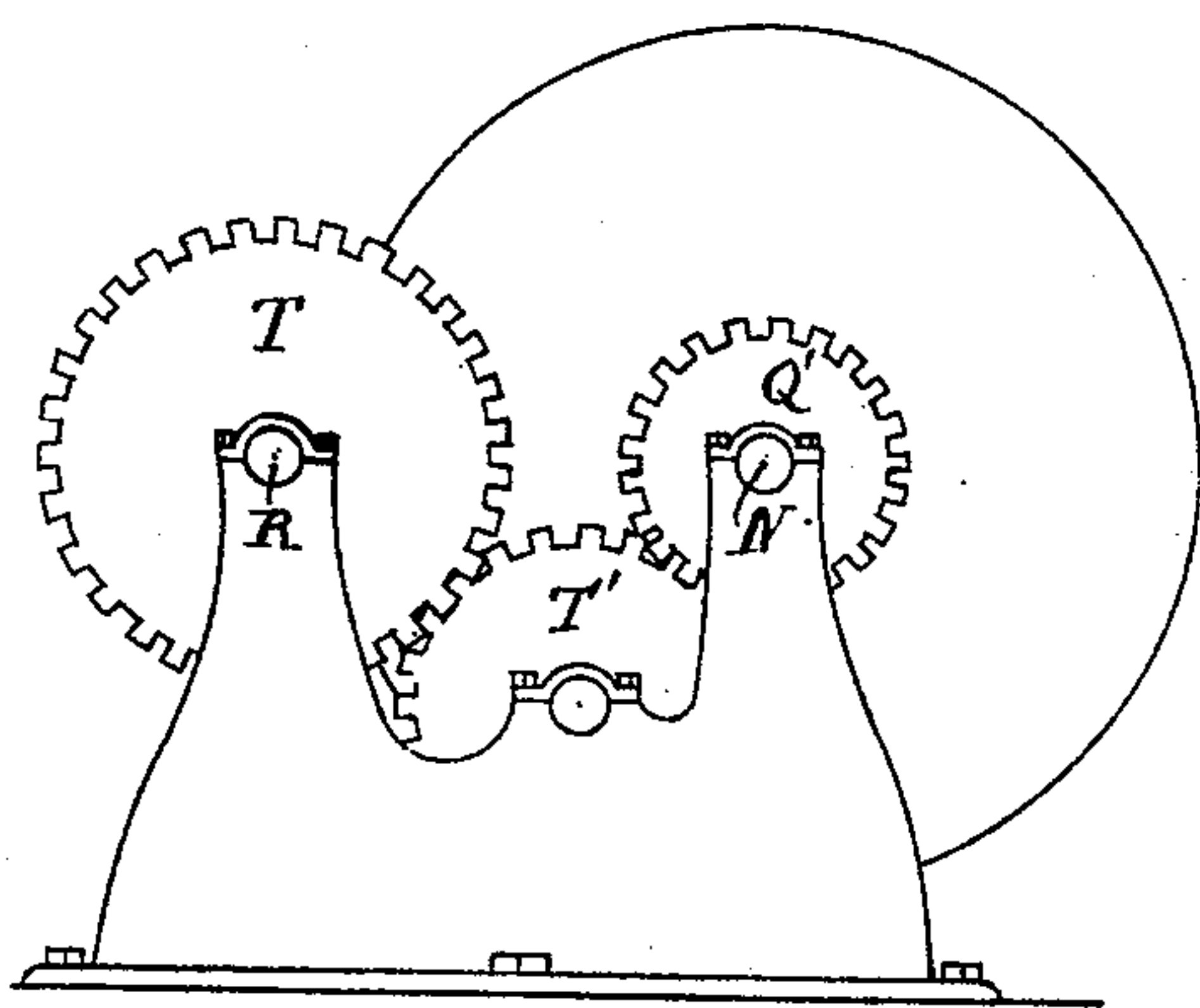


Fig. 3.

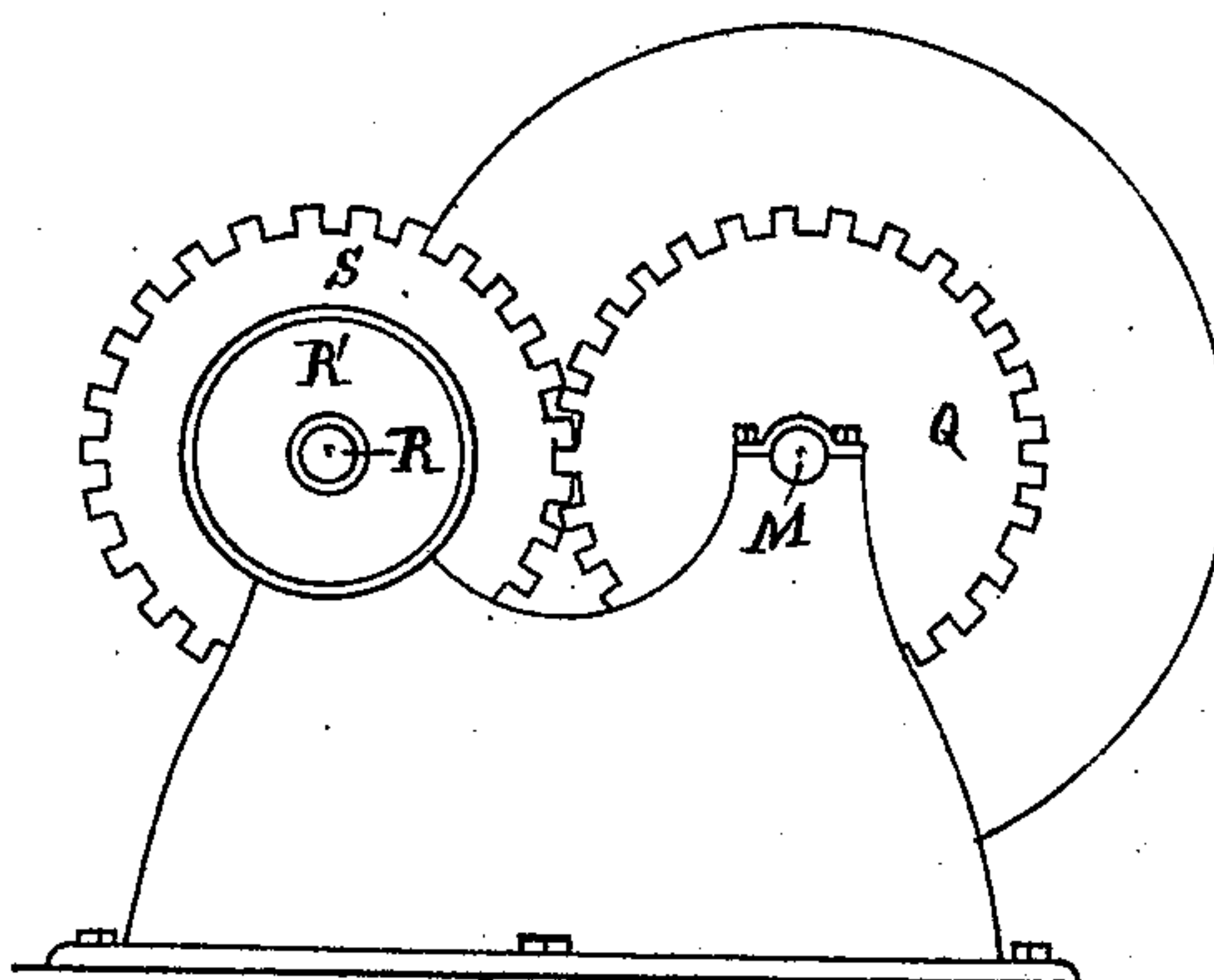


Fig. 4.

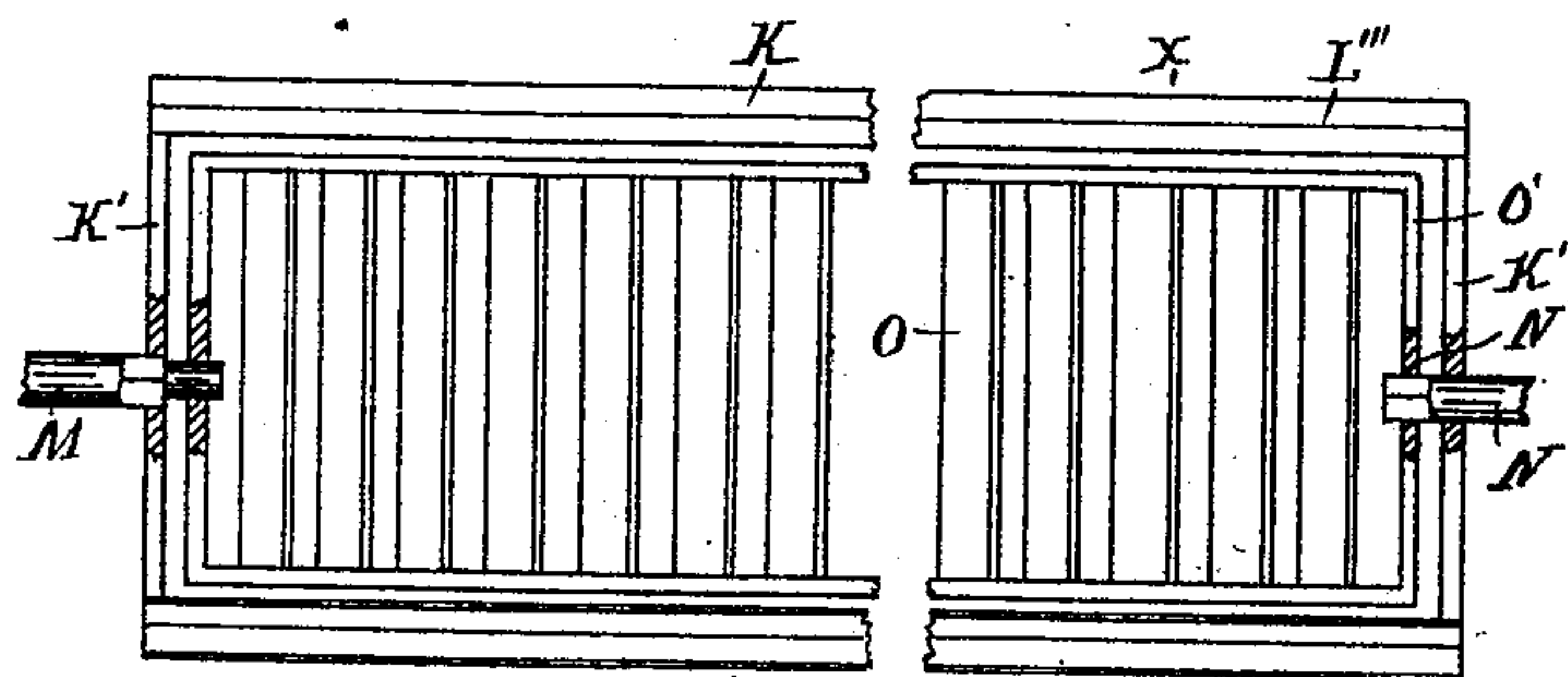


Fig. 5.

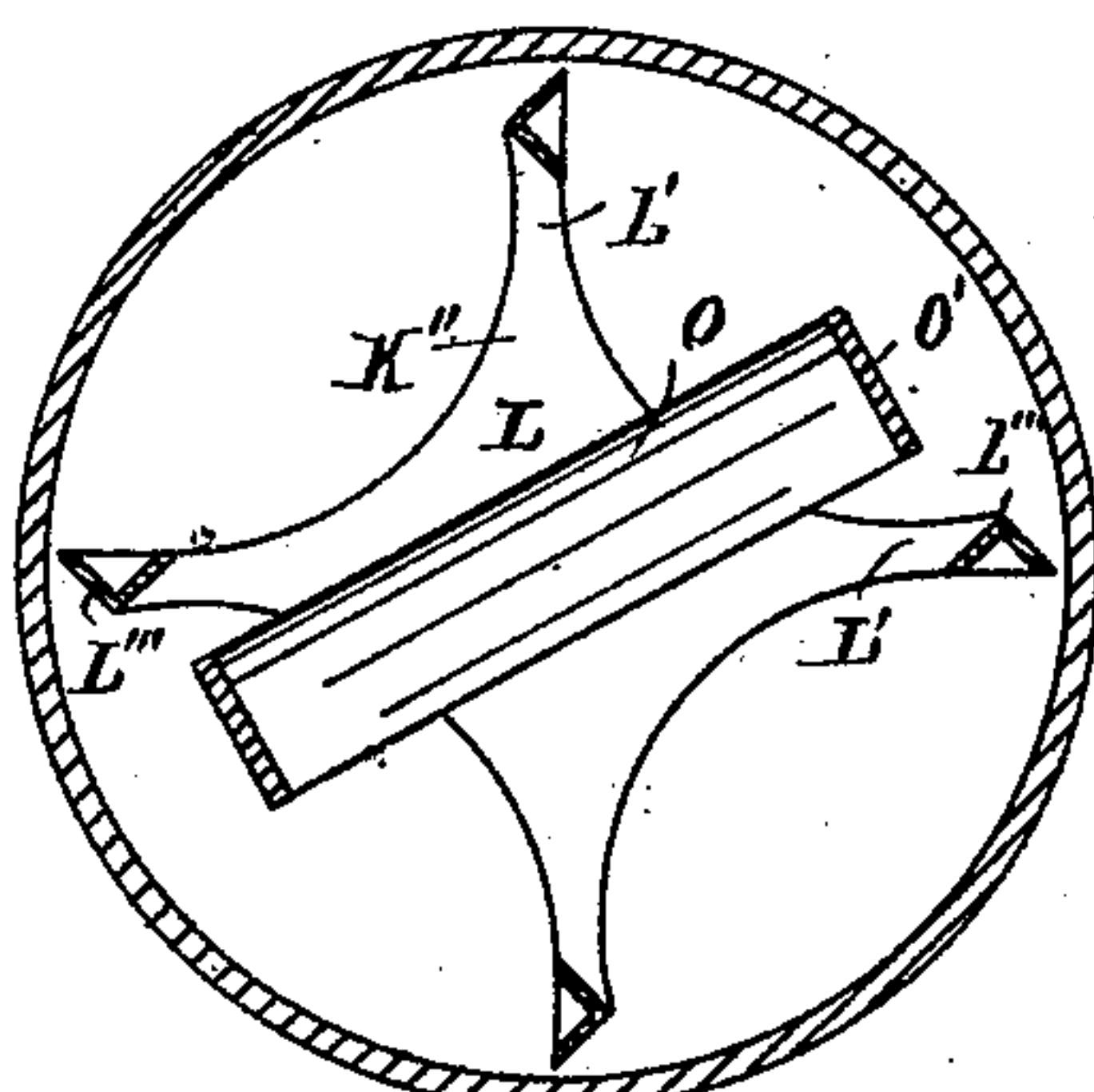


Fig. 6.

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# UNITED STATES PATENT OFFICE.

MILTON J. PALMER, OF TOLEDO, OHIO.

## APPARATUS FOR MAKING SOAP.

SPECIFICATION forming part of Letters Patent No. 437,448, dated September 30, 1890.

Application filed July 24, 1889. Serial No. 318,563. (No model.)

*To all whom it may concern:*

Be it known that I, MILTON J. PALMER, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in an Apparatus for the Saponification of Fatty Substances in the Manufacture of Soap; and I do hereby declare that the following is a full, clear, and exact description of the invention, which 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 the letters of reference marked thereon, which form part of this specification.

My invention relates to an apparatus for the saponification of fatty substances in the manufacture of soap, and has for its object to accomplish the same by a perfect chemical union with an alkaline solution when under a steam-pressure, with means for thoroughly incorporating a determinate quantity of water therewith prior to solidification of the saponaceous solution.

A further object is to provide means whereby a desired additional quantity of fatty substance or alkaline solution may be incorporated with the mixture while the apparatus is in operation by means of a supplemental charging-chamber in communication with the mixing-chamber.

The invention consists in the parts and combination of parts hereinafter described and pointed out in the claims.

In the drawings, Figure 1 is a front elevation of a complete apparatus. Fig. 2 is a longitudinal vertical section through the same with the supply-pipes and chambers omitted. Fig. 3 is an end view of the gearing for actuating the internal agitator. Fig. 4 is a like view of the opposite end, showing the gearing for revolving the float-reel. Fig. 5 is a longitudinal vertical section through the internal agitator and float-reel; and Fig. 6 is a transverse view of the same on lines *x x*, Fig. 5.

A designates a cylinder, and B a cylinder of smaller diameter placed within cylinder A, the two cylinders being closed at each end by heads C, whereby the same are rendered steam-tight.

Cylinder A is tapped upon the upper and lower sides, respectively, for the insertion of a steam-inlet pipe D, leading from any preferred source of steam, and an exit-pipe E for withdrawing the water of condensation therefrom, and in the annular space between the cylinders there is inserted through the cylinder-head a blow-off cock E', there being a like cock E'' leading from cylinder B.

F designates what I term the "main pipe," tapped through cylinder B, this pipe being connected by means of suitable couplings F' with branch pipes G and H, respectively, the pipe F extending above the union of pipes G and H and being surrounded with steam-jacket F'', in communication with a pipe F''', leading from the steam-supply, for a purpose hereinafter stated, pipe F being supplied with a valve I below the union of pipes G and H and with a like valve J some distance above the same.

Pipe G is supplied with a receptacle G' for containing alkaline solution, which may be allowed to flow into pipe F by turning a valve G'', arranged in the pipe below the receptacle, and pipe H is provided with a like receptacle H' for containing fatty substance, which is allowed to flow into pipe F by turning a valve H'' in pipe H intermediate receptacle H' and said pipe.

T represents a supplemental receptacle or chamber mounted on pipe F and in communication therewith above the juncture of the main and branch pipes. This receptacle is designed to receive one of the soap ingredients for use as occasion may require, as will be hereinafter explained.

Cylinder B is tapped at or near the lowest point by a pipe B', which may lead directly to a crutching-machine, if desired, or to receptacles for allowing solidification of the thoroughly mixed and saponified solution as it leaves the saponifier.

K designates a dasher or stirrer formed of end sections K' and K'', respectively, which consist of a central body portion L, formed with radial arms L', to which are secured transverse V-shaped floats or buckets L'', extending the length of the interior of cylinder B.

M designates a shaft, a squared portion of



which is inserted into a rectangular perforation formed centrally of the diameter of section K'. The shaft M is journaled in the cylinder-head in boxing rendered steam-tight by a stuffing-box M'. The opposite end of the dasher is journaled on a shaft N, rigidly secured in the end section of an agitator O, journaled within the reel K and revolved in a reverse direction thereto, as will be more fully described.

Agitator O is formed of a rectangular frame O', having cross-bars P secured thereto, the cross-bars being arranged parallel with one another and with the ends of the frame, said bars being placed obliquely, as shown, whereby when the solution is forced between the cross-bars by the revolution of the same the solution is given a spiral movement in addition to the rotary movement induced by the revolution of the frame. The agitator is journaled at one rounded end upon the end of shaft M, projecting inwardly from the squared portion which rests in the rectangular perforation of section K of the reel and at the opposite end upon shaft N, the inner end of which is squared and secured in a rectangular perforation N' in the end of frame O', the shaft extending through the reel and being journaled in the cylinder-head in a boxing rendered steam-tight by a stuffing-box K''. Upon shaft M there is secured a pinion Q, and upon shaft N there is secured a pinion Q' of less diameter.

R designates a counter-shaft journaled in parallel relation with shafts M and N and receives motion from a belt (not shown) upon pulley R'. Upon shaft R is secured a pinion S, which gears with pinion Q and revolves the dasher to the right, and at the opposite end of the shaft is secured a pinion T, which gears with a pinion T', the latter pinion intermeshing with pinion Q', thereby revolving the concentric agitator O in an opposite direction to the revolution of the dasher and with a greatly-increased motion.

In operation receptacles G' and H' are filled with alkaline solution and fatty matter, respectively. Steam is admitted through pipe D into the annular space between the two cylinders, and valves G'', H'', and I are opened, thereby allowing the alkaline solution and fatty matter to run into cylinder B. The agitator and dasher are caused to revolve through the medium of the gearing connected therewith, and the matter contained in cylinder B is thoroughly intermingled. The heat from the steam in the annular chamber raises the temperature in chamber B to such a degree that the water contained in the alkaline solution is converted into steam, when the V-shaped floats or buckets collect the vapor in its heated state and carry the same into the main body of the intermixed fluid, thereby heating the same uniformly, when the agitator O, by urging the solution in a rotary and spiral direction, thoroughly saponifies the mass and incorporates therewith the aqueous

vapor in the desired proportion, when the entire body in a thoroughly saponified condition is withdrawn through pipe B'.

When it is desired to manufacture a given quantity of soap at one time, the operator places what he conceives to be the proper quantity of each ingredient in its respective receptacle and commences to feed the alkaline solution and the fatty matter into cylinder B. Now, should he at any time find on examining the product that there is a deficiency in either the alkali or fatty matter, he can supply that deficiency through the medium of the supplemental receptacle T without changing the relative proportions originally placed in the receptacles G' and H'. In feeding the material from the supplemental receptacle into the cylinder B the valve I is first closed and then valve J is opened, permitting the liquid to flow down and fill that portion of the main pipe between these valves, when the valve J is closed and the valve I opened, thus permitting the liquid to intermingle with the alkali and fatty substance flowing through pipes G and H into the cylinder B. Another useful result attained by the supplemental receptacle, together with the steam-jacket immediately below it, is the facility with which scrap-soap and other like material may be introduced into cylinder B without disturbing the materials in the other receptacles, the heat from the steam-jacket serving to liquefy the contents of the supplemental receptacle, so that it may be fed to the cylinder in the manner before indicated.

Pipe F is provided with a cock I', by which to draw off, when desired, any fluid that may be in it.

By means of cock E'' in cylinder B the pressure of vapor may be withdrawn should it tend to limit or prevent the even feed of material thereto.

It will be seen that the apparatus is compact and easily managed, as well as continuous in operation.

What I claim is—

1. In an apparatus for the saponification of fatty substances, the combination, with an outer cylinder and an inner concentric cylinder, of a main pipe in communication with the interior of the inner cylinder and provided with a steam-jacket, a receptacle for alkali and a receptacle for fatty matter in communication with the main pipe below the steam-jacket, a steam-supply pipe in communication with the annular space between the cylinders and with the steam-jacket, and a supplemental receptacle in communication with the main pipe above the steam-jacket, said pipe being provided with a valve above and a valve below the steam-jacket, for the purposes set forth.

2. In an apparatus for the saponification of fatty substances, a steam-jacketed cylinder, a pipe communicating with the interior cylinder and the material to be introduced therein, in combination with a revoluble



dasher or stirrer, and a concentric agitator geared to revolve in a direction opposite to that of the reel, as and for the purpose set forth.

5 3. The herein-described agitating mechanism, comprising a dasher formed with V-shaped floats or buckets longitudinally thereof, a rectangular frame journaled within the dasher, in combination with gearing connected there-  
10 with to revolve the dasher and frame in opposite directions, as and for the purpose set forth.

4. In combination with a steam-jacketed cylinder, a dasher journaled within the cylin-

der, and an agitator geared to revolve in an 15 opposite direction to the revolution of the dasher and with an increased velocity by means of gearing upon shafts in parallel relation with the axis of the cylinder and inter-  
20 meshing with the gearing on the agitator- shaft, as and for the purpose set forth.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

MILTON J. PALMER.

Witnesses:

WILLIAM WEBSTER,  
CARROLL J. WEBSTER.