

(No Model.)

W. T. BAKER.

COATING PILLS, LOZENGES, &c.

No. 300,037.

Patented June 10, 1884.

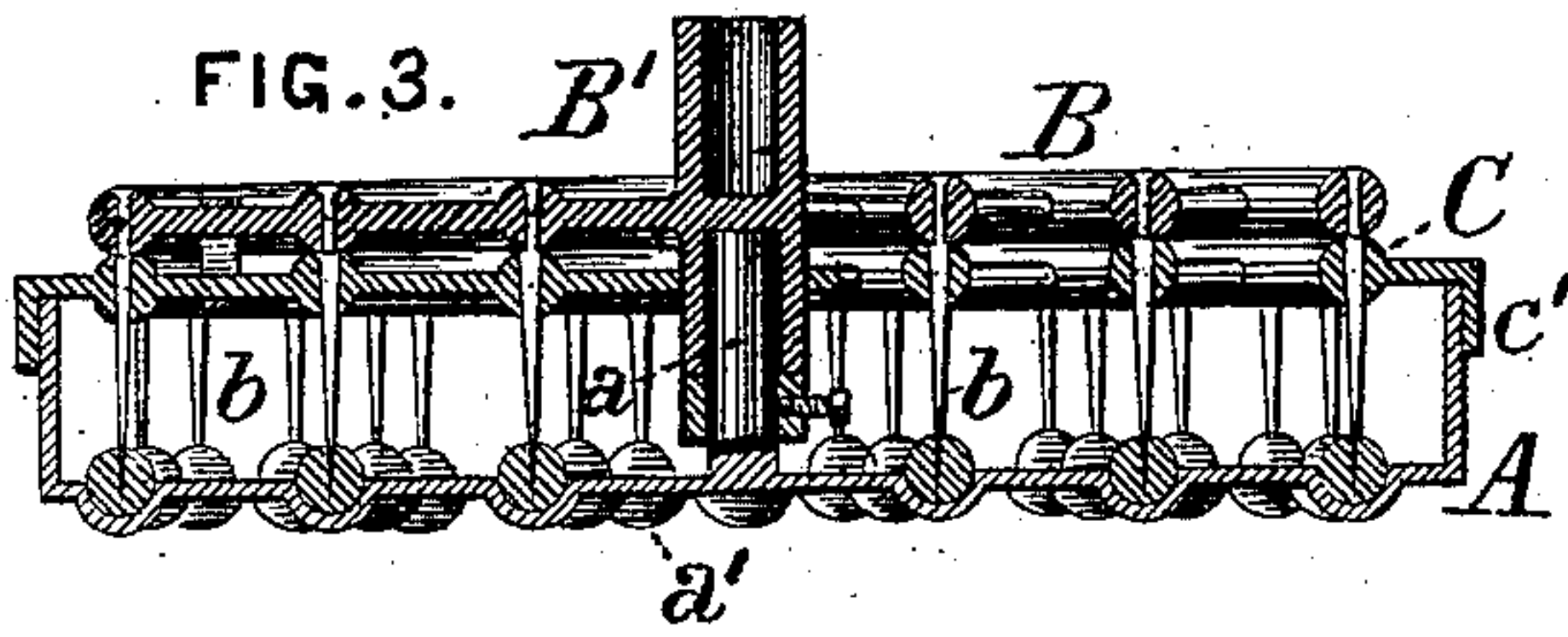


FIG. 1.

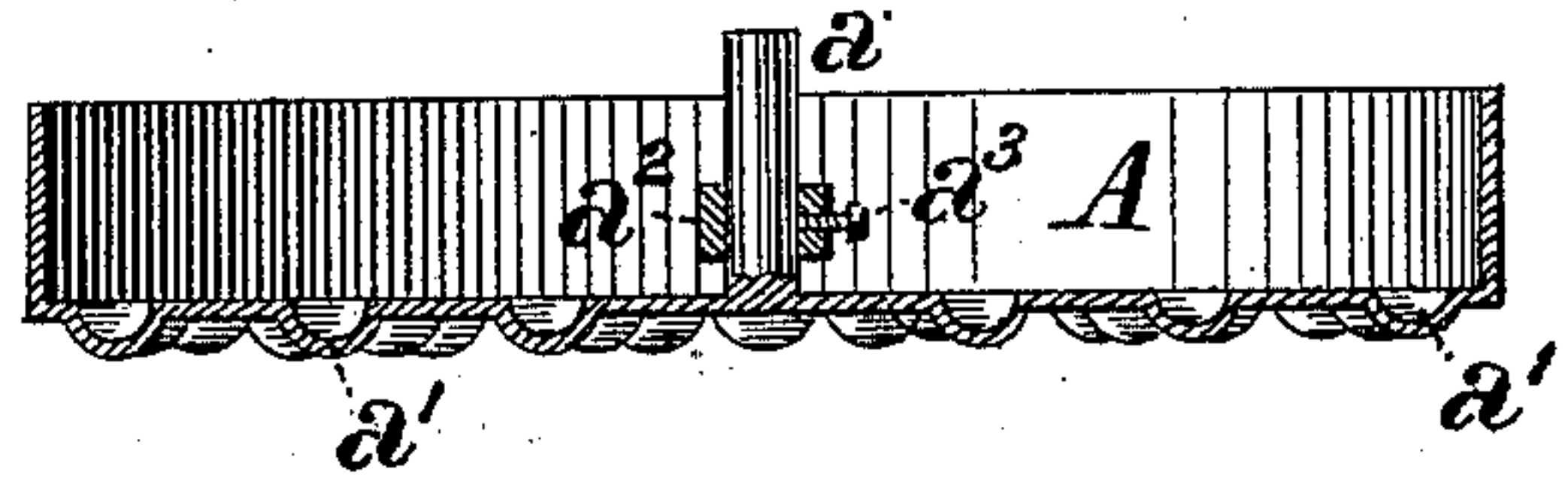


FIG. 4.

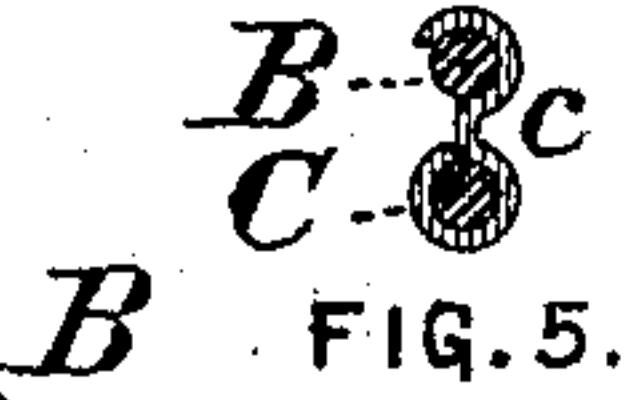
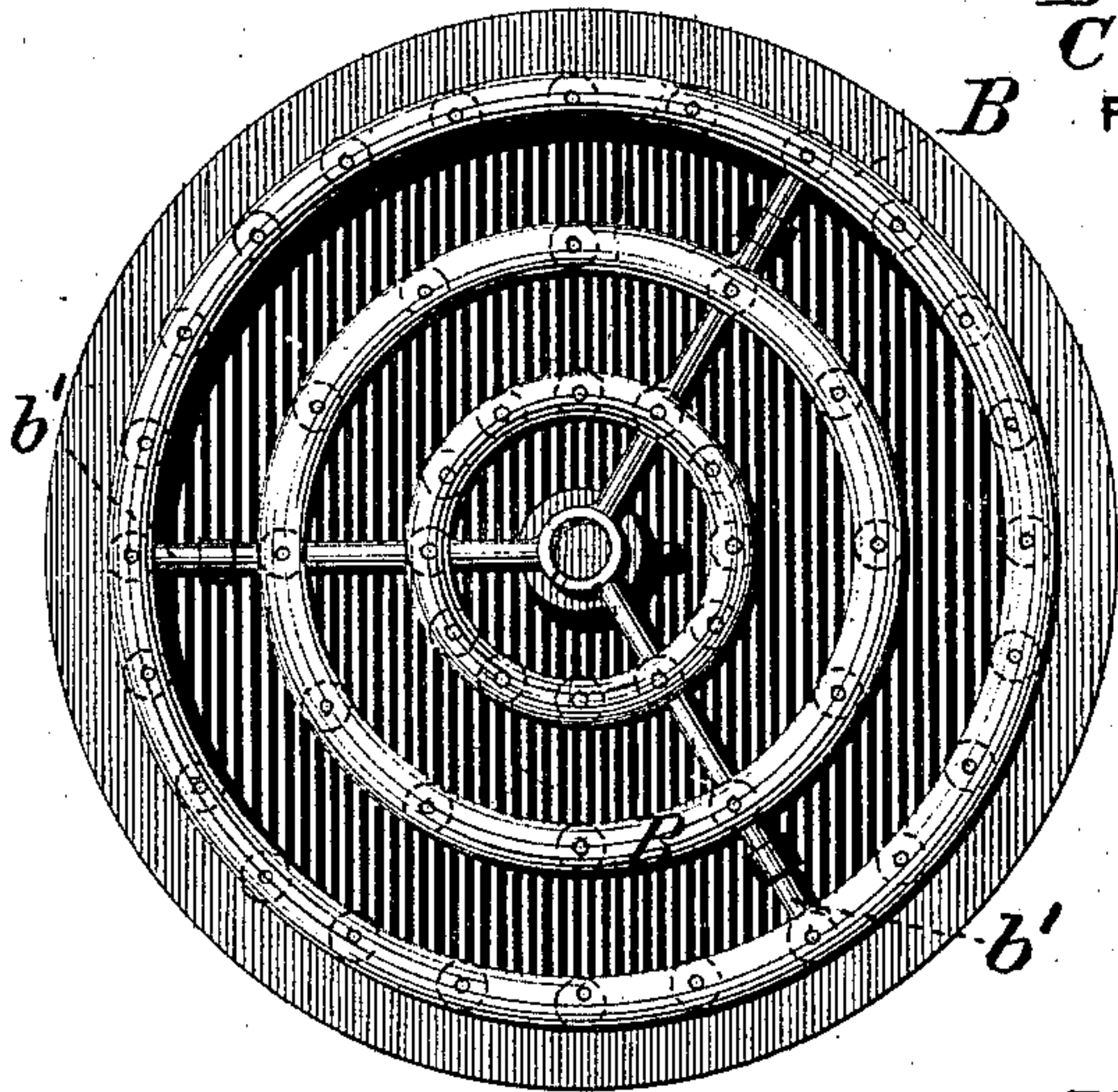


FIG. 2.

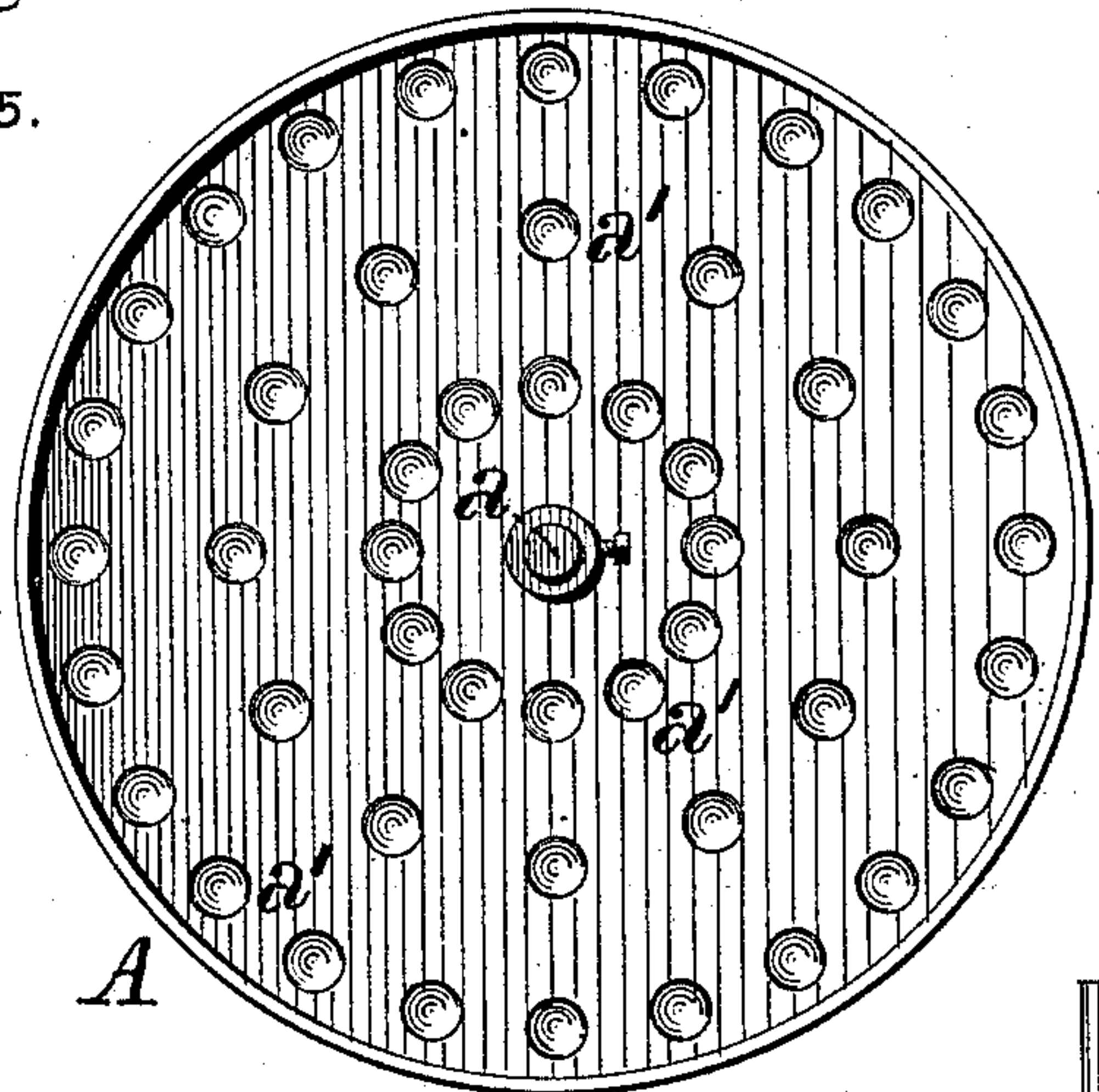


FIG. 6.

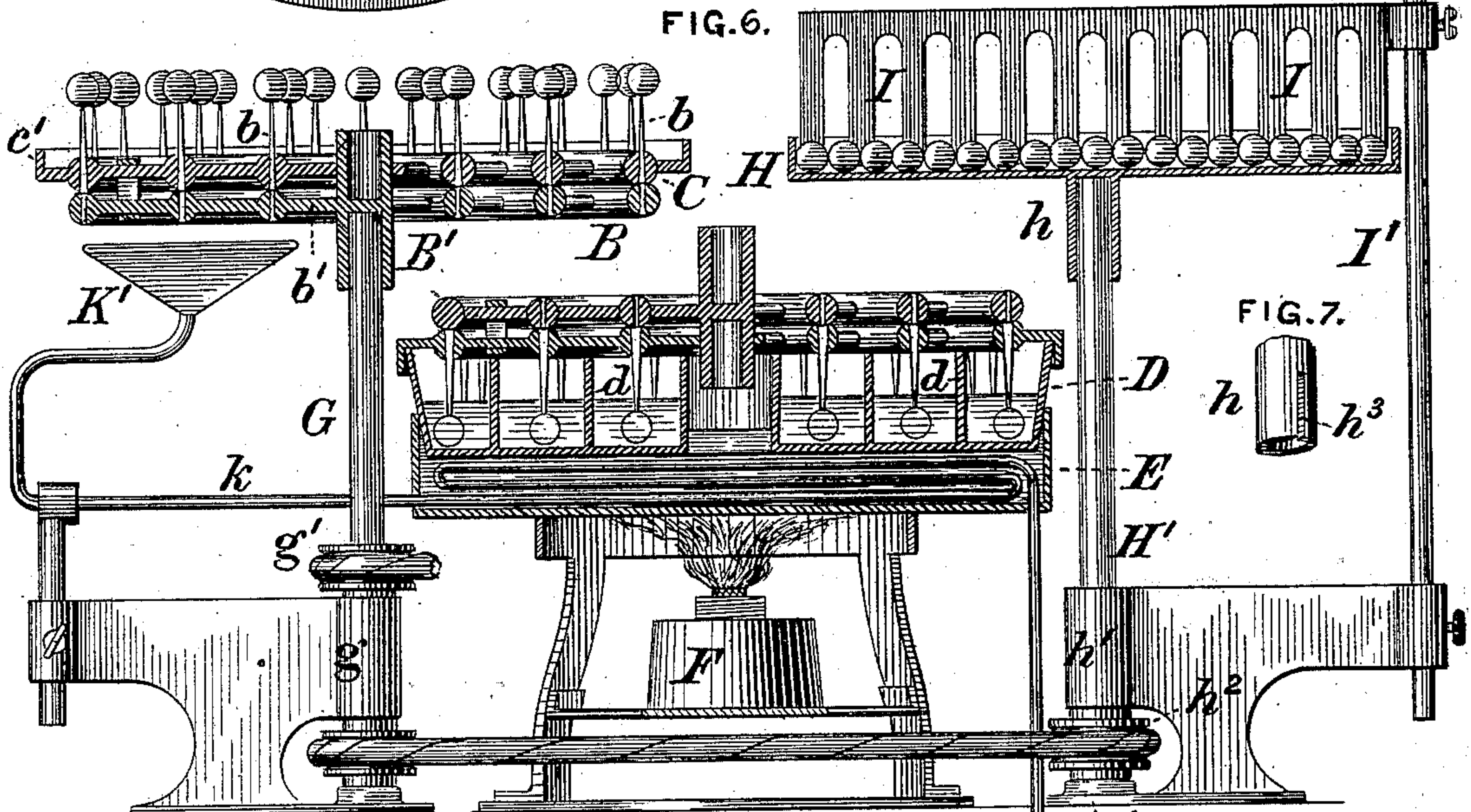


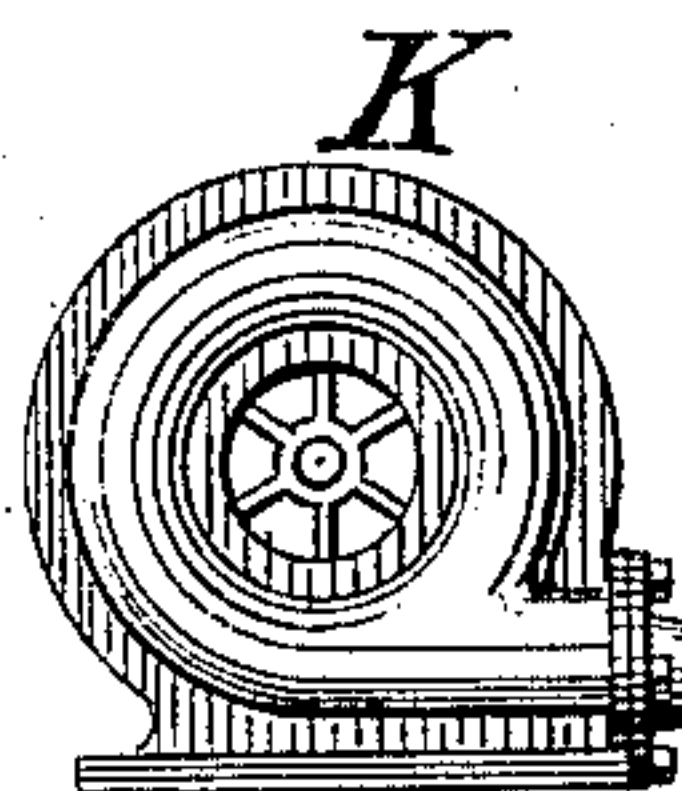
FIG. 7.



WITNESSES:

g'

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UNITED STATES PATENT OFFICE.

WALTER T. BAKER, OF PHILADELPHIA, PENNSYLVANIA.

COATING PILLS, LOZENGES, &c.

SPECIFICATION forming part of Letters Patent No. 300,037, dated June 10, 1884.

Application filed December 29, 1883. (No model.)

To all whom it may concern:

Be it known that I, WALTER T. BAKER, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Coating Pills, Lozenges, &c., of which improvements the following is a specification.

The object of my invention is to enable the covering or coating of pills, lozenges, pellets, troches, &c., with any suitable soluble coating material to be effected with thoroughness, economy, and dispatch, and upon a greater or less number of pills or other articles at a single operation, as may be desirable or convenient.

To this end my improvements consist in a certain novel method of coating, drying, and polishing pills or analogous articles, and in an apparatus usefully applicable to the practice thereof, all as hereinafter fully set forth.

To carry out my invention, the series of pills or other articles to be coated, being greater or less in number, as required, is first located in a proper receptacle in such relative position that the several articles may be simultaneously engaged by any device adapted to lift them from the receptacle and to hold them apart when lifted. The pills are next removed from the receptacle, and, while still connected to said holding and lifting device, are immersed in a bath of the desired coating solution. The series of pills thus coated is next rotated, while its members occupy the same relative positions as before until thoroughly dried, the operation being facilitated, if desired, by the application of heat, and finally the coated and dried pills are polished by rotation in a suitable vessel. In each of the several steps of the operation all the pills to be treated are simultaneously acted upon, and uniformity in result as well as economy of time is thereby attained. The process above set forth may be conveniently performed by the use of the apparatus hereinafter described, but is not necessarily dependent upon the specific mechanism thereof, as the same may be varied in sundry particulars without departing from the spirit of my invention or changing the character and sequence of the several steps of the operation.

In the accompanying drawings, Figure 1 is

a vertical central section through a pill-receptacle adapted to use in the operation of my invention; Fig. 2, a plan or top view of the same; Fig. 3, a vertical central section through the same, with the lifter and holder and the remover in position thereon; Fig. 4, a plan or top view of the parts when connected, as in Fig. 3; Fig. 5, a section through a clamp for connecting the lifter and holder with the remover; Fig. 6, a vertical section through an apparatus, illustrating the simultaneous performance upon different series of pills, of the several operations of coating, drying, and polishing, respectively; and Fig. 7, a view in perspective of the hollow shaft of the polisher detached.

For the treatment of pills, lozenges, or like articles under my invention by the apparatus herein illustrated, I provide a cylindrical pill-receptacle, A, which is open at top and closed at bottom, from which there projects upwardly a central shaft, *a*. A series of shallow recesses or cups, *a'*, each suited to form a seat or receptacle for one of the articles to be treated, is formed upon or secured to the inner surface of the bottom of the receptacle A, said recesses being arranged in any desired number and relative position. In the instance shown three circular series of recesses are employed, their being twelve recesses in the inner series, twelve in the intermediate, and twenty-four in the outer. The number of recesses in the receptacle, which is purely arbitrary, will depend upon the extent of the operations carried on by the apparatus; and, while the figure of the series is immaterial, the circular form, as shown, will be found a convenient one in connection with the construction of the coating bath presently to be described. The pills to be treated, in any desired number up to the aggregate of the recesses *a'* of the receptacle A, are deposited in said recesses in order to be spaced or adjusted in such relative positions as to be simultaneously lifted therefrom by a suitable device having corresponding pins or other projections, each capable of penetrating or clasp ing one of the pills when resting in a recess, and of holding the same when removed therefrom. The device here adopted for illustration, and which may be termed a "lifter and holder," consists of a frame, B,

formed of a series of three rings corresponding in diameter, respectively, with the three series of recesses in the receptacle A, and united to each other and to a central hollow shaft, B', by arms b' . The diameter of the bore of the hollow shaft B' is such as to enable it to be fitted upon the shaft a of the receptacle A, and the frame B is provided with a series of pointed pins, prongs, or tines, b , which correspond in number and relative location with the recesses a' . It will thus be seen that when fitted upon the shaft of the receptacle, with its pins in the direction of the bottom thereof, each of said pins may be brought directly over one of the recesses a' , and may be made to penetrate a pill resting in said recess by pressing the frame B downwardly upon the shaft a for the distance required, such downward movement being properly limited by an adjustable collar, a^2 , which may be fixed upon the shaft a by a set-screw, a^3 .

In order to admit of the detachment of the pills from the lifter and holder at the conclusion of the drying operation, I provide a remover, C, consisting of a frame substantially similar to that of the holder and lifter, but having in lieu of the pins of the latter a series of perforations corresponding in number and location with said pins, and of diameter proper to admit the same, so that when the pins are passed through the openings the frames may be brought into contact, as shown in Figs. 3, 4, and 6. The lifter and holder and the remover are connected by removable clamps c , which may be either coupled to the arms of the frames, as shown in Fig. 4, or to the rings thereof, as preferred. A downwardly-projecting flange, c' , the diameter of which is such as to fit closely around the receptacle A, or a series of equivalent guide projections, is formed upon the periphery of the remover C, and a mark or stop thereon, registering with a corresponding mark or stop on the receptacle, serves as a guide to direct each pin to the center of one of the recesses when the lifter and holder and the remover are connected and fitted on the shaft of the receptacle A to lift the pills therefrom. While I have herein described a lifting device which engages the pills by penetrating them, my invention is not in this particular confined thereto, as I may employ in lieu of the pins a series of pairs of flexible jaws, which, when moved together, will clasp the pills, and when sprung or pressed apart will release them, and such device I consider to be the mechanical equivalent of that shown in effecting the lifting and holding of the pills.

The solution with which the pills are to be coated is placed in a dish or pan, D, which is divided by partitions d into a series of sections corresponding in number with the several rows or series of recesses in the receptacle A, the object of such construction being to economize the solution by enabling the same to be supplied, as nearly as may be, in conformity to the larger or smaller number of pills to be

coated. Thus, for example, if only twelve pills or a less number, are to be treated, the solution need be supplied only to the central or to the intermediate section, and the pills are placed in the corresponding series of recesses of the receptacle. For more than twelve and not more than twenty-four the solution may be supplied either to the outer section or to the central and intermediate ones, and for any number greater than twenty-four, up to the maximum capacity of the receptacle, which in this case is forty-eight, solution must be supplied to all of the sections. The coating-pan D is heated in any suitable manner, preferably through the intermediation of a water bath, E, to which heat is applied by a lamp or furnace, F.

A drier-shaft, G, the upper end of which is adapted to fit within the opening of the hollow shaft B' of the lifter and holder B, is mounted in bearings g on any suitable base or stand, and carries a pulley, g' , by the application of power to which it may be rapidly rotated. For this purpose any suitable motive power may be required, electricity, clock-work, steam, or manual power being readily applicable to the light duty required.

The polishing of the pills is effected by the rotation of a polishing-dish, H, having a central tubular shaft, h , adapted to fit on one end of a polisher-shaft, H', which is mounted in bearings h' on a base or stand, and carries a pulley, h^2 , through which it may be rotated either from the drier-shaft or independently by a prime mover, as preferred. The shaft h of the polishing-dish may be provided with a lateral slot, h^3 , in order to facilitate, by the springing of the metal, the connection and disconnection of the polishing-dish and polisher-shaft, and a stationary adjustable stop or comb, I, connected by a set-screw, i , to a support, I', serves to prevent the continuous rotation of the pills in the same path, and thereby to induce polishing action by the contact of all portions of their surfaces, one with another and with the polishing-dish.

It may in some cases be desirable to facilitate the drying operation by the application of a current of heated air to the coated articles during their rotation by the drier-shaft, and to this end a fan, K, may be employed, said fan forcing air into a pipe, k , having a flaring or trumpet-shaped mouth-piece, K', located in such position that its discharge shall be adjacent to the lifter and holder when connected to the drier-shaft G. The current of air passing through the pipe k may be heated in any convenient manner.

In the construction shown the remover may be entirely detached from the lifter and holder; but, as its frequent removal and replacement when pills are treated in quantity continuously may tend to damage the pin-points by hasty or careless manipulation, it may be connected to the lifter and holder by any means

which will admit of its traverse toward and from the same, for a sufficient distance to effect the release of the pills therefrom, when required, without being entirely removed or slipped over the pin-points. One or more slotted links, engaging studs on the shaft of the remover, may be employed for this purpose, or an adjustable nut engaging said shaft may be employed for this purpose.

In operation the pills or other articles to be treated are placed in the recesses of the receptacle A, and a sufficient quantity of the proper coating-solution is heated in the coating-dish D. The remover C is then slipped onto and coupled to the lifter and holder B, and the two are fitted over the shaft *a* of the receptacle A and moved downward thereon until the pins *b* simultaneously penetrate the several pills. The lifter and holder and the remover are then detached from the receptacle A, and the pills adhering to the pins *b* are dipped in the coating-dish D to receive the desired coating. The lifter and holder and the remover, with the attached pills, are then removed from the coating-dish, and connected, in inverted position, as shown in Fig. 6, to the drier-shaft G, which is rotated rapidly until the pills are thoroughly dried, heated air being applied from the pipe *k* of the blower K during the operation, if desired. At the conclusion of the drying operation the coated and dried articles are pushed off the pins *b* by the downward movement of the remover C into the polishing-dish H, which is rotated until the articles are properly polished, when the rotation of the dish H is arrested and the finished articles are removed through a suitable gate or chute therein.

The arrangement and dimensions of an apparatus as above described may be varied according to the requirements of the trade in which it is to be employed, so as to be applicable as well on a small as on a large scale. It is thus desirably suited to the use of druggists who may from time to time have occasion to coat small quantities of pills, and will be found of equal utility in manufacturing establishments where the treatment is conducted continuously or on an extended scale.

I claim as my invention and desire to secure by Letters Patent—

1. In an apparatus for coating pills, lozenges, &c., a receptacle having a central shaft adapted to center a lifting device, and a series of seats or recesses located around said shaft, each of said seats being adapted to receive and support a pill or analogous article in a plane perpendicular to the shaft, substantially as set forth.

2. In an apparatus for coating pills, lozenges, &c., a coating dish or bath divided into two or more separate sections, substantially as set forth.

3. In an apparatus for coating pills, lozenges, &c., the combination of a lifter and holder having a series of rings or frames, each provided with projections adapted to engage a pill or analogous article, and a remover formed of a corresponding series of perforated rings or frames and connected to said lifter and holder, with the capacity of movement thereon when required to disengage the pills from the projections, substantially as set forth.

4. In an apparatus for coating pills, lozenges, &c., the combination of a recessed receptacle having a central shaft, a lifter and holder having central sockets on each side thereof, and a rotating drier-shaft, the socket on one side of the lifter and holder being adapted to fit on the shaft of the recess-receptacle and the opposite socket to fit on the drier-shaft, substantially as set forth.

5. In an apparatus for coating pills, lozenges, &c., the combination of a recessed receptacle, a lifter and holder, a remover, a coating-bath, a drier-shaft, a polishing-dish, and a polishing-shaft, substantially as set forth.

6. In an apparatus for coating pills, lozenges, &c., the combination of a lifter and holder, a drier-shaft, a fan or blower, a supply-pipe leading therefrom and discharging adjacent to the lifter and holder, and a heater connected with said supply-pipe between the blower and the discharge, substantially as set forth.

WALTER T. BAKER.

Witnesses:

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J. SNOWDEN BELL.