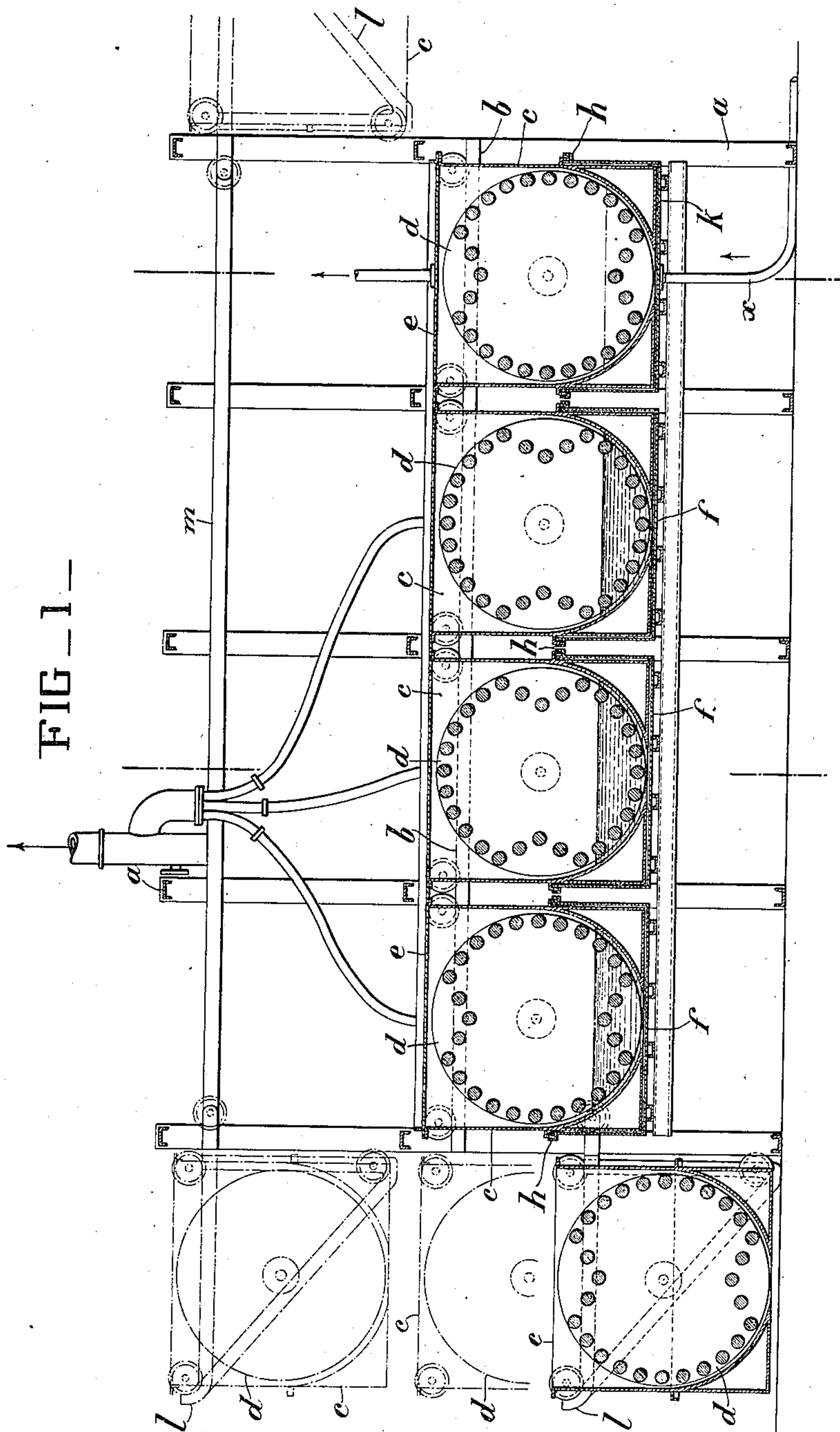


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APPLICATION FILED MAY 24, 1910.

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Patented Nov. 8, 1910.

2 SHEETS—SHEET 1.



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FIG - 3 -

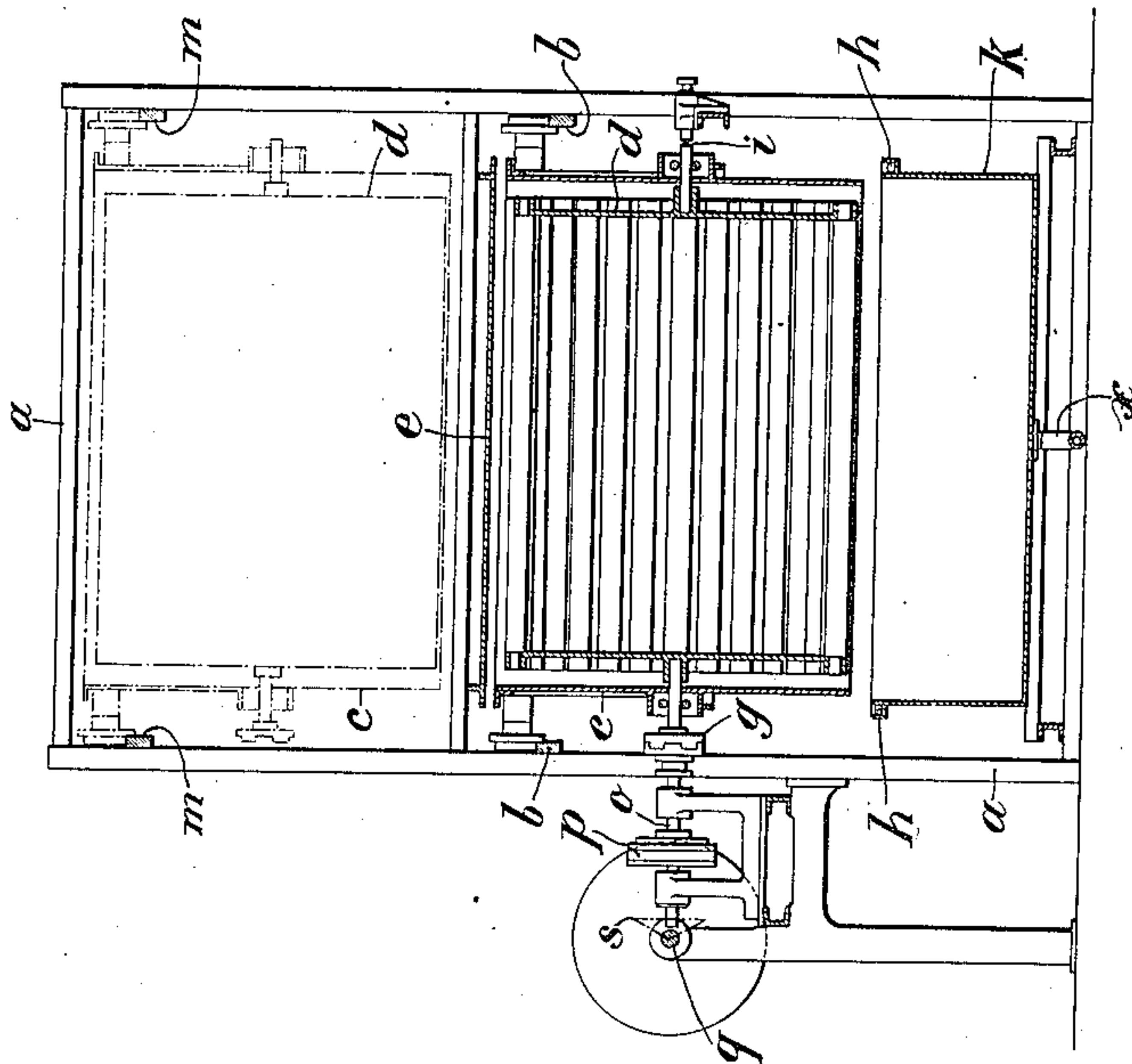
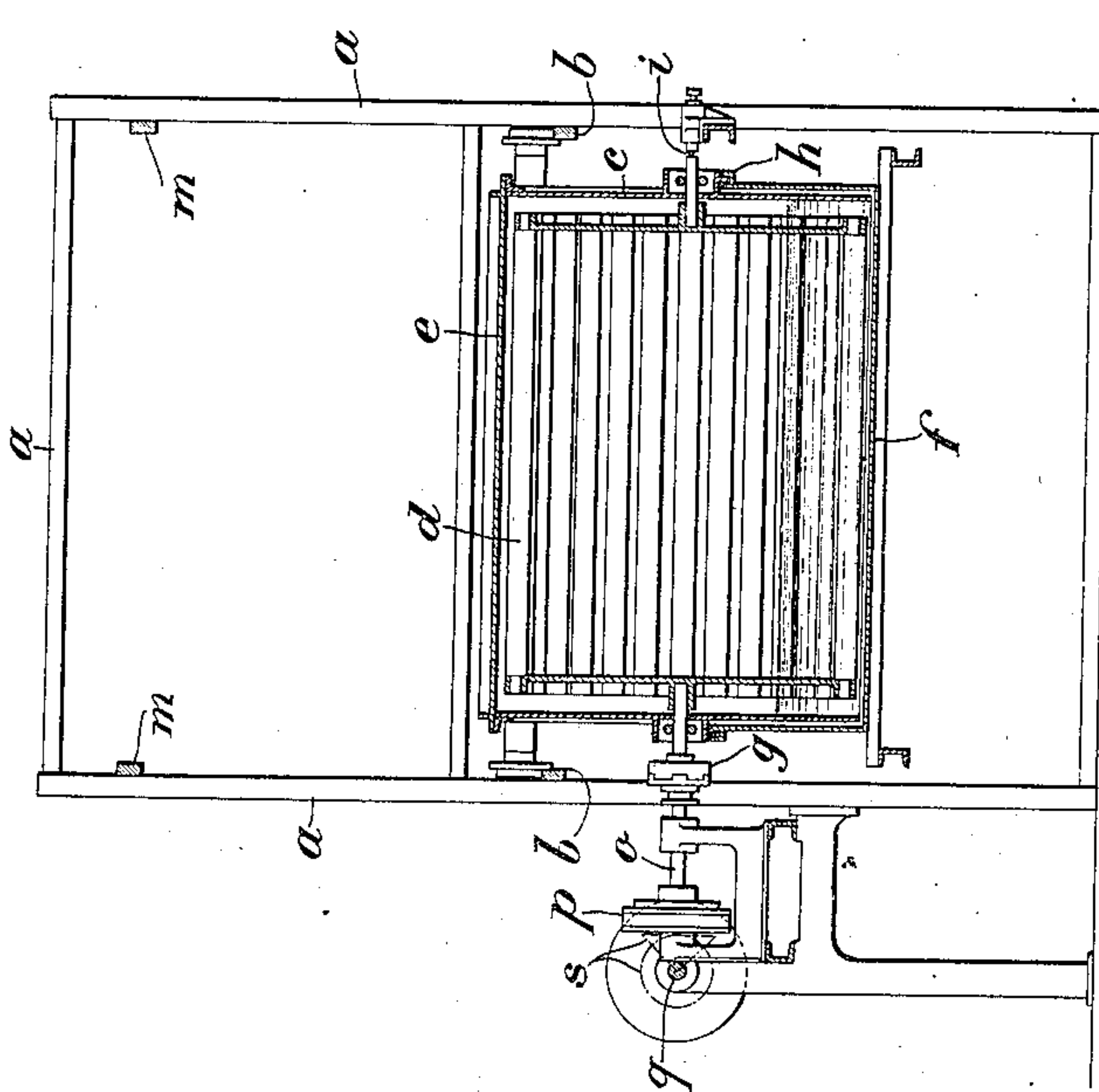


FIG - 2 -



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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BENZIN APPARATUS FOR WASHING, RINSING, DRAINING, AND DRYING TEXTILE MATERIALS.

975,078.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed May 24, 1910. Serial No. 563,162.

*To all whom it may concern:*

Be it known that I, ULRICH RÖTHLISBERGER, a citizen of the Swiss Republic, and resident of Basel, Switzerland, have invented  
5 new and useful Improvements in Benzin Apparatus for Washing, Rinsing, Draining, and Drying Textile Materials, of which the following is a full, clear, and exact specification.

10 In washing apparatus as heretofore constructed wherein benzin is used, it is impossible to carry out the process uninterruptedly, because there is not only necessary to await the end of the operation in the apparatus before inserting the fresh goods, but  
15 the apparatus has to be inoperative during the time that the goods are being inserted into, or taken out of the apparatus.

This invention relates to an improved apparatus which is arranged to permit of an uninterrupted washing and rinsing of the articles in benzin as well as the draining and drying of the same, while obviating any loss of benzin. With this object in view, squirrel-cage-like drums, the walls of which consists preferably of a number of horizontal rods, are revolubly mounted in displaceable boxes which are open at their lower ends and closed above by a movable cover.  
20 Vertically reciprocating receptacles which are arranged beneath the drums are adapted when in raised position to close the boxes which contains the drums. Some of the receptacles, the first ones, are filled with benzin and in the raised position, during the slow revolution of the corresponding drums, permit the articles introduced into the latter to be washed and rinsed in the benzin, while,  
30 in a partly lowered position, by quick rotation of the drums, they permit of a periodical draining by centrifugal force. Above the last empty receptacle, the goods are completely drained by quickly rotating the corresponding drum, and dried by circulating  
40 hot air while rotating at a lower speed. When the receptacles are moved into the lowermost position, the boxes and drums are periodically moved over the next receptacle after each working period, so that each drum  
50 will register with all the receptacles consecutively, that is to say, will undergo the various working stages in the apparatus step by step and so enable the articles to remain in the same drum during the entire cleansing process. The working process is, there-

fore, such that during a slow rotation, washing is taking place in one drum, rinsing in one or more subsequent drums, and drying in the last drum, and during a subsequent quick rotation, the articles are drained in  
60 the first drums and finally dried in the last drum. On the whole, therefore, the process is a continuous one, and need only be interrupted for the time required for shifting the drums, thus allowing of a considerably  
65 higher efficiency of the apparatus being attained.

To prevent an accumulation of benzin vapors and also to prevent the likelihood of an explosion, the vapors arising from the  
70 completely closed chambers containing the washing and rinsing drums, are preferably drawn away by a ventilator and regained for use by condensation.

To enable my invention to be fully understood I will describe the same by reference  
75 to the accompanying drawing, in which:

Figure 1 is a longitudinal section of an apparatus constructed in accordance with my invention, and having four working  
80 drums, Fig. 2 is a transverse section on Fig. 1 showing closed boxes and receptacles for the washing, rinsing and drying operations, and Fig. 3 is a transverse section on Fig. 1 showing the apparatus after the draining  
85 operation, the cover being lifted and the last receptacle *k* completely lowered to allow of the corresponding drum to be shifted away from above the receptacle.

*a* is the frame which is provided with rails  
90 *b* from which are suspended bottomless boxes *c* having revolubly mounted squirrel-cage-like drums *d* for the reception of the textile material to be treated. The boxes *c* are closed above by means of a common  
95 cover *e* and have provided beneath them a number of vertically adjustable receptacles *f*, *k*, which in their raised position are adapted to close their corresponding boxes *c* at the bottom. A glycerin closure is provided  
100 to insure the complete tightness between the boxes *c* and the receptacles *f*, *k*, thus making it impossible for the vapors to escape.

The drums *d* are at the one side kept in place by guiding rods *i* and at the other side  
105 are actuated by short shafts *o* with which they may be connected by means of clutches *g*. These shafts may be actuated from a main shaft *q* at two speeds, through the intermediary either of toothed gearings *s* when  
110



a slow speed is required for the purpose of washing, rinsing and drying, or of friction gearings *p* when a higher speed is required for the purpose of draining and final drying.

5 The apparatus is operated in the following manner: The first drum *d* is filled with the articles to be washed, and together with its box *c* is brought to register with the first receptacle *f* which is in its lowermost position and contains benzin and additional matter. The receptacle *f* is then lifted and the cover *e* put on. The clutch *g* is then put in and washing takes place in the first drum which rotates slowly, driven by means of the toothed gearing *s*. After partly lowering the receptacles *f*, the drums are revolved at a higher speed for the draining operation in the first drum, the gearings *p* being put in and the gearings *s* put out by ordinary coupling means not shown here. The receptacles *f* are then completely lowered, the cover *e* is raised and the first drum together with its box *c* moved over to the second benzin containing receptacle *f* for the rinsing operation. Then a second drum and box *c*, the former filled with articles to be washed, is brought to register with the first receptacle *f*, and the above process repeated for the second drum and also for the third and fourth drums. Thus finally the first introduced drum reaches the empty receptacle *k*, where by quick rotation and by the use of warm air admitted through a flexible pipe *x* and escaping at *y* (Fig. 1) the drying operation is completed, while simultaneously rinsing is taking place in the second and third drums and washing is taking place in the lastly introduced drum situated above the first receptacle *f*. It is therefore evident that by means of this apparatus washing, rinsing and drying may take place simultaneously, and during a quick rotation of the drums draining may be effected in all the drums simultaneously. The benzin vapors formed in the completely closed receptacles or spaces containing the washing and rinsing drums may be withdrawn by means of a ventilator *z*, indicated by dotted lines in Fig. 1, the suction pipe of which is preferably connected by means of flexible pipes to the cover *e* above the various drums, and recovered in a fluid condition by condensation. Since, furthermore, all these processes take place in closed chambers, all danger of explosion and of a loss of benzin is obviated. When these separate processes have been completed, the primarily introduced drum *d* and its box *c* pass out of the apparatus when the receptacles *f*, *k* are in their lowermost position, and pass to a lifting device *l* in order to be transported along a raised track *m* to the entrance side of the apparatus for the purpose of being again used after the articles have been removed from the drum, while at the entrance side of the appa-

ratus a substitution box *c* with freshly filled drum *d* is introduced.

From the above it will be obvious that all the operations required for the cleaning of the articles in benzin take place continuously in the same drum, while by means of the above mentioned lifting device, it is possible to easily handle the boxes *c* and drums *d* and make the process a continuous one. It will furthermore be understood that these lifting devices are not absolutely essential, that is to say, they may be done away with, in which case the boxes *c* and drums *d* would have to be transported sidewise from the exit end of the apparatus to the entrance end of the same.

This apparatus is especially suitable for working on a large scale.

The number of drums *d* and boxes *c* as well as receptacles *f*, *k* may of course be varied.

What I claim is:

1. In an apparatus for washing, rinsing, draining and drying textile materials, the combination of displaceable boxes open at the lower end, means to allow of shifting of said boxes through the apparatus, revoluble drums in said boxes for the reception of the articles to be treated, means to revolve said drums either rapidly or slowly, and vertically movable receptacles placed beneath said boxes, adapted to close them at the lower end when being in raised position, and some of which are designed to be charged with benzin, the whole being arranged in view of successively treating the articles in each drum with different benzin baths and draining and drying them by centrifugal force, substantially as and for the purpose described.

2. In an apparatus for washing, rinsing, draining and drying textile materials, the combination of displaceable boxes open at the lower end, means to allow of shifting of said boxes through the apparatus, revoluble drums in said boxes for the reception of the articles to be treated, means to revolve said drums either rapidly or slowly, vertically movable receptacles placed beneath said boxes, adapted to close them at the lower end when being in raised position, and some of which are designed to be charged with benzin, and a warm air circulation device connected to the last one of said receptacles, the whole being arranged in view of successively treating the articles in each drum with different benzin baths and draining and drying them by centrifugal force, whereby in the last receptacle the drying is completed by warm air admitted thereto, substantially as and for the purpose described.

3. In an apparatus for washing, rinsing, draining and drying textile materials, the combination of displaceable boxes open at the lower end, means to allow of shifting of said boxes through the apparatus, revoluble



drums in said boxes for the reception of the  
articles to be treated, means to revolve said  
drums either rapidly or slowly, vertically  
movable receptacles placed beneath said  
boxes, adapted to close them at the lower end  
when being in raised position and some of  
which are designed to be charged with ben-  
zin, and transport devices to allow of the  
transfer of the boxes with their drums from  
the exit end of the apparatus to the entrance  
end of the same, the whole being arranged in  
view of successively treating the articles in  
each drum with different benzin baths and  
draining and drying them by centrifugal  
force, whereby the drums after being emptied  
may be returned to the entrance end of the  
apparatus for a new passage through the  
same, substantially as and for the purpose  
described.

4. In an apparatus for washing, rinsing,  
draining and drying textile materials, the  
combination of displaceable boxes open at  
the lower end, means to allow of shifting of

said boxes through the apparatus, revoluble  
drums in said boxes for the reception of the  
articles to be treated, means to revolve said  
drums either rapidly or slowly, vertically  
movable receptacles placed beneath said  
boxes, adapted to close them at the lower end  
when being in raised position, and some of  
which are designed to be charged with ben-  
zin, and a ventilating device to draw off the  
benzin vapors from boxes and receptacles,  
the whole being arranged in view of succes-  
sively treating the articles in each drum with  
different benzin baths and draining and dry-  
ing them by centrifugal force, under evacua-  
tion of benzin vapors, substantially as and  
for the purpose described.

In witness whereof I have hereunto signed  
my name this 13th day of May, 1910, in the  
presence of two subscribing witnesses.

ULRICH RÖTHLISBERGER.

Witnesses:

GEORGE GIFFORD,  
AMAND BRAUN.