

No. 704,402.

Patented July 8, 1902.

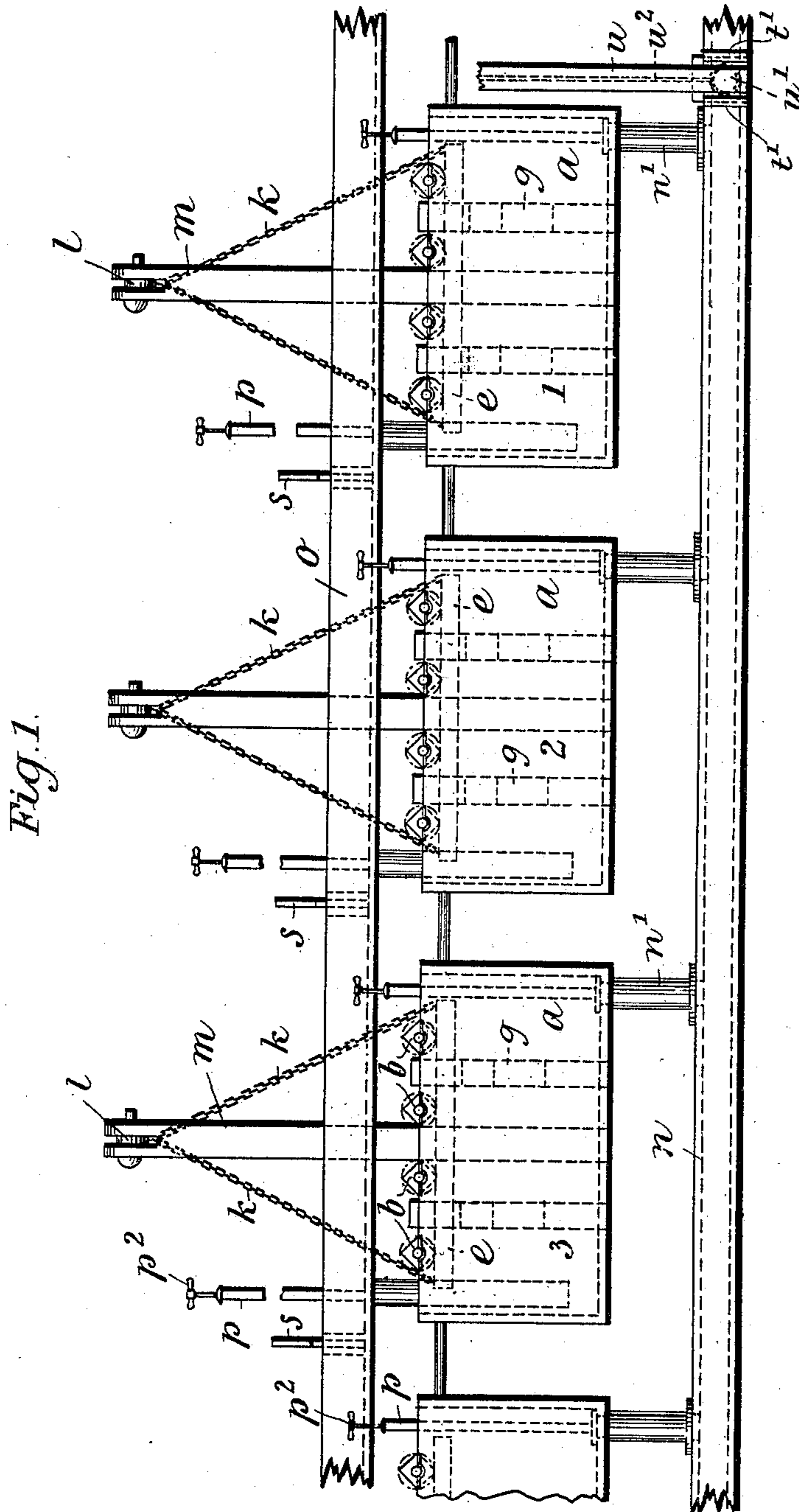
F. TAYLOR, A. COOKE & B. W. D. MONTGOMERY.

BLEACHING VAT

(Application filed Mar. 15, 1901.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES.

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Sarah McDonoghue

INVENTORS

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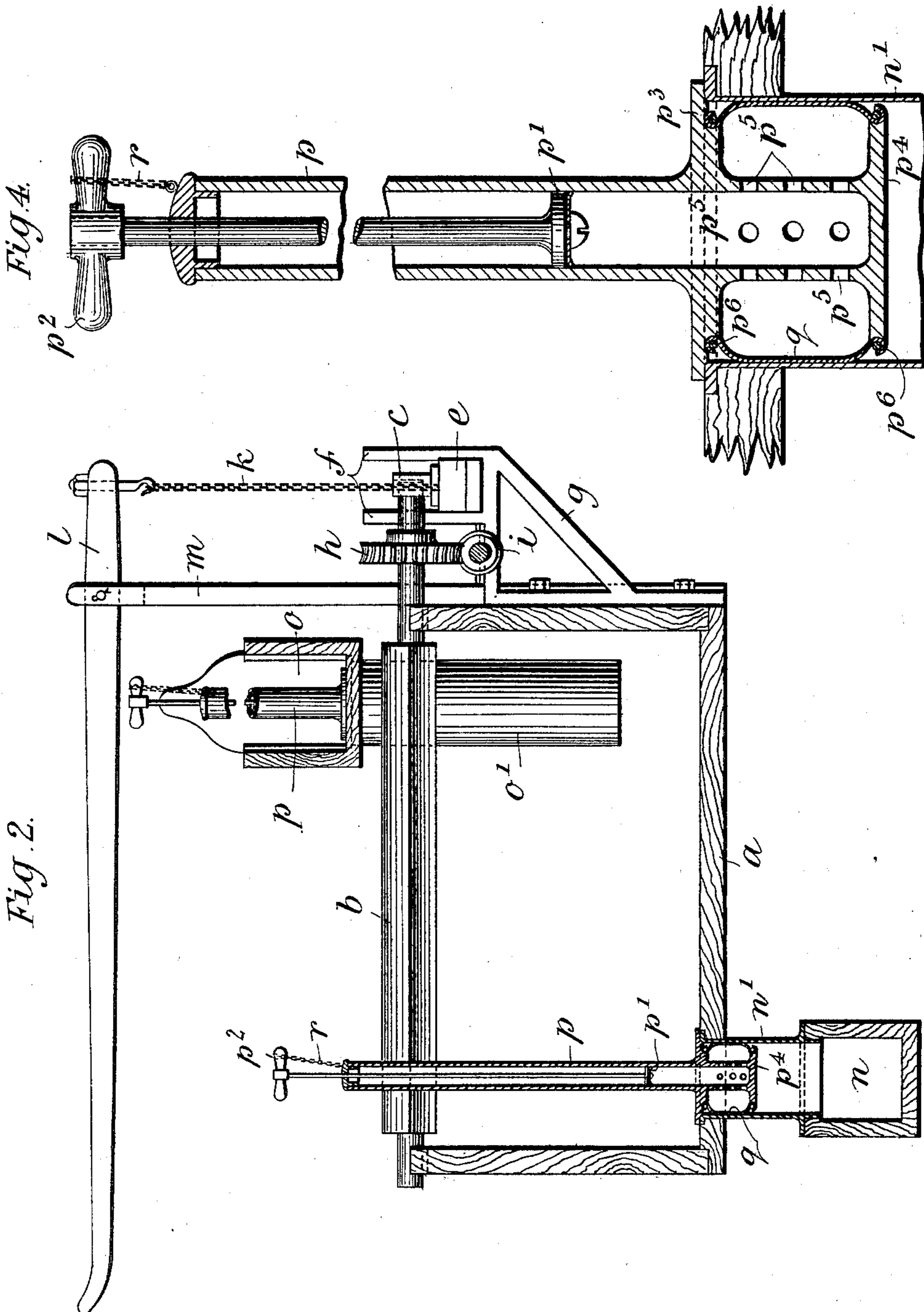
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3 Sheets—Sheet 2.



WITNESSES.

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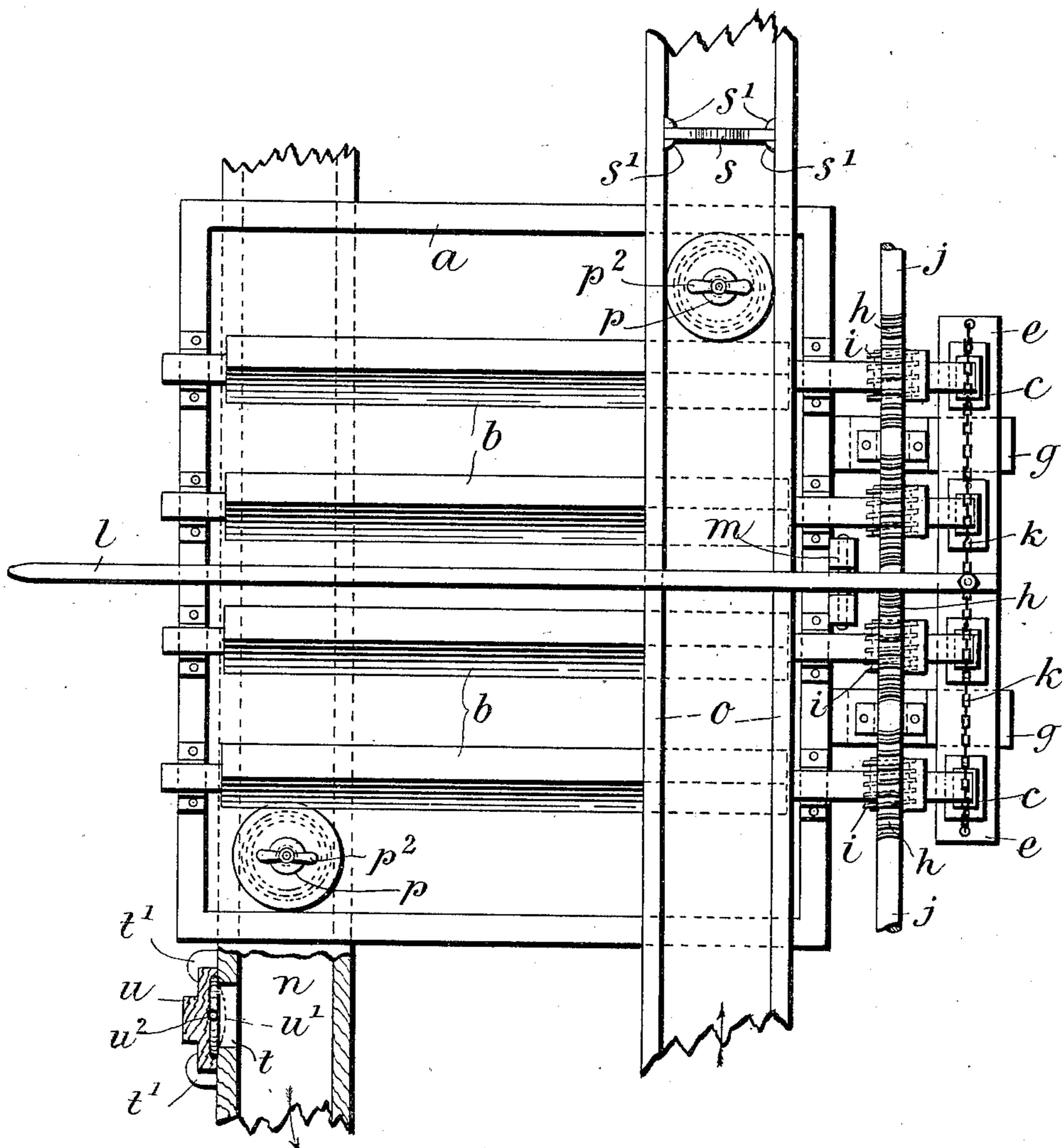
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3 Sheets—Sheet 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANK TAYLOR, OF DOAGH, AND ALEXANDER COOKE AND BOUGHEY
WILLIAM DOLLING MONTGOMERY, OF BELFAST, IRELAND, ASSIGNORS
TO THE LISHMAN PROCESS BLEACHING COMPANY, LIMITED, OF CORN-
HOLME, ENGLAND.

BLEACHING-VAT.

SPECIFICATION forming part of Letters Patent No. 704,402, dated July 8, 1902.

Application filed March 15, 1901. Serial No. 51,370. (No model.)

To all whom it may concern:

Be it known that we, FRANK TAYLOR, re-
siding at Doagh, county of Antrim, ALEXAN-
DER COOKE, residing at Notting Hill House,
5 Belfast, and BOUGHEY WILLIAM DOLLING
MONTGOMERY, residing at Fort William Park,
Belfast, Ireland, subjects of His Majesty the
King of England, have invented a certain new
and useful Improvement in Bleaching and
10 Like Vats, of which the following is a speci-
fication.

Our invention relates to an improvement
in bleaching and like vats applicable for use
when bleaching loose fibers and yarns, piece
15 goods, and the like, such vats being particu-
larly applicable when bleaching by the chlo-
rin process or other process where reagents
can be reused in bleaching piece goods or cot-
ton or linen yarns or the like in the form of
20 hanks of vegetable or animal fibers.

By the employment of the apparatus the
hanks or the like require less handling dur-
ing the bleaching or like process than here-
tofore, and consequently a saving in labor is
25 effected.

The apparatus comprises a series of becks
or vats for containing the bleaching liquors
and the necessary reagents, having rods, roll-
ers, or the like on which the yarns are loosely
30 carried, (or in the case of piece goods suit-
able winches or rollers,) together with means
for circulating the liquids and changing and
refreshing and agitating same.

In the accompanying drawings, Figure 1 is
35 a side elevation of so much of the apparatus
as is required to illustrate the invention.
Fig. 2 is a cross-section through one of the
vats and connected parts on a larger scale.
Fig. 3 is a plan of a vat on the scale shown
40 in Fig. 2; and Fig. 4 is a sectional elevation,
on an enlarged scale, of a plug forming part
of the circulating means.

We employ a number of vats *a*, across the
open tops of which are supported rollers *b*,
45 the front journals of which, as seen in Fig. 2,
may rest in plain bearings on the edge, while
the rear journals are extended and rest in
bearings *c*, carried by a beam *e*, resting be-
tween the upright arms or guides *f f* of brack-
50 ets *g*. The journals at this end also carry

worm-wheels *h*, engaged by worms *i* on a
shaft *j*, running the entire length of the ap-
paratus. The bearings are preferably formed
of or lined with Babbitt or other non-oxidiz-
ing metal. The beam *e* has attached to it at 55
its ends chains *k k*, connected to one end of
a lever *l*, pivoted to an upright *m*, the other
end of the lever extending across the vat to
the point of same and terminating in a han-
dle. By this arrangement the hanks or the 60
like can be rotated or caused to travel in the
bath or by pulling down the handle and rais-
ing the worm-wheels from the worms their
movement in any particular vat can be
stopped for inspection or otherwise. 65

Beneath the series of vats *a* is a trough *n*,
or it may be a pipe connected to each vat by
an open neck *n'*, which is closed by a plug
hereinafter described. The trough is con-
nected to a centrifugal or other suitable pump, 70
which draws off the liquors to a suitable set-
tling-tank and to or past refreshing means
and delivers them into a similar trough *o*,
situated above the tanks. The pump, set-
tling-tanks, and refreshing means are not 75
shown, as they are devices well understood
in the trade, the refreshing means of course
being arranged at suitable points and carry-
ing the necessary chemicals to renew the vats
as may be required. From the trough *o* there 80
depends into each tank a pipe or neck *o'*, as
shown, and the opening to such pipe or neck
is provided with a plug of a similar character
to that employed for the outlet of the tank.
These plugs are pneumatic and are arranged 85
so that a tight joint may be quickly made re-
gardless of any small obstruction or inequal-
ity in the plug-hole. They consist of a cyl-
inder or pipe *p*, Fig. 4, which in the case of
the outlet-plug may be long enough to reach 90
above the level of the vat and in the case of
the inlet sufficiently long to be reached from
any desired point, such cylinder containing a
piston *p'* and a suitable piston-rod and han-
dle *p''*. The cylinder is provided with a 95
flange *p'''*, which rests on the top of the neck
n' in the case of the outlet or the neck *o'* in
the case of the inlet to the tank or directly
on the bottom of the vat *a* or trough *o*, as the
case may be, if such necks are not employed 100

to line the openings. Below this flange the cylinder p is continued and terminates in a second smaller flange p^4 , capable of passing into the openings or necks, the cylinder p being perforated at p^5 . The flanges p^3 and p^4 are grooved at p^6 , and a piece of rubber tubing q is drawn over the lower flange p^4 and secured in the groove of same and in the groove of the upper flange p^3 by wiring same thereto or in other suitable ways. Thus an elastic chamber is formed communicating with the cylinder p , so that by forcing down the piston after the plug has been loosely put into the opening or neck air will be driven into the chamber and cause it to expand, as shown, forcing the rubber q against the side of the neck or opening. To retain the pressure so exerted, the handle p^2 may be held down by a chain r , which is attached to the cylinder p and a loop of which may be carried over the handle or it may be held in other ways.

In place of the piston and operating-handle a flexible pipe may be attached to the stem or cylinder, which will then form only a handle for the plug, such pipe terminating in a small valve, such as used for the pneumatic tires of vehicles and adapted to receive the end or the flexible tube of a hand-pump of any suitable type.

In the trough o are gates or sluices s , vertically movable in guides $s' s'$, such gates having rubber-covered edges, so that as they rest between the guides $s' s'$ a sufficiently-tight joint is obtained for the low pressure of liquid in the trough. Each trough is controlled by such a gate. The lower trough n is provided with a waste-opening t , which is closed by a sluice-gate u , vertically movable in guides $t' t'$. Such sluice-gate carries on its inner face a rubber pouch or bag u' , having a valve u^2 of the class employed for pneumatic tires, so that when deflated the sluice-piece can be dropped into the guides t' and be afterward inflated, so that the bag portion partly fills the opening t and closes same regardless of any small obstruction which may be lodged in the opening or on the outer face of the trough.

In operating with the arrangement of vats described No. 1 may be empty of solution, but loaded with yarn or the like, No. 2 filled with a suitable acid, and No. 3, say, with a permanganate-of-potash solution. The acid from No. 2 is now run out into the trough n and pumped into trough o , from which it runs into vat 1. No. 2 is then filled with yarn and the acid from No. 1 is similarly pumped around

and after being refreshed on its way is run into vat No. 2. Permanganate solution from No. 3 is similarly pumped around and run into No. 1, and No. 3 is then loaded with yarn and charged with acid drawn from 2 and suitably refreshed, and so on until the round is completed and the necessary shade of white or discoloration is obtained, when the apparatus is unloaded and a fresh supply of yarn introduced. The gates s determine the distance the liquors travel along the trough o . It will be seen that by the arrangement of the several vats all may be more or less kept filled with goods and a continuous series of steps carried on. The fall of the liquids into and from the vats and the travel of same provides the necessary agitation to effect the mixing of same and prevent settling.

What we claim is—

1. In combination, a vat having a discharge-opening, a delivery-trough for liquids above same having a discharge-opening above the trough, a discharge-trough beneath the vat, plugs for the discharge-openings both of the delivery-trough and the vat each comprising a cylinder, means for compressing air in same, a flange on the cylinder seating on the receptacle, a perforated extension of the cylinder below such flange, a further smaller flange adapted to pass into the opening of the receptacle and an elastic surrounding wall for the chamber formed between such flanges adapted to be expanded in the opening by the air-pressure in the cylinder.

2. In combination, a liquid-receptacle having an opening therein, a plug for such opening comprising a cylinder, piston, and operating means for the latter, a flange on the cylinder seating on the receptacle, a perforated extension of the cylinder below such flange, a further smaller flange adapted to pass into the opening of the receptacle and an elastic surrounding wall for the chamber formed between such flanges adapted to be expanded in the opening by the action of the piston.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

FRANK TAYLOR.
ALEXANDER COOKE.
BOUGHEY WILLIAM
DOLLING MONTGOMERY.

Witnesses:

JOHN MCQUADE,
SARAH O'DONOGHUE.