

No. 748,181.

PATENTED DEC. 29, 1903.

C. I. GOESSMANN.  
TREATING TANK.

APPLICATION FILED SEPT. 13, 1902.

NO MODEL.

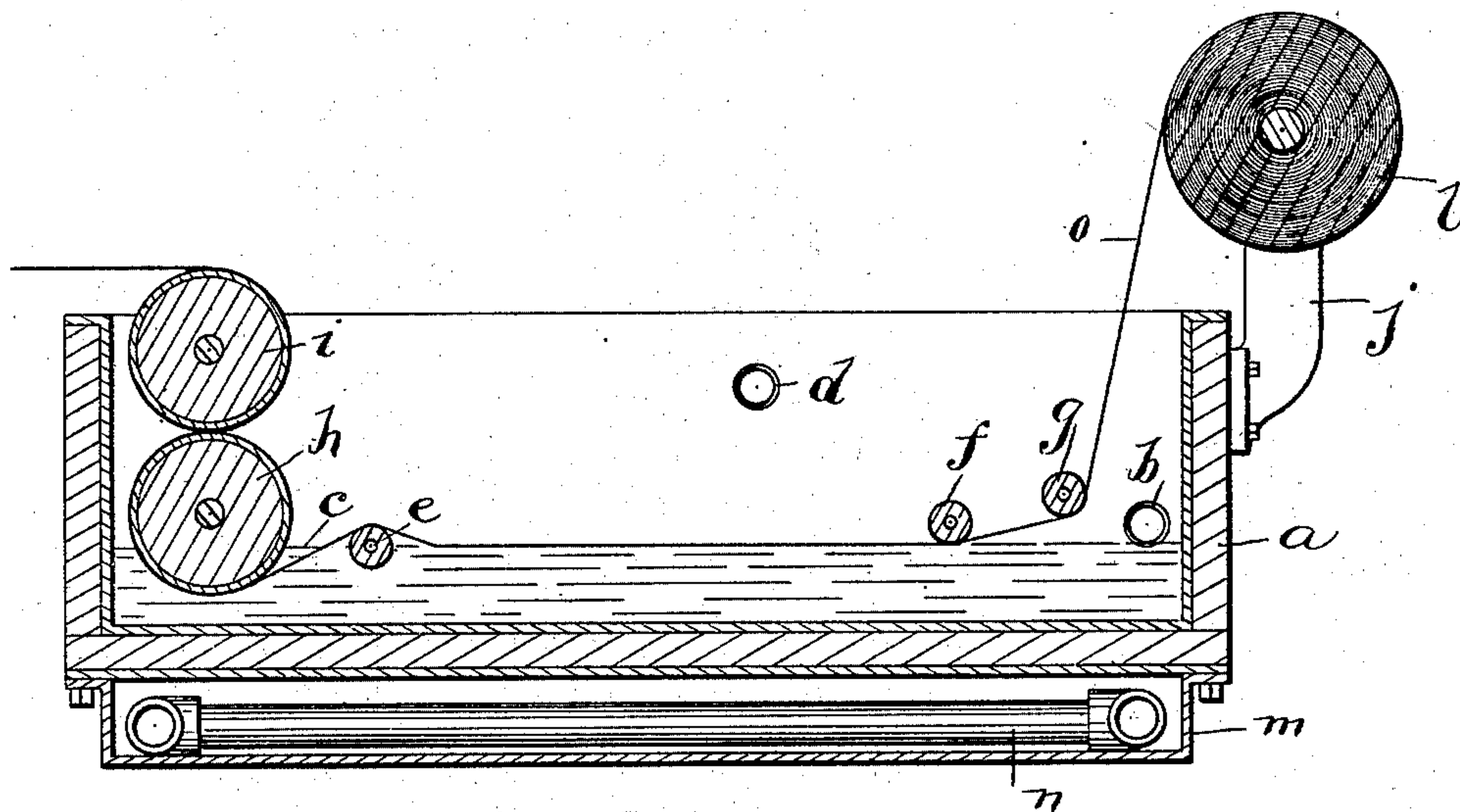


FIG. 1 -

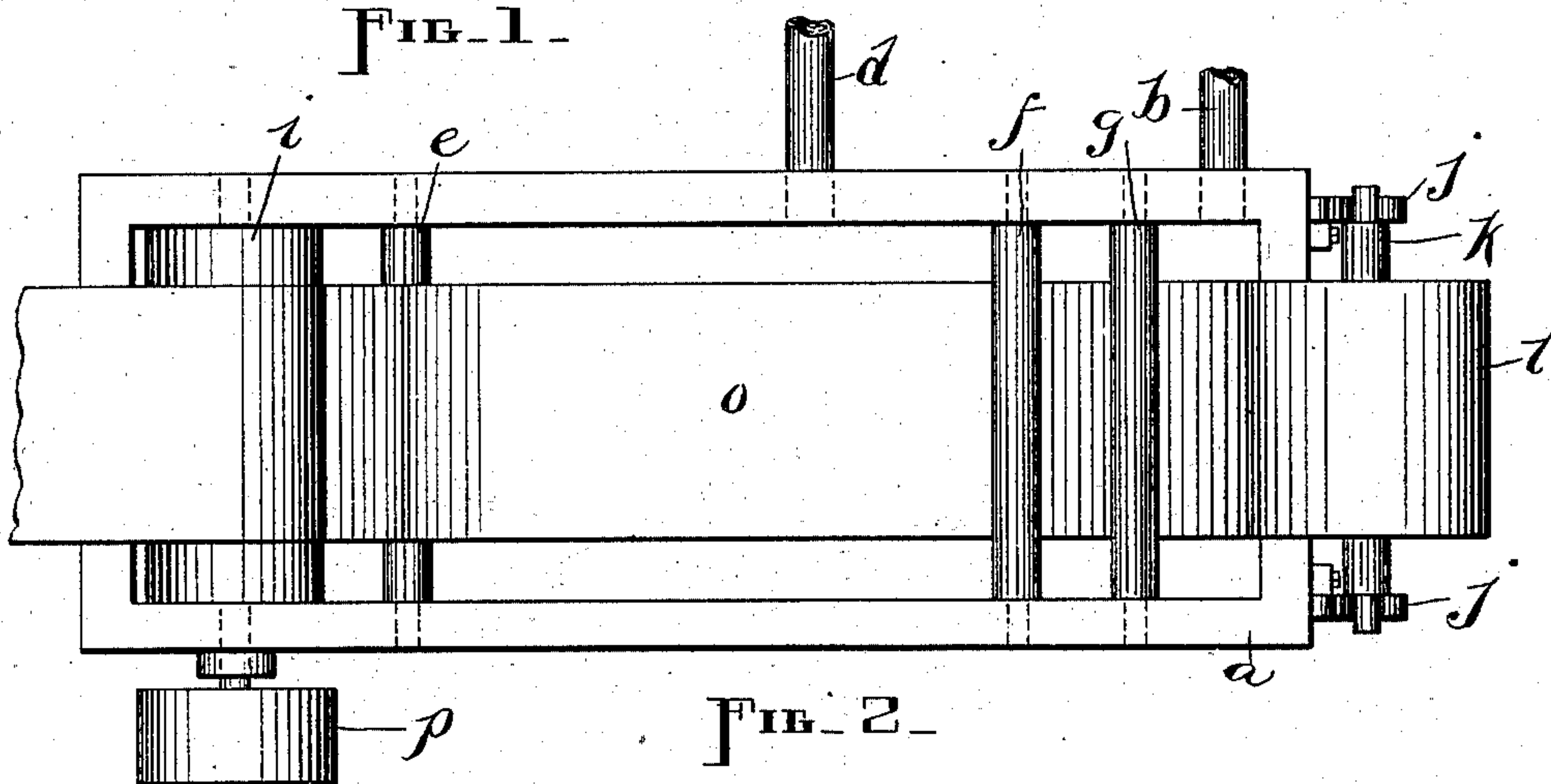


FIG. 2 -

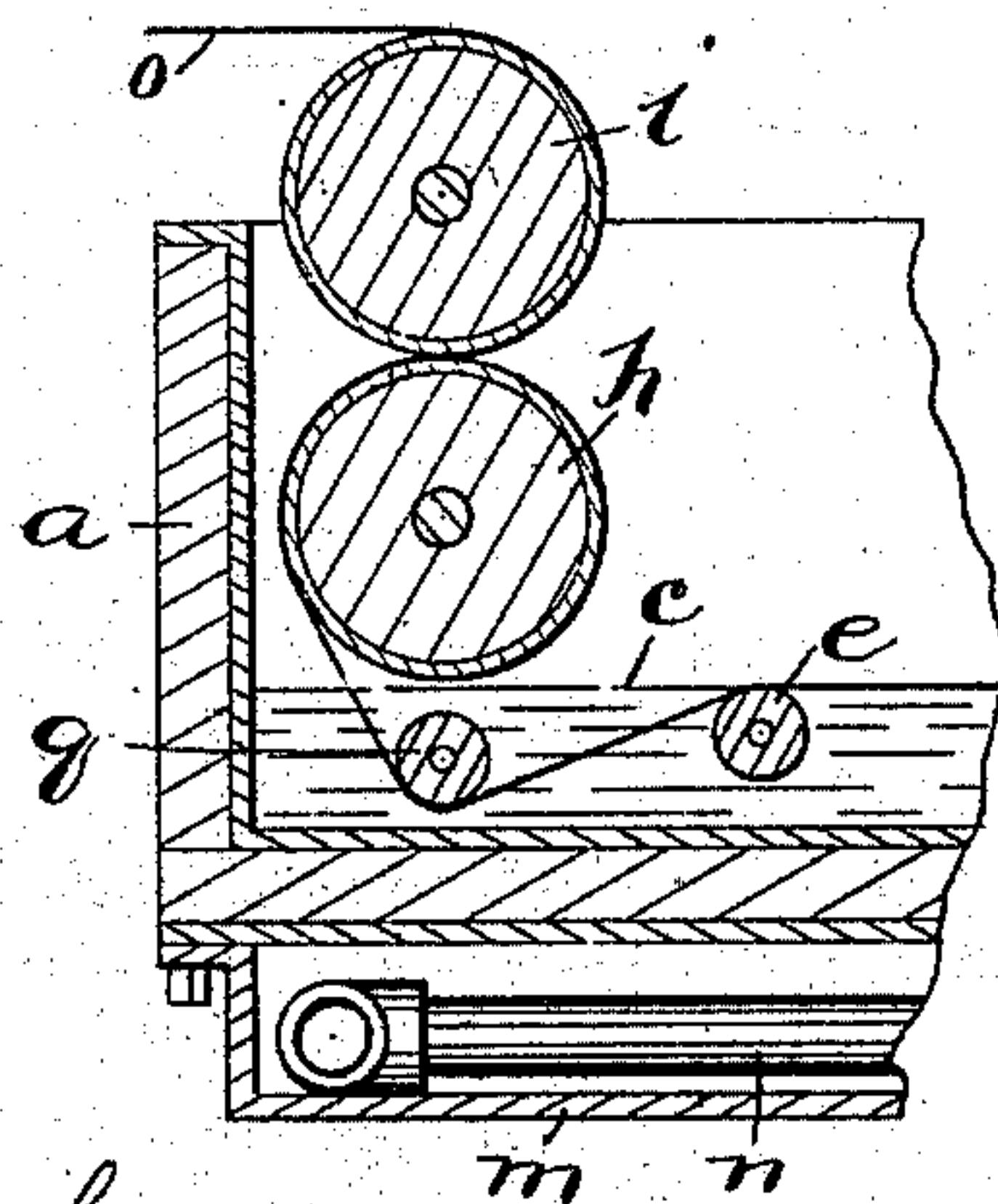


FIG. 3 -

Witnesses

*L. A. Leutter,*  
*A. C. Fairbanks*

Inventor  
*Charles Ignatius Goessmann*  
By *Webster, Keft & Lilly*  
Attorneys



# UNITED STATES PATENT OFFICE.

CHARLES IGNATIUS GOESSMANN, OF WORCESTER, MASSACHUSETTS,  
ASSIGNOR TO VELLUMOID PAPER CO., A CORPORATION OF WEST  
VIRGINIA.

## TREATING-TANK.

SPECIFICATION forming part of Letters Patent No. 748,181, dated December 29, 1903.

Application filed September 13, 1902. Serial No. 123,213. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES IGNATIUS GOESSMANN, a citizen of the United States of America, residing at Worcester, in the county  
5 of Worcester and Commonwealth of Massachusetts, have invented a new and useful Treating-Tank, of which the following is a specification.

My invention relates to improvements in  
10 tanks for treating a continuous strip of fabric with a glutinous, gelatinous, or other solution in which peculiarly - arranged guides and other parts or members are employed, as hereinafter set forth; and the object of my im-  
15 provement is to provide practicable and efficient means for subjecting paper or other fabric to a bath in such manner that the fabric shall take up and be thoroughly impregnated with the solution comprising said bath.  
20 Difficulty has been experienced heretofore in properly saturating fabric with some solutions, more especially those containing glue, for certain purposes, owing to the fact that partial exposure to air is desirable, if not nec-  
25 essary, during a part of the time the paper is being thus treated; and my invention is designed to overcome such difficulty. I attain this object by the means illustrated in the accompanying drawings, in which—

30 Figure 1 is a longitudinal vertical section through my improved tank; Fig. 2, a plan view of the same; and Fig. 3, a section of a part of the device, showing a modified form of construction.

35 Similar letters refer to similar parts throughout the several views.

A suitable tank *a* is provided, which may be made of wood and lined with sheet metal, if desired. In order to maintain a constant  
40 liquid-level in the tank and compensate for the loss of solution therefrom, said loss being represented by what the fabric carries away with it, the solution must be supplied faster than it is taken out by the fabric and an over-  
45 flow provided. To this end an overflow-pipe *b* opens through one side of the tank near the right-hand end, but may be located at any other convenient point, the bottom of said  
50 pipe, however, always being at the proper height above the floor of the tank to mark

the approximately constant liquid-level, (rep-  
resented at *c*,) and an inlet-pipe *d* opens into  
the tank through the same side with said pipe  
*b*; but the position of this pipe *d* even in re-  
gard to height is not material. The pipe *b* 55  
may lead back to the reservoir from which  
the solution is pumped or forced into the tank.  
The pipe *d* must be large enough to pour a  
volume of solution into the tank which is so  
much in excess of the amount carried away 60  
by the fabric that a constant stream escapes  
through the pipe *b*; otherwise the constant  
liquid-level could not well be maintained  
without resorting to more or less complicated  
float-valves or other mechanism impractica- 65  
ble for use in this kind of a tank. It follows  
as a matter of course that the pipe *b* should  
be of sufficient size to take care of the over-  
flow at all times.

Certain members which serve as guides 70  
are required in the tank, and these, with the  
exception of the squeeze-rolls, may be rotata-  
ble or not, as hereinafter explained; but the  
squeeze-rolls must revolve. Three rotary  
guides or rollers *e*, *f*, and *g* are shown in Figs. 75  
1 and 2 extending crosswise of the tank *a*,  
their supporting ends being journaled in suit-  
able bearings at or in the sides thereof. The  
roller *e* is located adjacent the left-hand end  
of the tank and the rollers *f* and *g* near the 80  
opposite end, the roller *g* being between the  
adjacent end of the tank and the roller *f*.  
The liquid-level mark *c* is in tangential rela-  
tion with the periphery of the roller *f*, which  
is positioned above said mark. The roller *e* 85  
is so placed that its upper surface is some  
distance above the mark *c*, and the roller *g*  
is raised to entirely clear said mark. Within  
and near the left-hand end of the tank *a* are  
two guide and squeeze rolls *h* and *i*, the first 90  
above and resting upon the second. The  
trunnions or shafts of the rolls *h* and *i* are  
mounted in any convenient manner at or in  
the sides of the tank. One or both squeeze-  
rolls may be covered with rubber or other 95  
yielding material.

At the right-hand end of the tank and ris-  
ing above the same are brackets *j j*, adapted  
to support the trunnions or shaft *k* of a paper  
or other fabric roll *l*. The brackets *j* may be 100



bolted to the outside of the end of the tank or otherwise secured in position.

A sheet-iron or other suitable jacket *m* is fastened beneath the floor of the tank and  
 5 contains a steam or hot-water coil *n*, which is heated from any convenient source. The solution is preferably heated before being run into the tank, after which said solution is prevented from cooling or maintained at  
 10 the desired degree of temperature by means of the aforesaid coil. After the tank has been supplied with the heated solution the strip *o* of material of which the roll *l* is made up is carried downward from said roll beneath the  
 15 guides or rollers *g* and *f*, up over the roller *e*, under and partly around the roll *h*, partly around the roll *i*, and thence away from the tank. The strip *o* is drawn through the tank by means of the rolls *h* and *i*, power being  
 20 applied to the former for this purpose through the medium of a pulley *p* on the trunnion or shaft of the same, gear, or other actuating mechanism. It will now be readily seen that the strip *o* is first exposed to the vapor arising from the hot solution while still supported  
 25 in the air, especially between the rollers *g* and *f*, where it is quite near the solution itself and being gradually brought into actual contact therewith. Next the strip is supported in  
 30 floating contact with and moved over the surface of the solution for some distance or until raised out of such floating contact by the roller *e*. Owing to the pressure of air on the strip after it leaves the roller *f* said strip maintains  
 35 a horizontal position for a considerable distance beyond said roller before being lifted from the solution by the roller *e*. While the top of the strip is exposed to the air in this manner, with the bottom in contact with the  
 40 solution, the air and gases in the fabric are driven off by the hot solution, which is itself drawn or driven into said fabric. The distance between the guide or roller *f* and the point where the strip leaves the solution to  
 45 pass over the guide or roller *e* represents the time of exposure to both solution and air, modified or regulated by the speed at which the strip is traveling, of course. During the passage of the strip over the roller *e*, between  
 50 the point where it leaves the solution and that where it encounters it again, said strip is exposed on both sides to the air for the final elimination of any air and gases that may yet remain in the fabric up to this time. After  
 55 leaving the roller *e* and upon arriving at the solution the strip is completely submerged below the surface thereof as it passes to the guide and squeeze roll *h*. Finally the strip is conveyed from the tank by the squeeze-  
 60 rolls, which at the same time remove the surplus solution as said strip is pressed between them. The elevated roller *e*, with the strip supported thereby, serves as a dam to prevent the solution from backing up onto the floating portion of said strip in case the speed of  
 65 the latter is slackened. The fabric is now thoroughly impregnated with the solution and

in a condition for such further treatment as the exigencies of the case demand.

My invention is useful without the guide or  
 70 roller *g*; but it has been found that the presence of this member obviates the liability of the formation of air-bubbles between the solution and the fabric, which sometimes interfere with the proper saturation of said fabric  
 75 by causing the latter to be gradually brought under the influence of the hot solution instead of being suddenly plunged into the same.

Instead of having the guide or roller *e* located so as to bring its upper surface above  
 80 the line *c* this member may be lowered so that said line is in tangential relation with its upper surface, as shown in Fig. 3. Here the lower surface of the roller *f* and the upper  
 85 surface of the roller *e* are in the same horizontal plane, and the fabric is not raised out of the solution before the final immersion. This arrangement gives satisfactory results in some instances.

If it is desired to elevate the squeeze-rolls  
 90 so that the bottom one is clear of the liquid contents of the tank, a fourth guide-roller *q* is located at the left of the roller *e*, with its lower surface at least below the mark *c*, as shown in Fig. 3. The squeeze-rolls are placed  
 95 above the roller *q* and receive the strip after it passes beneath said roller. This construction is only useful with a fabric having sufficient consistency when wet to stand the drawing strain incidental to moving the fabric  
 100 through the tank. Non-rotary guides other than squeeze-rolls too can be employed in place of those which revolve only when the fabric is tough enough to permit of its being  
 105 drawn over the same without tearing.

In order to adapt the same tank for the successful treatment of different weights or qualities of fabric, it is desirable that the guide members should be adjustable. Two-way adjustment—that is to say, vertical and horizontal—is preferred for these members, since  
 110 greater variety and nicety of adjustment may be thereby obtained. By adjusting either one or both of the guides *e* and *f* horizontally the distance between them is increased or decreased and the amount of floating contact of  
 115 the fabric with the solution varied accordingly. By raising or lowering the guide *e* the amount of complete exposure of the fabric to the air is varied, or this member may be  
 120 lowered into the position as shown in Fig. 3. The change in position vertically of the squeeze-rolls or the guide *q* alters the duration of the immersion of the fabric. The guide *f* would not be adjusted vertically unless the constant liquid-level were changed.  
 125 The position of the guide *g* may be altered to correspond with any change in position of the guide *f* or to change the angle at which the strip is brought into contact with the surface  
 130 of the solution. Ordinarily vertical adjustment of the squeeze-rolls or the guide *q* is sufficient for all purposes; but under some circumstances it might be desirable to adjust



the bottom roll or said guide horizontally. Any suitable means may be employed for the adjustment of the guide members, such as will readily occur to one skilled in the art.

5 What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a liquid-holding tank and means to maintain an approximately constant liquid-level therein, of means to  
10 guide a strip of fabric into floating contact with the surface of the liquid contents of said tank and into and through the liquid.

2. The combination with a liquid-holding tank and means to maintain an approximately  
15 constant liquid-level therein, of means to guide a strip of fabric into floating contact with the surface of the liquid contents of said tank, to raise said strip clear of the liquid, and to direct it into and through said liquid.

20 3. The combination with a liquid-holding tank and means to maintain an approximately constant liquid-level therein, of means to gradually guide a strip of fabric onto the surface of the liquid contents of said tank, to  
25 guide said strip in floating contact with the liquid, and to direct it into and through said liquid.

4. The combination with a liquid-holding tank and means to maintain an approximately  
30 constant liquid-level therein, of means to gradually guide a strip of fabric onto the surface of the liquid contents of said tank, to guide said strip in floating contact with the liquid, to raise it from such contact, and to  
35 direct it into and through said liquid.

5. The combination with a liquid-holding tank, of means to maintain an approximately constant liquid-level therein, and guide mem-  
40 bers so arranged in said tank that a line representing said level is in tangential relation with the lower surface of one of such members, two others of said members having their upper and lower surfaces respectively above and below such line.

45 6. The combination with a liquid-holding tank, of a guide member in said tank adjacent one end and having its lower surface in tangential relation with the surface of the liquid in the tank, and two other guide mem-  
50 bers adjacent the other end of the tank and in contact with said liquid.

7. The combination with a liquid-holding tank, of a guide member in said tank adja-  
55 cent one end and out of contact with the liquid in the tank, an associated guide member in peripheral contact only with said liquid, and a guide member adjacent the other end of the tank in contact with said liquid.

8. The combination with a liquid-holding  
60 tank, of two guide members in said tank adjacent one end, one of such members being out of contact with the liquid in the tank and the other in tangential relation with the sur-

face of said liquid, and two other guide mem-  
bers adjacent the other end of the tank ar- 65  
ranged in contact with the liquid therein.

9. The combination with a liquid-holding tank, of two guide members in said tank ad-  
70 jacent one end, and a third guide member adjacent the other end of the tank, the intermediate member having its lower surface be-  
low the horizontal plane of the lower surface of the first member, and the third member having its lower surface below the horizontal  
75 plane of the lower surface of the intermediate member, the second and third members being in contact with the liquid in the tank.

10. The combination with a liquid-holding tank, of two guide members in said tank ad-  
80 jacent one end, and two other guide members adjacent the other end of the tank, the horizontal plane at the lower surface of one of the intermediate members being below the lower  
85 surface of one of the end members and below the upper surface of the other intermediate member and above the lower surface of the other end member, all but the first member being in contact with the liquid in the tank.

11. The combination with a liquid-holding tank and means to maintain the contents  
90 thereof in a heated state, of two guide members in said tank adjacent one end, and two other guide members adjacent the other end of the tank, the second, third and fourth  
95 members being in contact with the liquid in the tank, the lower surfaces of the first pair occupying different horizontal planes and the upper and lower surfaces respectively of the second pair occupying different planes.

12. The combination with a liquid-holding  
100 tank, of means to maintain an approximately constant liquid-level therein, means to maintain the contents of said tank in a heated state, a guide member in the tank arranged with its lower surface on the horizontal plane  
105 represented by such level, an associated guide member entirely above such plane, and a third guide member positioned to assist in directing the paper below the surface of the liquid.

13. The combination with a liquid-holding  
110 tank, of means to maintain an approximately constant liquid-level therein, means to retain the contents of said tank in a heated state, two guide members arranged one entirely  
115 above such level and the other with its lower surface in line therewith, and two other guide members arranged with their upper and lower surfaces respectively above and below said level.

In testimony whereof I have signed my  
120 name to this specification in the presence of two subscribing witnesses.

CHARLES IGNATIUS GOESSMANN.

Witnesses:

F. A. CUTTER,  
ALLEN WEBSTER.