S. WILLNER.

APPARATUS FOR IMPREGNATING LOGS.

APPLICATION FILED MAY 20, 1910.

970,409. **Patented Sept. 13, 1910.**

3 SHEETS—SHEET 1.

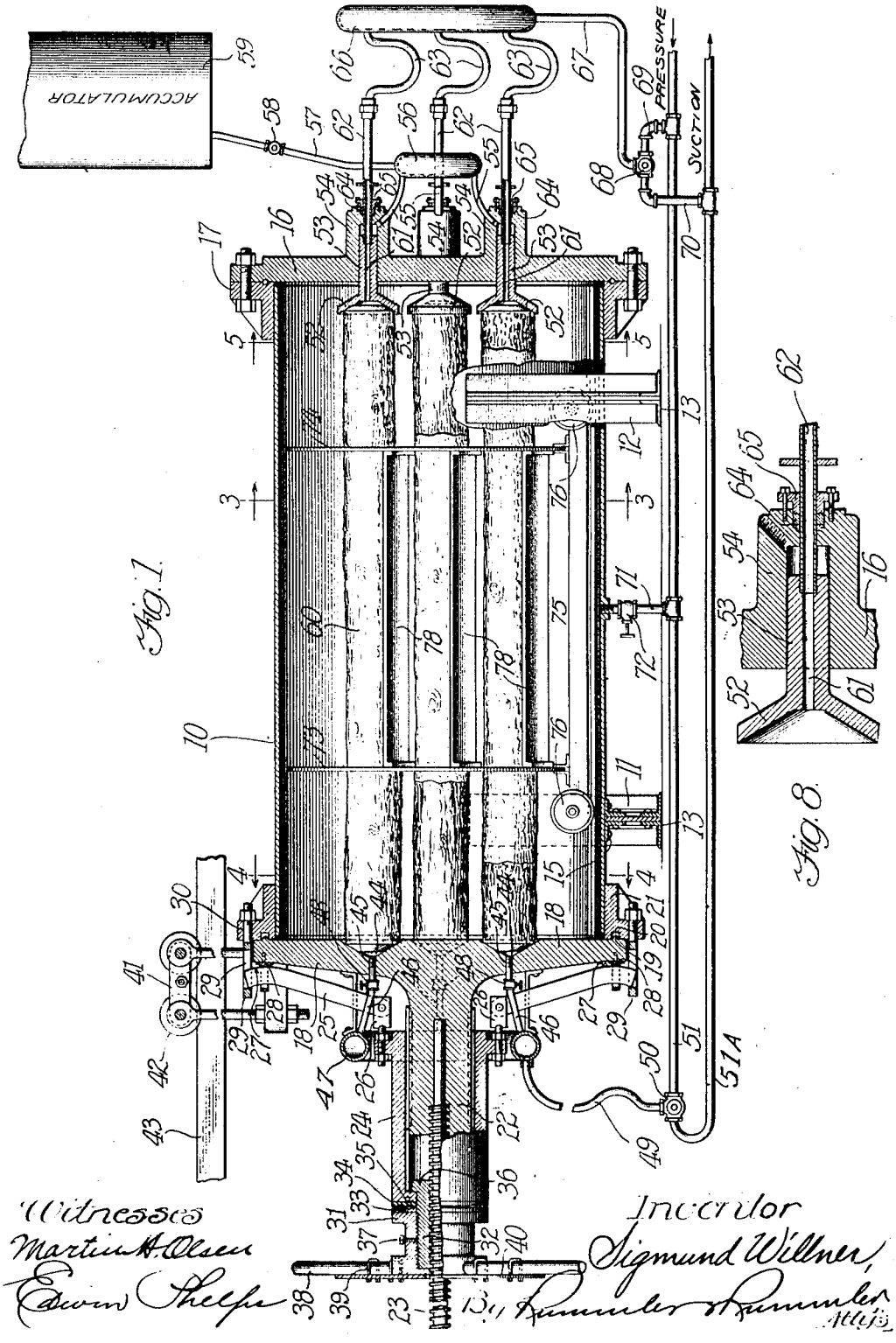

Fig. 1.

Fig. 8.

Witnesses
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3 SHEETS—SHEET 2.

Fig. 3.

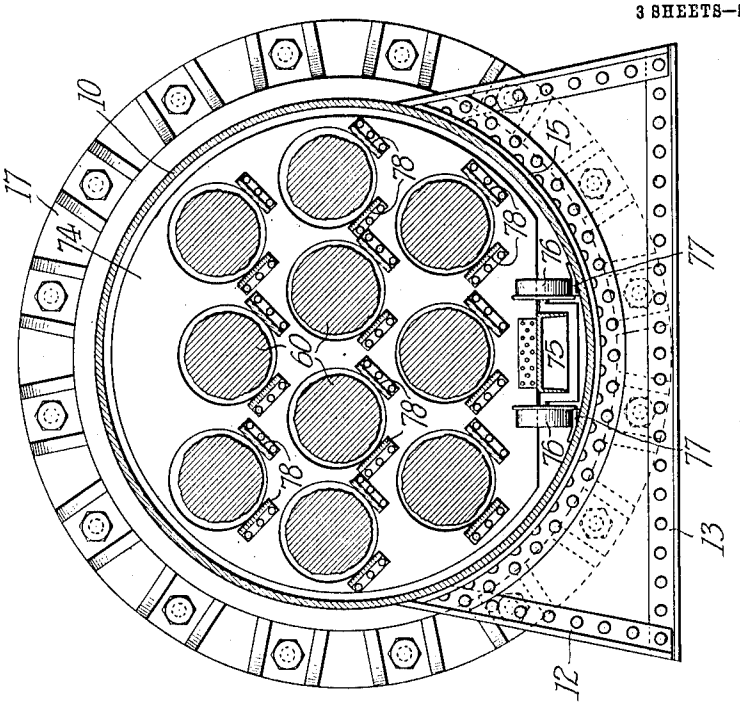
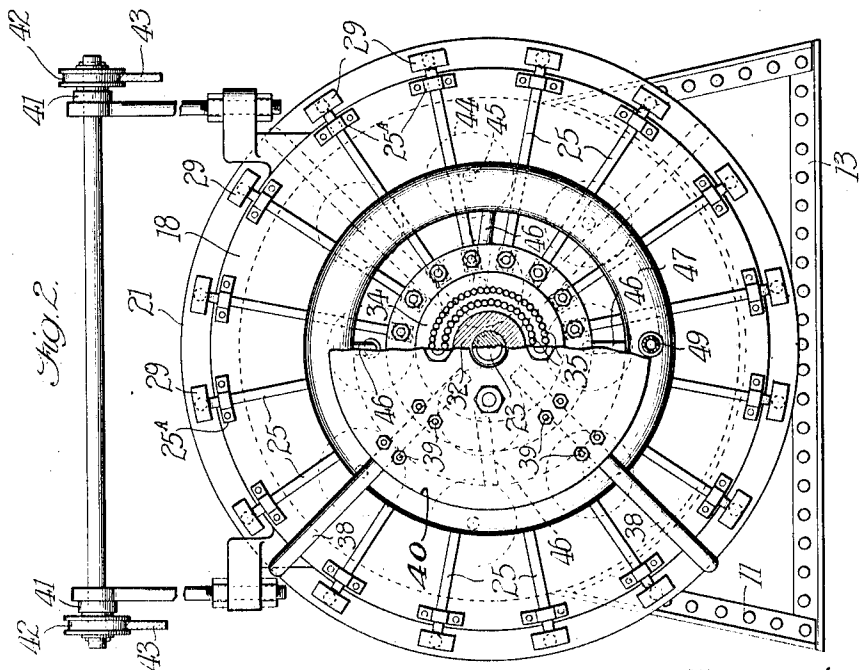


Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 4.

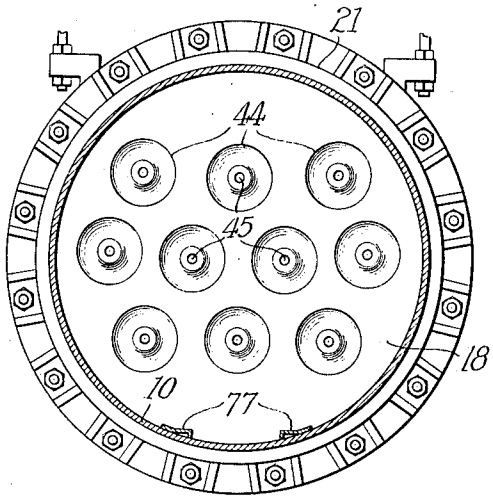


Fig. 5.

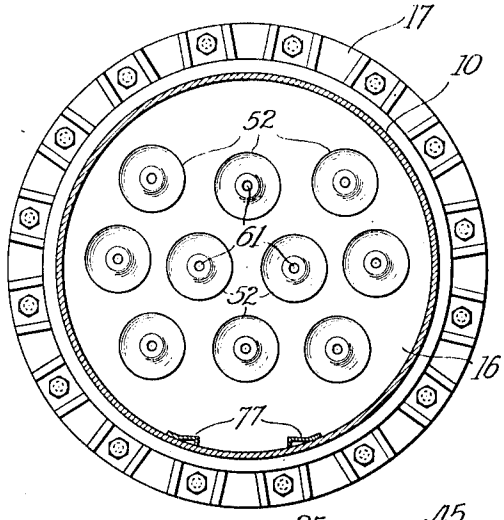


Fig. 6.

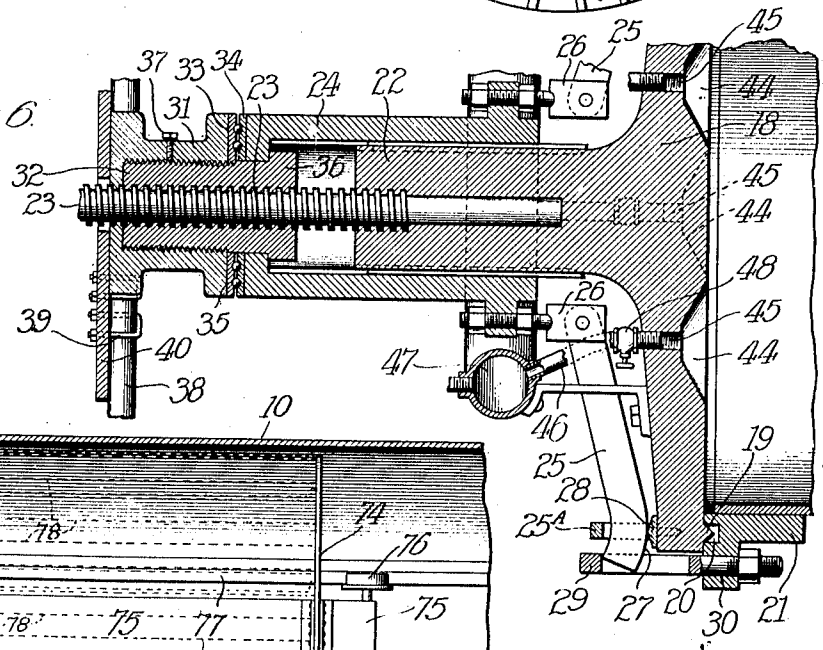
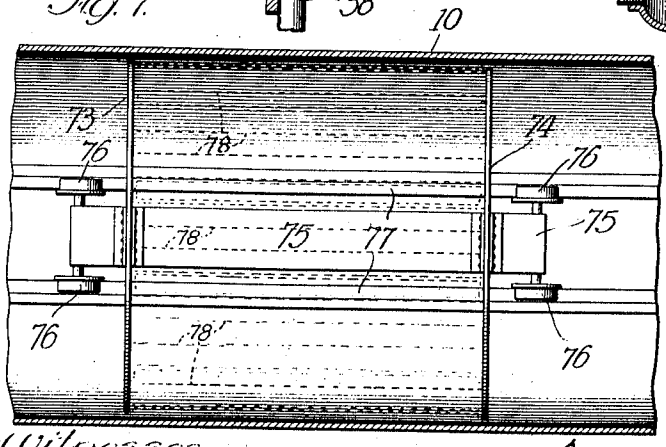


Fig. 7.



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UNITED STATES PATENT OFFICE.

SIGMUND WILLNER, OF CHICAGO, ILLINOIS.

APPARATUS FOR IMPREGNATING LOGS.

970,409. Specification of Letters Patent. Patented Sept. 13, 1910.

Application filed May 20, 1910. Serial No. 562,544.

To all whom it may concern:

Be it known that I, SIGMUND WILLNER, a subject of the Emperor of Germany, and a resident of Chicago, county of Cook, State of Illinois, have invented certain new and useful Improvements in Apparatus for Impregnating Logs, of which the following is a specification.

This invention relates to improvements in apparatus for impregnating logs with chemicals, coloring matter, or other liquid or gaseous substances.

One of the objects of the invention is to provide an apparatus of this class which is adapted for the simultaneous treatment of a number of logs without sacrificing any of the advantages which are capable of being attained by any other apparatus known to me and in which but a single log may be treated at one time.

Another object is to provide apparatus in the use of which the treated logs may be quickly removed and a new supply substituted.

Other objects are to prevent the waste of chemicals or coloring matter, and to prevent injury to the logs by reason of the high pressure employed in injecting the substances used into the pores thereof.

A still further object is to provide a form of closure for the receptacle which affords an extremely tight sealed joint between itself and the latter, and which may be easily and quickly opened or closed and locked in position, the locking means being easily operated but nevertheless capable of holding the closure in place against extremely high pressures.

Another object is to adapt the apparatus to the simultaneous treatment of logs of slightly different lengths in one receptacle.

The above and such other objects as may hereinafter appear are attained in the illustrative apparatus shown and described.

Referring to the drawings, Figure 1 is a vertical longitudinal section of the apparatus; Fig. 2 is an elevational end view, a portion of the hand wheel by means of which the closure is locked or unlocked being broken away. Figs. 3, 4, and 5 are vertical cross-sectional views of the device, the sections being taken on the correspondingly numbered lines of Fig. 1. Fig. 6 is an enlarged detail sectional view of a portion of the closure locking means. Fig. 7 shows a top plan of the log supporting carriage in position on its tracks within the receptacle. Fig. 8 is an enlarged sectional detail view of the movable log-receiving heads.

The receptacle 10 may consist of a cylindrical structure formed of heavy sheet metal and supported in cradles, each of which comprises a pair of upright members 11 and 12 connected by a transverse member 13 and supporting a curved plate 15 upon which rests the under side of the receptacle. One end of the receptacle is permanently closed by a heavy casting 16 secured by bolts or the like to a flange ring 17 which is riveted to the cylinder 10. The other end of the receptacle is provided with a movable closure comprising a circular head 18 having means for causing it to fit fluid tight upon the edge of the receptacle. As shown in the drawing, this means comprises an annular rib 19 upon the inner face of the head near its edge, this rib seating itself in a soft metal ring 20 which is disposed in a suitable groove formed for its reception in the face of a cast ring 21 which is provided with a flange 30 and riveted in position around the open end of the receptacle. A shank 22 extends from the outer side of the closure, and from this shank extends a screw-threaded spindle 23. A sleeve 24 is feathered upon the shank so that it is not permitted to rotate, but may slide back and forth on the shank, and carries upon its inner end a plurality of levers 25, each of which is pivoted at one end to suitable lugs 26 which are secured to the sleeve 24. Near the outer end of each lever the same is provided with a rounded cam surface 27 which bears upon a hardened block 28 which is secured upon the outer face of the head near its edge and serves as a fulcrum point for the lever. The outer end of each of these levers passes, when the sleeve 24 is moved along on the shank 22 toward the head 18, into the eye of an eye-bolt 29, these eye-bolts being secured to the flange 30 of the ring 21 which extends around the open end of the receptacle. Each of the locking levers 25 is guided in a strap 25^A.

The means which screws on the spindle 23 and thrusts the sleeve 24 toward the head 18 comprises a collar 31 and an inner sleeve 32, adapted to be locked against relative movement by a set screw 37, the collar 31 having a hardened face plate 33 between which and a similar face plate 34 carried by the sleeve 24 run one or more series of

anti-friction balls 35. The member 32 is formed with an enlargement or head 36 on its inner end, and is screwed into the member 31. This member 32 has threaded engagement with the spindle 23, the enlargement 36 forming a shoulder which engages an inturned flange on the outer end of the sleeve 24 to cause the sleeve to follow the screw-threaded member when the latter is rotated in the left hand direction, and thus causes the locking levers 25 to be withdrawn from the eye-bolts 29. This member 32 may be secured against rotation in the member 31 by means of a set screw 37. The member 31 is provided upon its outer end with handle arms 38 by grasping which the member 31 may be revolved. These arms are secured by means of U-bolts 39 to a plate 40 which is secured to the member 31, the plate and arms forming a type of hand wheel.

In order that the closure and its locking device may, when desired, be moved away from in front of the receptacle to permit the latter to be charged with logs that are to be treated, the closure and attached parts are hung from a carriage 41 which is provided with wheels 42 running upon suitable track rails 43. This track may, of course, extend to any desired point. When it is desired to close the receptacle after the logs have been put into it, the closure will be brought to the proper position before the mouth of the receptacle, the hand wheel being backed off far enough to draw in the locking levers. When the head has seated itself, the hand wheel will be revolved in the right hand direction. This moves the sleeve 24 on the shank 22 toward the head, and projects the locking levers 25 into the eye-bolts 29 and secures the head very firmly in place.

The inner face of the head 18 is formed with a plurality of conical sockets 44 which face into the receptacle, or toward the wall 16 thereof. Extending through the head 18, and communicating with these sockets, are passages 45 which communicate by means of pipes 46 with a header 47, each of the pipes 46 being controlled by a hand valve 48 by means of which communication between the header 47 and any one of the sockets may be established or broken when desired. The header 47 is connected by suitable means, such as a flexible pipe 49, with the casing of a valve 50, this valve being a three-way valve or other suitable device by means of which communication may be established between the pipes 49 and either one or the other of two pipes 51 and 51A, as desired. One of these latter pipes communicates with a pressure pump and a supply of the chemical or other fluid which is to be employed, while the other pipe communicates with a suction pump. For convenience it will be assumed that the pipe 51 communicates with the fluid supply and pressure pump, while the pipe 51A leads to the suction pump. It is evident that the valve 50 may be so set that the liquid will be forced from the pipe 51 through the pipe 49 into the header 47, and thence into the various sockets 44, or it may be so set that the flow of liquid to the header is cut off and a suction effect is exerted upon the sockets.

The casting 16 which forms the end of the receptacle opposite the closure head 18 is provided with a plurality of movable socket members 52 carried by pistons 53 which have longitudinal movement in cylinders 54 which may be cast integral with the plate 16. Each of these socket members 52 has its face formed as a conical socket similar to the sockets 44 of the closure head 18. Each socket member 52 is so disposed as to aline with one of the sockets 44, so that a log may be supported by its ends in each of the sockets 44 and the corresponding socket member 52. The chamber at the rear of each piston 53 is connected by means of a pipe 55 with a header 56, which is in turn connected by means of a pipe 57, having a valve 58 therein, with an accumulator 59 or other source of hydraulic pressure.

When the valve 58 is opened, liquid under high pressure is admitted to the header 56 and flows through the pipes 55 into the cylinders behind the pistons 53. This causes the socket members 52 to be moved simultaneously inward until each member is brought into firm engagement with the end of a log. These logs 60 are prepared before being placed in the receptacle by chamfering each end of each log, the chamfered ends being given a bevel corresponding to that of the tapering walls of the sockets, so that a fluid tight joint will be made between the end of the log and the conical socket. A sufficient amount of wood is turned off, in chamfering the ends of the logs, to insure a tight joint between the end of the log and the walls of the socket, in order that all of the fluid which is forced into the sockets may be compelled to pass through the log from end to end. No more should be turned off, however, than is necessary, as it is desirable to provide, at the end of the log, as large an area as possible which will be exposed to the fluid. By having the socket member 52 so arranged that each member moves independently of the others, provision is made for the seating of each member firmly against its log, even though the logs be of slightly different lengths.

The piston 53 of each socket member is provided with a longitudinal bore 61 for the passage of the treating fluid to the socket. Into each bore 61 screws the end of a pipe 62, these pipes being connected by means of flexible pipes 63 with a header 66. Each pipe 62 slides in a packing ring 64 which is pressed into fluid tight engagement with

the pipe 62 by a follower 65. The header 66 is connected by means of a pipe 67 with the casing of a three-way valve 68. From one side of this valve leads a pipe 69 to the pressure or supply pipe 51, a pipe 70 leading from the other side of the valve to the suction pipe 51A. It is evident that by manipulating the valve 68, the header 66, and consequently the chambers in the sockets of the socket members 52, may be brought into communication with either the pressure pipe 51 or the suction pipe 51A, as desired. The receptacle 10 is also connected to the pressure pipe 51 by means of a pipe 71, controlled by a valve 72. By properly setting the valves 50 and 68, the fluid which is being employed for treating the logs may be made to flow through the logs in either direction, as desired. The combined pressure and suction effect causes the fluid to pass quickly through the log. By reversing the valves the direction of flow is at once reversed. By opening the valve 72 and permitting the fluid to pass through the pipe 71 into the receptacle, a pressure equal to that employed for injecting the fluid into the logs may be maintained in the receptacle, this pressure preventing the logs from being burst or split as the effect of the extremely high pressure employed in injecting the fluid into the same.

For the convenient handling of the logs there is provided a carriage which is adapted to take as many logs as there are sockets and socket members to receive the same. This carriage is mounted to run upon track rails so that it may be easily run into the receptacle and as easily withdrawn with its load of logs after the logs have been treated. This carriage comprises two upright plates 73 and 74 which are secured at their lower edges to a channel iron 75 which forms the body of the carriage and is provided with a pair of wheels 76 at each of its ends. The track rails 77 are secured to the bottom of the receptacle. Each of the plates 73 and 74 is formed with a plurality of circular openings for the reception of the logs. Flat bars 78 are secured at their ends to the plates 73 and 74 below and at each side of each opening. When the end of a log is passed through one of the openings in the plate 73, it rests upon these bars and may be slid along upon said bars until the end of the log passes through the opening in the other plate, as seen in Fig. 1. The openings and the supporting bars are so located that the logs must be lifted out of contact with the bars when the sockets which receive the ends of the logs are brought together. Because of the cone-shaped form of the ends of the logs, and the corresponding shape of the sockets, the logs will be picked up and lifted off the supporting plates by the sockets. Provision is thus made for the successful handling of logs of slightly different diameters, or of logs which are not straight, or which have projecting knots or the like on their surfaces.

In the operation of the device, the head and other parts of the closure are moved away from the mouth of the receptacle, being supported upon the track rails 43. The carriage, after being loaded with logs in the manner above described, will be run in on the track rails, the socket members 52 being retracted. The closure is then brought to position in front of the mouth of the receptacle, and the head of the same is placed against the flange ring which extends around the edge of the receptacle. The hand wheel being now revolved, the sleeve 24 is moved toward the head 18, and the locking levers 25 are thrust out and pass into the eyes of the eye-bolts 29. The head is thus securely locked in place, and a fluid tight connection is made between the head and the mouth of the receptacle. The valve 58 being now opened, and hydraulic pressure being applied to the pistons 53 of the socket members 52, the members are driven inward, and each member is brought into engagement with the end of the corresponding log. The pressure of the members 52 and the counteracting pressure of the sockets 44 of the closure head 18 cause the logs to be lifted off the supporting bars 78 of the carriage. Each log is supported, and fluid tight connection is made between its ends and the sockets which support it, even though the individual logs be of different lengths. By manipulating the valves 50 and 68, fluid under pressure is applied to each log at one end while the opposite end of each log is connected with the suction pump. By reversing the valves 50 and 58, the direction of flow through the logs is reversed. This may be repeated as many times as desired. The logs are prevented from being split by the application of pressure upon the exterior of each log equal to that applied in forcing the liquid into the log, this being accomplished by opening the valve 72 and admitting fluid under pressure to the receptacle. After the treatment has been completed, the rotation of the hand wheel 40 in the left hand direction unlocks and withdraws the locking levers 25 from the eye-bolts 29 and permits the closure to be moved away from the mouth of the receptacle upon the track rails 43. The carriage with its load of logs may now be drawn out of the receptacle.

Although but one specific embodiment of this invention is herein shown and described, it will be understood that many of the details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:

1. In wood impregnating apparatus, the combination of a receptacle, a closure therefor, a log receiving carriage adapted to be moved into and out of said receptacle, a conical socket adapted for the reception of the end of a log, a movable member having a socket facing said first named socket, and means for moving said member toward said first named socket, said sockets being so located with respect to the carriage that their centers are slightly above the center of the log when the latter is in place in the carriage, whereby the log will be lifted from the carriage when the sockets approach each other.

2. In apparatus for impregnating logs, the combination of a receptacle, a closure therefor, a plurality of cone-shaped sockets in said receptacle, a plurality of independently movable members having each a cone-shaped socket in alinement with one of said first named sockets, and a log receiving carriage movable into and out of said receptacle, said sockets being so located with respect to the carriage that their centers are above the centers of the logs when the latter are supported by the carriage.

3. In log impregnating apparatus, the combination of a receptacle, a track arranged therein, a carriage movable on said track and having a plurality of log supporting means, a closure made movable to permit said carriage to enter and leave said receptacle, a plurality of conical sockets arranged in said receptacle and corresponding in number and position with the log supporting means upon the carriage, a movable member corresponding to each of said sockets and having a conical socket facing the same, and means for moving said members independently of each other, said members and sockets being arranged to lift said logs from said carriage when brought together.

4. In a log impregnating apparatus, the combination of a receptacle, a plurality of log supports in said receptacle, a plurality of pairs of opposed conical sockets located above and at opposite ends of said supports, in position to engage the ends of the logs thereon, the sockets at one end being movable toward those at the opposite end and adapted to lift the logs from said supports and center them, and fluid pressure apparatus connected with said sockets.

Signed at Chicago this 18th day of May 1910.

SIGMUND WILLNER.

Witnesses:
EUGENE A. RUMMLER,
EDWIN PHELPS.