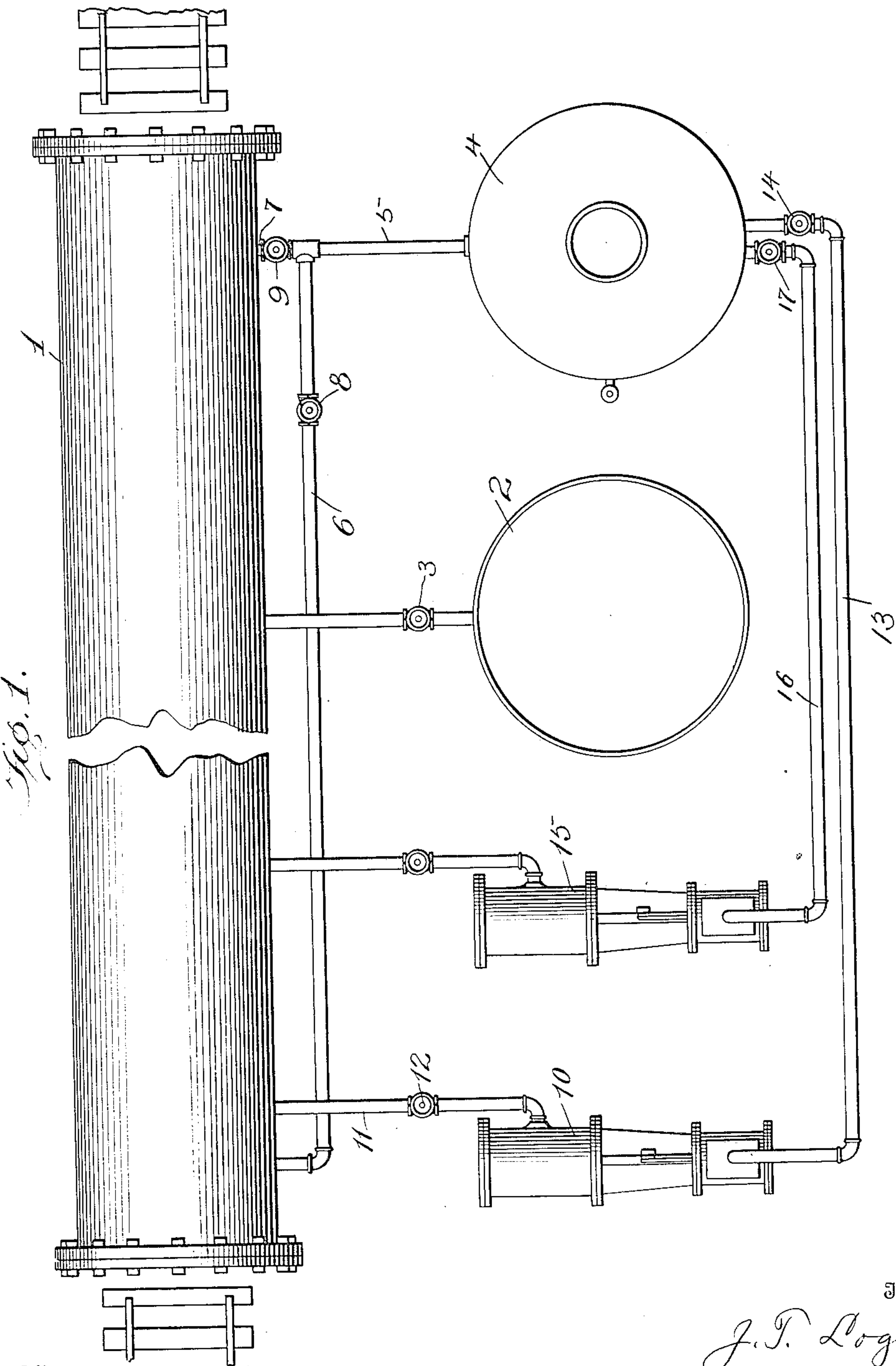


No. 831,793.

PATENTED SEPT. 25, 1906.

J. T. LOGAN.
PROCESS OF PRESERVING WOOD.
APPLICATION FILED FEB. 2, 1906.

2 SHEETS—SHEET 1.



Witnesses
Edwin L. Bradford
P. H. Burch

By

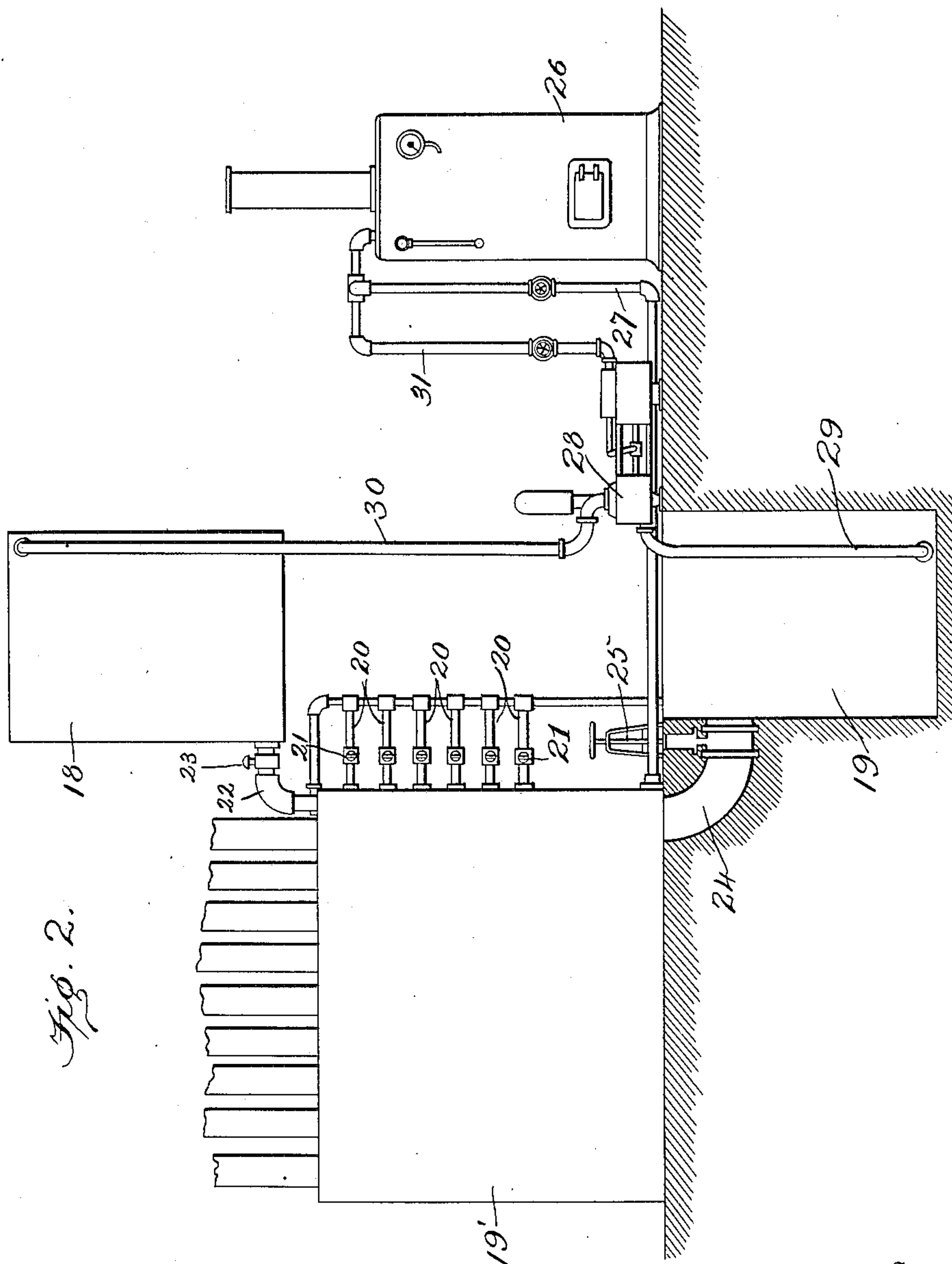
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J. T. Logan,
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Inventor

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UNITED STATES PATENT OFFICE.

JOHN THOS. LOGAN, OF TEXARKANA, TEXAS.

PROCESS OF PRESERVING WOOD.

No. 831,793.

Specification of Letters Patent.

Patented Sept. 25, 1906.

Application filed February 2, 1906. Serial No. 299,110.

To all whom it may concern:

Be it known that I, JOHN THOS. LOGAN, a citizen of the United States, residing at Texarkana, Texas, have invented a Process of Preserving Wood, of which the following is a specification.

This invention relates to wood preservation, and particularly to a process of prolonging the utility of poles which are set up with the lower or butt ends in the ground; and the object is to provide a process for removing all sap or moisture from the wood by heat and vacuum treatment and for impregnating the wood with preserving fluids which will prevent dry rot or other decay, whereby the utility of the wood is prolonged indefinitely.

Reference is had to the accompanying drawings, which form a part of this application and specification.

Figure 1 is a broken plan view of the apparatus for carrying out the objects of this invention. Fig. 2 is a side elevation of the apparatus for treating the ends of poles or wood with hot and cold creosote-baths.

A cylinder 1 is provided in which the wood to be treated is placed. A tank 2 is provided for holding chlorid of zinc which may be let into the cylinder 1 by opening the valve 3. A boiler 4 is provided for producing steam for heating the interior of cylinder 1 and the wood which may be placed in this cylinder. A pipe 5, having branches 6 and 7, is connected to the boiler 4, and the branches 6 and 7 are connected to the cylinder 1. Steam may be turned into cylinder 1 by valve 8 or valve 9. A vacuum-pump 10 is provided for creating a vacuum in the cylinder 1, this vacuum-pump being connected to cylinder 1 by a pipe 11, which is provided with a valve 12. The pump 10 is operated by steam, which may be obtained from the boiler 4 by means of pipe 13, which is provided with a cock 14. A force-pump 15 is provided for exerting pressure within the cylinder 1. This pump is also used for forcing unused chlorid of zinc back in the tank 2 when the cylinder 1 is to be opened. The pump 15 is operated by steam, which may be obtained by a pipe 16 from the boiler 4. This pipe is provided with a cock 17.

Fig. 2 shows a tank 18 for containing creosote, a tank 19 to receive the butt-ends of poles and to contain creosote for heating and impregnating the poles with creosote, and a submerged tank for receiving hot cre-

osote from the tank 19'. The tank 19' is provided with a number of overflow-pipes 20, which are provided with valves 21. The object of a plurality of pipes is to provide for heating the poles to different heights. All the valves 21 above the height to be treated are left open, so that the overflow of creosote will escape to tank 19. A large pipe 22, provided with a cock 23, is provided for letting cold creosote run from the tank 18 to the vat 19', and a larger pipe 24 is provided for the sudden emptying of the creosote from the tank 19' into the tank 19. This pipe is provided with a cut-off valve 25. The tank or vat 19' may be heated with steam, which is obtained from the boiler 26 by means of a pipe 27. The creosote in tank 19 may be forced back into the tank 18 by means of the pump 28 and pipes 29 and 30. The pump 28 is driven by steam derived from the boiler 26 through pipe 31.

This invention has been thoroughly tested in the treatment of telegraph and telephone poles, poles for electric railways, and the like. The first part of the process or treatment is similar in most respects to that invented by Sir William Burnett. The poles are cut of the proper size as to length and diameter. They are then loaded on small cars and transported into hugh cylinders. The cylinders are then sealed air and gas tight. Provision is made for drawing out any moisture that may be in the wood or poles. This is done by means of steam, dry heat, and vacuum. The liquid sap which is contained in the wood is vaporized by live steam being introduced into the hermetically-closed cylinders which contain the poles, and under a pressure of twenty to thirty-five pounds. This steaming is continued until all the moisture contained in the wood is vaporized. The steam is then blown off, and a vacuum of twenty-two to twenty-six inches is created. By means of the vacuum, together with the aid of dry heat maintained in the cylinders by means of steam-heated coils, the moisture or liquid sap contained in the wood is extracted. The preserving fluid is then introduced into the cylinders while the vacuum is maintained. The wood is in condition to receive the preserving fluid. It may be said that there is a vacuum in every cell in the wood. By means of the suction of every cell of the wood, aided by subsequent pressure of force-pumps, a solution of chlorid of zinc or other antiseptic salts is injected into every cell

and cell-wall on the wood which is being treated. The surplus solution is then drawn off, and the poles are removed from the cylinders and air or kiln dried. When the poles
5 are thus dried, they contain air-cells which are filled by subsequent treatment.

Means are provided for heating the butt-ends of the poles for the purpose of expanding the air in the wood-cells and for impreg-
10 nating the wood with preserving fluid. It is preferable to heat the wood with hot fluid. For this purpose the poles are then transported to immense vats which are adapted to contain creosote heated to approximately
15 205° Fahrenheit. The creosote must be of sufficient quantity to treat from four to nine feet of the butt-ends of the poles. The poles are then elevated and the butt-ends set in the creosote in the vats and allowed to re-
20 main in the hot creosote until the creosote has heated the butt-ends of the poles entirely through, which operation expands the air in the wood-cells. Then by means of large valves the hot creosote is suddenly
25 drawn from the vats and immediately cold creosote is turned into the vats in quantity to equal the hot creosote removed. This heating by the hot creosote has expanded or rarefied the air in the pores of the wood.
30 When the poles are cooled under the treatment with cold creosote, the air in the pores of the wood contracts and draws in the cold creosote. In this manner the poles are thoroughly impregnated throughout with chlorid
35 of zinc and the butt-end sections impregnated with creosote and the utility of the poles is prolonged indefinitely.

Having fully described my invention, what I claim as new, and desire to secure by Let-
40 ters Patent, is—

1. A process of preserving wood which consists of extracting all moisture and sap from the wood, impregnating the wood with chlorid of zinc, kiln-drying the wood, subjecting
45 the ends of the wood to a prolonged hot bath

of creosote, and then subjecting the same ends of the wood immediately to a cold bath of creosote.

2. A process of preserving wood which consists in treating the wood with live steam in
50 a sealed vessel, subjecting the wood to dry heat and to a vacuum, treating the wood in the same vessel with chlorid of zinc and forcing the same into the wood, drying the wood, treating the ends of the wood with a
55 bath of hot creosote, and treating the same ends of the wood in quick succession with a bath of cold creosote.

3. A process of preserving wooden poles which consists in heating the poles with live
60 steam in a sealed vessel until the sap or water in the poles is evaporated, creating a vacuum in the sealed vessel and simultaneously treating the poles with dry heat, injecting chlorid of zinc into said sealed vessel, forcing the
65 chlorid of zinc into the poles in said vessel by pressure, kiln-drying the poles, treating the butt-ends of the poles with hot creosote, and in quick succession treating the said butt-ends with cold creosote.
70

4. A process of preserving wooden poles which consists of treating the poles in a
sealed vessel with hot steam until the sap or water in the poles is evaporated, extracting
75 all moisture from the poles and the vessel by creating a vacuum in said vessel and simultaneously heating the poles, injecting chlorid of zinc into said vessel, forcing the chlorid of zinc into the poles by pressure, kiln-drying
80 the poles, expanding the air in the wood-cells of the butt-ends of the poles by hot fluid, and treating the said butt-ends in quick succession with cold creosote.

In testimony whereof I set my hand, in the presence of two witnesses, this 26th day of
85 January, 1906.

JNO. THOS. LOGAN.

Witnesses:

W. C. DAVIS,
J. L. LOGAN.