

(No Model.)

H. F. ECKERT.  
APPARATUS FOR PRESERVING TIMBER.

No. 509,724.

Patented Nov. 28, 1893.

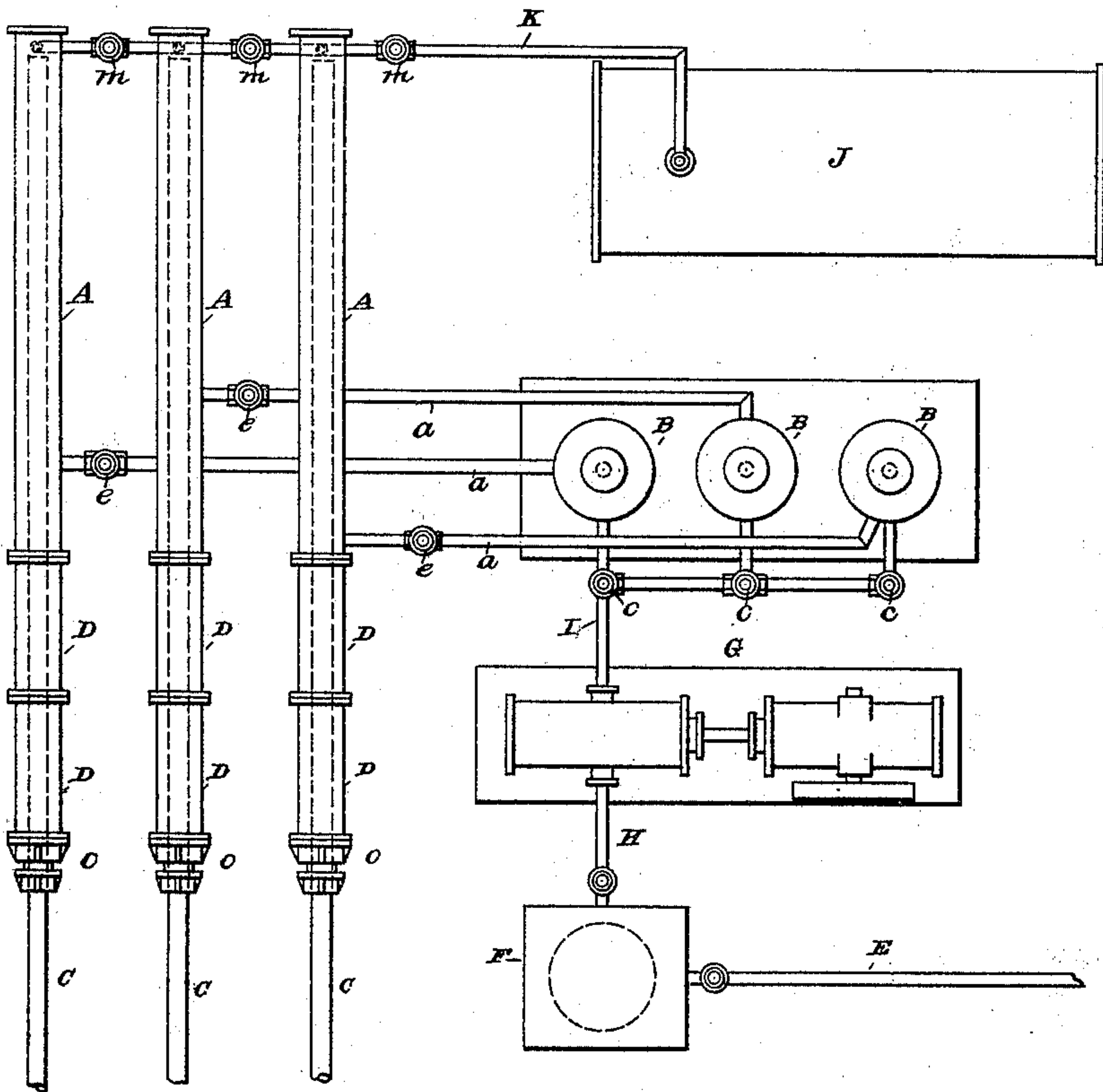


Fig. 1.

Fig. 2.

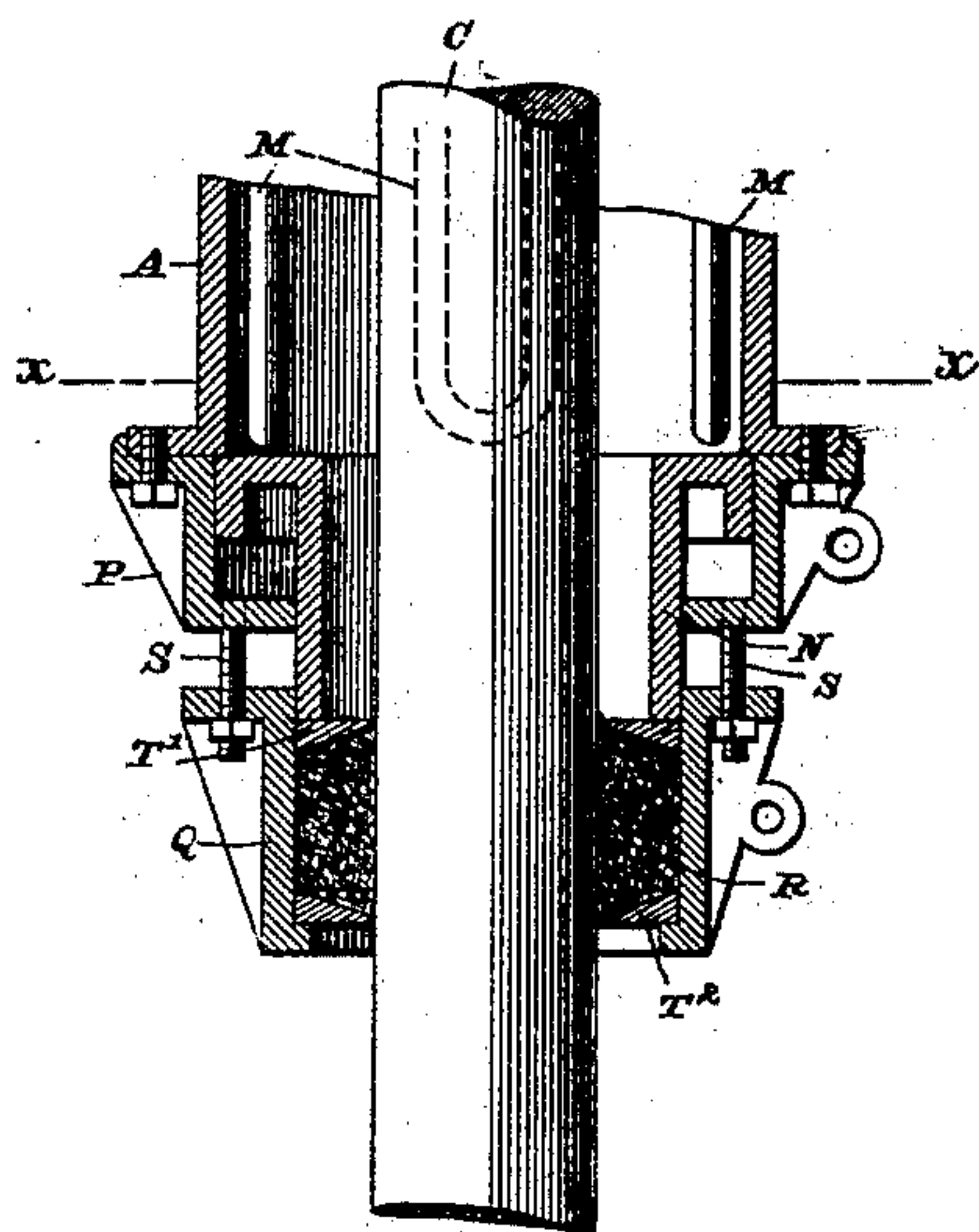
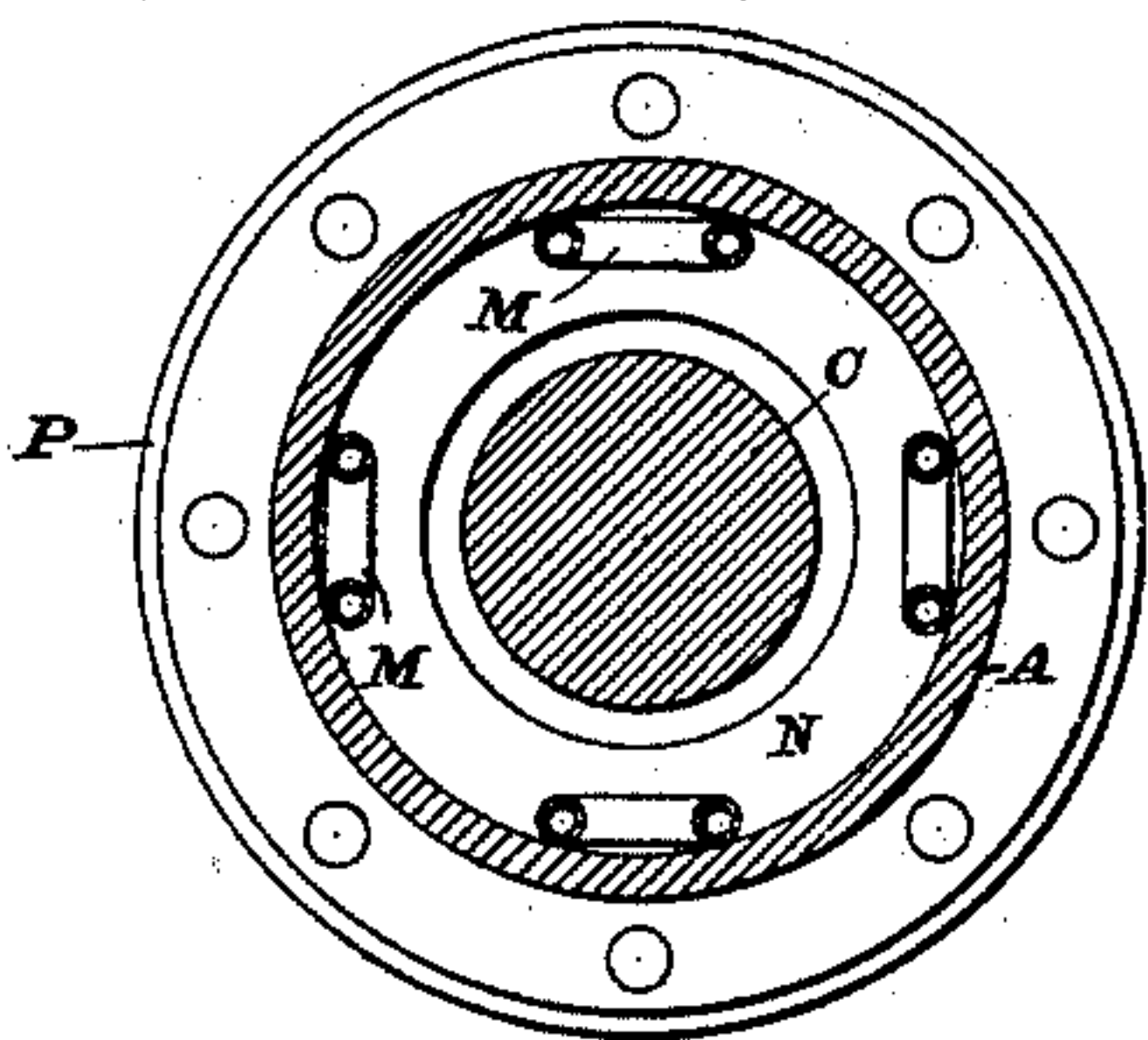


Fig. 3.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR PRESERVING TIMBER.

SPECIFICATION forming part of Letters Patent No. 509,724, dated November 28, 1893.

Application filed June 8, 1893. Serial No. 476,987. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY F. ECKERT, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Apparatus for Preserving Timber with Creosote or other Preservative Liquids; and I hereby declare the following specification and the drawings therewith to be a full, true, and exact description of my improvements and a method of applying the same.

My invention relates to timber-preserving processes, wherein the wood is impregnated with liquids, creosote, or the like, applied under pressure in closed vessels or retorts, and to a more rapid and effectual method of so treating timber, especially structural piles, to be driven in the earth or under water.

My improvements consist in treating separately, in different retorts, piles or other kinds of timber exposed to moisture and decay, limiting such treatment to any desired portion thereof, and confining the pressure for injecting the liquid to the sides and one end of the timber, or to the sides only, leaving one or both ends exposed to the atmosphere and without pressure. Also, in providing accumulators connected with the retorts, through which the preservative fluid is forced on its way to the retorts, these accumulators determining the pressure applied, also the rate and amount of liquid forced into the timber after the supply is shut off.

The objects of my invention are to provide apparatus of the kind, portable in character, that can be moved without much expense to places where timber is to be treated, to reduce the volume of oil or liquid required in the containing or impregnating vessels, to facilitate the passage of the liquid into the wood by exposing a portion of the latter to the atmosphere and relieved from pressure, and to provide means of constantly determining the amount of the impregnating liquid that is forced into the wood, also the rate at which it is absorbed. To attain these objects, I employ apparatus as herein set forth and illustrated in the drawings, forming part of this specification, and to which reference is now made.

Figure 1 is a plan view, or diagram, show-

ing the arrangement of an apparatus for impregnating structural piles according to my invention. Fig. 2 is a longitudinal section through a gland or stuffing box that confines the treatment to one end, or so much of the piles as is to be impregnated or filled with the preservative liquid. Fig. 3 is a transverse section on the line  $x-x$  of Fig. 2, showing the heating pipes in the retort to maintain the temperature of the oil or fluid while it is being forced into the timber.

Similar letters of reference on the different figures of the drawings indicate corresponding parts thereof.

In processes for the preservative treatment of timber as heretofore applied, the custom has been to wholly inclose a number of pieces in a large vessel or retort, filled with the fluid to be injected into the wood, and to have this vessel subjected to pressure for that purpose. The volume of the preservative oil or liquid thus required is many times that of the timber treated, requiring its transfer from the retort to supply tanks each time that a new charge is inserted. The timber in this case being wholly enveloped by the preserving liquid, there was no escape for the sap or moisture in the timber, which is driven in toward the center and excludes the impregnating liquid accordingly.

In my improved apparatus, which will now be described, both the methods and results are different.

Referring to the drawings, A A A are retorts or pipes in which the timbers or piles C C are inserted. These retorts or pipes A may consist of any number, as the extent of the work may require, and their length can be adapted to that of the timber by means of the detachable sections D, of which there can be more or less, as the length of the timber to be treated may require. The piles C are inserted for such portion of their length as is required, the remainder projecting beyond the retort, as shown in the drawings.

The retorts A are filled with creosote or other preservative oil or fluid, which flows from some source of supply through the pipe E to a tank F, which is heated by a furnace beneath, or by means of steam pipes when more convenient, so that the fluid when viscous is softened or thinned by heat so that it can



be readily impelled by a steam or other pump G, to which it is supplied from the tank F by a pipe H. From the pump G the fluid is forced through a pipe I, branched and communicating with the accumulators B B B, and these are again separately connected to the retorts A A A by the pipes *a a a*, each retort and its accumulator acting independently, the flow being controlled by valves *e e e* and *c c c*.

The accumulators B being of the common construction, consisting of a cylinder and a loaded piston resting on the contained fluid, do not require detailed description. The rams or pistons are loaded so as to produce the required pressure on the liquid in the retorts A, and have other functions, to be hereinafter described.

To maintain the temperature of the retorts A, and of their contents, while timber is being treated, they can be set in a furnace or heated chamber, or, as in the drawings, be subjected to the heat of steam, by means of pipes placed inside the retorts and surrounded by the contained fluid; or the entire retort, or a part thereof, can be surrounded by a steam jacket. In applying this method of heating I employ a steam boiler J from which a steam pipe K connects separately to each of the retorts A, the steam to each being controlled by valves or cocks *m m m*.

Inside the retorts A are arranged series of pipes M, that are disposed longitudinally in tiers as shown in Figs. 2 and 3, connected with the pipe K and boiler J, as before explained. The terminal end of these pipes M is connected with a steam trap, or provided with an escape cock to discharge condensed water in the usual manner.

To prevent the escape of the impregnating fluid around the timbers where it enters the retorts A, I employ glands and stuffing boxes O O O, in Fig. 1, and shown enlarged in Fig. 2, consisting of a short cylinder P, bolted to, and forming the end of the retorts A, a movable piston and gland N, and a stuffing box Q. Such glands can be applied at both ends of the retorts A if required, but in practice it is generally desirable to treat one end of the timber for the distance it will be exposed to water or moisture. The action of these packing glands is automatic. When the pile C is inserted the stuffing box Q, containing fibrous or other suitable packing R, is drawn up by means of the screws S, sufficiently to prevent the impregnating liquid from flowing out when the retort A is filled, the packing R, being compressed between the two junk rings T' T'. The upper ring T' bears against the gland N, which at the top is formed into a piston fitting in the cylinder P, so that when pressure is applied in the retort A, the piston is subjected to a force equal to its area, and concentrates this great pressure on the lesser area of the ring T', moving it outward and compressing the packing R around the pile C with great force and preventing escape of the

impregnating fluid around the pile or timber C.

If desired, packing glands can be provided at both ends of the retorts A, so that both ends of the timber will be relieved of pressure and the middle section of the piece be treated. When the pressure in the retort A is removed, the packing can then be readily removed and another piece of timber inserted.

Referring to the accumulators B, these have the purpose of maintaining the required pressure in the retorts A after they are filled and the pump G has ceased to operate, the degree of such pressure being regulated by the load on the pistons of the accumulators.

After the pump G is stopped, the rate and amount of preservative fluid forced into the timber is indicated by the descent and displacement of the accumulator pistons showing the progress of the process in the retorts A.

Having thus explained the nature and objects of my invention and methods of applying the same, what I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus for preserving timber, the combination of a retort or retorts of tubular form, to receive single pieces of timber, said retorts being made in sections so that they may be adjusted to the length of the timber and being provided with stuffing boxes with a sliding interior cap or gland adapted to be operated by the pressure of the liquid within the retort so as to compress the packing around the timber in the same degree and means for supplying the preservative fluid under pressure to said retorts.

2. In an apparatus for preserving timber, the combination of a retort for receiving the piece of timber, said retort consisting of sections, the end of the retort being provided with a stuffing box with sliding interior cap or gland adapted to be operated by the pressure of the liquid within the retort so as to compress the packing around the timber in the same degree, a pump for injecting the preservative fluid into the retort and a steam boiler for supplying steam to the retort to heat the impregnating fluid substantially as described.

3. In an apparatus for preserving timber, the combination of a retort made in sections so that it may be adjusted as to length to correspond with the length of the individual piece of timber received therein for treatment, the end of the retort being provided with a stuffing box with sliding interior cap or gland adapted to be operated by the pressure of the liquid within the retort, a forcing pump for supplying the impregnating fluid under pressure to said retort and the heating device for heating the fluid within the retort, substantially as described.

4. In an apparatus for preserving timber, a sectional retort having one end provided with a stuffing box with sliding interior cap or gland adapted to be operated by the pressure of the liquid within the retort and means for



supplying the liquid to the retort, substantially as described.

5 In an apparatus for preserving timber, the combination of a system of separate retorts or vessels for each piece of timber to be treated, said retorts being provided with stuffing boxes with sliding interior cap or gland adapted to be operated by the pressure of the liquid within the retort so as to compress the  
10 packing around the timber in the same degree and means for injecting and compress-

ing the preservative fluid in the retorts, and a heating device for heating same substantially as described.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses. 15

HENRY F. ECKERT.

Witnesses:

JAMES L. KING,

WILSON D. BENT, Jr.