

(No Model.)

2 Sheets—Sheet 1.

H. M. PIERCE.

PROCESS OF AND APPARATUS FOR THE MANUFACTURE OF TURPENTINE.

No. 277,506.

Patented May 15, 1883.

Fig. 1.

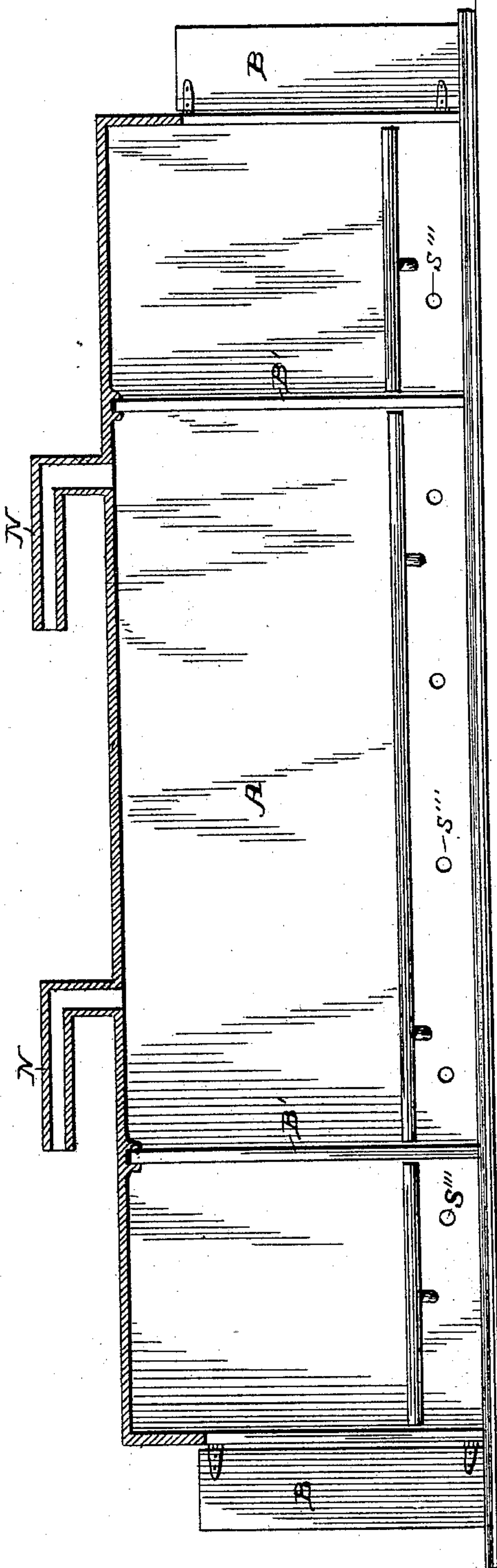
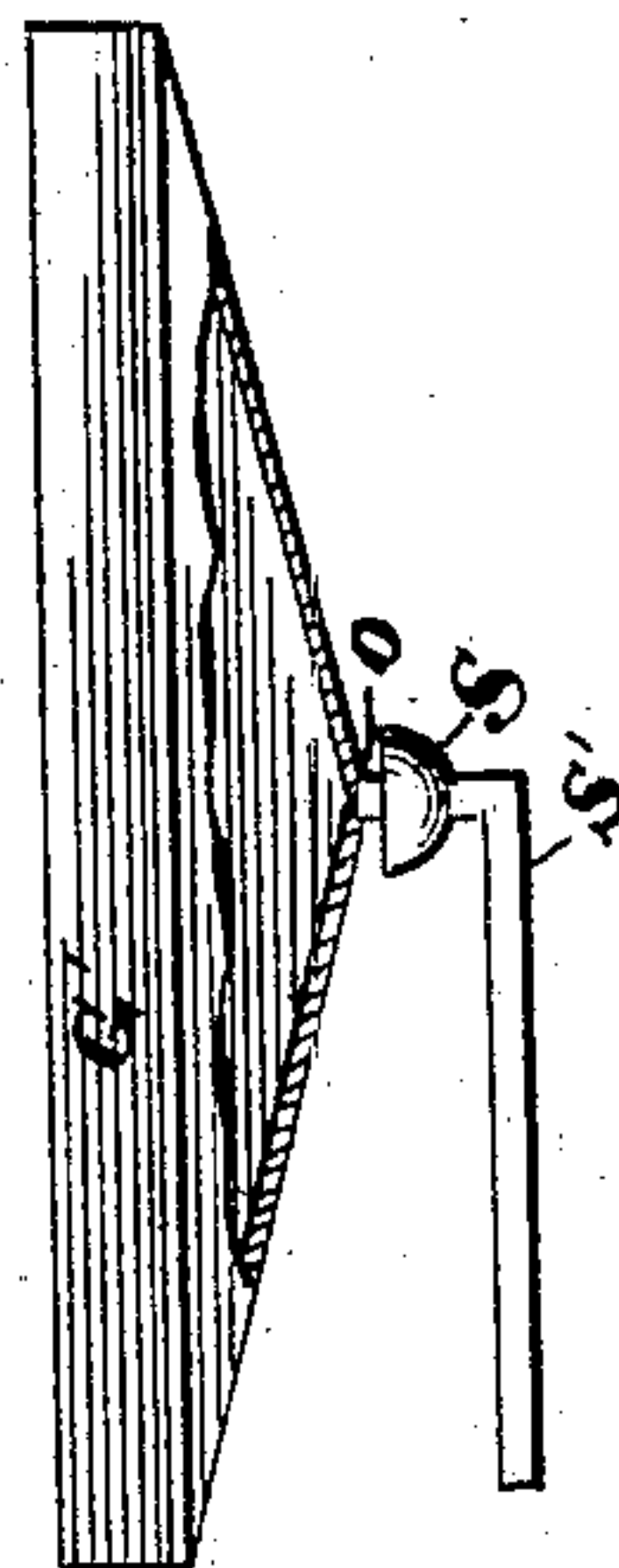


Fig. 3.



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Fig. 1.

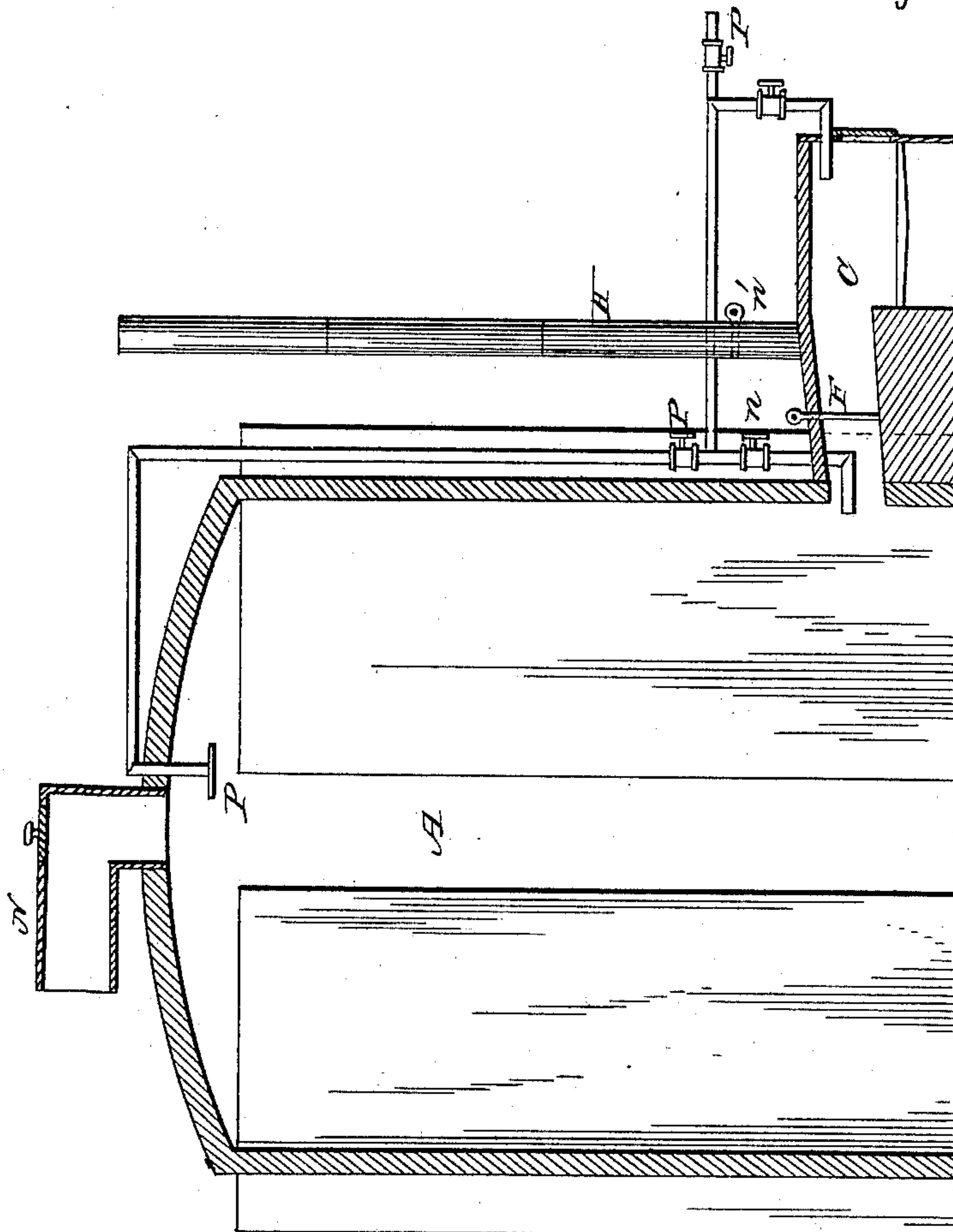
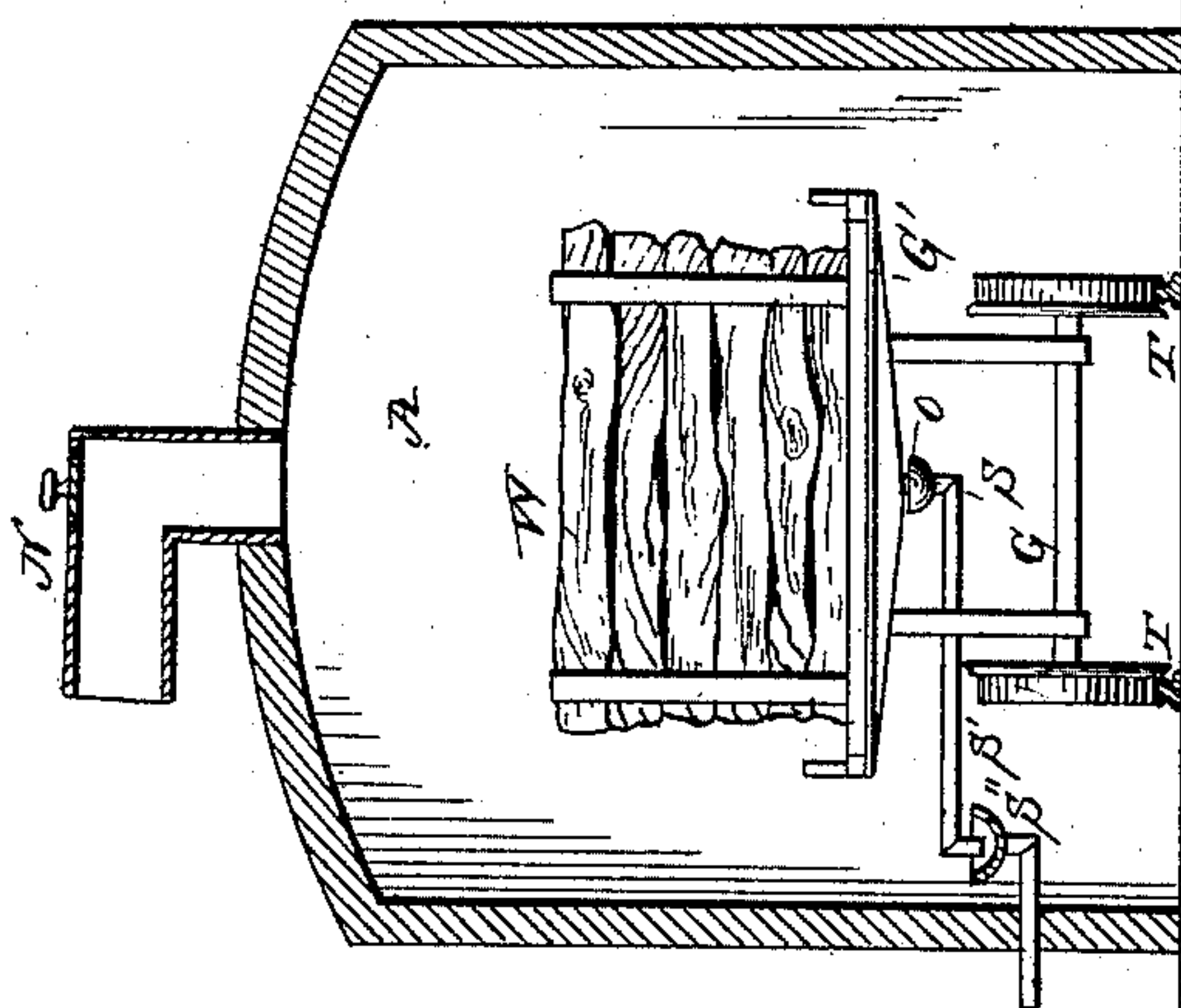


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

HENRY M. PIERCE, OF CHICAGO, ILLINOIS.

PROCESS OF AND APPARATUS FOR THE MANUFACTURE OF TURPENTINE.

SPECIFICATION forming part of Letters Patent No. 277,506, dated May 15, 1883.

Application filed November 25, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY M. PIERCE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Processes of and Apparatus for the Manufacture of Turpentine and other Resinous Compounds; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to separate turpentine, rosin, &c., from resinous wood. Pyroligneous acid, that contains all the valuable wood products proper, is the result of the recombination of the gases evolved in the destructive distillation of wood, while turpentine and other valuable resinous compounds exist as such in certain kinds of soft wood—such as pine, tamarack, &c.—and can be obtained by tapping the resinous tree, or can be set free by the application of heat. In the nature of the case but a small percentage of the resinous compounds can be obtained by making incisions into a tree, although the tree itself may be killed by this treatment. By the application, however, of heat, all the resinous products disseminated throughout the woody fiber of the tree can be obtained. In fact, far more turpentine can be obtained by my process from a dead tree than was ever obtained from the tapping that killed it.

It is evident that the apparatus for the treatment of wood to obtain its resinous compounds should be of cheap and simple construction, and of such capacity as to handle regularly large quantities of wood in transit to kilns, in which it is to be reduced to charcoal for use in the manufacture of iron and other purposes. To this end I have devised the method and apparatus hereinafter described.

Figure 1 represents a vertical longitudinal section of a long low kiln, A, provided with one or more tracks, T T, along the bottom. B B are inlet and outlet doors, and B' B' are interior sliding doors. These sliding doors B' B' slide outward through the walls of the kiln. N N are chimneys for retiring vapors.

S''' are outlet-openings for the outflow of rosin, &c., formed in the kiln.

Fig. 2 is a vertical transverse section through center of car and kiln; and Fig. 3 is a detached view of car-platform.

Like letters refer to like parts wherever they occur.

G represents the car. W is the wood loaded on it. G' G' is the platform of the car, which may be made of sheet-iron. This car bottom inclines to the center through its length, with holes O along the line of greatest depression. These holes are over the open gutter S, which runs lengthwise under the car. This gutter inclines from its ends to the center, where it discharges into conduits S'. S'' is a gutter running lengthwise of the kiln, and along the wall thereof, near the bottom, and communicating at one or more places with the outside of the kiln through outlets S''' S'''.

Fig. 4 represents a vertical section of the kiln and the heat-generating furnace connected therewith. A is a transverse section of the kiln. C is the furnace. F is the flue connecting it with the kiln. H is the stack of furnace, and n n' are dampers in flue and stack. P is a steam-pipe, which has jets projecting either into the kiln or through the furnace, or both.

The operation of my system for the recovery of resinous compounds from wood is as follows: One or more trains of cars loaded with wood are run into kiln A, the doors at both ends closed, and the heat from the outside furnace turned into the body of the kiln. At the same time I turn steam into the kiln, either through the heat-generating furnace or directly into the body of the kiln, or both. I raise and graduate and hold the heat in the kiln at a temperature at which the wood is gradually freed from its resinous matter. The heat largely disassociates the turpentine from the resinous compounds and volatilizes it. These turpentine-vapors, with the aqueous vapors, escape through pipes or chimneys N N', &c., and are collected and condensed, preferably by the method and means described in an application of even date herewith. The turpentine is separated from the watery diluent in the ordinary manner. The rosin exudes from the wood and

runs from the car-platform to the gutters, whence it is drawn outside to the kiln. After these resinous substances have been extracted the cars are run out of the kiln. Should it be desirable to make the operation continuous, sliding doors B' are inserted at proper distances from both ends of the kiln. By closing the sliding doors near the exit one or more cars can be removed or trapped out from the kiln without lowering the heat of the kiln. These sliding doors are again withdrawn, the remaining section of the train or trains moved forward, and the same operation repeated at the other end of the kiln to introduce or trap in a like number of cars loaded with fresh wood. The exit of these cars is at the furnace or heat-generating end of the kiln.

I am aware that steam and also the products of combustion and superheated gases have heretofore been separately employed in the distillation and carbonization of wood, and do not herein claim either when separately employed, because neither will accomplish what I have in view. The heated products of combustion or superheated gases have a tendency to char the wood rapidly and fix the resins therein, while the steam alone is inclined to condense on and saturate the wood, prolonging the time and increasing the labor of its subsequent treatment, whereas in my process sufficient steam is admitted to temper the dry heat of the gases, &c., and much more satisfactory results are obtained. I am also aware that a retort for the distillation of wood has been provided with a water-jacketed pitch basin or receptacle arranged in the retort below the wood-receptacle, and do not therefore broadly claim a pitch or resin gutter; but,

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The method herein described for obtaining turpentine and resins from wood, which consists in subjecting the wood in a closed chamber to the action of heated gases and steam, retiring the gases and vapors from the closed chamber and condensing them, substantially as and for the purpose specified.

2. In apparatus for extracting turpentine and resins from wood, the combination, with a kiln having a drip-gutter arranged along the side thereof, of a guttered movable wood-receptacle having a conduit leading to the side gutter of the kiln, a furnace, and a steam-supply pipe, both of which deliver into the kiln, substantially as and for the purpose specified.

3. The combination, with a kiln or heating-chamber for the treatment of wood, of a trough or gutter arranged along the side thereof, and provided with one or more discharge-pipes, substantially as and for the purpose specified.

4. A car for use in kilns or heating-chambers, said car having an inclined or guttered platform for collecting fluids and conduits or pipes for conducting off the fluids, substantially as and for the purpose specified.

In testimony whereof I affix my signature, in presence of two witnesses, this 20th day of November, 1882.

HENRY M. PIERCE.

Witnesses:

I. W. RITTER, Jr.,
H. B. MOULTON.