

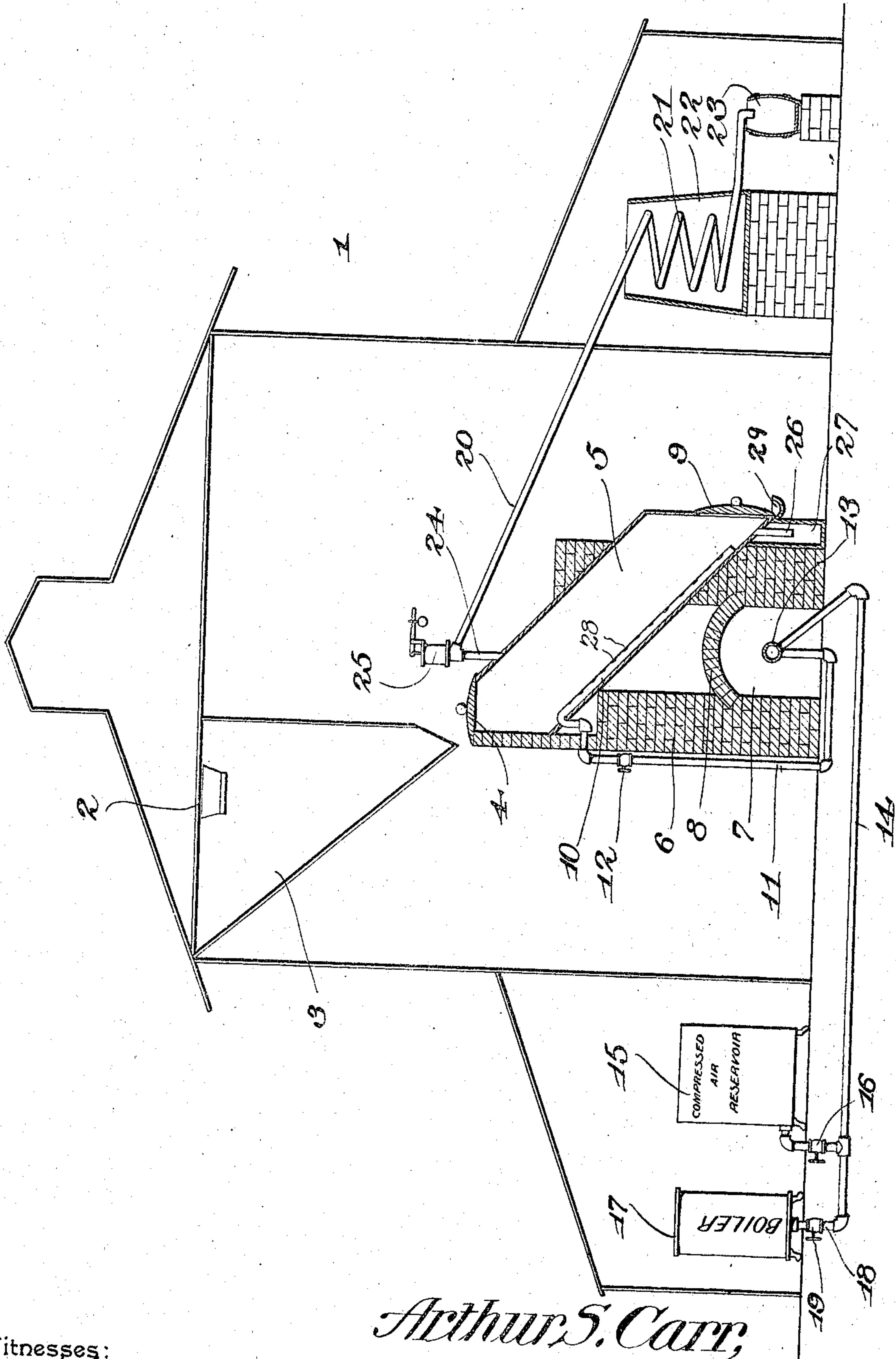
No. 840,607.

PATENTED JAN. 8, 1907.

A. S. CARR.

STILL.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ARTHUR S. CARR, a citizen of the United States, residing at Hattiesburg, in the county of Perry and State of Mississippi, have invented a new and useful Still, of which the following is a specification.

This invention has relation to stills; and it consists in the novel construction and arrangement of its parts, as hereinafter shown and described.

The object of the invention is to provide a rapid and thoroughly practical manner for distilling turpentine, to conserve uncontaminated the first distillate or white turpentine, and to effect distillation of the heavier oils and tar; furthermore, to facilitate charging and emptying of the retort, effecting thereby a saving in labor and a consequent reduction from the cost of procedure.

The still consists, primarily, of a foundation, a flue constituting a furnace, a header arranged within the flue and out of contact with the walls thereof, means for supplying steam and compressed air to the header, an inclined stationary retort supported by the foundation and having its ends disposed beyond the heating zone of the furnace, said retort being steam-tight, a charging-door combined with the upper end of the retort, a discharging-door combined with the lower end thereof, a conveyer arranged adjacent to the discharging-door, a perforated pipe disposed upon the lower side of the retort and terminating short of the discharging-door, a discharging-pipe arranged in the lower side of the retort between the discharging-door and the lower terminal of the perforated pipe, a connection between the perforated pipe and the header whereby the former may be supplied with heated compressed air or compressed and superheated steam, a vapor-offtake pipe connected with the top, a condensing-coil with which the off-take-pipe connects, and a safety-valve mechanism located upon said off-take-pipe and adapted to be automatically operated by the accumulated pressure within the retort to open communication between the said retort and the condensing-coil, whereby the vapors may pass from the steam-tight retort to the coil, said safety-valve mechanism adapted to automatically close when the pressure within the retort is reduced.

Referring to the drawings, 1 designates

the still-house or inclosure in which the still is arranged, the same being of any preferred construction and having arranged in its top an elevator 2 for feeding wood to the hopper 3, which is arranged over the charging-door 4 of the retort 5. The retort is made of any suitable material and is capable of withstanding pressure and is supported in an inclined position by a foundation 6 of brick or masonry. Extending the entire width of the foundation is a flue 7, constituting the furnace, an arch-wall 8 serving to keep the products of combustion from impinging the retort. By disposing the retort on an incline, as shown, the feeding of the wood thereto is facilitated, and the necessity of any handling is thus obviated. The lower portion of the retort is provided with a discharging-door 9, this door, as well as the charging-door 4, being combined with the retort in such manner as to present a steam-tight closure.

The ends of the retort are beyond the heating zone of the furnace and are thus much cooler than the intermediate portion of the retort, and this arrangement is of great utility, for the reason that it prevents destructive decomposition of the heavier vapors that pass to the bottom of the retort and are caught, as will be hereinafter described, while the lighter vapors are carried off to a suitable condenser, presently to be described. The greatest liberation of the vapors and their products of distillation takes place at the center of the retort, and by the provision of suitable blast mechanism, described farther on, the liberated vapors are driven away from the zone, those that are heavier passing to the bottom and those that are light passing to the top of the retort and thence to a condenser.

Arranged along the bottom of the retort is a perforated pipe 10, which extends outward through the retort near its upper end and is connected with a pipe 11, provided with a valve 12, the pipe 11 being connected with a header or heating-pipe 13, arranged within the flue and in position to be directly impinged against by the products of combustion, the object of the header being to heat the air or the air and the steam, as the case may be, before passing to the retort, thereby causing a rapid distillation of the turpentine and other products in the wood. Connecting with the header 13 is one end of a pipe 14, the opposite end of which communicates

with a reservoir 15, which is designed to contain air under high pressure, the compression of the air being effected in any suitable manner. (Not necessary to be shown.) The valve 5 16 on the pipe 14 operates to prevent the escape of air or to regulate its escape, as required. As it is essential that there be some moisture present to effect proper distillation and to form a vehicle for carrying off the vapors, a steam-boiler 17 is provided which 10 connects through a pipe 18 with the pipe 14, the valve 19 on the pipe 14 operating to shut off the supply of steam thereto when desired. Connecting with the upper side of the retort 15 near its upper end is a vapor-offtake pipe 20, which leads to a condensing-coil 21. Said coil is disposed within a tank 22, containing cool water, the lower end of the coil being projected through the tank to convey the 20 condensed vapors to a suitable receptacle 23. The vertical portion 24 of the pipe 20 carries a safety-valve 25, which will operate to close the exit through the pipe 20 until a predetermined pressure has been reached, thereby 25 insuring that the proper distillation of the wood is effected. The pipe 20 carries off the first distillate or white turpentine in an uncontaminated condition to the condensing-coil, whence it is removed in the manner 30 above described. The lower under side of the retort is provided with a discharge-pipe 26, which is designed to empty into a reservoir or receptacle 27, this receptacle being provided to catch heavier oils and tar escaping from the retort. 35

In the initial operation of the still—that is to say, in securing the first distillate—the fire is applied in the furnace and compressed air and steam are permitted to pass through the 40 pipe 14 to the header 13, where the steam and air are heated, and thence pass to the retort, where they escape in jets through the perforations 28 of the pipe 10. The employment of this pipe is of the greatest importance, 45 inasmuch as it insures proper treatment of the whole mass of stock throughout the extent of the retort, which could not be effected if the air and steam were simply shot into the retort from a nozzle. The presence 50 of air and steam will cause a pressure within the retort, and when this reaches a predetermined point the safety-valve 25 automatically opens and allows the vapors to pass to the condensing-coil, where they are 55 caught. When all the turpentine has been distilled, the valve 19 is closed and the heated air under pressure is alone supplied to the retort, which causes the distillation from the wood of the tar and heavy oils, which escape through the pipe 26 to the reservoir 27. 60 After the distilling is completed the discharge-door 9 is opened, and the wood or stock is

discharged upon the conveyer 29, disposed adjacent to the end of the retort. When the retort is to be charged, the charging-door 4 65 is opened and the requisite amount of wood in proper condition is supplied to the hopper 3, whence it escapes to the retort.

It will be seen from the foregoing description that although the still of this invention 70 is exceedingly simple of construction it combines in a novel and proper manner all of the essential elements necessary for producing rapid and effective distillation, and, moreover, by disposing the retort in the man- 75 - ner described the vapors are uncontaminated and escape from the retort in a pure condition.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is— 80

In a still the combination with a foundation, of a flue constituting a furnace, a header arranged within the flue and out of contact with the walls thereof, means for supplying 85 steam and compressed air to the header, an inclined stationary retort supported by the foundation and having its ends disposed beyond the heating zone of the furnace, said retort being steam-tight, a charging-door 90 combined with the upper end of the retort, a discharging-door combined with the lower end thereof, a conveyer arranged adjacent to the discharging-door, a perforated pipe disposed upon the lower side of the retort, 95 and terminating short of the discharging-door, a discharge-pipe arranged in the lower side of the retort between the discharging-door and the lower terminal of the perforated pipe, a connection between the perforated pipe and the heater whereby the 100 former may be supplied with heated compressed air, or heated compressed air and superheated steam, a vapor-offtake pipe connected with the top of the retort, a condensing-coil with which the offtake-pipe connects, and a safety-valve mechanism located upon said offtake-pipe and adapted to be 105 automatically operated by the accumulated pressure within the retort to open communication between the said retort and the condensing-coil whereby the vapors may pass from the steam-tight retort to the coil, said safety-valve mechanism adapted to automatically close when the pressure within the 110 retort is reduced. 115

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ARTHUR S. CARR.

Witnesses:

J. P. WILLIAMS,
W. P. JONES.