WINANTS & GRIFFEN.

Turpentine Still.

No. 82,263. Patented Sept. 15, 1868.

Fig. 1. Fig. 2. Fig. 3.

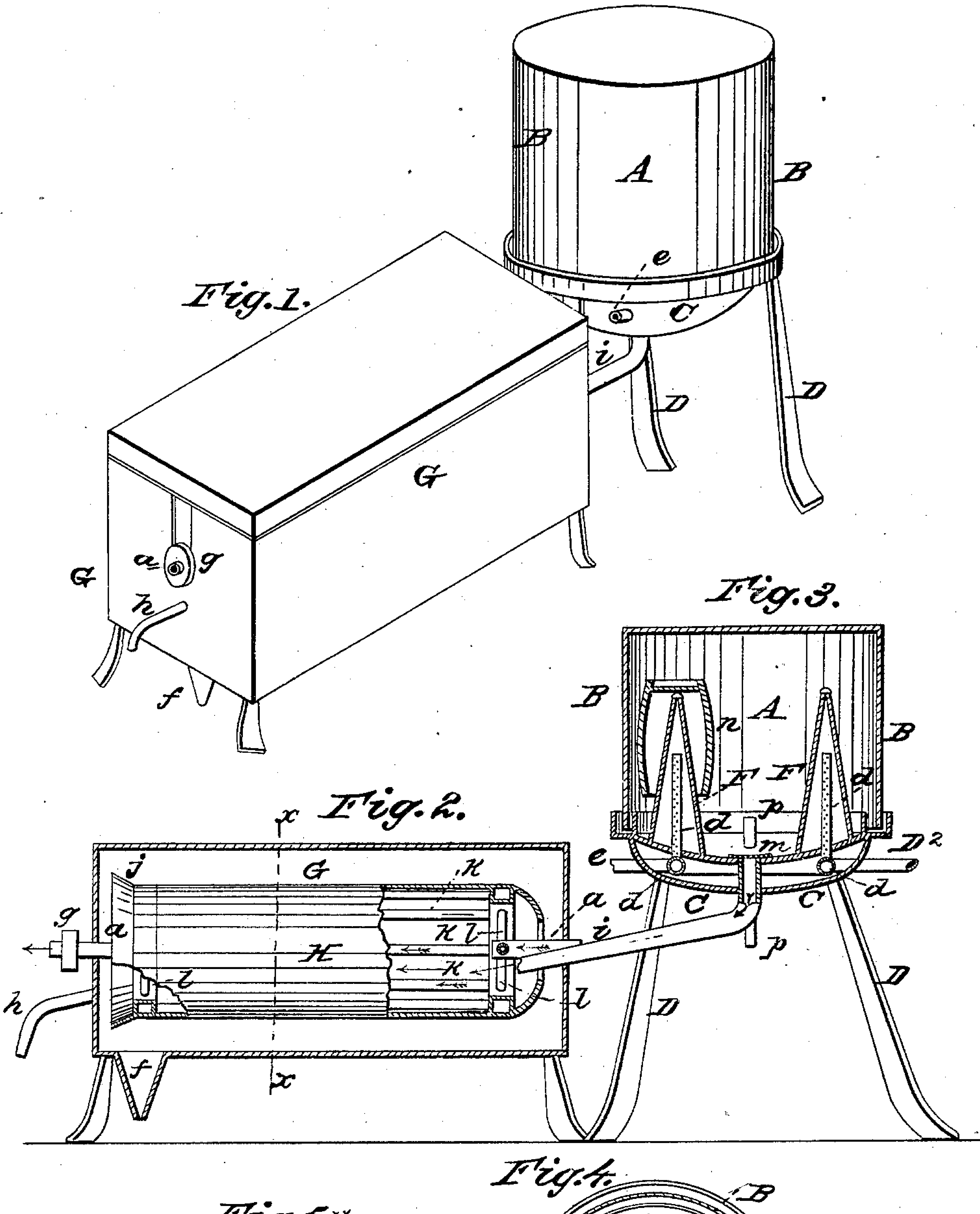


Fig. 5

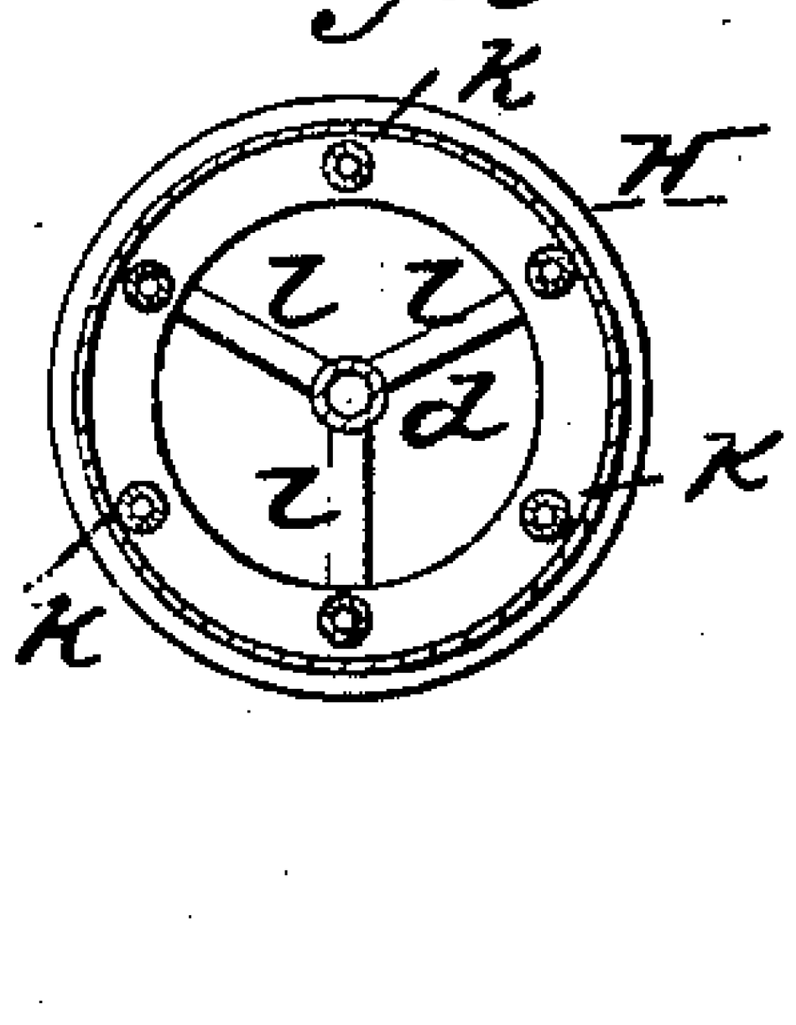
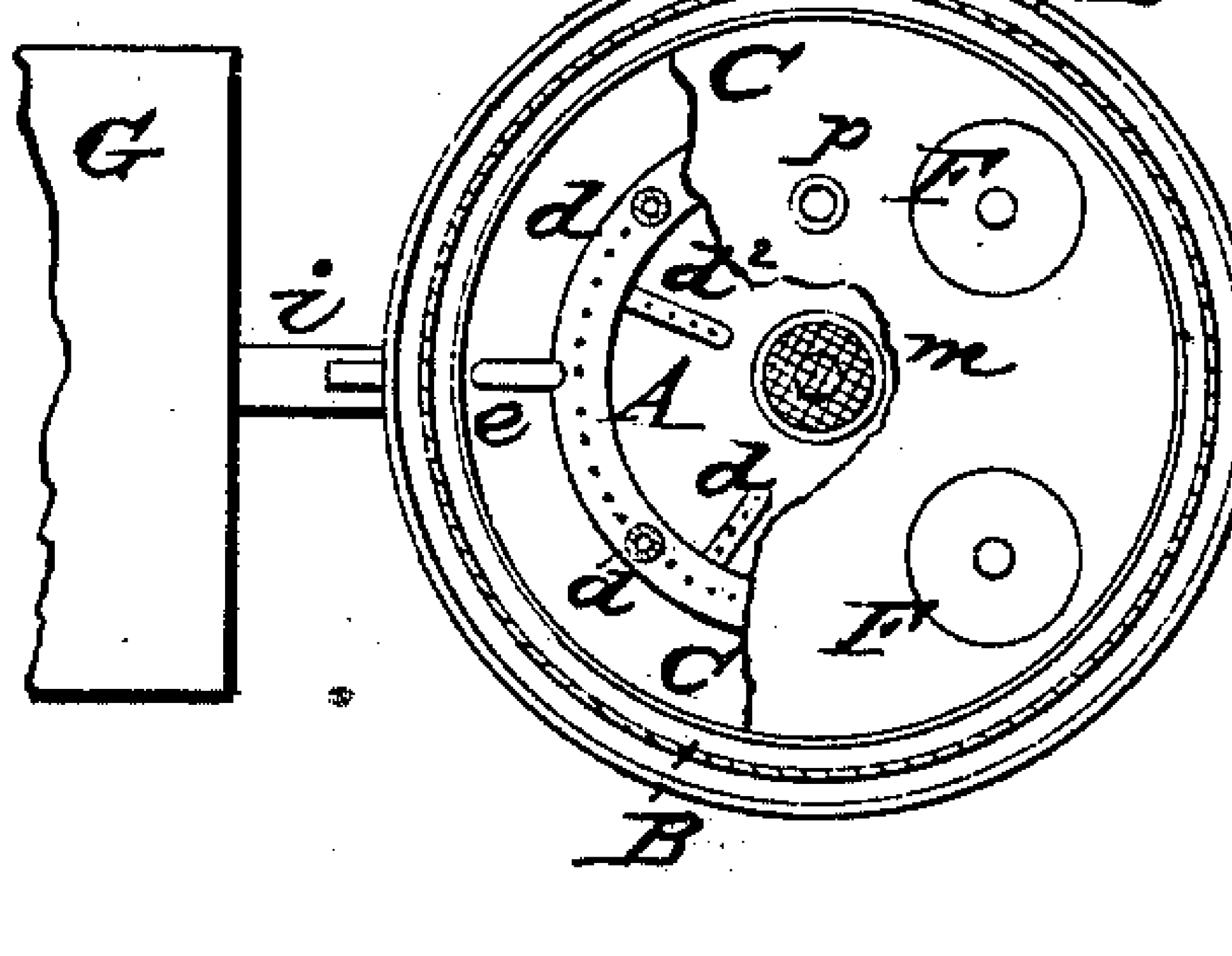


Fig. 4.



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J. E. WINANTS, OF BROOKLYN, AND JOHN F. GRIFFEN, OF NEW YORK, N. Y.

Letters Patent No. 82,263, *dated September* 15, 1868.

IMPROVEMENT IN STILLS FOR TURPENTINE.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that we J. E. WINANTS of Brooklyn, county of Kings, and State of New York, and JOHN F. GRIFFEN, of New York, county and State of New York, have invented certain new and useful Improvements in Manufacturing Turpentine; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this application.

Our invention relates to certain new and useful improvements in the distillation of turpentine, and in the apparatus for melting the crude material and carrying on the process of distillation.

Previous to our invention it has been customary, in the process of distilling crude turpentine and other material, to employ a retort in which the crude material has been heated to a sufficient temperature to produce evaporation, and which retort has been made with a "goose-neck" extending up from the dome of the retort, and through which goose-neck the products of distillation were carried off to the condenser.

We have found, by experiment, that the vapors of turpentine and oil are heavier than air, and that in rarefying such vapors sufficiently, by increasing their temperature, to enable them to ascend into and through the goose-neck, the retort has to be so highly heated as to burn or materially injure the rosin or other residuum in the retort, and to avoid this damage to the rosin, and at the same time economize heat, and more successfully carry on the process of distilling turpentine, are the main objects of the first part of our invention, which consists in carrying on the distillation at a comparatively low temperature, and allowing the vapors to escape and pass off at a point just above or below the solid contents of the still.

And our invention further consists in a still composed of a rotatory steam-heated cylinder, through which the crude material is passed in a state of agitation, and which is arranged within a suitable case, provided with an inlet for the crude material and outlets for the products of distillation and rosin, or residuum, as will be presently explained.

And our invention further consists in an improved apparatus for melting the crude turpentine out of the barrels, feeding it to the still, and for drying the barrels, all as hereafter more fully explained.

To enable those skilled in the art to make and use our invention, we will proceed to describe it more fully, referring by letters to the accompanying drawings, in which—

Figure 1 is a perspective view of our improved melting and distilling-apparatus.

Figure 2 is a vertical longitudinal section of the still.

Figure 3 is a vertical section of melting-apparatus.

Figure 4 is a plan view, showing the arrangement of the steam-pipes of melting-apparatus, and

Figure 5 is a detail cross-section of the still steam-cylinder.

In the several figures the same parts are designated by the same letters of reference.

A is the melting-chamber, which is composed of a removable cylindrical case, B, which rests on a double bottom or case, C, supported by standards D at a suitable height relatively to the still.

This double bottom or case C is provided with internal steam-tubes *d*, which are supplied from a steam-pipe, D^2, and the case C is provided with an exhaust-pipe, *e*, through which the steam passes off from said case. The steam-tubes *d* are arranged in a peculiar manner, and perforated, as will be presently more fully explained.

F is a series of conical barrel-supporters, which extend upward from the steam-case C, and on which the barrels of crude turpentine are placed upside down, the heated cones penetrating contents of the barrels, as illustrated at fig. 3.

G is the case or still-chamber, in which the distillation is effected. It is a simple tight case, suitably supported, and provided with an outlet or exit-pipe, *f*, near one end, for the discharge of the rosin, and with a pipe, *h*, through which the fumes or vapors of turpentine pass off to any suitable condensing-apparatus. Within the case G is arranged a steam-heated rotary cylinder, H, which is mounted on a hollow steam-shaft, *a*, having suitable bearings where it passes through the ends of case G, and provided with a pulley at *g*, by means of which it is rotated.

This cylinder H is formed, as shown, with an opening at one end, through which the melted crude turpentine is discharged from the supply-pipe *i* into the interior of said cylinder, and is left entirely open and flared at *j*, at the other end, to permit the free discharge of the material passed through.

The cylinder H is provided inside with longitudinally-arranged steam-pipes, *k k*, communicating by means of the radial steam-arms *l* with the central or axial steam-pipe or shaft *a*. Steam is supplied to the shaft *a*, and circulates through all the steam-tubes, as indicated by the red arrows, and the crude material from the melting-apparatus passes from the latter into the steam-cylinder, and through it, as indicated by the black arrows in the drawing.

That end of the cylinder H into which the melted material is fed may be elevated somewhat above the level of the other end, if deemed expedient, to facilitate the passage of the material through said cylinder. We propose to place over the mouth of the exit of the melting-chamber a suitable filter or strainer, *m*, to prevent the passage, into the pipe *i*, of chips or other matter which might clog it up. We have represented at *n n* the barrels of crude turpentine as arranged on the melting-cones F. These steam-heated cones are of a sufficient height to leave a space beneath the mouth of the inverted barrel ample for the free exit from the latter of its contents as it is melted out. *p* is a pipe, to allow the fumes of melted material to pass into any condenser.

The steam-tubes in the melting-chamber case C are so arranged, with vertical branches perforated all around, extending up into the cones F and radial branches d^2, perforated only on top, as to eject the live steam only on to those surfaces of the melting-apparatus which are in contact with the crude material to be melted, and consequently the heat of the steam is most advantageously and economically applied.

The general operation of the whole apparatus may be thus briefly explained:

The cones F being supplied with barrels of crude turpentine, and the case B placed over them, with its base resting in a trough supplied with water, to prevent the vapors passing out, a sufficient head of live steam put on to the melting-apparatus, and also on to the still, and the rotatory steam-cylinder H put in motion, the crude turpentine will be melted out of the barrel gradually and thoroughly, and passing through the strainer *m*, and thence on through the supply-pipe *i*, will be discharged into the cylinder H. As this cylinder revolves, with its steam-heated pipes *k k* and arms *l l*, the contained material will be thoroughly and constantly agitated and tumbled by the pipes *k k* and arms during its passage through said cylinder, so that only the residuum will be left to be discharged at the outlet-end of said cylinder, all the volatile portions of the turpentine being vaporized or distilled out effectually by the said steam-heated and agitating-cylinder. The products of distillation will all pass off through the pipe *h*, from which they are conducted to the condenser, while the rosin passes off into any suitable receptacle through the exit-pipe *f*.

Whenever it is necessary to replenish the melting-chamber, the cylindrical case B is removed, and a fresh supply of filled barrels put in. In melting out the crude turpentine from the barrels on the steam-cones F, not only the entire contents of the barrels may be exhausted, but the barrels may be quite dried out clean.

It will be understood that by the process and apparatus described, we are enabled to thoroughly distill the turpentine from the crude material at a comparatively low temperature to the solid portion of the mass, thus avoiding any burning or injury to the rosin. The solid material, being continually agitated and brought into fresh contact with heated surfaces, has all the turpentine distilled out without any excessive and injurious heat, and thus not only is the process more economically conducted, but more successfully, and with better results.

By performing the operation of distillation in the manner described, and at a low temperature in the mass, in lieu of heating the mass highly, and causing it to boil up, as is customary, in the retort, so that a goose-neck has to be used, we are enabled to carry off the products of distillation at a point low down, and consequently more completely extract the turpentine, while, at the same time, we carry little or no foreign matter to the condenser, and can produce a larger percentage of and purer turpentine from the same quantity and quality of crude turpentine than can be done by any other process or apparatus known to us.

Of course the details of construction of the apparatus may be varied, and modifications may be made in carrying out the several characteristic features of our improvements, without departing from the spirit of our invention.

Having described our invention so that those skilled in the art can fully understand and practise it, what we claim as new, and desire to secure by Letters Patent, is—

1. The process, substantially as described, of distilling the crude material and extracting the fumes at a low temperature, and carrying them off from the lower portion of the still, as and for the purposes set forth.

2. Also, the employment, in combination with the chamber or case of the still, of a steam-heated rotating agitator-cylinder, into and through which the crude material passes during the process of distillation, substantially as described.

3. Also, the employment, in combination with the melting-chamber, of one or more heated barrel-supporters, F, adapted to hold and melt out the contents of the barrels, substantially as hereinbefore described.

4. Also, the employment of steam-tubes so perforated as to eject the live steam on to those surfaces which are required to radiate the greatest quantity of heat, substantially as herein set forth.

In testimony whereof, we have hereunto set our hands and seals, this 28th day of March, 1868.

JNO. F. GRIFFEN. [L. S.]
J. E. WINANTS. [L. S.]

Witnesses:
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