

F. B. COLE.

STILL.

APPLICATION FILED OCT. 31, 1904.

Fig. 1.

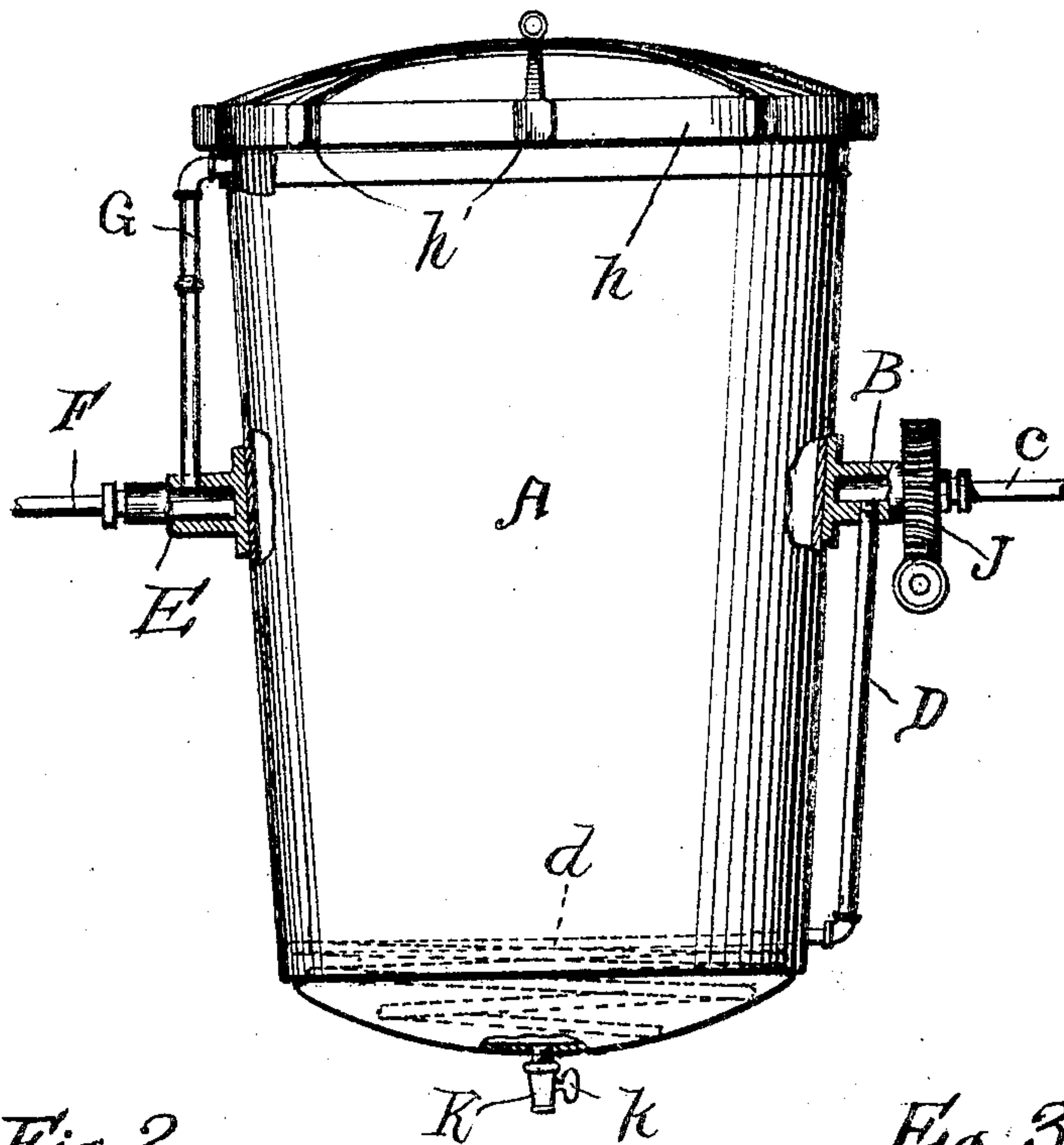


Fig. 2.

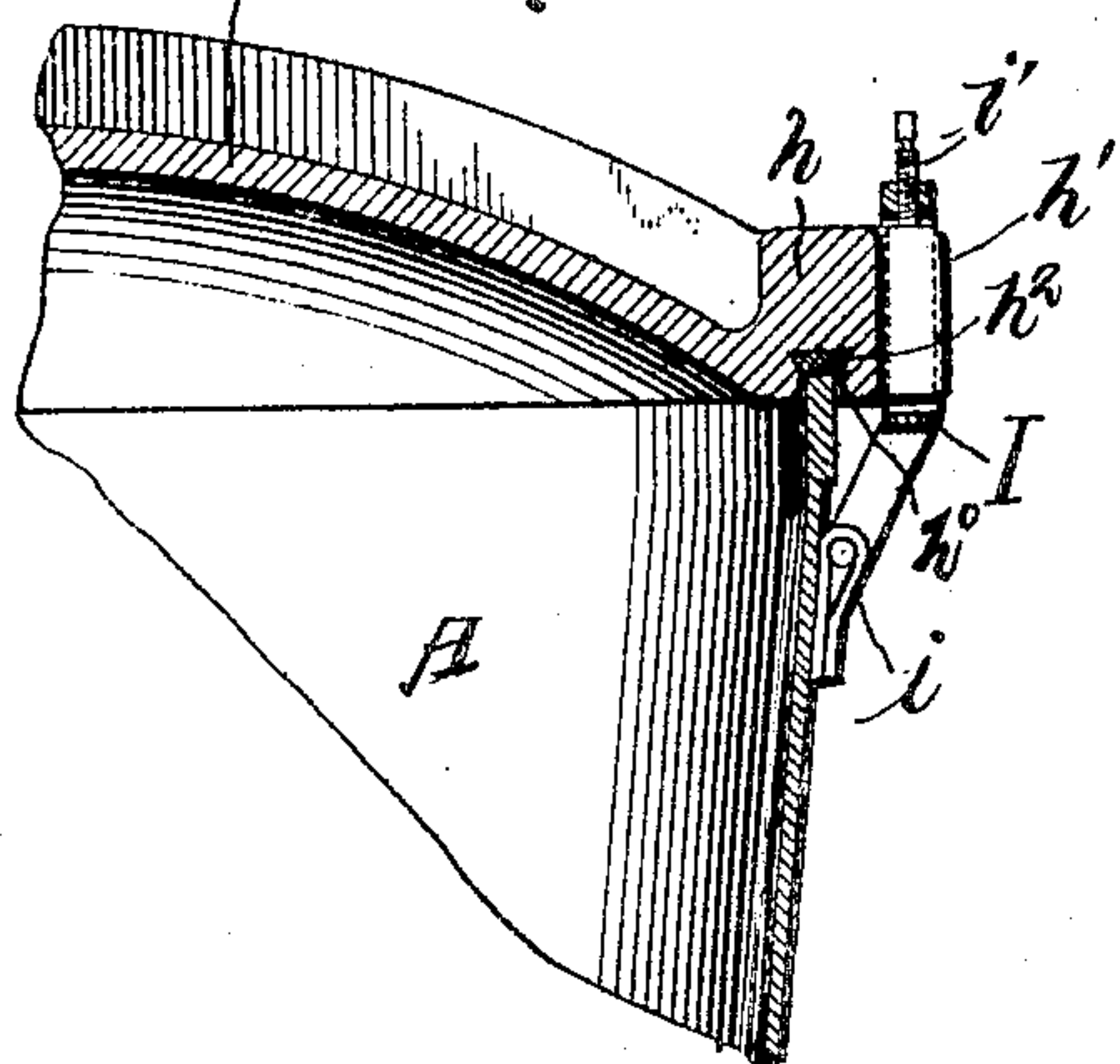


Fig. 3.

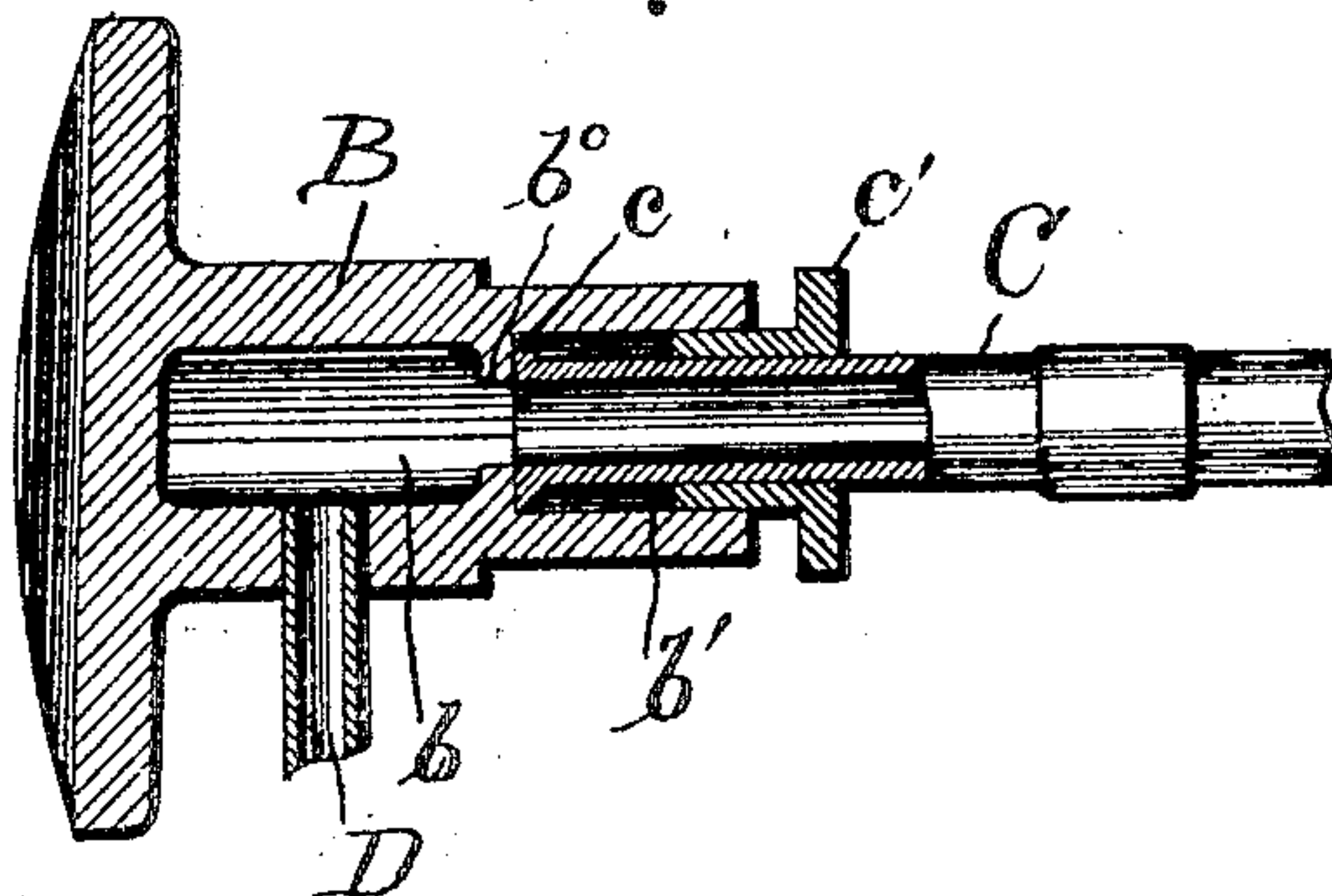
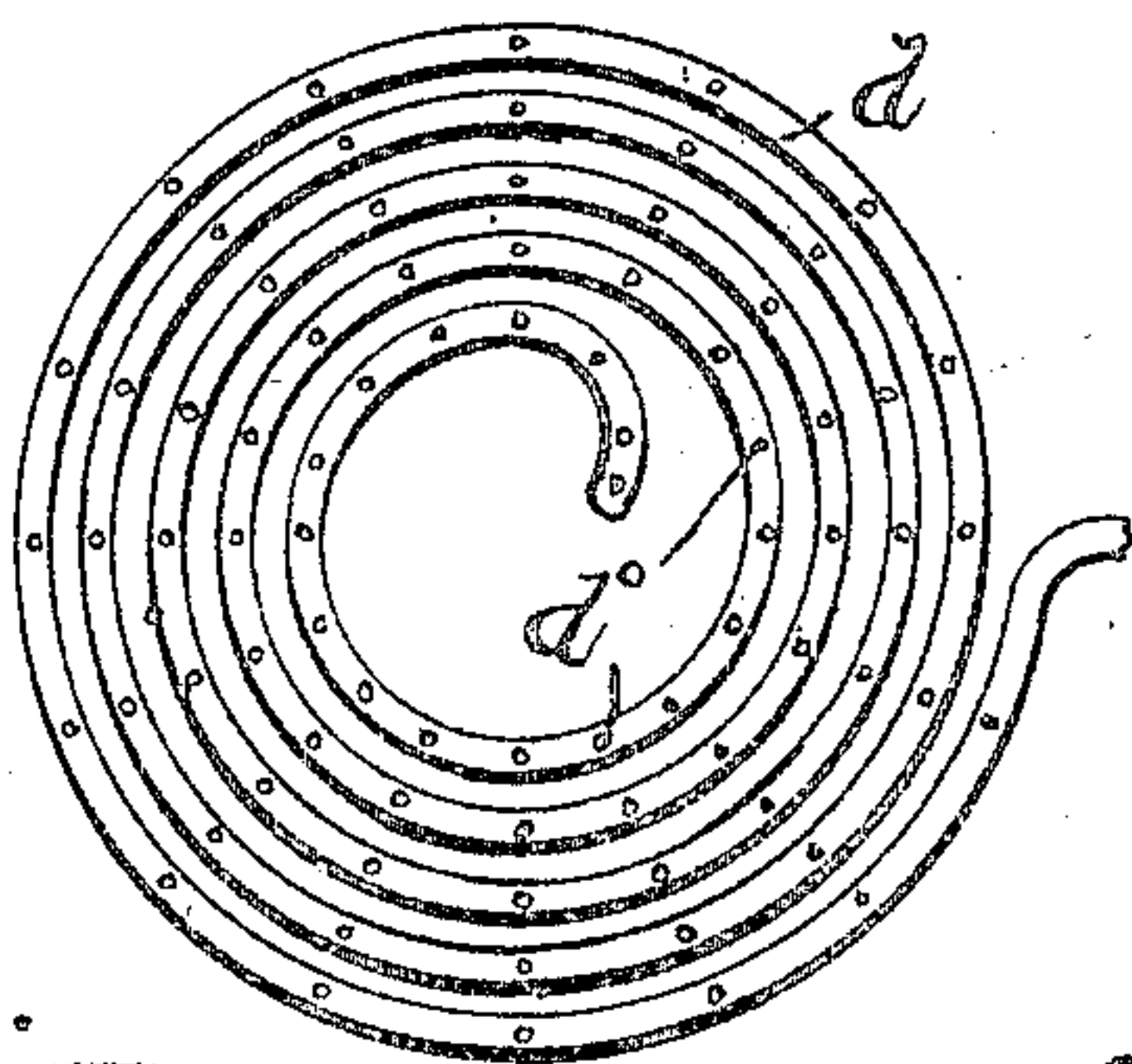


Fig. 4.



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# UNITED STATES PATENT OFFICE.

FRANK B. COLE, OF NEWNAN, GEORGIA.

## STILL.

No. 804,708.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed October 31, 1904. Serial No. 230,836.

*To all whom it may concern:*

Be it known that I, FRANK B. COLE, a citizen of the United States, residing at Newnan, in the county of Coweta and State of Georgia, have invented certain new and useful Improvements in Stills; 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.

My invention relates to improvements in distilling apparatus, and particularly to stills or digesters for extracting oil of sassafras, turpentine, and other products from wood. In the old form of still, wherein fire heat is used for heating up the retort, there is a great risk of combustion caused by the overheating of the resinous products, and, furthermore, the heat has such a destructive effect on the wood contained therein as to relieve the same of its other volatile products which combine with the turpentine, but which, owing to their impurity, must afterward be separated therefrom, necessitating the further distillation of the combined product in order to release the turpentine and produce a purified article. To avoid these objections, it is not uncommon in distilling wood to introduce steam into the chamber or retort containing the loaded material, which may be in the nature of ground wood or chips of same, the live steam passing through the mass extracting the lighter volatile products, which are absorbed thereby and led off to the condenser, where they are released and the purified turpentine discharged in a suitable receptacle. The application of the steam to the contents of the retort, whether the steam be used alone or in conjunction with fire heat, also serves the purpose of softening the wood fiber, causing it to readily give up its lighter volatile products, and at the same time keeps the wood in a moist condition, avoiding the risk of charring and combustion if fire heat is also being used.

My invention relates particularly to stills of this class; and, broadly speaking, the invention consists of a revolubly-mounted retort provided with a detachable cover, but, more specifically, in the latter class of stills comprises a retort provided with the detachable cover and revolubly mounted on hollow trunnions adapted to receive the live steam and to discharge the products of distillation, whereby after all of the volatile products have been extracted the retort may be turned on

its bearings and the more readily discharged of its contents.

To more fully describe the invention, reference is had to the following description and accompanying drawings, illustrating the preferred embodiment of the invention, the particular features of novelty being succinctly pointed out in the appended claims.

In the drawings the same letters of reference indicate the same parts in the several views.

Figure 1 is an elevation of the still, digester, or retort, partly broken away and partly in section; Fig. 2, a fragmentary sectional view showing the manner of securing the detachable top in place; Fig. 3, a longitudinal section through the inlet-trunnion bearing, showing the trunnion in sectional detail with the worm-wheel omitted; and Fig. 4, a plan view of a perforated coil-pipe in the bottom of the still.

A is the revolubly-mounted retort, preferably conical in construction and supported on transverse trunnions, whereby the retort may be tilted in a vertical plane for more readily charging the same and discharging its exhausted contents.

The trunnion (designated by B) is preferably of the construction shown more particularly in Fig. 3, wherein the same is so longitudinally bored as to form the chambers  $b$  and  $b'$ , separated by the apertured diaphragm  $b^0$  and having its closed inner end affixed to the retort.

Within the chamber  $b'$  is disposed the end of the fixed inlet-pipe C, which is preferably provided with the annular flange  $c$ , adapted to rest snugly against the diaphragm  $b^0$ , which forms a seat therefor,  $c'$  designating a bushing encircling the inlet-pipe C and adapted to fit within the chamber  $b'$  for making a steam-tight joint with the hollow trunnion.

D designates a pipe communicating at one end with the interior of the chamber  $b$  and at the other end with the lower portion of the retort A, where it may be connected with any suitable nozzle or other means for injecting the live steam, preferably in sprays, against the contents of the retort. In the drawings for the purpose of illustration, and for this purpose only, the injector is shown in the nature of a rosette or coil-pipe  $d$ , provided with a plurality of upwardly-directed jet-apertures  $d^0$ . The opposite or outlet trunnion E is preferably, as shown, similar in construction



to the inlet-trunnion and is connected with the eduction-pipe F, leading to the condenser, (not shown,) G designating a pipe communicating from the top of the retort to the hollow trunnion.

The detachable cover H may be of any preferred construction and may be secured to the top of the retort in any suitable way; but for the purpose of illustration I have shown in the drawings a simple method of accomplishing this end, and for this purpose the outer rim *h* of the cover is provided with a plurality of lugs *h'*, adapted to be respectively engaged by a yoke member I, pivotally connected, as at *i*, to the body of the retort and provided at its upper end with suitable fastening means, such as the binding-screw *i'*. The outer rim *h* of the cover is preferably annularly recessed, as at *h''*, Fig. 2, and dovetailed within this recess is a suitable packing-ring *h'''*, of rubber, metal, fibrous or other material, for making a steam-tight joint between the cover and retort, the upper end of the retort being preferably of reinforced construction, as shown at *a*.

Any suitable means may be provided for rotating the still around its horizontal axis, and a convenient means for doing so is illustrated in the drawings by the worm-gear connection designated at J. Also any suitable means may be provided at the bottom of the still for drawing off any resinous products which may percolate to the bottom of the still; but I have simply illustrated this by a cock K, provided with a turning plug or key *k*, as this feature forms no part of the present invention.

From the foregoing the operation of the still is apparent. The steam, being injected into the loaded still through the rosette or coil-pipe *d* and passing through the mass therein, extracts and absorbs the turpentine, and the products of distillation are carried out through the pipe G at the top of the retort, passing through the eduction-pipe F to the condenser. When the distillation of the charge has been completed, if desirable, the resinous products may be drawn off, and the cover being removed the retort is tilted for discharging its contents, and by the injection of live steam the cleansing out of the retort is the more readily effected.

It will be observed that the pipes D and G, being connected at one end to the retort and their other ends with the hollow trunnions, will rotate with the retort, while the inlet and eduction pipes C and F remain stationary and provide bearings for the trunnions.

Obvious changes might be made without departing from the spirit of the invention, and I do not wish to limit myself to the exact details as disclosed herein, and, furthermore, although in the distillation of turpentine it is preferable to use steam it will be obvious

that other heated fluids might be used with the distilling apparatus, and in my improved still I do not wish to be necessarily limited to the use of steam.

What I claim is—

1. The combination with a revoluble still supported by transversely-disposed hollow trunnions, having closed inner ends, affixed to said still at their closed ends, of means for introducing a heated fluid to said still and means for discharging same, comprising communicating pipes between said hollow trunnions and said still, an inlet-pipe communicating with one of said hollow trunnions, and an outlet-pipe communicating with the other of said hollow trunnions.

2. The combination with a revoluble still supported by transversely-disposed hollow trunnions, having closed inner ends, affixed to said still at their closed ends, of means for introducing a heated fluid to said still and means for discharging same, comprising a communicating pipe leading from one of said hollow trunnions to the bottom of said still, and a second pipe communicating between the other of said hollow trunnions and the top of said still, an inlet-pipe communicating with one of said hollow trunnions, and an outlet-pipe communicating with the other of said hollow trunnions.

3. The combination with a revoluble still supported by transversely-disposed hollow trunnions, having closed inner ends, affixed to said still at their closed ends, of means for introducing a heated fluid to said still and means for discharging same, comprising a pipe communicating between one of said hollow trunnions and the bottom of said still, means located within said still connected to the lower end of said pipe for evenly distributing said fluid at the bottom of said still, a pipe communicating between the top of said still and the other said hollow trunnion, an inlet-pipe communicating with one of said hollow trunnions, and an outlet-pipe communicating with the other of said hollow trunnions.

4. The combination with a revoluble still supported by transversely-disposed hollow trunnions, having closed inner ends, affixed to said still at their closed ends, of means for introducing a heated fluid to said still and means for discharging same, comprising communicating pipes between said hollow trunnions and said still, means for tilting said still in a vertical plane, an inlet-pipe communicating with one of said hollow trunnions, and an outlet-pipe communicating with the other of said hollow trunnions.

5. The combination with a revoluble still supported by transversely-disposed hollow trunnions, having closed inner ends, affixed to said still at their closed ends, of means for introducing a heated fluid to said still and means for discharging same, comprising communicating pipes between said hollow trunnions and said still, an inlet-pipe communicating with one of said hollow trunnions, and an outlet-pipe communicating with the other of said hollow trunnions.



nions and said still, means for tilting said still in a vertical plane comprising a worm-wheel and worm operatively associated with one of said trunnions, an inlet-pipe communicating with one of said hollow trunnions, and an outlet-pipe communicating with the other of said hollow trunnions.

6. The combination with a still provided with transversely-disposed hollow trunnions, for tilting the still in a vertical plane, said trunnions having closed inner ends and affixed to said still at their closed ends, of a detachable cover therefor, provided with an annular recess adapted to receive the upper edge of the still, a gasket of suitable packing material within said recess, means for securing said cover to said still, comprising a plurality of lugs, disposed circumferentially around said cover and a plurality of yokes pivoted to said

still and adapted to engage and interlock with said lugs, means for introducing a heated fluid to the contents of the still, comprising an inlet-pipe communicating with one of said trunnion-bearings and a second pipe communicating between said trunnion and the lower end of the still, means for carrying off the products of distillation, comprising a pipe communicating between the top of the still and the other of said trunnion-bearings and an eduction-pipe for said second bearing, and means for rotating said still on its horizontal axis.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK B. COLE.

Witnesses:

H. M. LUNDIE,  
JACK H. POWELL.