(No Model.)

G. F. WILSON.

REVOLVING BOILER FOR PAPER MAKING AND OTHER PURPOSES.

No. 265,649. Patented Oct. 10, 1882.

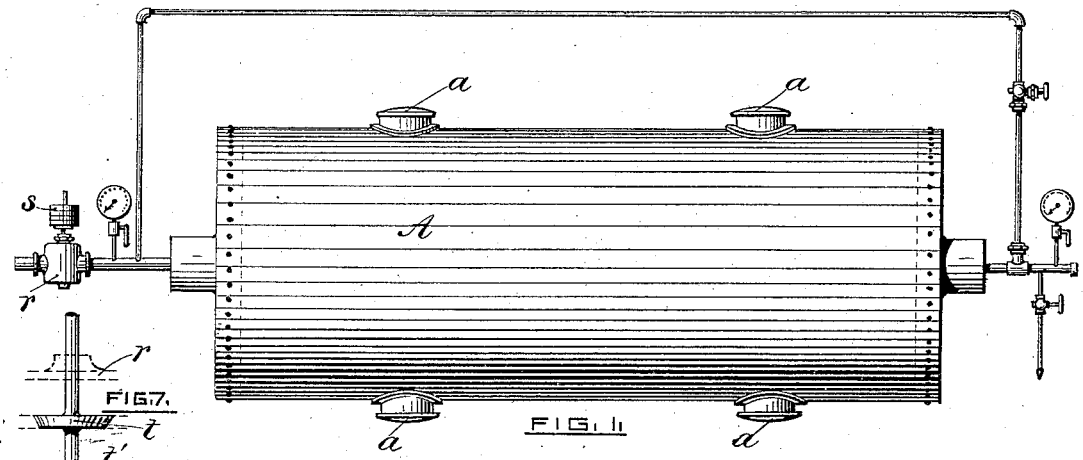

FIG. 11

FIG. 7.

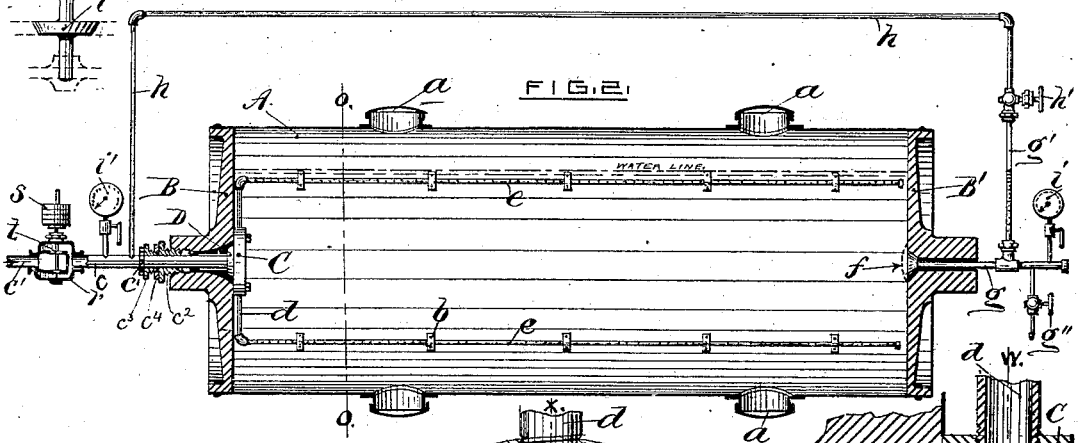

FIG. 2.

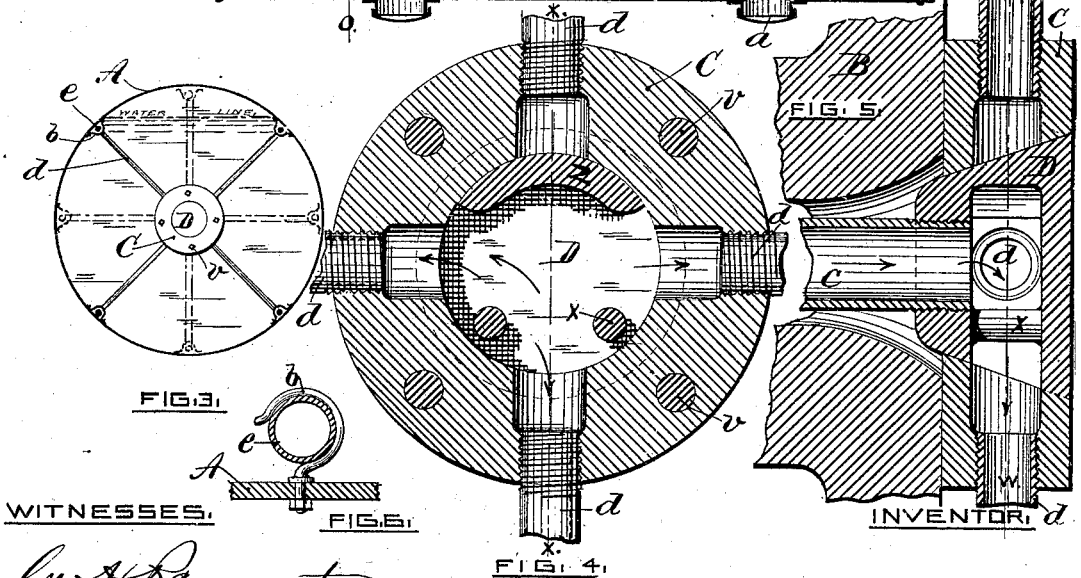

FIG. 3.

FIG. 4.

FIG. 5.

FIG. 6.

WITNESSES.

Geo. H. Remington

Charles Partridgaw.

INVENTOR.

Geo. F. Wilson

UNITED STATES PATENT OFFICE.

GEORGE F. WILSON, OF EAST PROVIDENCE, RHODE ISLAND.

REVOLVING BOILER FOR PAPER-MAKING AND OTHER PURPOSES.

SPECIFICATION forming part of Letters Patent No. 265,649, dated October 10, 1882.

Application filed June 6, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE FRANCIS WILSON, of East Providence, State of Rhode Island, have invented a new and useful Improvement in Revolving Boilers for Paper-Making and other Purposes, which invention is fully set forth in the following specification.

This invention has reference more particularly to an apparatus for boiling rags or other stock for paper-pulp, comprising a horizontal revolving receptacle or boiler into which the rags or stock is put with chemicals and water, and into which, after it is hermetically sealed, steam is admitted through one or both journals.

The nature of my invention consists in the introduction of steam into the revolving "boiler," so called by its makers and by the manufacturers of paper who use it, in such a manner that it will only enter the contents of the boiler in or under the water having the chemicals in solution for treating the rags or other materials used for the manufacture of paper, preparatory to the chloride of lime or other bleaching part of the processes.

In revolving boilers as heretofore constructed steam has been introduced generally through the journals at one end of the boiler, sometimes at each end; but no provision has been made for determining the height of the water-level in them, nor for drawing off an excess of water, nor for knowing exactly the steam-pressure and heat inside of the boiler. An apparatus has been devised and used for the purpose of reducing the pressure of steam in the revolver below that carried in the boilers where the steam is generated for common use in paper mills or works; but it is uncertain in use, and only operates when in good order by wiredrawing the steam. To accomplish these several and other desirable results which the old form of construction failed to attain I have devised the following-described improved mechanism and appliances.

In order to enable persons skilled in the art to manufacture and use, as well as to avoid using, my invention, I will describe it somewhat in detail, referring to the several figures represented in the annexed drawings, to which reference may be had for a full knowledge of the same.

Figure 1, letter A, represents a view of the revolving bleach, with its man-hole entrances used for filling the boiler, and others at the bottom, which, by reason of the great weight of the man-hole entrances, it has been found necessary to use as balances for the upper ones. Fig. 2 is a vertical longitudinal section of the revolver, showing the proper height of the water-level or water-line and the means which I have devised for the introduction of steam into the contents of the boiler below that water-line.

In order to determine where the water-line is inside the boiler, which, when in use, is hermetically sealed, I have inserted the pipe *h* into the steam-pipe carrying steam into the boiler at the point *c* and between the boiler and the steam-gage. This pipe *h h* runs around above the boiler in any convenient way for fastening it to the other or right-hand end of the boiler, through the journal of which I have inserted the steam-pipe *g*, which has been connected with the pipe *h h* by a glass tube, *g'*, Fig. 2.

At *f* is shown a strainer, which, in drawing off the water through the valve *g''*, prevents the rags from entering the pipe and stopping it up. This arrangement secures an indication not only of the pressure, and consequently the heat inside of the boiler, but enables the operator to determine the height of the water in the boiler by means of the glass tube *g'*. The water, being of greater specific gravity than steam, falls to the same level in the glass tube that it has inside of the boiler. I have thought proper to put on the steam-gage *i* to indicate the pressure at this end as well as it is indicated by the pressure-gage *i'* at the other end of the boiler.

I have also provided the valve *g''* for drawing off the water in the boiler, should it at any time rise to too high a point.

To secure the introduction of the steam below the water-line and prevent its introduction above, I have devised the following-described method: I insert the steam-pipes *e e*, which are attached to the inner sides of the boiler by means of a hook, *b*, or other similar contrivance, (shown in Fig. 6,) and are perforated with holes in sufficient numbers throughout the length of the pipe to secure the introduction of steam into the contents of the boiler below the water-line. The method which I

have devised for this purpose will be known by considering the construction of the valve C and the ring in which it operates, Fig. 2, and will be, perhaps, the better understood by reference to an enlarged view of the same shown in Fig. 4, in which C is the ring which is attached to the head of the boiler B, Fig. 2, which ring is fastened, as shown in Fig. 4, by the bolts *v v*.

The valve D D D (shown in Figs. 3, 4, and 5) is stationary—that is, it does not turn with the boiler and the ring C, heretofore referred to—and is the means by which steam is introduced into the boiler through the pipe *e e*, Fig. 2.

In order to prevent the escape of steam into the boiler above the water-line, I have constructed the valve D with a solid piece of metal, (shown at Z, Fig. 4,) which effectually prevents the escape of steam from any of the steam-pipes while passing over this valve Z into the boiler above the water-line. The valve D is made conical in shape, and rests in a conical seat in the hollow ring C. The stuffing-box c^2 is placed within the hollow journal, and is accessible from without. By means of the screws c^3 c^4, which work against a collar, c', on pipe *c* and a shoulder formed by the end of the stuffing-box, the position of valve D in its seat can be regulated without stopping the rotation of the boiler. For practical operation, however, the pressure of the steam in the boiler against the head of the conical valve is sufficient to keep it tight.

Fig. 7 will show the form of valve like or similar to one which I propose to use for reducing the pressure in the revolver below what is carried in the steam-generating boiler of the mill or works. It is a simple puppet-valve, in which the upper portion of the valve is larger than the lower portion. This valve is kept in its seat by means of weights placed on the stem outside of the valve, as shown at *s s*, Figs. 1 and 2. Other devices for regulating the pressure of steam and water for this and other similar purposes have been made and used successfully. I do not limit myself to the use of any particular valve, aiming to use the best that can be obtained for securing the end sought.

Having now described my said invention and the manner of carrying the same into effect, what I claim is—

1. In a paper-digester, the combination, with the revolving boiler, of a level-indicating glass tube and draw-off cock, substantially as described.

2. In a paper-digester, the combination, with the revolving boiler, of the level-indicating glass tube, the pipe connected therewith and communicating through the journal with the interior of the boiler below the water-line, and the steam-pipe, also connected with the level-indicating tube, substantially as described.

3. The combination, with the revolving ring provided with ports, of the conical valve having a seat in said ring and provided with a metal piece or device for successively closing said ports, substantially as described.

4. The combination of the revolving boiler, the hollow journal, steam-supply pipe passing through said journal, the distributing steam-pipes, the conical valve operating to put the supply-pipe into communication with said distributing-pipes as they successively pass below the water-level, and the adjusting devices for regulating said valve, located without said boiler, substantially as described.

5. The combination of the revolving boiler, hollow ring, and pipes *e*, connected therewith, the supply-pipe passing through the journal of the boiler and terminating in a conical valve, the stuffing-box c^2, and adjusting devices c^3 c^4, located outside of said boiler, so as to be accessible while it is in motion, substantially as described.

6. In a paper-digester, the combination of the revolving boiler, the valve for regulating the pressure of steam in said boiler, the level-indicator for indicating the level in said boiler, and the draw-off cock, substantially as described.

7. In a paper-digester, the combination of the revolving boiler, the interior steam-distributing pipes, the steam-inlet pipe extending through the journal of the boiler, the water-pipe extending through the opposite journal, the level-indicating tube connected with said water-pipe, the draw-off cock, also connected therewith, and the steam-pipe connecting the level-indicating tube with the aforesaid steam-inlet pipe, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

GEO. F. WILSON.

Witnesses:
DAVID A. WALDRON,
JOHN F. CAULKINS.