(No Model.)

J. WHITE.

PAPER DRYING CYLINDER.

No. 560,309. Patented May 19, 1896.

FIG 2.

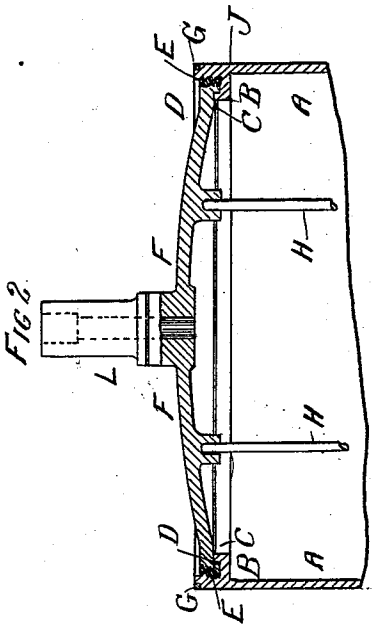


FIG 4.

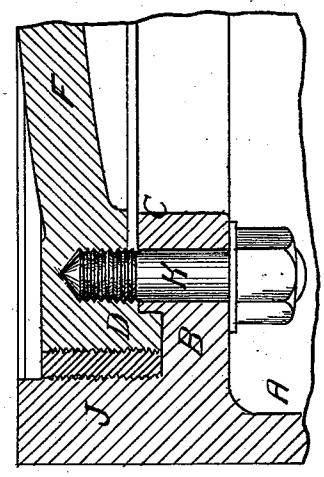


FIG 1.

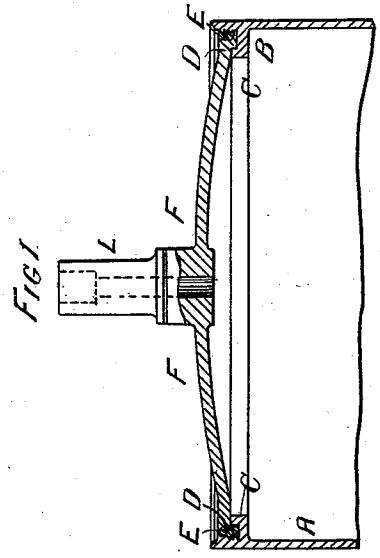
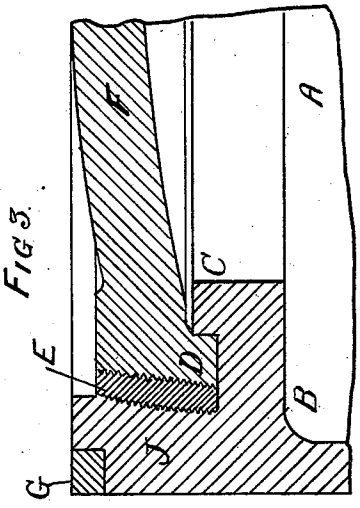


FIG 3.



Witnesses:-
W. C. Pinckney
L. Holloway

Inventor
John White,
By F. Allborn
Attorney.

ANDREW B. GRAHAM, PHOTO-LITHO. WASHINGTON, D.C.

UNITED STATES PATENT OFFICE.

JOHN WHITE, OF EDINBURGH, SCOTLAND.

PAPER-DRYING CYLINDER.

SPECIFICATION forming part of Letters Patent No. 560,309, dated May 19, 1896.

Application filed June 22, 1895. Serial No. 553,652. (No model.) Patented in England December 29, 1894, No. 25,245.

To all whom it may concern:

Be it known that I, JOHN WHITE, engineer, of the firm of James Bertram & Son, Limited, a subject of the Queen of the United Kingdom of Great Britain and Ireland, residing at Leith Walk Foundry, Edinburgh, Scotland, have invented new and useful Improvements in the Construction of Cylinders for Drying Paper in Paper-Making Machines and for Like Purposes, (which have been patented in Great Britain by Letters Patent, dated December 29, 1894, No. 25,245;) and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art or manufacture to which it relates to make and use the same.

My invention relates to drying-cylinders for paper-making machines, and is also advantageously applicable in the construction of any cylinders subjected to great changes of temperature or to other actions tending to render their joints defective. A cylinder of the kind to which my invention is applicable is commonly made with a cylindrical cast-iron shell closed by end disks having hollow trunnions, by means of which the cylinder is carried and through which steam is introduced to heat the cylinder; and my invention has more particularly to do with the joints between the cylindrical shell and the end disks.

Figures 1 and 2 of the accompanying drawings are horizontal sections showing modifications of the manner of jointing the ends of cylinders according to my invention. Fig. 3 is an enlarged horizontal section of a part of the modification shown in Fig. 2. Fig. 4 is a horizontal section of a part of another modification.

In the modification shown in Figs. 1, 2, and 3 the shell A of the cylinder is cast with an inward flange B at each end and at a short distance inward from the end. At the outer face of the flange B and at its inner edge a projecting rib C is formed and is made to accurately fit the inside of an inward flange D, formed on the end disk F. The outside of the flange D on the end disk F is conical, and a counterpart conical recess is formed in the inside of the part J of the cylindrical shell A, extending beyond the flange B of the shell. The conical recess of the cylindrical shell A is at its outer edge, which is smallest in diameter, just large enough to admit the larger inner edge of the conical flange D of the end disk F, and when the end disk is in position there is an annular conical space between the two conical surfaces. The conical surfaces are by preference serrated. A suitable material E, preferably metallic, is run or forced into the annular conical space without segmental keys when the conical surfaces are serrated, but with them when smooth, if desired, and the material is calked or driven in to fill the inner part of the space. As shown in Figs. 2 and 3, increased strength may be obtained by shrinking on a steel or wrought-iron ring G in a groove formed for it around the extreme edge of the cylindrical shell A. The end disks F may be stayed by rods H, screwed into them and joined by right-and-left screw-nuts.

In the manner described a secure and tight joint is formed, capable of withstanding considerable pressure and not liable to be rendered leaky by the action of steam or of impurities such as often accompany the steam, especially when exhaust-steam from an engine is used.

Instead of shaping the ends J of the cylindrical shell A and the flanges D of the end disks F so as to form conical joint-spaces they may be shaped so as to form cylindrical joint-spaces, as shown in Fig. 4, to be calked like the conical joint-space, the end disks F being in this modification fixed by stud-bolts K to the internal flanges D of the cylindrical shell, while the parts are otherwise as in the first-described modification.

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

1. As means for securing the end disks to cylinders for drying paper in paper-making machines, the inward flange B formed on the cylinder-shell A and having at its inner edge a projecting rib C, in combination with the flange D on the end disk F and an annular ring of packing material E interposed between the flange D and the outer end part J of the shell, substantially as described.

2. In a cylinder for drying paper in paper-making machines, and for like purposes, the inward flange B formed on the cylinder-shell

and provided at its inner edge with a projecting rib C, in combination with the end disk F having a flange D, and an annular ring of packing E interposed between the flange D and the outer end of the cylinder-shell, the annular packing-space having serrated walls, substantially as set forth.

3. The combination with the cylinder A provided with inward flange B having at its inner edge a projecting rib C, in combination with end disk F having flange D, an annular ring of packing material interposed between the said flange D and the outer end part J of the shell and bolts or stays fitted to bind together the disks and cylinder, substantially as set forth.

In witness whereof I have hereunto set my hand and seal this 5th day of June, 1895.

JOHN WHITE. [L. S.]

In presence of—
JOHN TAYLOR,
JOHN RITCHIE.