

No. 872,358.

PATENTED DEC. 3, 1907.

J. G. LIDDELL.
PIPE JOINT.

APPLICATION FILED FEB. 23, 1907.

3 SHEETS—SHEET 2.

Fig. 2.

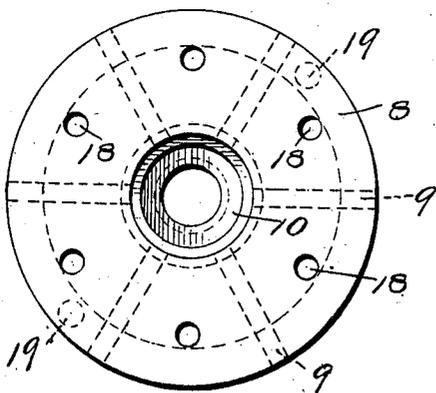
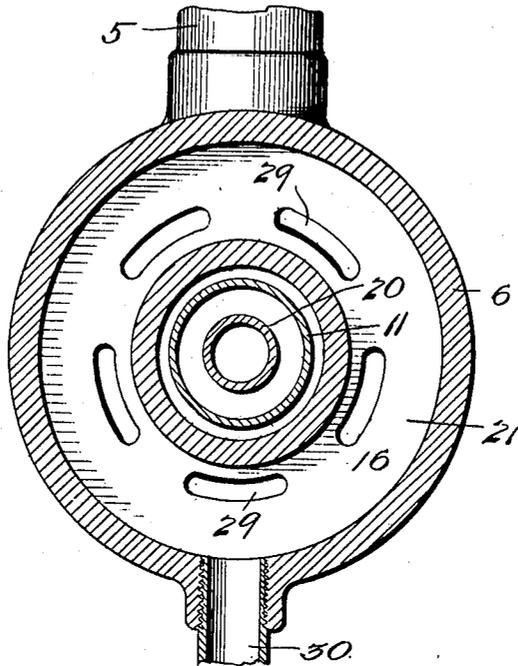


Fig. 3.

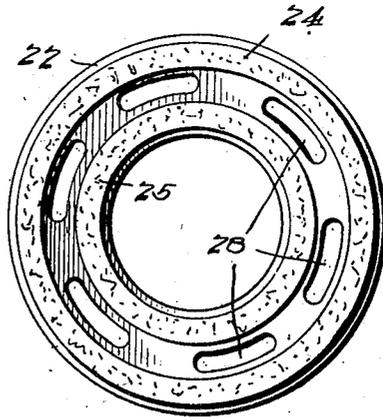


Fig. 4.

Witnesses

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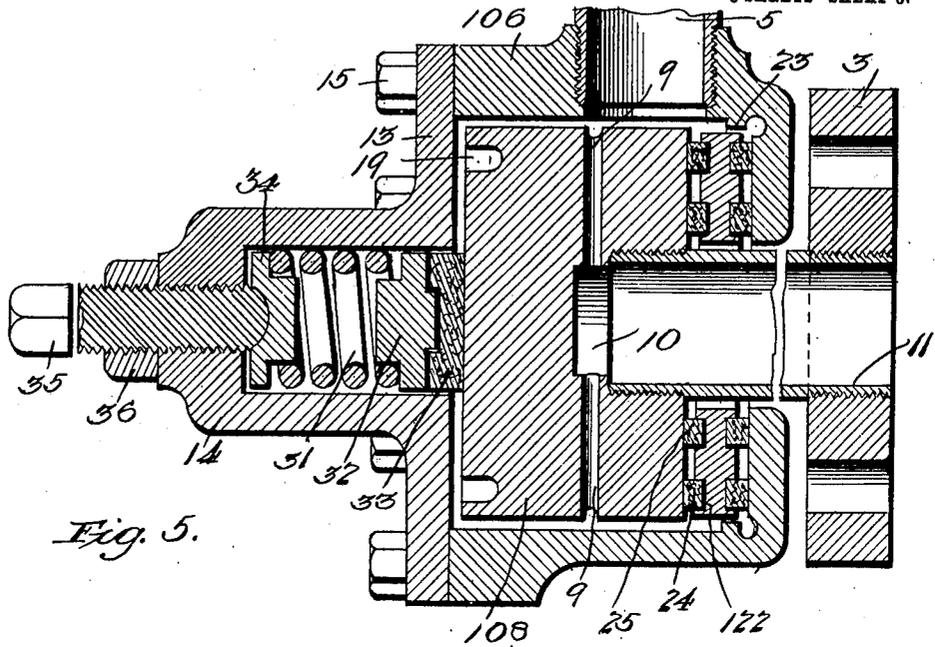


Fig. 5.

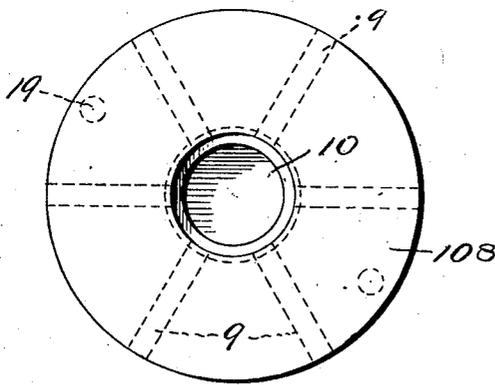


Fig. 6.

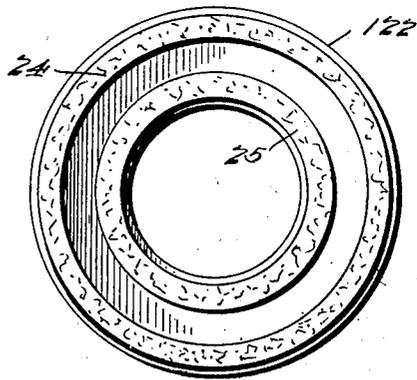


Fig. 7.

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UNITED STATES PATENT OFFICE.

JOHN G. LIDDELL, OF EAST WALPOLE, MASSACHUSETTS.

PIPE-JOINT.

No. 872,358.

Specification of Letters Patent.

Patented Dec. 3, 1907.

Application filed February 23, 1907. Serial No. 358,930.

To all whom it may concern:

Be it known that I, JOHN G. LIDDELL, a citizen of the United States, residing at East Walpole, in the county of Norfolk and State of Massachusetts, have invented new and useful Improvements in Pipe - Joints, of which the following is a specification.

This invention relates to improvements in pipe joints, and more especially to that class of pipe joints used to supply steam to rotating cylinders or drums such as are in common use in paper machines, and other drying or heating apparatus.

One object of the invention is to provide a joint of this character which shall be steam tight, and which will not be readily subject to leakage through wearing of the parts.

Another object is to provide a revolving pipe joint which shall be simple and efficient, and which may easily be taken apart for inspection or repair.

With the above and other objects in view, as will appear as the nature of the invention is better understood the same consists in the combination and arrangement of parts, and in certain details of construction hereinafter described, and illustrated in the accompanying drawings, forming part of this specification, and in which:—

Figure 1 is a longitudinal section through the improved joint, and associated parts; Fig. 2 is a transverse section on the line 2—2, of Fig. 1, looking in the direction of the arrows; Fig. 3 is a view of one face of a cylindrical member, hereinafter described; Fig. 4 shows a sealing plate hereinafter referred to; Fig. 5 is a view similar to Fig. 1, showing a modified form of the invention; Figs. 6 and 7 illustrate modifications of the parts shown in Figs. 3 and 4, respectively.

Referring to the drawings in detail, 1 designates a drum or roll such as is used in paper manufacture and other arts. This drum is supported on journals 2, over the end of which is tightly secured a cap 3, by means of stud bolts 4. The steam pipe 5 is screwed into a cylindrical frame or casing designated in its entirety as 6. On its outer end this casing is closed by means of a head 13, secured as by bolts 15 and provided with a central tubular extension 14 hereinafter referred to. At its opposite end the casing 6

is formed with a central aperture for the passage of the steam pipe 11, and around this aperture is constructed a hollow annular space or chamber 16.

Arranged within the casing 6 is a cylindrical head or member 8, hereinafter referred to as the "swivel block". This swivel block is of smaller diameter than the interior bore of casing 6, and is centrally disposed therein so as to preserve a space 7 between itself and the walls of the casing. As shown in Figs. 1 and 3 this swivel block is provided near one end with a chamber 17 communicating with a series of parallel ports or openings, extending axially from the chamber 17 to the farther face of the block, and in its other face with holes or sockets 19 for the reception of a wrench or other tool. The swivel block is also provided with a series of radially arranged ports 9 forming communication between the periphery of the block, and a central chamber 10. Opening into this chamber is one end of a pipe 11, the same being rigidly screwed into the swivel block. This pipe is of relatively large diameter and connects at its other end with the cap 3, as above described. Arranged centrally within this pipe 11 is a smaller pipe 20 which passes through the chamber 10 and screws securely into the block 8 in such manner as to be in communication with the chamber 17. Its other end extends a suitable distance within the roll or drum 1.

Between the inner wall 21 of the annular chamber 16, and the rear face of the swivel block 8 is located what is termed a sealing plate 22. This consists of an annular disk embracing the pipe 11 and retained in its central position by means of an internal annular flange 23, projecting from the inner wall of the casing 6 and preferably formed integral therewith.

Let into each face of the plate or disk 22 is a pair of packing rings 24 and 25, 26 and 27 composed of some soft material and arranged one without the other concentrically so as to preserve a space between them. One pair of rings seat tightly against the face of block 8 and the other pair against the wall 21 of casing 6. In the space between the concentric pairs of packing rings the plate 22 is provided with a series of circularly disposed arc-

shaped slots 28 as clearly shown in Fig. 4. The wall 21 is also provided with a series of similar slots, 29, as clearly shown in Fig. 2. Both these series of slots are ranged on circles of the same radius, and also of the same radius as that on which ports 18 in block 8 are disposed, the result being that all three sets of ports or slots aline, as shown in Fig. 1. It will thus be seen that by virtue of the steam tight joints formed by the packing rings, a closed passage is established between chamber 17 and chamber 16. From chamber 16 leads an exhaust or drip pipe 30.

The operation of the device is as follows:
 15 The rotation of drum 1 causes the pipes 11 and 20 and the swivel block 8 to revolve with it. Steam enters through pipe 5 into the fixed casing 6, and thence finds its way through radial ports 9 into chamber 10, and thence through pipe 11 into the chamber 12 and roll 1. The exhaust steam or water is forced back through pipe 20 into chamber 17. From chamber 17 it passes through ports 18, and slots 28, 29 into chamber 16 and out by exhaust pipe 30. Thus it will be seen that the packing rings 24, 25, 26 and 27 serve at all times to keep the live steam separate from the exhaust, and are the only parts of the device subject to wear. These rings, it is obvious, can be readily removed and renewed at small expense. It will also be noted that by the above construction, there is provided but a single steam tight joint and this is so arranged that it serves to take care of both the inlet and exhaust passages. This is a decided advantage.

The necessary pressure between the packing rings and their cooperating faces is secured by means of a spring 31, arranged within the tubular extension 14 of the head 13 and confined between two caps 32 and 34. The tension of this spring may be adjusted by means of set screw 35 held by lock nut 36. A wearing pad or shoe 33, preferably of some soft material, is employed between cap 32 and the face of the swivel block.

In Figs. 5, 6 and 7, there is shown a simple modification of my device for use where it is not desirable to lead the exhaust out through the same connection. The swivel block 108, in this form of the device, is provided with the radial ports only, otherwise being made solid, and the packing plate 122 is also solid, the slots being omitted. The annular chamber 16 of Fig. 1 is also absent. Otherwise, the construction and operation are identical with that of the form shown in Figs. 1 to 4, and need no further description.

Having thus described my invention, I claim as new and desire to secure by Letters-Patent:—

1. A pipe joint for revolving journals, comprising a fixed casing with which one pipe communicates a swivel block centrally dis-

posed in said casing, spaced apart therefrom, and provided with a plurality of ports, and a discharge pipe screwed centrally into said block, and communicating with said ports.

2. Means for supplying steam to a rotating drum, comprising a fixed casing in communication with the steam supply, a perforated swivel block arranged to rotate within said casing, an inlet pipe connected therewith for conveying steam to the drum, and a sealing member arranged between the swivel block and casing.

3. Means for supplying steam to a rotating roll or drum, comprising a casing to which steam is admitted, a swivel block in said casing, radial ports in said block converging to a central chamber, and a pipe rigidly secured at one end, in this chamber, and at the other end in the revolving drum.

4. In a revolving steam tight pipe joint, a casing, a swivel block mounted therein, a pipe connected with said swivel block, a sealing element between one face of said swivel block and the casing, and means acting upon the other face of said swivel block for holding it against the sealing element.

5. In a steam tight, revolving pipe joint, a sealing member comprising a plate provided on each face with a plurality of packing elements.

6. In a steam tight, revolving pipe joint, a sealing member comprising a plate or disk, and a plurality of concentric packing rings let into each face of the plate.

7. In a pipe joint, a casing, a member swiveled therein carrying a pipe, and a packing member sealing the joint between the swiveled member and casing, and supported loosely by a flange on said casing.

8. In a rotating pipe joint for hollow journals, a casing, a removable head therefor, a swivel block, and a packing element within said casing, the arrangement being such that both said last named elements can be removed when the head is removed.

9. A sealing element for rotating pipe joints, comprising a plate, a plurality of packing rings let into each side of the plate, and a plurality of apertures formed in said plate, between the packing rings.

10. Means for supplying steam to hollow revolving drums which comprises a feed pipe screwed into said drum, an outlet pipe within said feed pipe and also communicating with said drum, a swivel block into which both pipes are secured, a fixed casing surrounding said pipes and swivel block, said casing comprising two chambers, a supply pipe communicating with one chamber, and an exhaust pipe communicating with the other chamber, said swivel block also provided with two chambers with which the feed and outlet pipes connect, and two sets

of ports establishing communication between the two sets of chambers.

11. In a revolving pipe joint, a cylindrical casing to which fluid may be supplied, a cylindrical swivel block carrying an outlet pipe arranged to turn within said casing, packing means between the casing and swivel block provided with apertures, and corresponding

apertures in the walls of said casing adapted to register therewith.

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

JOHN G. LIDDELL.

Witnesses:

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H. WARE BARNUM.

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