No. 879,845. PATENTED FEB. 25, 1908.

A. ALDRICH.

STEAM FITTING OR JOINT FOR JOURNALS OF ROTARY STEAM CYLINDERS OR OTHER REVOLVING BODIES.

APPLICATION FILED SEPT. 3, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

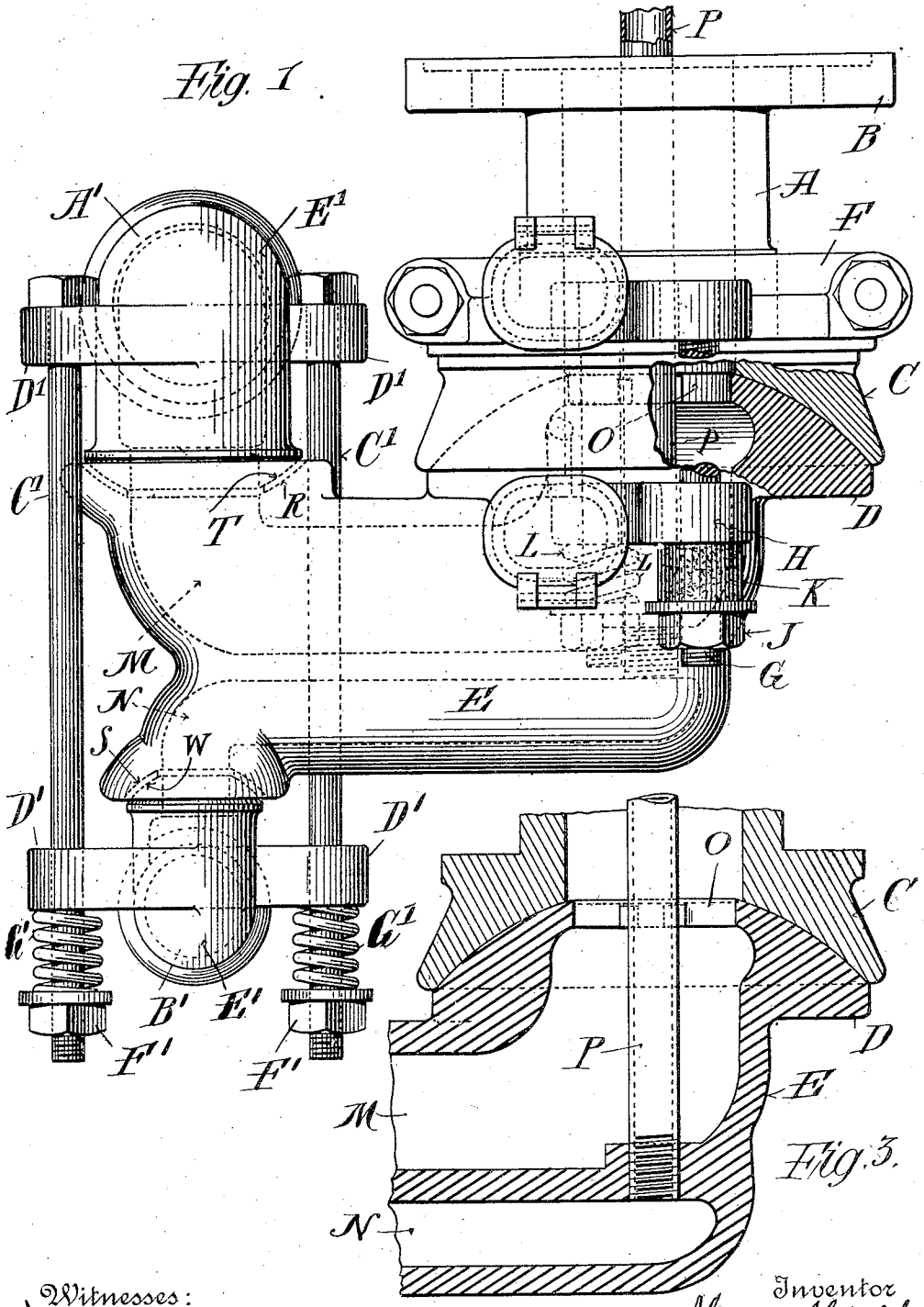


Fig. 3.

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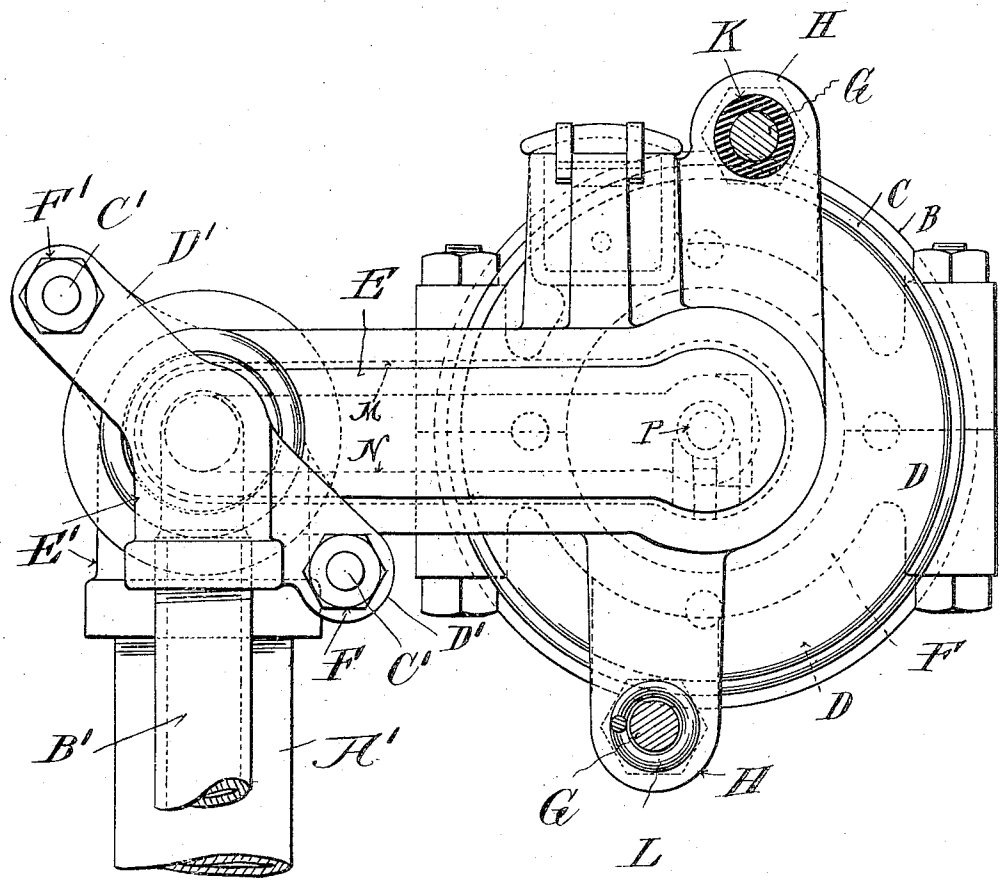


Fig 2.

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STEAM FITTING OR JOINT FOR JOURNALS OF ROTARY STEAM-CYLINDERS OR OTHER REVOLVING BODIES.

No. 879,845. Specification of Letters Patent. Patented Feb. 25, 1908.

Application filed September 3, 1907. Serial No. 391,006.

To all whom it may concern:

Be it known that I, ALONZO ALDRICH, a citizen of the United States, residing at Beloit, county of Rock, State of Wisconsin, have made a certain new and useful Invention in Steam Fittings or Joints for Journals of Rotary Steam-Cylinders or other Revolving Bodies, of which the following is a specification.

This invention relates to steam fittings or joints for journals for rotary steam cylinders, or other bodies.

The object of the invention is to provide a steam fitting or joint for journals for rotary steam cylinders or other bodies, such as are employed for making paper pulp and other purposes, which is simple in construction and efficient in operation.

A further object is to provide means in a fitting or joint of the character referred to to compensate for expansion or contraction of the steam supply pipes, or for settling of the supply mains, without impairing the efficiency of the joint.

Other objects of the invention will appear more fully hereinafter.

The invention consists substantially in the construction, combination, location and arrangement of parts, all as will be more fully hereinafter set forth, as shown in the accompanying drawings and finally pointed out in the appended claims.

Referring to the accompanying drawings and to the various views and reference signs appearing thereon: Figure 1 is a view in top plan of a fitting or joint for journals embodying the principle of my invention, parts being broken out and in section, to show the steam joint of the rotary cylinder. Fig. 2 is an end elevation of the construction shown in Fig. 1. Fig. 3 is a broken detail view in section of the rotary cylinder steam joint.

The same part is designated by the same reference sign wherever it occurs throughout the several views.

In certain classes of machines used in the manufacture of paper, and for other purposes, a rotary cylinder or other vessel is employed to which steam is supplied and from which the condensation is drawn or siphoned. In such machines it is usual to supply the steam and withdraw the water of condensation through the hollow journal of the cylinder, and hence the necessity for providing a steam tight joint between the stationary fitting through which the steam is supplied and the condensation is withdrawn, and the rotating cylinder or vessel, so as to permit the rotations of the cylinder or vessel without loss or escape of the steam. In the use of such machines it is usual to supply the steam from, and to deliver the withdrawn water of condensation into mains which are supported upon the floor of the building or suspended from the ceiling or beneath the floor, the supply and siphon pipes being arranged to form a connection between such mains and the journal of the rotary cylinder. It frequently happens that the mains or their supports settle or sag. It also frequently happens that the steam and siphon pipes expand and contract lengthwise. In such cases, where a rigid connection is made between the mains and the journal of the rotary cylinder, the steam joint is impaired and the steam escapes therethrough. This is particularly true where any considerable degree of steam pressure is maintained in the cylinder.

It is among the special purposes of my present invention to provide means such that expansion or contraction of the steam supply or exhaust pipes, or settling of the mains will not affect the efficiency of the steam joint.

In carrying out my invention I propose to employ a fitting and connect the same by means of a steam tight joint to the end of the revolving cylinder or to the journal or journal extension thereof, and I connect the steam and exhaust pipes to such fitting in laterally offset relation with respect to the axis of said steam tight joint, whereby, in case of expansion or contraction of said pipes, or in case of settling of the mains to which said pipes are connected, said fitting can move axially with respect to the bearing seat thereof against the cylinder journal or extension, and without impairing the steam tight joint between these parts.

Referring to the drawings, reference sign A, designates the hollow journal of the rotating cylinder, or an extension thereof, said journal being formed with or connected to the cylinder by means of the head B, or otherwise, in the usual or any ordinary manner. At its outer end, the journal A is shaped to form a bearing seat as at C, to re-

ceive a coöperating seat D, formed on a fitting E. In the particular form shown, but to which my invention is not to be limited or restricted, the bearing seats C, and D, are ground to form a steam tight joint between the journal or its extension, and the fitting, and to this end one of these seats is concaved and the other correspondingly convexed as shown. By this construction, a steam tight joint between these parts is maintained while permitting the rotary movements of the cylinder, and at the same time rotary displacement of the seat D of the fitting, in axial relation with respect to the cylinder journal and the joint, is also permitted without in any manner impairing the efficiency of the joint as a steam tight joint. Under ordinary conditions the fitting E, is stationary with reference to the rotating cylinder, but is permitted a movement such as will cause the bearing seat D to have a slight axial movement relative to the seat C, without impairing the efficiency of the joint as a steam tight joint.

Any suitable or convenient means may be employed for maintaining the bearing relation of the seats C and D, and to maintain the joint steam tight, while permitting the former to revolve and the latter to have a slight axial movement. In the particular form shown, to which my invention, however, is not to be limited or restricted, a collar F is loosely mounted on the journal or extension A, and carries screw bolts G, which extend through ears H, formed on the fitting E. The nuts J, on the ends of the bolts G, serve to draw the parts together to form the steam tight joint. It is obvious that the fitting and the journal end may be held together in many other different ways and my invention does not concern itself with this particular feature. Where a collar and bolts and nuts are employed, and, if desired, a washer K, or rubber or other resilient material may be interposed between the nuts J and the ears H, or, if desired, coil springs L, may be so interposed. Such resilient washers or springs merely serving to permit the slight axial movement of the fitting above referred to without impairing the efficiency of the steam tight joint.

The fitting E, is provided with an offset or lateral extension, that is, said fitting is offset laterally with respect to the bearing seat D. Said fitting and its lateral extension is provided with a passage M, of large area, and also a passage N, of small area. The passage M, delivers through an opening O, formed through the bearing seat D, and into the hollow journal A, and thence into the cylinder. Through this passage the steam is supplied to the cylinder. A pipe P, communicates at one end with the passage N, and extends longitudinally through the axial openings of seats D and C, and the journal A, into the cylinder and serves as a means for withdrawing the water of condensation from the cylinder.

From the foregoing description, it will be readily seen that the movement referred to of the fitting E, axially with reference to the steam joint, will not disturb or vary the relation of this exhaust pipe with reference to the cylinder.

At the outer or free end of the fitting E, or the laterally off-set portion thereof, and at the outer ends of the passages M, and N, therethrough, I form oppositely presented bearing seats R, S, with which respectively coöperate similar seats T, W, at the ends of the steam supply and exhaust pipes A′, B′, thereby forming steam tight joints at these points. The construction of these joints may be similar to that of the joint between the cylinder journal or extension A, and the fitting E, above described, and are what is known as ball joints. The pipes A′, B′, extend ordinarily in vertical relation to the offset portion or lateral extension of the fitting E, as most clearly shown in Fig. 2 and connect the passages M, and N, with the supply and exhaust mains. The joints between these pipes A′, and B′, and the fitting E, may be maintained efficiently steam tight while permitting slight relative rotation of the seats R, T, and S, W, in any suitable or convenient manner. I have shown a simple arrangement wherein rods C′ are passed through ears D′, formed respectively on the couplings E′, and nuts F′, serve to draw said couplings towards each other. If desired, springs or other resilient means, G′, may be interposed between the nuts and the ears, as clearly shown thereby providing a desirable resiliency which permits the relative rotative movement of the parts of these joints without impairing the efficiency of the steam tight joints.

From the foregoing description it will be seen that I provide an exceedingly simple and efficient construction of journal bearing for rotating steam cylinders wherein any expansion or contraction of the steam supply or exhaust pipes, or any settling or displacement of the mains is accommodated without impairing the efficiency of the steam tight joints of the parts of such bearing. It will also be seen that when such expansion, contraction, settling or displacement occurs the fitting E, moves or swings slightly about the axial line of the journal bearing without disturbing the relation of the ball joints by which said fitting is respectively connected to the journal extension of the cylinder and to the supply and exhaust pipes.

Many variations and changes in the details of construction and arrangement might readily occur to persons skilled in the art and still fall within the spirit and scope of my

invention. I do not desire, therefore, to be limited or restricted to the exact details shown and described. But

Having now set forth the object and nature of my invention and a construction embodying the principles thereof, what I claim as new and useful and of my own invention and desire to secure by Letters Patent is—

1. In a steam fitting or joint for journals for revolving steam cylinders, the combination of a hollow journal a fitting, a pipe connected to the fitting, and steam joints between said fitting and journal and pipe respectively, and means for permitting relative rotary movements of said fitting and journal and pipes.

2. In a device of the class described, a hollow journal, a fitting, said journal and fitting having coöperating bearing seats to form a steam tight joint therebetween, and a steam pipe having relatively rotative steam tight connection to said fitting in laterally off-set relation with respect to said steam joint.

3. In a device of the class described, a hollow journal, a fitting, said journal and fitting having coöperating relatively rotative bearing seats to form a steam tight joint therebetween means for maintaining said seats in bearing relation with respect to each other, said fitting having a laterally off-set portion, and a steam supply pipe having relatively rotative connection to said off-set portion.

4. In a device of the class described, a hollow journal having a seat in its end, a fitting, having a passage therethrough and having bearing seats at the respective ends of said passage, the bearing seats in said fitting lying in substantially the same plane, a steam supply pipe having relatively rotative connection with one of said fitting bearing seats, the other of said fitting bearing seats coöperating with the seat in the end of the journal.

5. The combination with a hollow revolving journal, and a steam supply pipe, of a laterally off-set fitting and relatively rotative steam joint connections between the ends of said fitting and said journal and pipe respectively.

6. The combination with a hollow revolving journal a steam supply and an exhaust pipe, of a fitting having passages extending in laterally off-set relation with respect to the axis of said journal, and relatively rotative steam tight joints between said fitting and journal and pipes respectively.

7. The combination with a hollow revolving journal of a fitting, means for maintaining relatively rotative steam tight connections between said journal and fitting, said fitting having a portion off-set laterally from the axis of said journal, a steam pipe connected to the off-set portion of said fitting and means for maintaining relatively rotative steam tight connections between said pipe and fitting.

8. The combination with a hollow journal, of a fitting having a passage therethrough, an exhaust pipe communicating with said passage and extending through said journal, said fitting having an extension laterally off-set from the axis of said journal, a pipe having relatively rotative steam joint connection to said laterally off-set extension, and relatively rotative steam joint connections between said fitting and journal.

9. The combination with a hollow journal of a fitting having a steam joint connection permitting relative rotary movements of said parts, said fitting having an extension off-set laterally from the axis of said journal, passages formed through said fitting and communicating at one end through said journal, oppositely presented bearing seats at the outer ends of the passages in said fitting, pipes having relatively rotative connections coöperating with said bearing seats and means for maintaining said connections steam tight.

10. The combination with a hollow journal, of a fitting having an extension off-set laterally from the axis of said bearing, pipes connected to the off-set portion of said fitting, and steam tight ball joints between said fitting and journal and pipes.

In testimony whereof I have hereunto set my hand in the presence of the subscribing witnesses, on this 19th day of July A. D., 1907.

ALONZO ALDRICH.

Witnesses:

R. K. ROCKWELL,

GUY R. HOLLISTER.