

(No Model.)

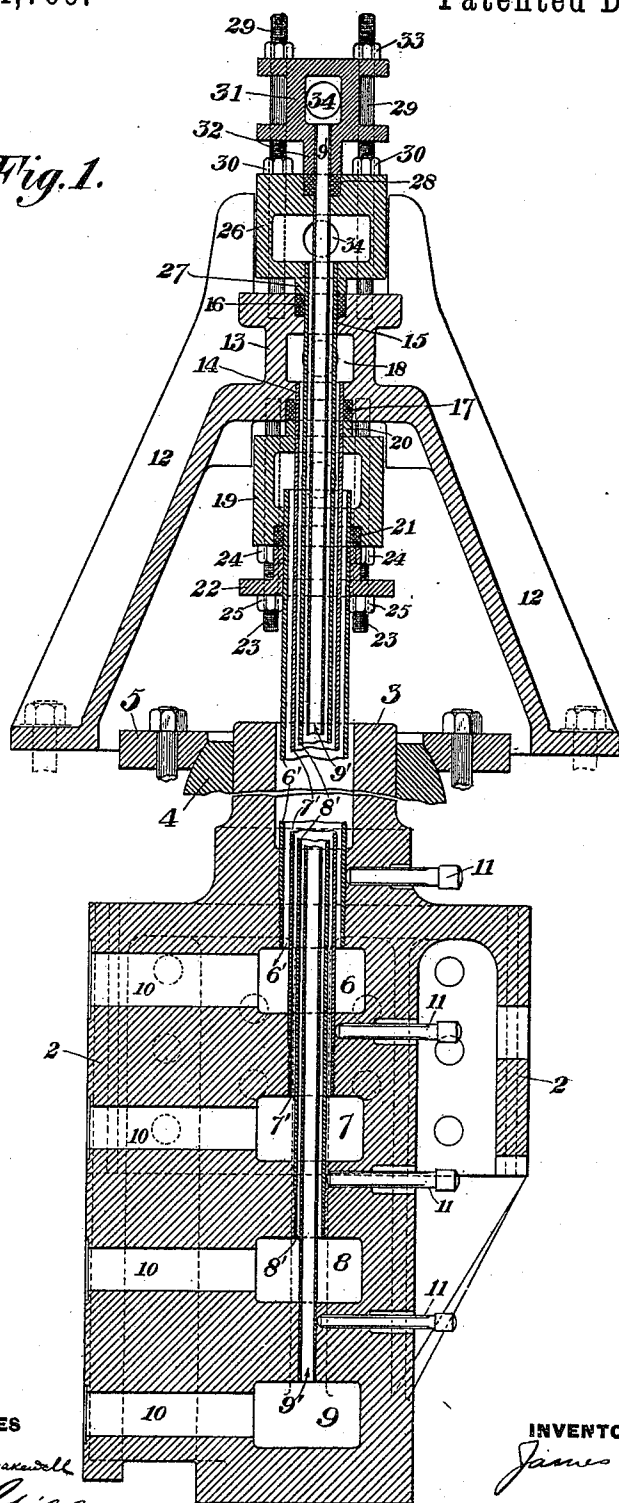
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J. A. BURNS.
CRANE.

No. 464,706.

Patented Dec. 8, 1891.

Fig. 1.



WITNESSES

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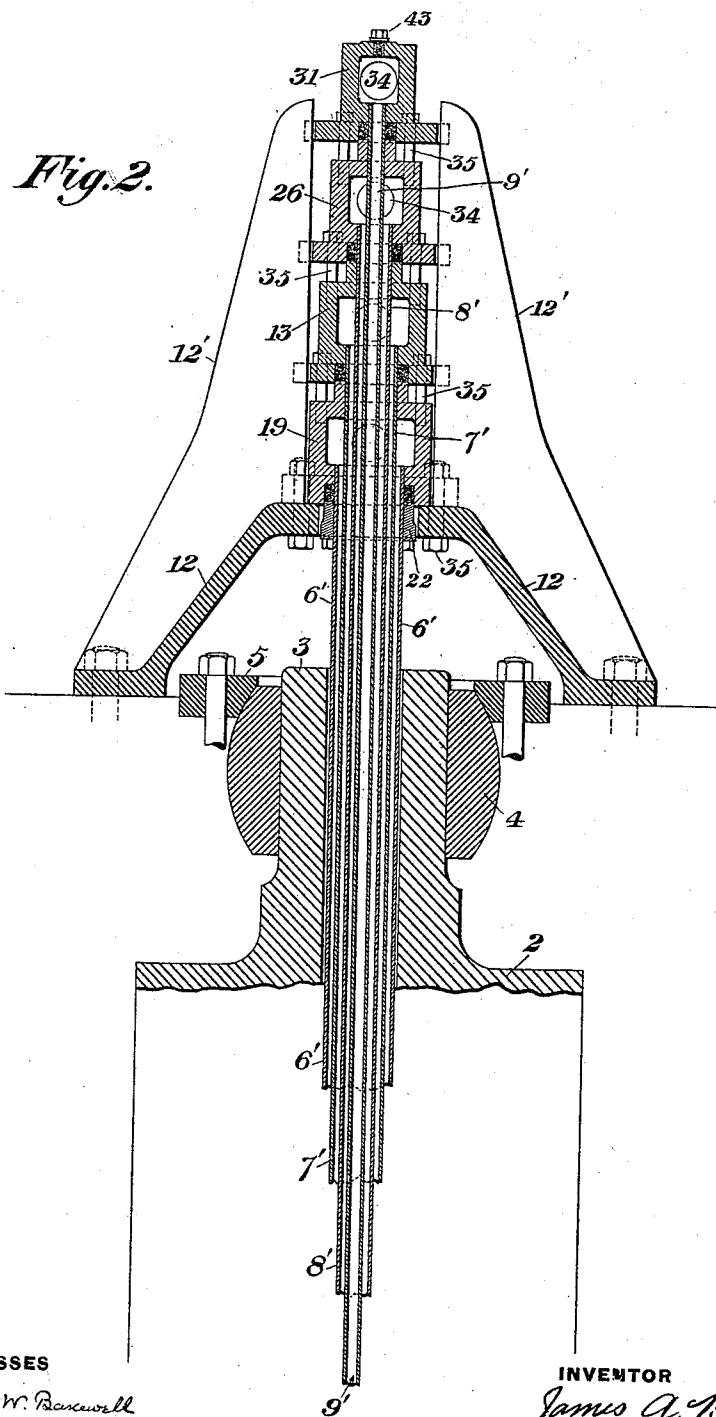
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CRANE.

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WITNESSES

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(No Model.)

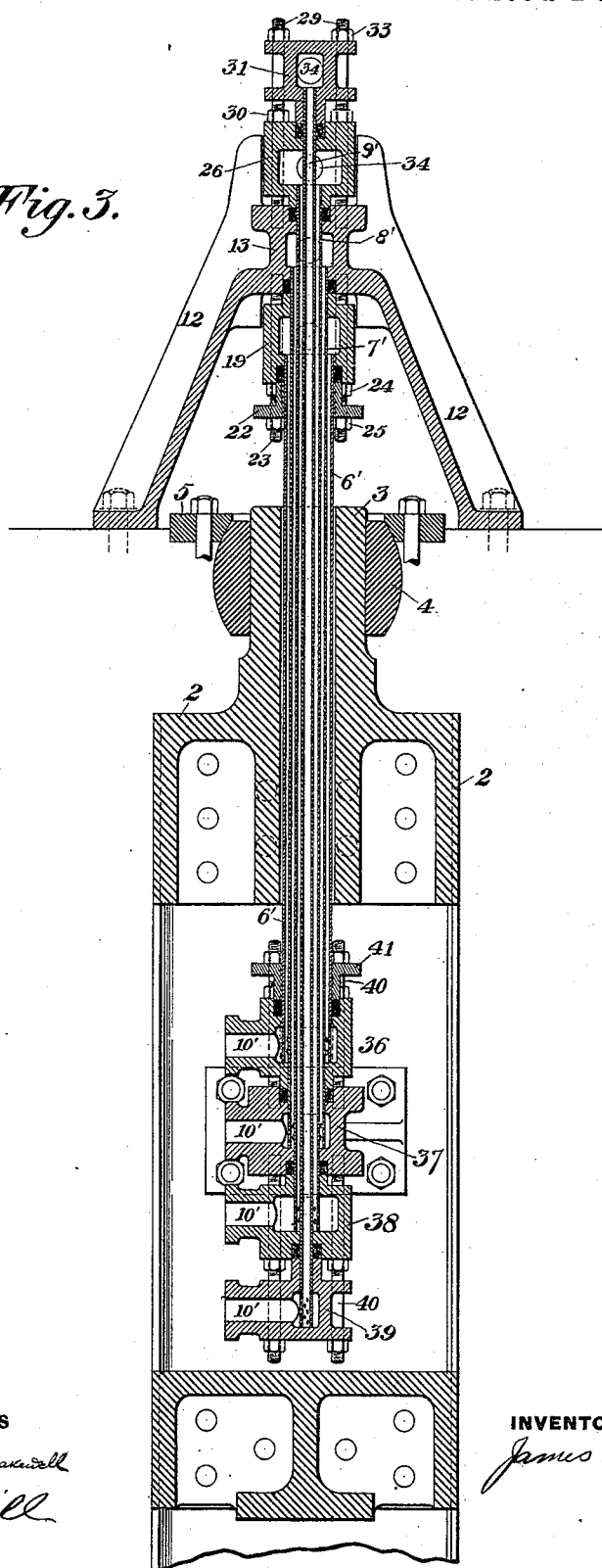
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Patented Dec. 8, 1891.

Fig. 3.



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UNITED STATES PATENT OFFICE.

JAMES A. BURNS, OF HOMESTEAD, PENNSYLVANIA.

CRANE.

SPECIFICATION forming part of Letters Patent No. 464,706, dated December 8, 1891.

Application filed November 25, 1890. Serial No. 372,639. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. BURNS, of Homestead, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Cranes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 shows the top journal and water connections of my improved crane in vertical section. Figs. 2 and 3 are similar views showing modification of my invention.

The object of my invention is to provide means by which water or other motive fluid may be conducted to the rotatory mast of a crane to supply power for operating the usual crane-motors, which may include the main lifting-motor of the crane and other auxiliary motors carried by the crane and adapted to lift or shift its burden. The difficulty of supplying motive fluid will be apparent when it is considered that the mast of the crane rotates, and the connections must be arranged so as to accommodate themselves to such rotation.

Referring now to the drawings, 2 represents a block or casting fixed to the top of the mast of the crane. The upper end 3 of this casting, which is cylindrical in form, constitutes the top journal of the crane and is journaled in a suitable bearing 4 in the top of the steadiment 5. The casting 2 is formed with a series of chambers 6 7 8 9, having lateral passages 10, connected with pipes, (not shown,) which form channels for the supply and exhaust of water to and from the various crane-motors. The water connections hereinafter described are designed to form water-passages from these chambers 6 7 8 9 to and from points of supply and exhaust off the crane. To this end I employ four vertical pipes 6', 7', 8', and 9', arranged concentrically within each other, the pipe 6' extending through a passage in the block 2 to the chamber 6 and connected with the said block by a screw connection, the pipe 7' extending through the pipe 6' and a passage in the block to the chamber 7 and likewise secured to the block, the pipe 8' extending through the pipe 7' and a passage in the block to the chamber 8 and secured to the block, and the pipe 9' passing through the pipe 8' and a passage in the block to the chamber 9 and also fixed to the block.

11 11 are bolts, which pass laterally through the block and bear against the respective pipes for the purpose of locking them and preventing them from turning independently of the crane-mast.

12 is a frame or casting fixed in position above the top bearing of the crane and having a middle box portion 13, which forms the bearing for two of the pipes 7' and 8', having at its lower end a passage 14, in which the pipe 7' fits, and at the upper end a passage 15 in line therewith, through which the pipe 8' passes. At the upper end of the passage 15 is a cavity adapted to receive a packing-ring 16, and at the lower end of the passage 14 is a chamber adapted to receive a packing-ring 17. In the box 13 is a chamber 18, into which the end of the pipe 7' opens. Below the box 13 is a hollow casting or box 19, having a passage at its lower end, in which the end of the pipe 6' is fitted, so that the latter shall terminate at and open into the chamber in the interior of the box, and at its upper end having a passage through which the pipe 7' passes. The upper end of the box 19 is formed with an annular projection 30, adapted to serve as a follower to compress the packing 17, and at its lower end is a cavity adapted to contain a packing-ring 21, fitted around the pipe 6' and having a compressing-follower 22. The box 19 is secured to the box 13 by bolts 23, having nuts 24, by means of which the boxes may be drawn together to compress the packing 17, and nuts 25 on the same bolts may be utilized to force the follower 22 against its packing. Above the box 13 is a box 26, having a vertical passage at its lower end, in which the pipe 8' fits, so that it shall terminate at and open into the chamber in the interior of the box, and having at its upper end a passage through which the pipe 9' passes. At the lower end of the box 26 is an annular tongue 27, adapted to compress the packing-ring 16, and at its upper end is a cavity adapted to receive a packing-ring 28, which is fitted around the pipe 9. Bolts 29, fitted with nuts 30, hold the box 26 to the box 13 and serve to draw these parts together to compress the packing 16. The pipe 9' extends above the box 26 into a hollow box 31, closed at the top and formed at its lower end with an annular tongue 32, adapted to fit against the packing

28. This box 31 may be held to the box 13 by the bolts 29 and by nuts 33. Each of the boxes 13, 19, 26, and 31 is stationary and is provided with a water-inlet (or outlet) pipe 34, leading to the places of fluid supply or exhaust. When the parts are thus constructed and arranged, the water will pass through the pipes 34 to the chambers in the respective boxes 13, 19, 26, and 31, and will thence pass through the pipes 6' 7' 8' 9' to the chambers 6, 7, 8, and 9 and thence through the passages 10 to the several crane-motors or from the motors in the reverse direction, accordingly as the passages are used for supply or exhaust. The crane-mast is perfectly free to rotate on its vertical axis, and as it rotates the several pipes will rotate with it in their respective boxes. When water-pressure is admitted to the lifting-cylinder of the crane, it will cause the mast to lift a little, and as the pipes are not fixed to the water-boxes this vertical motion is freely permitted. A most effective and simple series of water connections is thus afforded.

One of the advantages of the arrangement is that there is no difficulty in getting access to the packing of the pipes for the purpose of renewing or adjusting the same. Thus to get access to the packing 21 I loosen and lower the follower 22. To get access to the packing 17, I loosen the nuts 24 and 25, move the box 19 down on the pipe 6', and in like manner access may be had to the packing-ring 28 by loosening the nuts 33 and raising the box 31, and to the packing 16 by loosening the nuts 30 and raising the box 26.

It will be understood by those skilled in the art that changes in the construction and relative arrangement of the various parts of the apparatus may be made without departure from the scope of my invention, as herein-after claimed. It will be understood, also, that although I have shown the parts arranged to afford only four water-passages additional passages may be provided for by adding other upright pipes and correspondingly increasing the number of boxes above the crane-journal.

The essential feature of my invention consists in the separate water boxes or chambers fitting around the pipes, which are arranged concentrically within each other, said boxes having stuffing-box cavities and the several boxes being adapted to serve to each other the function of followers. The simplicity of this construction and its efficiency will commend it to the skilled mechanic. The boxes are easy to make and to bore out, the necessary parts are few in number, and to refit or adjust them it is only necessary to loosen and move the boxes. Making the boxes separate from each other is novel and is advantageous, because it enables me to utilize my improvement in providing more than two rotatory water connections, whereas if the boxes were all made in a single casting they could not be so used, since they would not afford access to the joints for the purpose of packing them.

Any of the pipes may also be renewed without difficulty and without making it necessary to remove the others.

In Fig. 2 I show a modified construction of the apparatus, in which the box 13 is not fixed, as in Fig. 1, all the boxes being movably set on the pipes and nested each one into the next, as shown, so that each shall serve as the follower for the stuffing-cavity at the end of the next. The boxes are held each to the other by bolts 35, and are supported by means of a frame 12, and are prevented from rotation by the fitting of vertical ribs 12' on said frame in notches made in flanges on said boxes. The advantage of this construction is that, if desired, all of the boxes may be lifted up vertically from the pipes. The top box 31 of the series may have at its upper end an opening closed by a plug 43, which may be removed to permit the addition of another pipe, if desired.

It will be understood that instead of employing the water connections on the mast, as shown in Fig. 1, I may use in the mast water connections of the same type as shown above the mast in Figs. 1 and 2. This is illustrated in Fig. 3, in which I show a series of water boxes or chambers 36, 37, 38, and 39 fitted around perforations at the ends of the pipes 6', 7', 8', and 9', as shown, each box having an annular tongue adapted to serve as a follower for the stuffing-cavity of the next box and each having a lateral water-passage 10'. The box 37 may be fixed to the mast, as shown, and the other boxes secured to it by bolts 40. The end box 36 has a separate follower 41, which compresses the packing in its stuffing-cavity. As shown in Fig. 3, both ends of the pipes are provided with these water-boxes, and the pipes may turn in either or both sets of boxes. The water-boxes above the mast in Fig. 3 are shown as being of the same construction as those illustrated in Fig. 1; but, if desired, other known forms of water connection at this place may be employed.

In another application, Serial No. 389,919, filed April 22, 1891, I claim, *inter alia*, the combination, with the crane-journal, of pipes arranged within each other extending below the crane-journal and opening at different levels and water-boxes encircling the pipes at their openings. I also claim therein such construction with the pipes opening at different levels both above and below the crane-journal, and also claim the same with the water-boxes at one end fixed to the pipes and at the other end loosely encircling the same.

I do not claim, broadly, water passages or pipes extending through the crane-journal and having openings at different levels with encircling water boxes or chambers, my claims in this regard being restricted to the arrangement of the respective pipes within each other, as above stated.

I claim—

1. In fluid connections for rotating mechan-

ism, the combination of pipes arranged within each other and opening at different levels, separate water-boxes encircling the pipes at their openings, and packing for the joints between the several boxes, substantially as and for the purposes described.

2. In fluid connections for rotating mechanism, the combination of pipes arranged within each other and opening at different levels and separate water boxes or chambers encircling the pipes at their openings and having packing-cavities, said boxes fitting against each other and serving to each other the function of packing-followers, substantially as and for the purposes described.

3. In fluid connections for rotating mechanism, the combination of pipes arranged within each other and concentrically with the crane-journal and opening at different levels, boxes having end openings of successively-smaller diameter encircling the pipes at their openings, said boxes having stuffing-cavities and each having a tongue adapted to enter the end of the next box and to serve as a follower therefor, and bolts by which the boxes may be drawn together, substantially as and for the purposes described.

4. In fluid connections for rotating mechanism, the combination of pipes arranged within each other and opening at different levels, separate water boxes or chambers encircling the pipes at their openings, and packing for the joints between the several boxes, said pipes being fixed to the mast and adapted to rotate within said boxes, substantially as and for the purposes described.

5. As means for conducting water to or delivering it from a pipe and for permitting ro-

tation, a hollow box or chamber having a passage for the pipe, an annular packing-cavity at one end, and an annular follower projection at the other end, substantially as and for the purposes described.

6. In fluid connections for rotatory cranes, the combination, with the crane-journal, of pipes arranged within each other, extending through the crane-journal above and below the same and opening at different levels, and water boxes or chambers encircling the pipes at their openings at both ends, substantially as and for the purposes described.

7. In fluid connections for rotatory cranes, the combination, with the crane-journal, of pipes arranged within each other and extending through the crane-journal below the same and opening at different levels, and water boxes or chambers encircling the pipes at their openings, substantially as and for the purposes described.

8. In fluid connections for rotatory cranes, the combination, with the crane-journal, of pipes arranged within each other, extending through the crane-journal above and below the same and opening at different levels, and water boxes or chambers encircling the pipes at their openings at both ends, the water-boxes at one end being fixed to the pipes and those at the other end loosely encircling the same, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 7th day of November, 1890.

JAMES A. BURNS.

Witnesses:

THOMAS W. BAKEWELL,
W. B. CORWIN.