

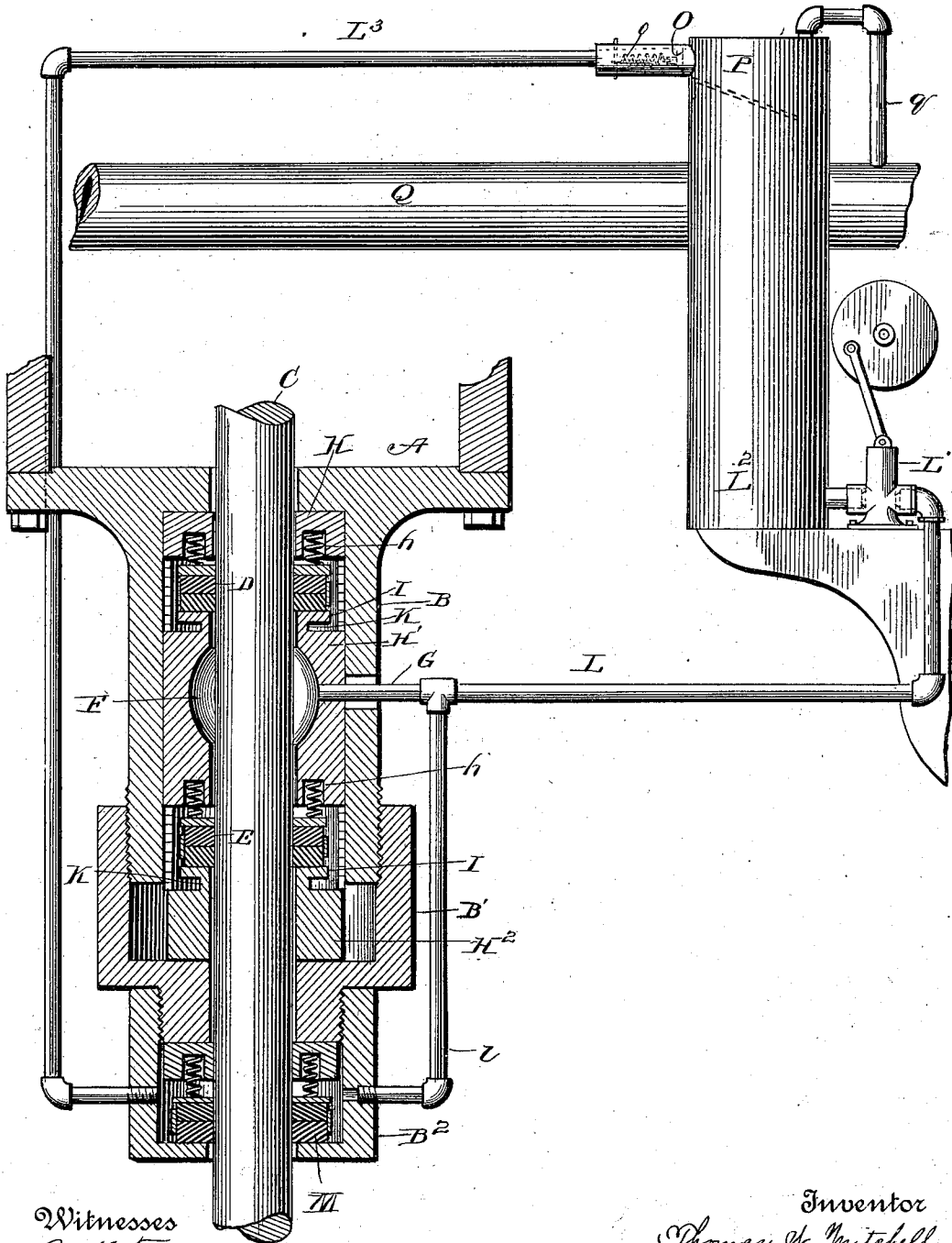
No. 728,124.

PATENTED MAY 12, 1903.

T. W. MITCHELL.  
ROD PACKING.

APPLICATION FILED MAR. 28, 1901.

NO MODEL.



Witnesses  
J. M. Fowler  
Thomas Durant

Inventor  
Thomas W. Mitchell  
by Church & Church  
his Attorneys.

# UNITED STATES PATENT OFFICE.

THOMAS W. MITCHELL, OF OMAHA, NEBRASKA.

## ROD-PACKING.

SPECIFICATION forming part of Letters Patent No. 728,124, dated May 12, 1903.

Application filed March 28, 1901. Serial No. 53,240. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS W. MITCHELL, a citizen of the United States, residing at Omaha, in the county of Douglas, State of Nebraska, have invented certain new and useful Improvements in Rod-Packing; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to improvements in rod-packing, and is designed more especially with a view to the successful packing of the rods of ammonia-compressors or ice-machines or machines of like character where noxious gases are handled or where the machines are subjected to sudden or extreme variations of temperature, the invention having for its object, primarily, to guard against possible escape or loss of any of the gases being compressed and regardless of the variations in temperature to which the rod and connected parts may be subjected.

To the above ends the invention consists in maintaining a circulation of oil through the rod-packing and preferably maintaining a pressure in said oil-circulating system sufficient to prevent the expansion of the gases which may be absorbed by the oil to a sufficient degree to congeal the oil.

The invention further consists in mounting the packing-rings of the packing so as to have an extended contact with the rod, but a narrow or restricted engagement with the fixed portion of the packing, whereby said rings are allowed to assume the temperature of the rod regardless of the temperature of the inclosing casing and, further, whereby the gases may pass around outside of said packing-rings to further aid in maintaining their temperature and the temperature of the rod uniform.

The invention further consists in certain novel details of construction and combinations and arrangements of parts, all as will now be described, and pointed out particularly in the appended claims.

The accompanying drawing is a vertical section through a packing for the rod of an ice-machine embodying my present improvements, the oil-circulating system and return-

pipe of the compressor being shown diagrammatically.

The letter A indicates the head of a compressor-cylinder having a stuffing-box B, provided with an aperture for the passage of the usual compressor-rod C. In the preferred construction the stuffing-box B has a cylindrical chamber therein surrounding the rod, and in this chamber two sets of packing-rings D and E are mounted, separated slightly from each other, and between them an oil-chamber F is formed for the reception of a lubricating and absorbing body of oil which is supplied through a branch pipe G, as will be presently explained. The stuffing-box B is closed by a cap B', which also serves to hold the packing-rings in place, for which purpose suitable retaining-rings H H' H<sup>2</sup> are provided, said retaining-rings fitting within the gland and around the rod. In the retaining-rings H and H' recesses are formed for the reception of springs h, which serve to hold the packing-rings D and E together and seat them against the supporting flange or seat I, located on the side of the retaining-rings away from the compressor-cylinder. The packing-rings and the seats I are located in chambers, and the only connection between said rings and the walls of the chambers is formed by a relatively narrow annulus K, located on the side of the packing-rings away from the compressor-cylinder. The seat I, with its supporting-annulus K, effectually bars the passage of any of the gases from the outside of the packing-rings, while the rings themselves bar the passage of any gases along the surface of the rod and between the rings. This construction permits said rings to change their temperature practically in accordance with the changes of temperature which occur in the rod itself and in the gas or liquid which is in the compressor-cylinder, for it will be observed that the packing-rings having extended contact with said rod and any gases that pass out along said rod will pass outside of the packing-rings or into the chamber surrounding said rings and impart its temperature to the rings, and because of the very small quantity of metal uniting the rings and body of the stuffing-box or which contacts with the body of the stuffing-box the temperature of the rings is controlled only to a slight

extent by the temperature of the stuffing-box itself.

As before stated, a chamber F is formed between the packing-rings D and E, and the oil is supplied to this chamber through a branch G of a pipe L, constituting a portion of a circulating system which includes a pump L', a tank L<sup>2</sup>, and a return-pipe L<sup>3</sup>. The return-pipe L<sup>3</sup> preferably leads from a secondary or expansion packing which is located outside of the main packing and preferably held in place by a secondary cap B<sup>2</sup>, carried by the main cap B' of the stuffing-box. This secondary packing contains packing-rings M of any approved type, and the chamber surrounding said packing-rings and extending in around the rod at the inner side of said packing-rings is in communication with the pipe L through a branch pipe l, and the return-pipe L<sup>3</sup> leads directly from said chamber, as shown. The return-pipe L<sup>3</sup> preferably opens into the upper end of the tank L<sup>2</sup> through a check-valve O, set to prevent any backward movement of the oil or the entry of gas into the pipe L<sup>3</sup>, and preferably set so as to maintain a pressure in said pipe L<sup>3</sup> sufficient to prevent the expansion of the gases which may have been absorbed by the oil and which if allowed to expand might congeal the oil, and so arrest the circulation. In front of the discharge-valve O and within the tank L<sup>2</sup> a spreader or separator P is preferably located, so as to spread the oil into as thin a film as possible as it is discharged in order to facilitate the expansion of gases which may be held by said oil, as will be presently explained.

The letter Q indicates the return-pipe of the compressor system of an ice-machine or ammonia-compressing apparatus, and the tank L<sup>2</sup> is preferably in direct communication with said return-pipe Q through a small pipe q. Thus any gases accumulating in the tank L<sup>2</sup> find ready egress and pass into the general circulating system of the compressing apparatus.

In operation, now, the rod C is kept lubricated by the oil in the respective oil-chambers, and any gas which may find its way

past the packing-rings or be carried past the packing-rings by the surface of the rod will be absorbed by the oil in the said chambers and effectually prevented from escaping or being lost, inasmuch as the oil is maintained in a circulating system which carries it back to the tank L<sup>2</sup> and permits gases held by it to escape or expand and return to the general system of the compressing apparatus.

The valve O is preferably loaded by a spring o, the tension of which may be adjusted in accordance with any well-known valve construction and should be adjusted to prevent the opening of the valve save when the pressure within the pipe L<sup>3</sup> equals or exceeds the pressure within the tank A or in the return-pipe Q, which determines the pressure within the tank. Obviously the pump L' may be operated to give any desired pressure; but the pressure indicated has proven to be efficient and to accomplish all of the desired ends.

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

1. In rod-packing for compressors the combination with the stuffing-box, the rod passing through the stuffing-box and the packing-rings surrounding said rod within the stuffing-box, and a support for said packing-rings located on the side thereof away from the compressor-cylinder and having a narrow wall forming the connection between said support and stuffing-box whereby the packing-rings may be surrounded by gases and conform to the temperature of the rod; substantially as described.

2. In rod-packing for compressors, the combination with the stuffing-box having the packing-rings therein and intermediate oil-chamber, of a second independent oil-chamber in said stuffing-box, pipes connecting said oil-chambers and a circulating system of pipes communicating with said oil-chambers and means for maintaining the circulation of oil in said pipes; substantially as described.

THOMAS W. MITCHELL.

Witnesses:

GEO. F. KING,  
A. L. FROST.