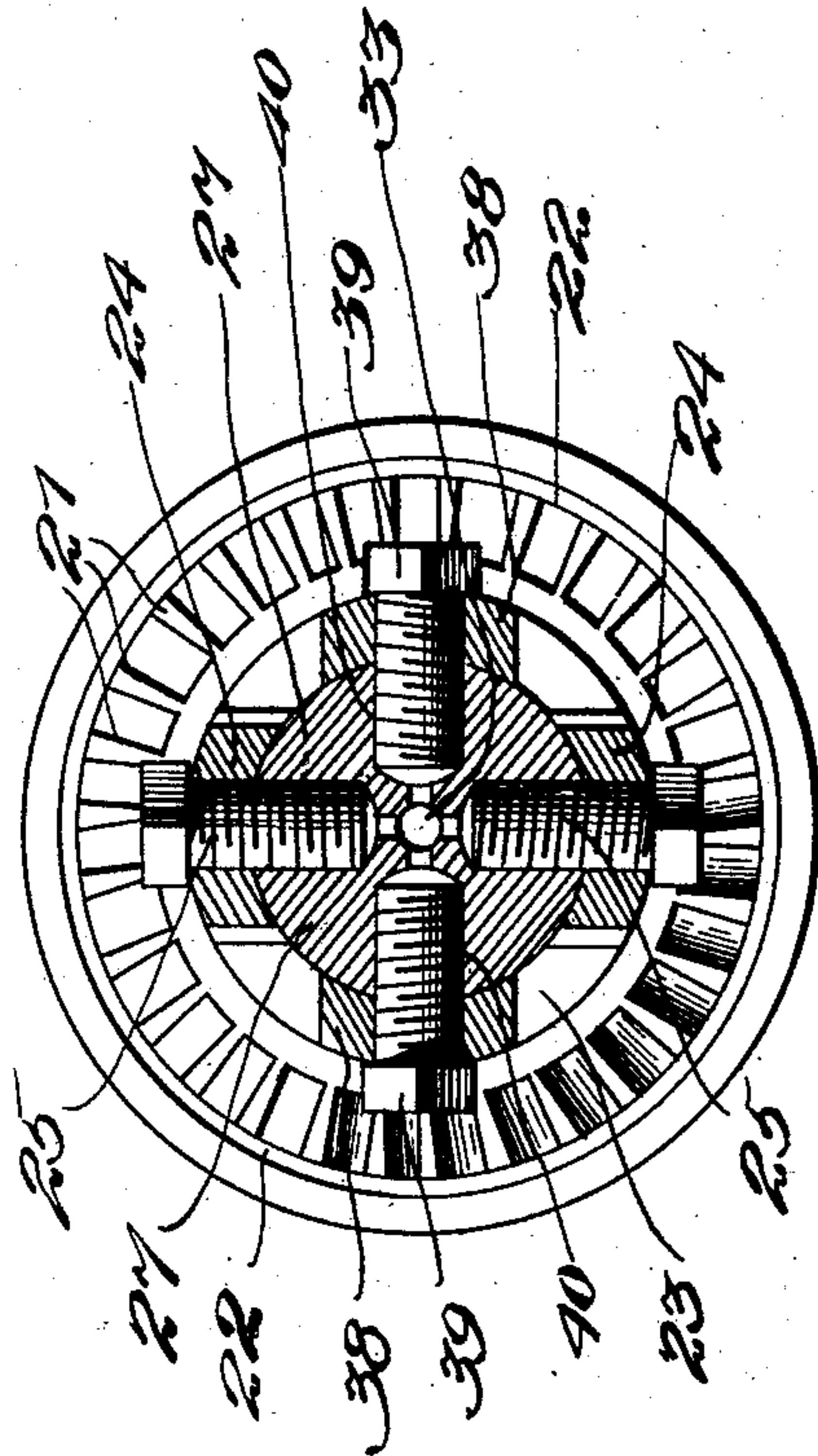
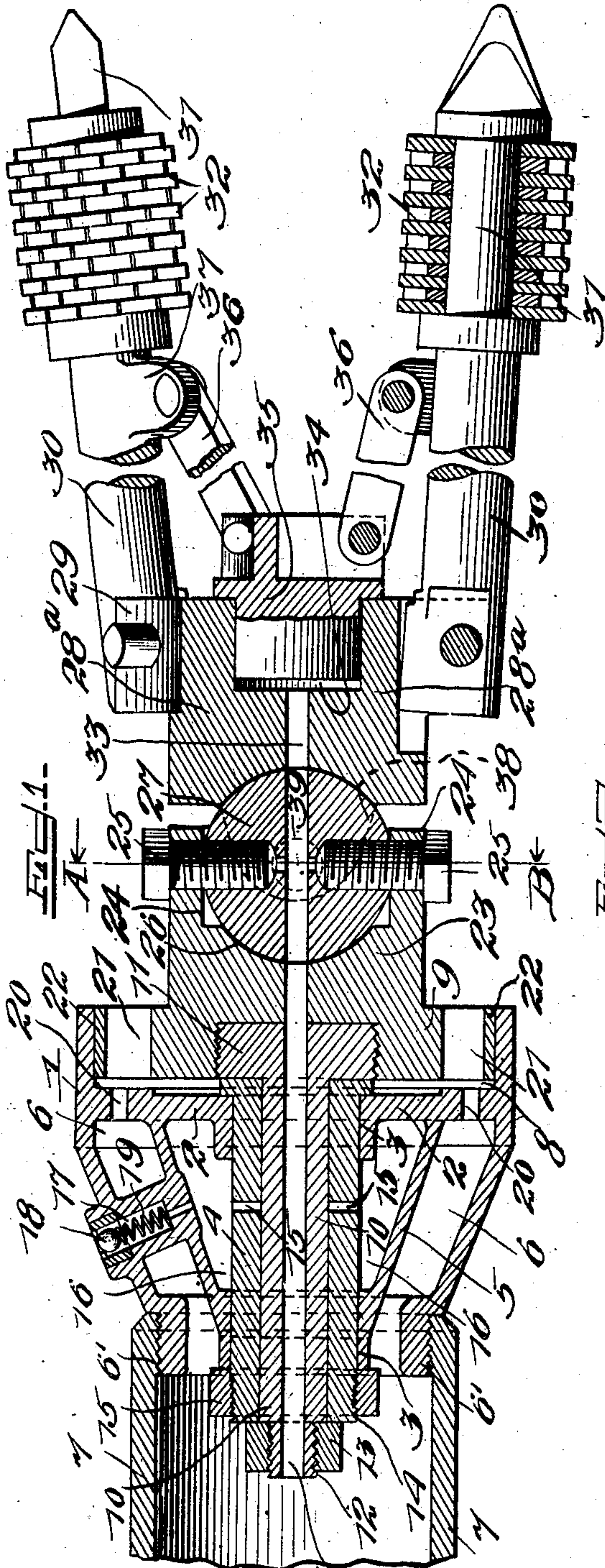


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TUBE CLEANER.
APPLICATION FILED SEPT. 15, 1908.

973,740.

Patented Oct. 25, 1910.



Witnesses:
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UNITED STATES PATENT OFFICE.

THOMAS ANDREWS, OF ROCKAWAY, NEW JERSEY.

TUBE-CLEANER.

973,740.

Specification of Letters Patent.

Patented Oct. 25, 1910.

Application filed September 15, 1908. Serial No. 453,197.

To all whom it may concern:

Be it known that I, THOMAS ANDREWS, a citizen of the United States, residing at Rockaway, in the county of Morris, State of New Jersey, have invented certain new and useful Improvements in Tube-Cleaners, of which the following is a specification.

The invention relates to improvements in tube cleaners and has particular reference to a device designed to operate in bent boiler tubes, water pipes, gas mains, and also horizontal boiler tubes.

The object of the invention is the providing of a universal or ball and socket joint having associated therewith means for receiving a fluid from a fluid supply to actuate a cutting head and arms carrying a plurality of cutters, and means for swinging said arms outwardly to engage the interior walls of a boiler tube.

In the following is described in connection with the accompanying drawings one embodiment of the invention, the features thereof being more particularly pointed out hereinafter in the claim.

In the drawings Figure 1 is a longitudinal sectional view of the device, parts being shown in elevation to more clearly illustrate the invention; and Fig. 2 is a cross sectional view on the line A—B of Fig. 1.

Similar numerals of reference indicate similar parts throughout the several views.

In the drawings 1 designates a casing having formed on its interior a web 2 which in turn has cast therewith a bearing 3 adapted to receive a removable bushing 4. The said web 2 has also formed therewith an inner wall 5, providing between the outer casing 1 and said inner wall 5 a fluid passage 6 adapted to receive a fluid from a suitable source of supply. The casing 1 has formed on one end a nipple 6' adapted to receive pipe coupling 7 and on its other end a chamber 8 for the rotary head or turbine 9. Said bushing 4 has mounted therein a shaft 10 having formed thereon a threaded head 11 rigidly mounted in said rotary head 9, the inner end of said shaft being threaded at 12 to receive jam nut 13. The inner end of said bushing 4 is also threaded at 14 to receive a lock nut 15, the object of said nut 15 being to provide means for holding said bushing 4 in place in the bearings 3. The bushing 4 has therein a plurality of holes 15 adapted to receive a lubricant from oil chamber 16, said chamber being fed through oil

cup 17 which is held normally closed by means of ball valve 18 and spring 19.

The web 2 has therein a plurality of ports 20 which communicate with fluid passage 6 and chamber 8 the latter being in direct alinement with a series of turbine blades 21 formed on the outer periphery of said rotary head 9. The said blades 21 have shrunk on their ends a band 22 adapted to fit snugly within housing 8. Rotary head 9 is provided with a body portion 23 having formed thereon lugs 24 carrying set screws 25, and at its central portion with a socket 26 adapted to receive the ball 27 provided with threaded holes 28 for said set screws 25. 28^a indicates an auxiliary rotary head also provided with a reception socket and carrying lugs 29 which have pivotally mounted therein arms 30, said arms 30 having mounted in their outer ends bolts 31 carrying a plurality of cutters 32. Shaft 9, ball 27, and auxiliary rotary head 28^a have formed therein a fluid passageway 33 which communicates at its outer end with a chamber 34 having mounted therein a piston 35 carrying links 36 pivotally mounted in lugs 37 cast with said arms 30. The said auxiliary rotary head 28^a has formed thereon lugs 38 having mounted therein set screws 39 adapted to engage in holes 40 also formed in said ball 27. The structure as above described provides means for permitting the rotary head to turn radially about a given center, and at the same time cause said arms carrying the cutters to expand or swing outwardly a predetermined distance to engage the interior walls of a boiler tube or similar article.

The operation of the device is as follows: Fluid under pressure in the form of air, steam, water, or gas, is fed into fluid passage 6 through pipe couplings 7, thence to ports 20 into chamber 8 where it strikes against blades 21 causing the rotation of the turbine 9 and all of the parts connected therewith.

The device as above described is applicable for use as a straight tube cleaner as well as in tubes having bends and curves formed therein, as the ball and socket described as being formed and attached to the body portion 23 and auxiliary driving head 28^a will permit the arms 30, carrying the cutters 31, and said head 28^a, to follow a curve or bend in a boiler tube. Fluid is also fed through passage 33 to chamber 34 in auxiliary head

27 to actuate piston 35 and cause said arms 30, carrying cutters 31, to swing outwardly and engage the interior walls of the tube.

The device as herein shown and described
5 may be varied without departing from the spirit of the invention.

What I claim and desire to secure by Letters Patent of the United States is:—

A device of the character described comprising a head having a chamber in one end
10 thereof, a piston in said chamber, arms pivoted to said head, rotary cutters on said arms, links pivoted to said piston and said arms, a casing with a turbine head therein,
15 said first named head and said turbine head

each having lugs thereon, and each having a socket formed in their adjacent ends and a ball pivoted to each of said heads, said ball and each of said heads having openings forming a communicating passage to said 20 chamber.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses this 28th day of August, 1908.

THOMAS ANDREWS.

Witnesses:

FRED H. BLANCHARD,
J. R. HARROP.