

No. 758,145.

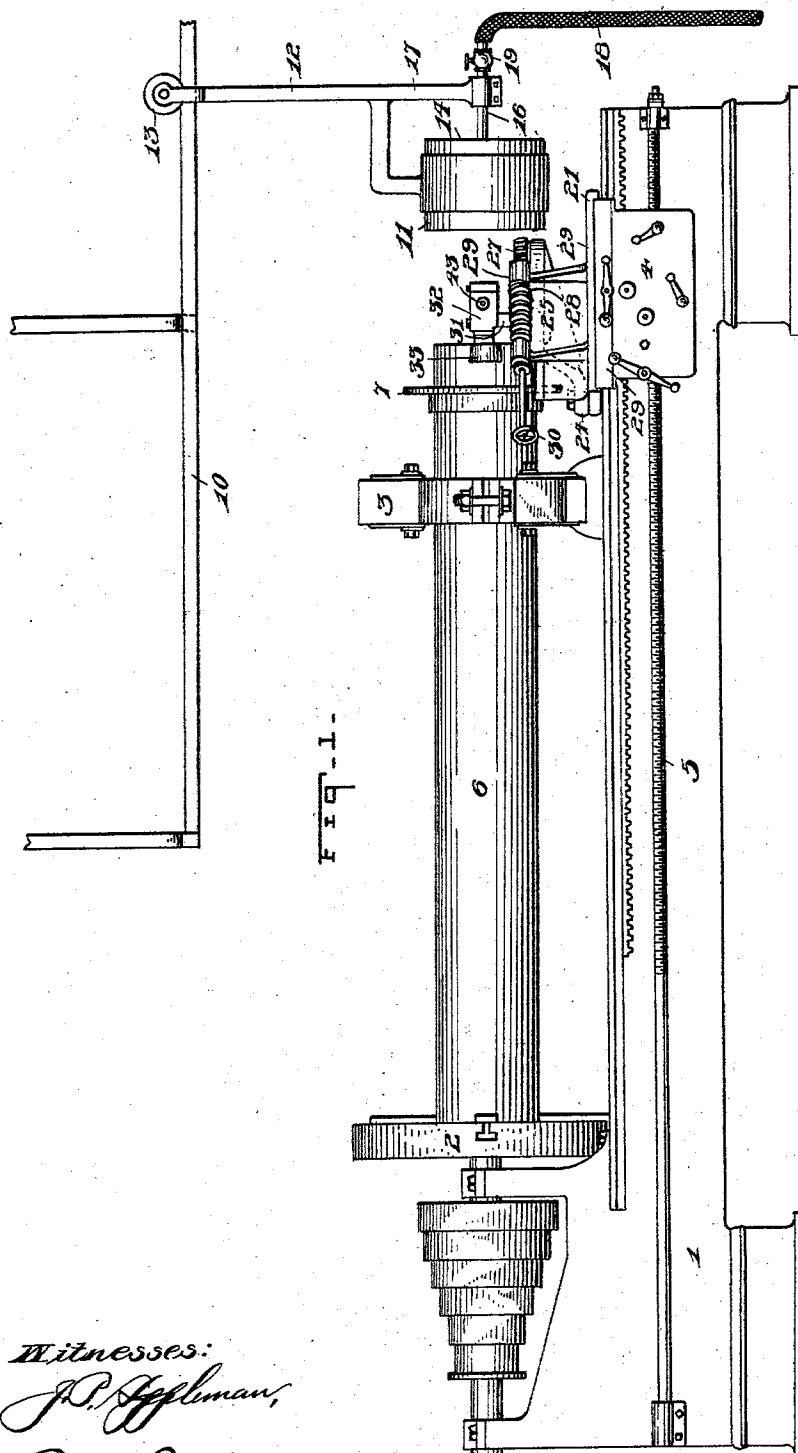
PATENTED APR. 26, 1904.

A. F. NORDENSKJÖLD.
MECHANISM FOR FLANGING THE ENDS OF TUBES.

APPLICATION FILED OCT. 24, 1903.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses:
J. P. Hoffman,
G. A. Barber.

Inventor
A. F. Nordenskjöld,
By *Wm L. Price,*
Atty.

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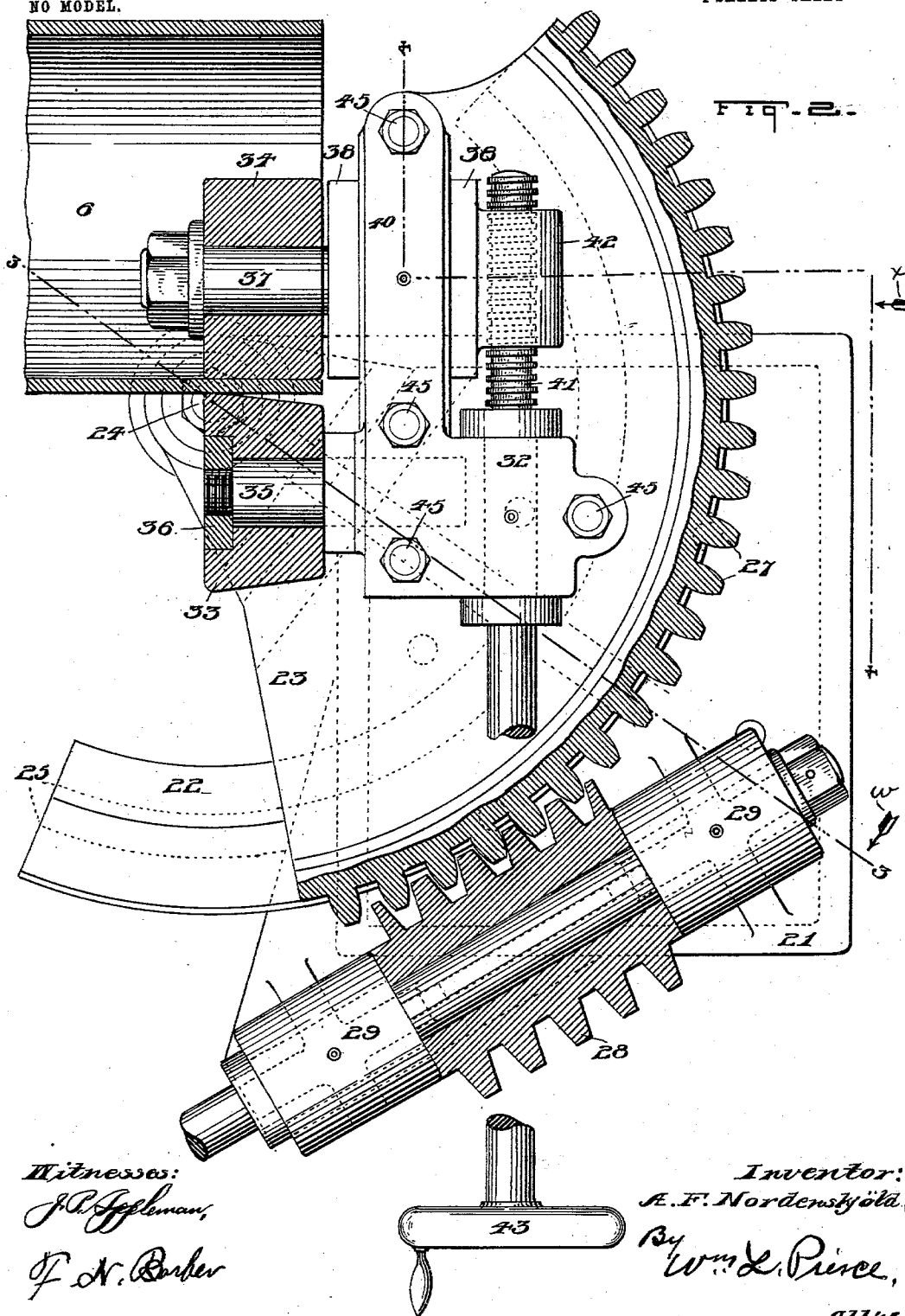
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4 SHEETS—SHEET 3.

FIG-3-

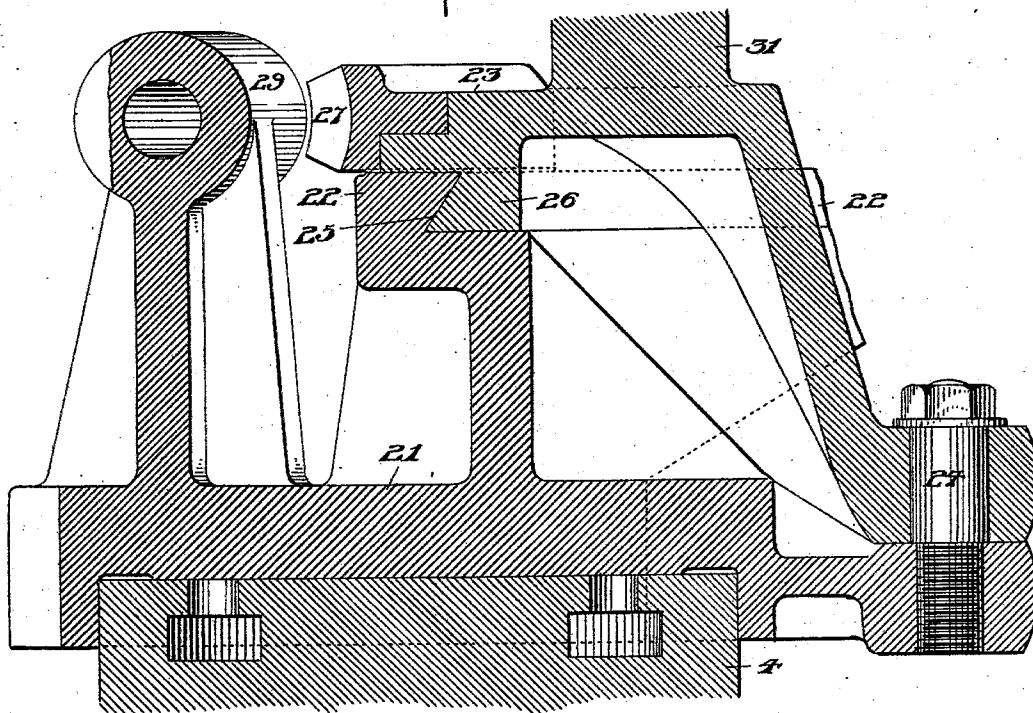
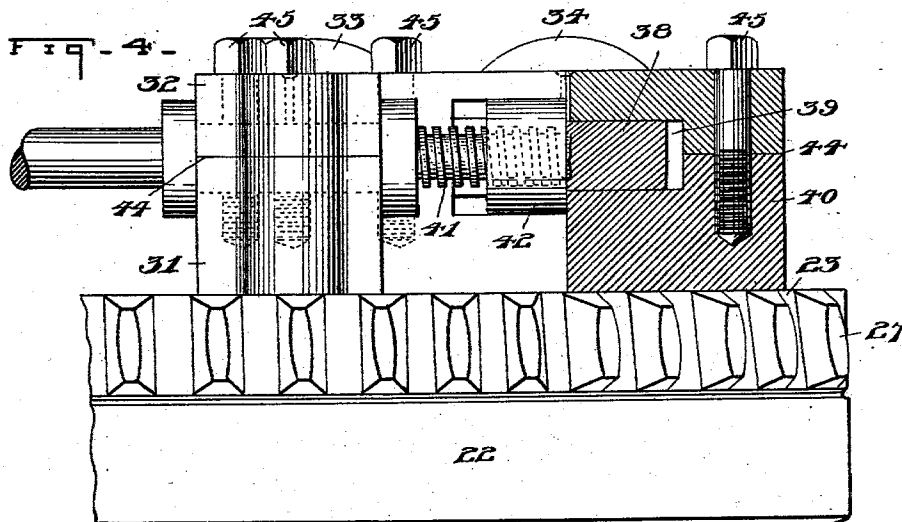


FIG-4-



Witnesses:

J. P. Appleman.

T. N. Barber.

Inventor:

A. F. Nordenskjöld,

By Wm. L. Pierce,

Att'y.

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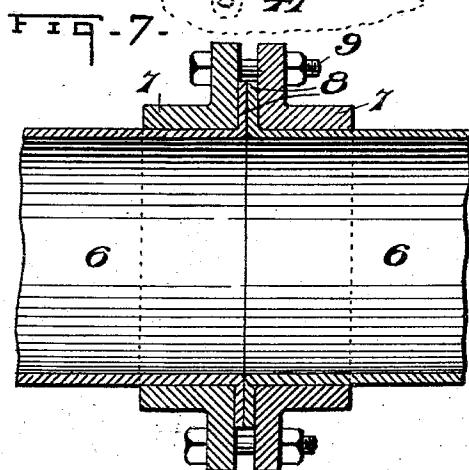
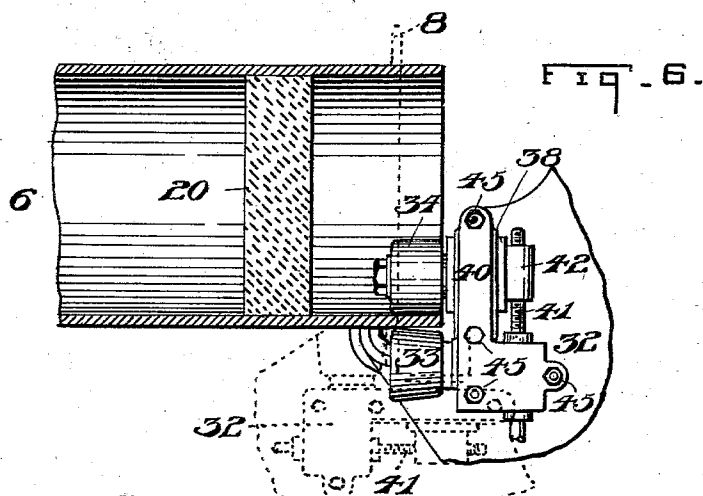
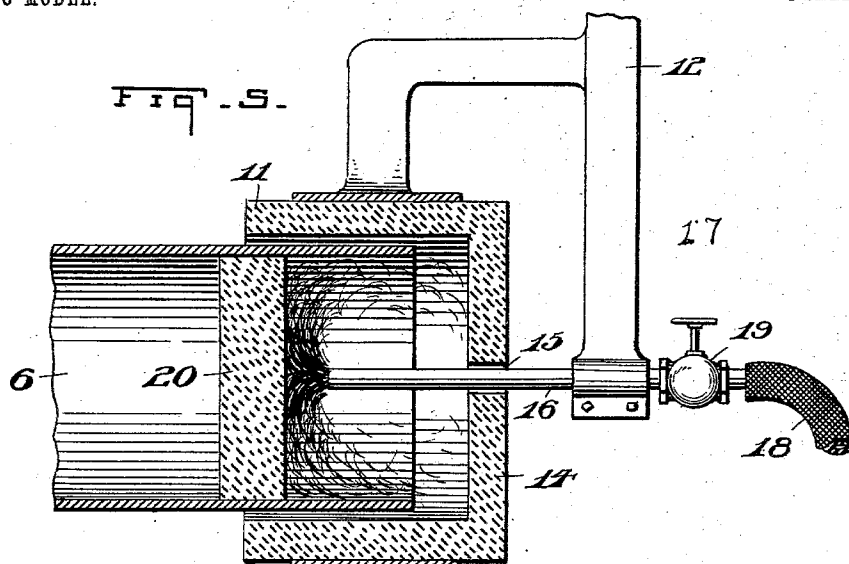
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4 SHEETS—SHEET 4.



Witnesses:
J. P. Hoffmann,
J. A. Barber.

Inventor:
A. F. Nordenskjöld,
By *Wm. L. Pierce,*
Att'y.

UNITED STATES PATENT OFFICE.

ANTON FREDRIK NORDENSKJÖLD, OF PITTSBURG, PENNSYLVANIA,
ASSIGNOR TO PITTSBURG VALVE, FOUNDRY AND CONSTRUCTION
COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF
PENNSYLVANIA.

MECHANISM FOR FLANGING THE ENDS OF TUBES.

SPECIFICATION forming part of Letters Patent No. 758,145, dated April 26, 1904.

Application filed October 24, 1903. Serial No. 178,355. (No model.)

To all whom it may concern:

Be it known that I, ANTON FREDRIK NORDENSKJÖLD, a citizen of Sweden, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered new and useful Improvements in Mechanism for Flanging the Ends of Tubes, of which the following is a specification.

My invention relates to mechanism for flanging the ends of metal tubes; and its objects are to provide a mechanism by which I may first heat the portions of the tubes to be flanged and then gradually bend and stretch the metal without cracking or injuring the same. I preferably use an ordinary lathe, on which I mount the tube as for lathe-work, and whose slide-rest I employ as a support and carrier for my bending mechanism.

Referring to the drawings, Figure 1 is a side view of my invention; Fig. 2, a horizontal section of the bending mechanism proper, taken through the bending-rolls and the gearing of the carrier therefor; Fig. 3, a section on the line 3 3 of Fig. 2 looking as the arrow *w* flies; Fig. 4, a view, partly in end elevation and partly in vertical section, on the line 4 4 of Fig. 2, looking in the direction the arrow *x* points; Fig. 5, a vertical section showing the manner in which I heat the tubes; Fig. 6, a horizontal section of the tube, together with a fragment in plan of the bending mechanism; and Fig. 7, a vertical section showing the flanged tubes united.

1 represents the bed of a metal-lathe, on which is supported the ordinary head-stock 2, the rest 3, the slide-rest 4, and screw 5, which moves the slide-rest. I secure the tube 6 to be flanged in the head-stock 2, so that the tube will rotate therewith, and I place the tube in the rest 3, in which it rotates during the flanging operation. Before commencing to heat the tube I place thereon the flanged collar 7, as shown in Fig. 1. This collar is a portion of the pipe-coupling, there being a collar 7 on each of the tubes to be joined, as shown in Fig.

7. The collars 7 are slid up against the flanges 8 of the tubes and are drawn toward each other by the bolts 9, thus clamping the flanges tightly together.

Suspended over the lathe is a track 10, on which a hood or heating-chamber 11 is supported by means of the carrier 12, having the wheel 13 adapted to the track 10. The hood or chamber 11 is a cylinder of fire-clay or other refractory material and has one end closed by the bottom 14, in which there is a hole 15, through which a metal tube 16 is passed. The tube 16 is adjustably supported on the carrier 12 by the arm 17 and is connected to a hose 18, which supplies gas for heating the tube 6. The pipe 16 is provided with a stop-valve 19. The hole 15 is larger than the tube 16 in order that air may enter the hood to burn the gas. The hood does not fit the tube closely, as shown in Fig. 5, in order that the products of combustion may escape and at the same time heat the tube externally. Within the tube 6 I place a plug 20, of refractory material, to form the inner wall of the heating-chamber. After the tube 6 is properly mounted on the lathe, as described, the carrier 12 is pushed along the track 10 until the hood has been pushed over the end of the tube, the collar 7 and the plug 20 having been previously applied, as above described. The gas is turned on by the valve 19 and ignited and allowed to burn until the end of the tube has become sufficiently heated for the bending operation. The gas is then turned off and the hood withdrawn, and the bending mechanism proper, now to be described, is employed.

On the top of the slide-rest or carriage 4 I secure in any well-known manner the plate 21, which supports the arc-shaped track or guide 22, on which slides the arc-shaped carriage 23, pivoted to the plate 21 by the bolt 24. The track 22 has an undercut groove 25, in which a correspondingly-shaped rib or tongue 26 on the carrier 23 fits, whereby the carrier will be held down on the guide in its oscillation.

tions on the bolt or pivot 24. The periphery of the arc of the carrier 23 is provided with gear-teeth 27 in mesh with the worm-wheel 28, journaled in the two standards 29, supported on the plate 21. The worm is operated by the hand-wheel 30. Upon the carrier 23 is a standard 31, which supports the bracket or rest 32 for the rolls 33 and 34. The roll 33 is fixedly carried by the bracket by means of the pin or journal 35, having one end secured in the bracket. This roller is secured to the pin by a nut 36, countersunk in the outer end of the same, so as to be flush therewith, in order that the end of the roll may engage the side of the tube, as shown in dotted lines in Fig. 6, since a right-angled flange could not be formed otherwise. The roll 34 is journaled on the pin 37 on a block 38, slidable horizontally in the slot 39 in the extension or arm 40 of the bracket 32. The carrier 32 has journaled therein the screw 41, which is threaded in the lug 42 on the block 38 and operated by the hand-wheel 43. The carrier 32 and its arm 40 are in two parts, joined at the line 44 and secured together by the bolts 45. After the tube has been properly heated, as already explained, the carriage 4 is moved in the usual manner toward the tube until the rolls have passed sufficiently past the end of the tube to make the flange the proper height, the roll 34 being within the tube and the roll 33 without. The hand-wheels 30 and 43 are turned so as to bring the rolls against the sides of the tube. The head-stock is then started and the tube continually rotated. The hand-wheel 30 is turned gradually or from time to time, as may be necessary, so as to rotate the carrier 23 toward the wheel 30 until the end of the tube has been bent at the desired angle, as shown by dotted lines on Fig. 6, at which time the rotation of the head-stock and the hand-wheel 30 is stopped. The roll 34 may, if necessary, be moved away from the flange by the wheel 43 and the roll 33 then moved away from the flange by the wheel 30. The top of the slide-rest can then be slid transversely in the usual manner, carrying the rolls away from the tube.

By the words "lathe" and "lathe construction" used in the description and claims I do not use the same in any specific sense except

as including a machine having a lathe-like construction.

In some instances I may find it necessary to heat the pipe during the flanging operation, which may be done in an evident manner.

Having described my invention, I claim—

1. In a tube-flanging machine, means for rotating the tube, a pair of rolls between which the wall of the tube passes during rotation, a pivotally-supported carrier for the rolls, and means for moving the carrier pivotally.

2. In a tube-flanging machine, means for rotating the tube, a pair of rolls between which the wall of the tube passes during rotation, a pivotally-supported carrier for the rolls, means for adjusting the space between the rolls, and means for moving the carrier pivotally.

3. In a tube-flanging machine, a lathe construction, including the slide-rest, flanging-rollers, and a pivoted carrier for the rollers supported on the rest, the rollers capable of forming a flange on the end of the tube as the latter rotates and the carrier turns on its pivot.

4. In a tube-flanging machine, a lathe construction including the slide-rest, a plate thereon, a track on the plate, a carrier guided on the track, means on the carrier for engaging the tube and bending a flange thereon, and means for moving the carrier on the track.

5. In a tube-flanging machine, a lathe construction including a slide-rest, an arc-shaped track thereon, a carrier thereon adapted to said track, gear-teeth on the arc of said carrier, and means coöperating with said teeth to cause said carrier to travel on the track, and means on the carrier for engaging the ends of the tube and flanging the same.

6. In a tube-flanging machine, means for rotating the tube, a pair of rolls between which the wall of the tube passes during rotation, a pivotally-supported carrier for the rolls, means for moving the carrier pivotally, and means for heating the tube.

Signed at Pittsburg this 21st day of October, 1903.

ANTON FREDRIK NORDENSKJÖLD.

Witnesses:

F. N. BARBER,
A. M. STEEN.