No. 678,966. Patented July 23, 1901.

J. A. MOONEY.

FEATHER RENOVATOR.

(Application filed Jan. 16, 1900. Renewed Dec. 14, 1900.)

(No Model.)

Fig. 4.

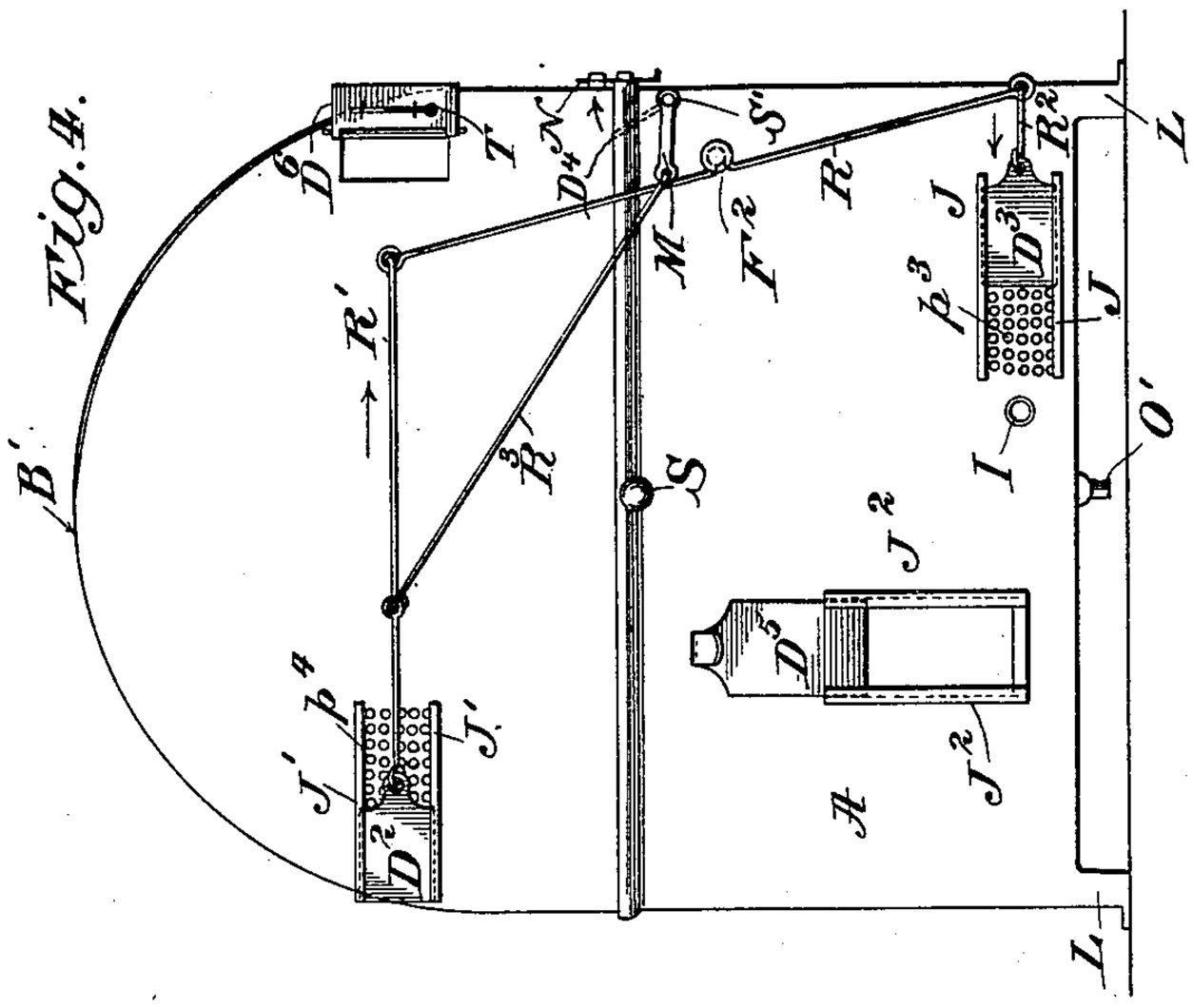
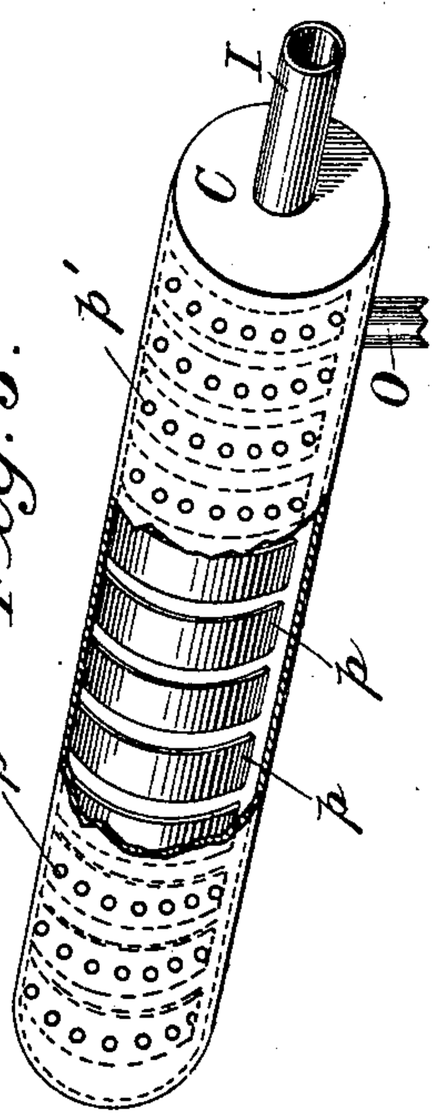


Fig. 3.



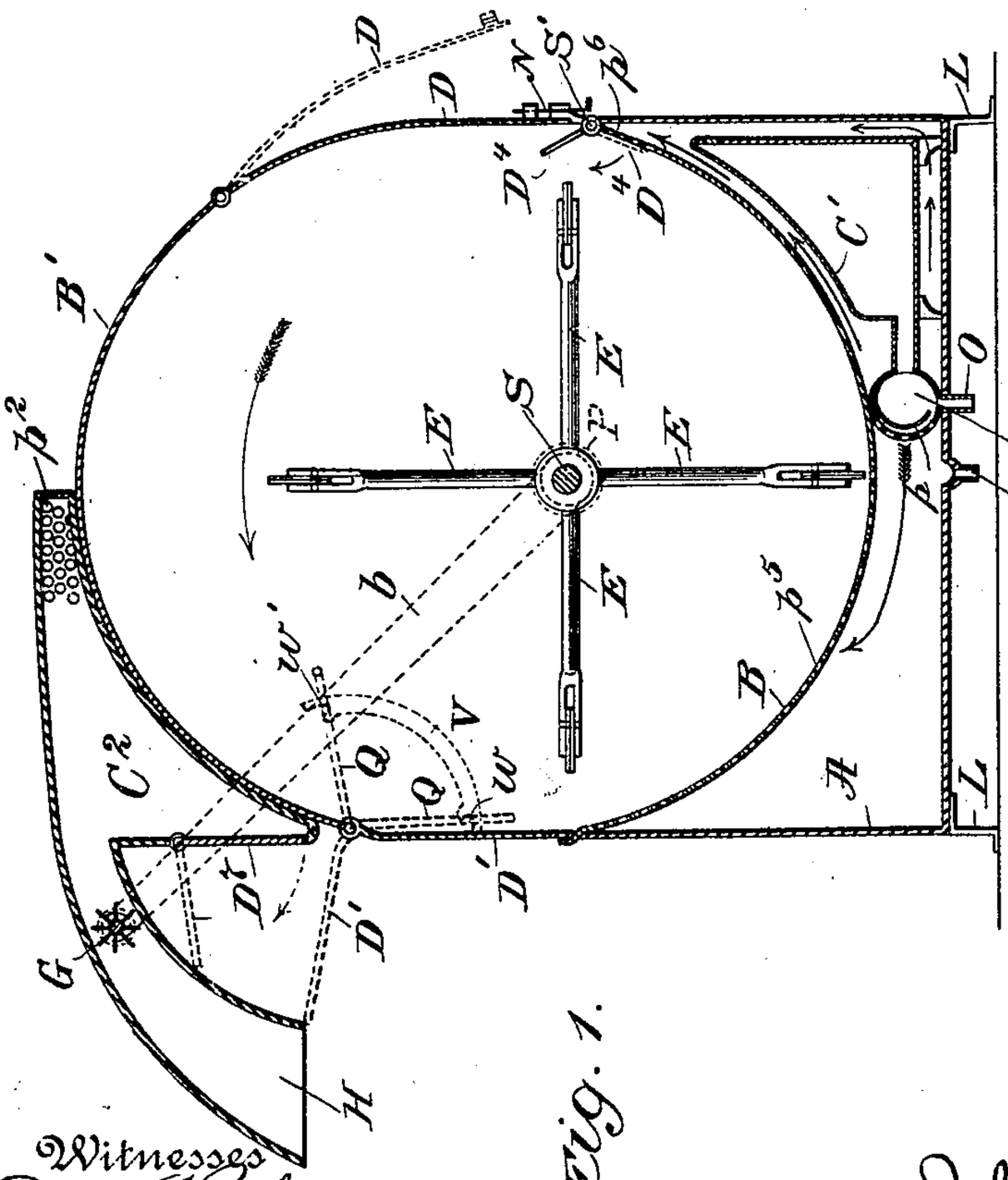


Fig. 1.

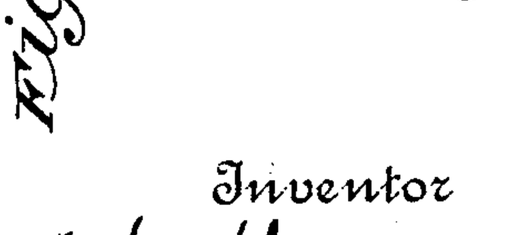


Fig. 2.

Witnesses
Edward Rowland.
M. F. Keating

Inventor
John A. Mooney
By his Attorney
Charles J. Kintner.

UNITED STATES PATENT OFFICE.

JOHN A. MOONEY, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-THIRD TO FRANCIS F. WILSON, OF ROCKVILLE CENTER, NEW YORK.

FEATHER-RENOVATOR.

SPECIFICATION forming part of Letters Patent No. 678,966, dated July 23, 1901.

Application filed January 16, 1900. Renewed December 14, 1900. Serial No. 39,926. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. MOONEY, a citizen of the United States, residing at New York, borough of Brooklyn, in the county of Kings, State of New York, have made a new and useful Invention in Feather-Renovators, of which the following is a specification.

My invention is directed particularly to improvements in that type of feather-renovators in which steam and hot air are utilized for the purpose of cleansing the feathers and subsequently heating and drying the same; and its objects are, first, to provide a perfect means for quickly and thoroughly cleansing and purifying feathers and analogous materials—such as hair, wool, and the like—and, second, to effect the same in such manner as to avoid the presence in buildings of obnoxious odors which usually result from the renovating of such materials.

My invention will be fully understood by referring to the accompanying drawings, in which—

Figure 1 is a transverse sectional view taken through the body of the entire machine. Fig. 2 is a detail perspective view of a part of the stirring reel or fan. Fig. 3 is a perspective view of the condenser which regulates the admission of comparatively dry steam to the chamber of the apparatus, part of the exterior surface thereof being broken away to better illustrate the interior structure of the condensing-plates. Fig. 4 is an end elevational view of the entire machine with the down-collecting chamber detached.

Referring now to the drawings in detail, in all of which like letters of reference represent like or equivalent parts wherever used, it will be noted that the apparatus is made in three distinctive parts, separable from each other—first, the base A in the nature of a rectangular chamber supported upon legs L L and having a semicylindrical interior base B, provided with perforations p^5; second, an upper cylindrical part B′, the lower portion of which fits snugly within a recess in the upper part of the base A when the two parts are put together, the lower part or base A being provided with journal-boxes for sustaining the shaft S of the reel or fan, (illustrated partly in perspective view in Fig. 2 and in side elevational view in Fig. 1,) and, third, the down-collecting chamber C^2, attached to the upper surface of the part B′.

D represents a door hinged to the part B′ for receiving the material within the renovating-chamber, said door being provided with a latch N, adapted to secure it to the lower part or base A when closed.

D′ represents an additional door for the emission or exit of the renovated material, said door being pivoted to the upper part B′ and provided with an operating or controlling arm Q, adapted to be locked in either of two notches *w w′* of a locking-segment V on the outside of the machine, the arrangement being such that said door when closed will appear as in full lines and when open as in dotted lines. (See Fig. 1.)

The reel or fan is composed of four or more pairs of rotary arms E E E E, secured to the shaft S and provided at their outer ends with sheet-metal fan-blades F F′, pivoted in pairs to the ends of said arms and so constructed as to be of serrated or saw-tooth form, said teeth being illustrated by the letters *t t*. These fan-blades are so constructed that when used for feathers the two will be combined as shown in full lines, Fig. 2, with their opposite ends secured to the outer ends of the arms E E, and when used for hair, wool, or the like they will be arranged as shown in dotted lines, with the free ends secured by a pin or otherwise to the shaft S.

P is the pulley upon the shaft S, and K is an operating-crank for rotating the reel or fan.

C is a condensing-chamber of tubular form provided on one side with perforations *p′ p′*, located directly beneath the corresponding perforations p^5 p^5 in the base B of the renovating-chamber, the length of this chamber being the same as that of the width of the entire machine.

I is an inlet-pipe for admitting steam to the condensing-chamber, and O a corresponding outlet-pipe for permitting the condensed vapors to pass off by their own weight.

p p p are metallic condenser-plates of curvilinear form corresponding to the curvilinear form of the condensing-chamber C and located one in front of each row of perfora-

tions p' p' and in such proximity thereto as to prevent the live steam from passing directly through the openings, the function of this arrangement being to cause the wet or live steam to be condensed and pass off by the plates p p and outlet-pipe O, while the comparatively dry steam enters the renovating-chamber through the perforations p^5, as will be described later on in connection with the description of the mode of operation.

O′ is a drainage-pipe for the base of the machine.

C′ is a heating-chamber connected directly to the condensing-chamber C and receiving steam directly therefrom, said heating-chamber being supported by standards or legs and located beneath the base of the machine and so constructed or arranged as to afford free air circulation around the entire chamber, as indicated by the arrows in Fig. 1.

D^4 is a door in the base of the machine above the heating-chamber and adapted to close the perforations p^6 p^6, which admit air from said heating-chamber.

p^3 p^3 p^4 p^4 are perforations in the outer wall of the machine adapted to admit air to the renovating-chamber and the area exterior to the heating-chamber, and D^3 D^2 are doors adapted to slide, repectively, in guideways J J and J′ J′ and in such manner as to close said perforations or leave them open, as desired.

R is an operating-rod fulcrumed at F^2 on the side of the machine, its opposite ends being connected by links R′ R^2 directly to the sliding doors D^2 D^3.

R^3 is an additional link connected to the link R′ and an arm M, which in turn is connected to a shaft S′, to which is secured the door D^4, above referred to, the arrangement being such that all of these doors may be operated at one and the same time.

It will be apparent on inspection of Fig. 1 of the drawings that the location of the perforations p^6 p^6 and door D^4 at the extreme upper right-hand end of the circular base B at a point on the opposite side from the emission or exit opening normally closed by the door D′ and the arrangement of the air circulation about the hot-air chamber C′ is such that the hot air passing therethrough will enter the renovating-chamber at such an angle as to tend to force the light dried feathers outward in the direction of the arrows through the emission or exit opening when the door D′ is open as they are moved in front of said perforations by the reel or fan, this arrangement being important in view of the fact that none of the heavier materials which are usually found in feathers to be renovated will be forced out through the exit-opening.

D^6 is a door adapted to close an opening in the renovating-chamber for enabling one to observe the condition of the material while the machine is operating, and T is a thermometer secured to the inner side thereof for giving an indication of the temperature.

D^5 is an additional door for closing and opening, affording access to both the renovating-chamber and that part of the chamber in immediate proximity to the condensing-chamber, said door being provided with sliding guideways J^2 J^2.

C^2 is the down-collecting chamber, secured to the upper surface of the part B′ and provided on one or more sides with perforations p^2 p^2.

H is an air-circulating chamber of the same width as the entire machine, with its free end located directly above the upper edge of the emission or exit opening, the arrangement being such that when the door D′ is open, as shown in dotted lines, its free edge will rest against the lower inner surface of said air-circulating chamber, while the upper end of said circulating-chamber is connected directly to the down-collecting chamber.

D^7 is a door for permitting of the removal of the down from the chamber C^2, said door being shown in closed position in full lines and in open position in dotted lines.

Within the air-circulating chamber H is located a rotary fan G of the same width as the chamber, the supporting-shaft of said fan being journaled in the opposite sides thereof and provided with a pulley, which is connected by a belt b to a driving-pulley P on the shaft S of the reel or fan. (See Fig. 2.)

The operation of the apparatus is as follows: The material to be renovated is placed within the renovating-chamber through the door D. All of the several doors D to D^7, inclusive, are then closed, steam is admitted to the condensing-chamber C through the pipe I, and the reel or fan is rotated by the crank K in the direction of the curved arrow, Fig. 1. Consequently as the steam enters the condenser it passes first against the condensing-plates p p and into the heating-chamber C′. The comparatively dry steam passes through the perforations p' p' in the direction of the arrow to the left upward through the perforations p^5 p^5 into the renovating-chamber. The reel or fan is thus rotated continuously and the material subjected to the steam the desired length of time, the temperature thereof being regulated in accordance with the thermometer T. After the material is sufficiently renovated the steam is shut off in the pipe I and the doors D^2, D^3, and D^4 are opened by causing the operating-rod R to be rotated in the reverse direction of the hands of a watch, (see Fig. 4, where all of said doors are shown as open,) thereby permitting the accumulated hot air from around the heating-chamber C′ to pass upward into the renovating-chamber through the perforations p^6 p^6. The rotation of the reel or fan is still continued, and the door D′ is opened and locked in its outer position, as shown by dotted lines in Fig. 1. In view of the fact that the steam which enters

the renovating-chamber through the perforations p^5 in the base B is comparatively dry steam, owing to the action of the condenser-plates p in the perforated condensing-chamber C, the mass of feathers or material to be renovated is not appreciably moistened. It will therefore be understood that after the reel or fan has been rotated a sufficient length of time and the mass of feathers subjected to the proper amount of steam for cleansing purposes sufficient heat has been set up in the heating-chamber C′ and the surrounding air-chamber, as indicated by the arrows, to effectually dry the volume of feathers being renovated in the renovating-chamber. Consequently as the material to be renovated becomes dry and light it is forced forward under the fan-like action of the reel or fan and the joint action of the hot air entering through the perforations p^6 in the direction of the arrow and passes out into the feather or receiving room, there being sufficient heat set up in said chamber at each operation to effect the desired result, as described, for each volume of feathers placed in the machine. The light or down portion of the feathers passes upward by reason of the draft set up in the air-circulating chamber H by the fan G, which is driven rapidly by the belt b when the reel is rotated. Hence the down passes inward and settles in the down-collecting chamber C^2, the perforations p^2 p^2 acting as an outlet for the circulating air, while the down itself is not permitted to pass therethrough. When the material is all renovated and thoroughly dried, it will be found that nothing remains upon the base B but refuse and dirt, which may be removed on opening the door D^5, as may also the matter which may accumulate in the base A which fails to pass away by the outlet-pipe O′. The renovated feathers or other material may be collected in the feather-room, and the down which has accumulated in the down-collecting chamber C^2 may be removed through the door D^7.

With such an apparatus I find it possible to thoroughly renovate feathers, hair, wool, or analogous materials in the most effective manner, and by reason of the fact that the entire apparatus is permanently closed during the operation of renovation I avoid the presence of objectionable odors in buildings where it becomes necessary to effect such renovation. By arranging the reel or fan as shown in Fig. 2, with fan-blades F F′ pivoted, respectively, to the outer ends of the arms E E, I am enabled to adapt the same apparatus for renovating hair, wool, and other materials which are heavier than feathers by attaching the free ends of the fan-blades F F′ to the shaft S, as shown, as I find that when the fan-blades are arranged as shown in full lines in Fig. 2 it is difficult to rotate the fan while renovating such materials. This feature of my invention has therefore an especial utility for the renovation of materials of the character named.

I do not limit myself to the especial details of construction hereinbefore described, and illustrated in the accompanying drawings, as many of the features thereof may be materially departed from and still come within the scope of my claims hereinafter made.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A feather-renovator having a reel or fan and a renovating-chamber provided with a perforated base located under one portion of the chamber and a heating-chamber under the other portion thereof; in combination with a condensing-chamber adapted to supply steam to the renovating-chamber through the perforated base and to the heating-chamber, said renovating-chamber being provided with an exit-opening on one side and an opening above the heating-chamber located at a point opposite the exit-opening, said latter opening being adapted to admit hot air into the renovating-chamber only at a point near the upper surface of the mass of feathers, in such manner as to dry them and force them outward through the exit-opening as the air enters the chamber, substantially as described.

2. A feather-renovator having a renovating-chamber provided with receiving and exit openings and doors for closing the same; a rotary reel or fan located therein; a perforated base located under one portion and a heating-chamber located under the other portion thereof; in combination with a condensing-chamber adapted to admit steam into the renovating-chamber through the perforated base and into the heating-chamber; together with an opening into the renovating-chamber above the heating-chamber, said opening being located at a point on the opposite side from the exit-opening of the renovating-chamber and provided with a door for closing it, all of said parts acting substantially as and for the purpose set forth.

3. A feather-renovator having a renovating-chamber and a reel or fan located therein; in combination with a perforated condensing-chamber located under or beneath the base of the renovating-chamber and provided with a series of curved condenser-plates located in front of the perforations; together with means for admitting steam into the condensing-chamber, substantially as described.

4. A feather-renovator having a renovating-chamber provided with a perforated base, a steam-condensing chamber located beneath said base and a heating-chamber operatively connected with said condensing-chamber; together with means for admitting hot air into the renovating-chamber, substantially as described.

5. In a feather-renovator a reel or fan having fan-blades F F′ each pivotally supported

to an arm E and adapted to be united together so as to form one continuous fan-blade, or to have their detached ends united to the shaft of the reel or fan, substantially as described.

6. In a feather-renovator a reel or fan having fan-blades F F′ provided with serrations or teeth *t t*, said fan-blades being pivoted to arms E E and the free ends thereof adapted to be connected either to the opposite arms or to the shaft of the reel or fan, substantially as described.

In testimony whereof I have hereunto subscribed my name this 11th day of January, 1900.

JOHN A. MOONEY.

Witnesses:
C. J. KINTNER,
M. F. KEATING.