(No Model.) 2 Sheets—Sheet 1.

E. P. CALDWELL.

ROTARY FLANGER.

No. 454,110. Patented June 16, 1891.

Fig. 1

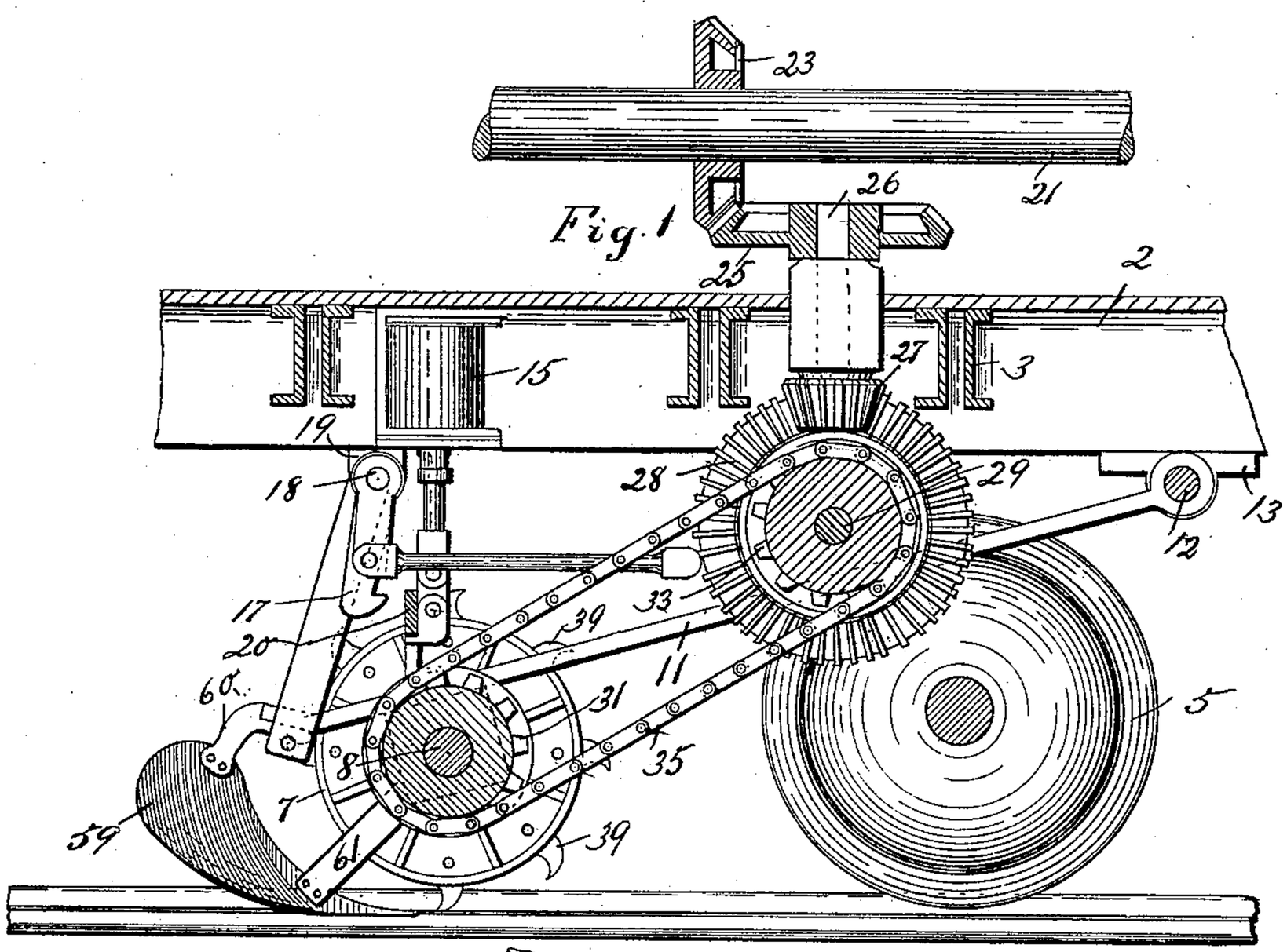

Fig. 2.

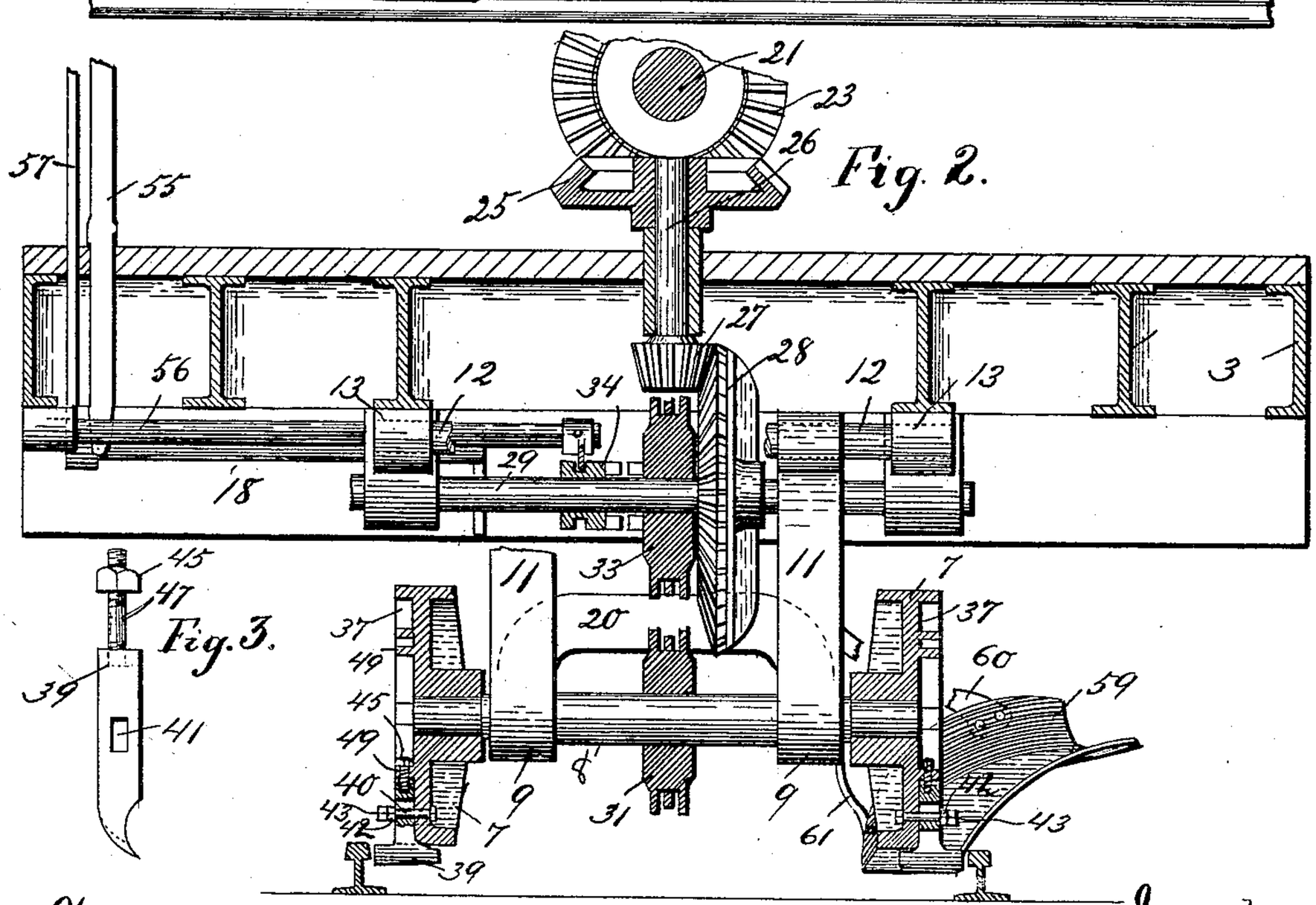

Fig. 3.

Witnesses:-
S. W. Roberts.
J. Jessen

Inventor.
Edward P. Caldwell.
By Paul & Mewin Atty's.

(No Model.) 2 Sheets—Sheet 2.

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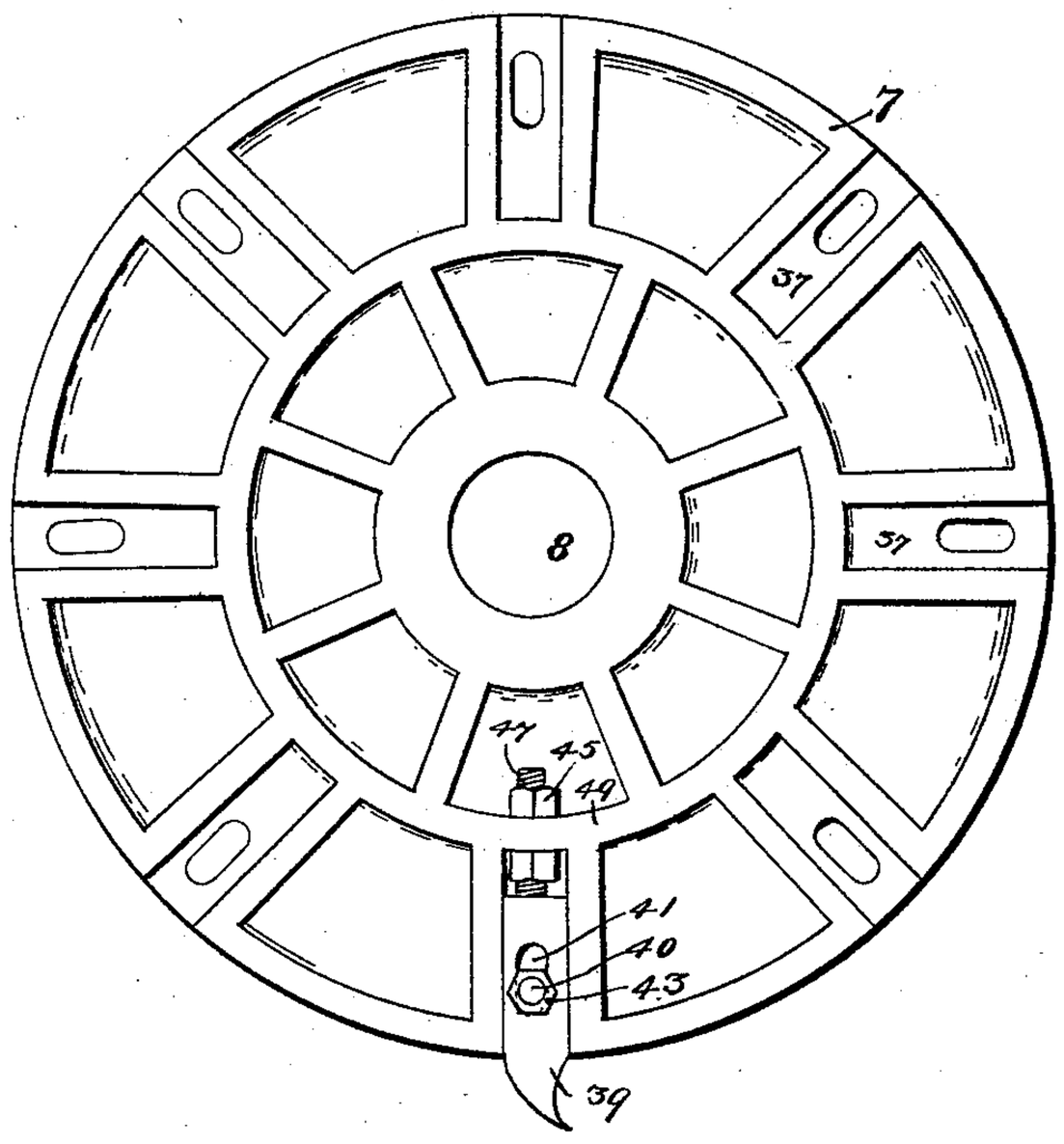
ROTARY FLANGER.

No. 454,110. Patented June 16, 1891.

Fig. 4.



Witnesses:-
S. H. Roberts.
C. G. Hawley.

Inventor.
Edward P. Caldwell
By Paul & Mason Atty.

UNITED STATES PATENT OFFICE.

EDWARD P. CALDWELL, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR OF ONE-HALF TO COMMODORE P. JONES, OF SAME PLACE.

ROTARY FLANGER.

SPECIFICATION forming part of Letters Patent No. 454,110, dated June 16, 1891.

Application filed March 24, 1890. Serial No. 345,055. (No model.)

To all whom it may concern:

Be it known that I, EDWARD P. CALDWELL, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain Improvements in Rotary Flangers, of which the following is a specification.

This invention relates to improvements in mechanism designed particularly to remove snow and ice from railway-tracks, and is particularly useful where ice is allowed to accumulate next to the rail on the inside thereof, impeding and obstructing the running of trains; and it consists, generally, in a rotating wheel adapted to rotate on the inside of each rail and in close proximity thereto, carrying a series of adjustable cutters by means of which flange-room may be made through ice or snow to any depth or any suitable gage. This rotating wheel carrying the adjustable cutters may be caused to rotate by being connected by a suitable driving-chain to an axle of the moving train or driven by suitable gear from a motive power carried upon the car to which the flanger is attached, or attached directly to the wheel of an ordinary car and upon the same axle.

Other objects of the invention are hereinafter more fully detailed, and will more clearly appear from the accompanying drawings, taken in connection with this specification.

In the drawings, Figure 1 is a side elevation and partial section showing my improvement attached to a car. Fig. 2 is a vertical section through different parts, showing driving mechanism. Fig. 3 is a detail of the adjustable cutter.

In the drawings, 2 represents the body of a car, having the girders 3 and supporting truck-wheels 5. Arranged underneath the body of the car are the cutter-wheels 7, rigidly secured to the shaft 8, which has suitable bearings 9 in the pivoted arms 11, which are pivotally secured to the body of the car by means of pivots 12 passing through said arms and the ears 13, which are securely bolted to the bottom of said car. Above said cutter-wheel 7 and secured to the frame of said car is a cylinder 15, provided with a suitable piston and having a suitable connection with a supply of steam or compressed air for operating said piston, which has suitable connection with said shaft 8, whereby said cutter-wheels may be raised or lowered at will by the use of steam or air in said cylinder. Arranged at any suitable point is the pivoted dog 17, secured to the shaft 18, having bearing 19, secured to the frame of the car. When the cutter-wheel 7 is raised, the dog 17 engages the cross-bar 20 on said wheel and retains it in its elevated position. In the drawings I have shown mechanism for rotating said cutter-wheels 7 as used in connection with a platform-car, though it may be used with any snow-plow or with an ordinary car.

In the construction shown, 21 is the main shaft, rotated by direct connection with a suitable engine. (Not shown.) Upon the shaft 21 is arranged a bevel-gear 23, meshing with the gear 25 on the vertical shaft 26, which, by means of the meshing bevel-gear 27 and 28, will cause the horizontal shaft 29, which is secured in suitable bearings underneath the floor of said car, to rotate when said main shaft 21 is rotated. Upon the shaft 8 is secured the sprocket-wheel 31, and the sprocket-wheel 33 is journaled loosely upon the shaft 29. They may be of any suitable relative size, having the driving-chain 35 for imparting the motion of the shaft 29 to shaft 8 when said sprocket-wheel 33 is thrown in gear by means of the clutch 34, which is adapted to slide upon a feather or spline on said shaft 29.

Upon the outer face of the cutter-wheels 7, in radial grooves 37 thereon, are arranged a series of cutters 39, being adjustably secured to said wheels by means of bolts 40 passing through holes in the body of said wheel and through a slotted opening 41 in said cutters, and held in place by means of the nuts 42 and 43, the outer one acting as a lock-nut. The inner end 47 of the cutter 39 is preferably round and screw-threaded to receive the adjusting-nut 45. This end 47 is adapted to pass through a suitable opening 48 in the flange projection 49 on the outer face of said wheel, formed at the inner end of said groove 37, against which the adjusting-nut 45 is adapted to bear. The lower part of the cutter 39 is adapted to project beyond said wheel, and is preferably constructed of greater width than that portion secured in the groove in said wheel, in order to give greater width to cut.

One side is also preferably constructed concave and the other convex, the concavity and convexity terminating at their outer extremities in a knife-edge, which is preferably in a plane at a slight angle to that of the shaft 8, thereby forming a cutter which cuts deeper next to the rail and tends to throw the loosened ice and snow away from the rail.

In its application to an ordinary car the sprocket-wheel 33 may be arranged upon the axle of the car-truck instead of a separate shaft, as shaft 29, in which case the belt 35 and sprocket-wheel 31 are arranged, as shown. A lever 55, connected to the clutch 34 by means of the rod 56, is arranged above the floor for operating said clutch. A lever 57, secured to the shaft 18, is provided to release the dog 17 from engagement with the cross-bar 20 when it is desired to lower the cutter-wheel.

While the construction shown for imparting motion to the flanger may be modified, as above described, by connecting it to the car-truck axle by means of a sprocket-wheel and chain, other means may be used without departing from my invention, or the cutter-wheel may be secured directly to the inside of the car-wheel and adapted to rotate with the car-wheel, in which case no other motive power is necessary.

In order to remove the snow and ice from between the rails, where it would be left by the device hereinbefore described, I provide a chute 59, rigidly secured by the arms 60 and 61 to the arm 11, so that when the shaft 8 is raised or lowered the chute 59 is raised or lowered in unison therewith, and is so arranged that its forward end is just behind the cutters 39, permitting their rotation without striking said conveyer. The chute is preferably constructed in the form of a plow-share, the rear portion extending outward over the rail to secure the depositing of the snow and ice conveyed over it a sufficient distance from the rail.

I claim as my invention—

1. In a rotary flanger, the combination, with the shaft 8, of the cutter-wheel 7, having radial grooves 37 and flange 49, cutters 39, adjustably secured to said wheel in said grooves, and suitable driving mechanism for rotating said shaft, for the purpose specified.

2. In a rotary flanger, the combination, with a wheel adapted to be rotated, of a series of cutters adjustably secured thereto, said cutters having their outer ends formed with a concave and convex side terminating in a knife-edge, substantially as described, and for the purpose set forth.

3. The combination, with the body of a car, of the shaft 8, having bearings in the arms 11, pivotally secured to said car, the wheels 7, secured to said shaft, cutters 39, adjustably secured to said wheels, and suitable driving mechanism for rotating said shaft, substantially as described, and for the purpose specified.

4. The combination, with the body of a car, of the shaft 8, arms 11, forming bearings for said shaft and pivotally secured to said car-body, wheels 7, secured upon said shaft, cutters 39, adjustably secured to said wheels, chutes 59, pivotally secured to said car-body and adapted to be raised and lowered in unison with said wheels, and suitable mechanism for rotating said shaft 8, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 4th day of March, 1890.

EDWARD P. CALDWELL.

In presence of—
A. C. PAUL,
R. H. SANFORD.