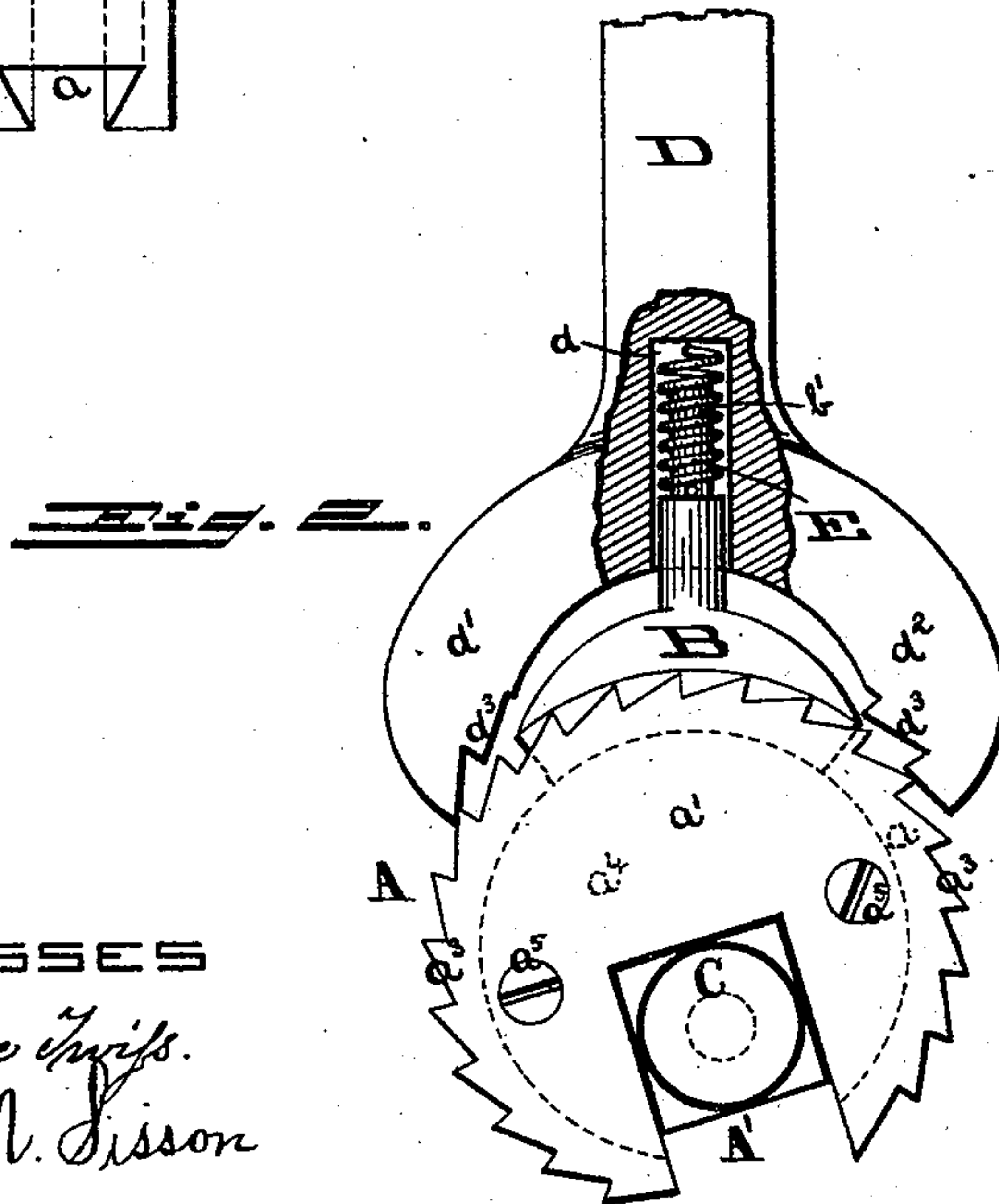
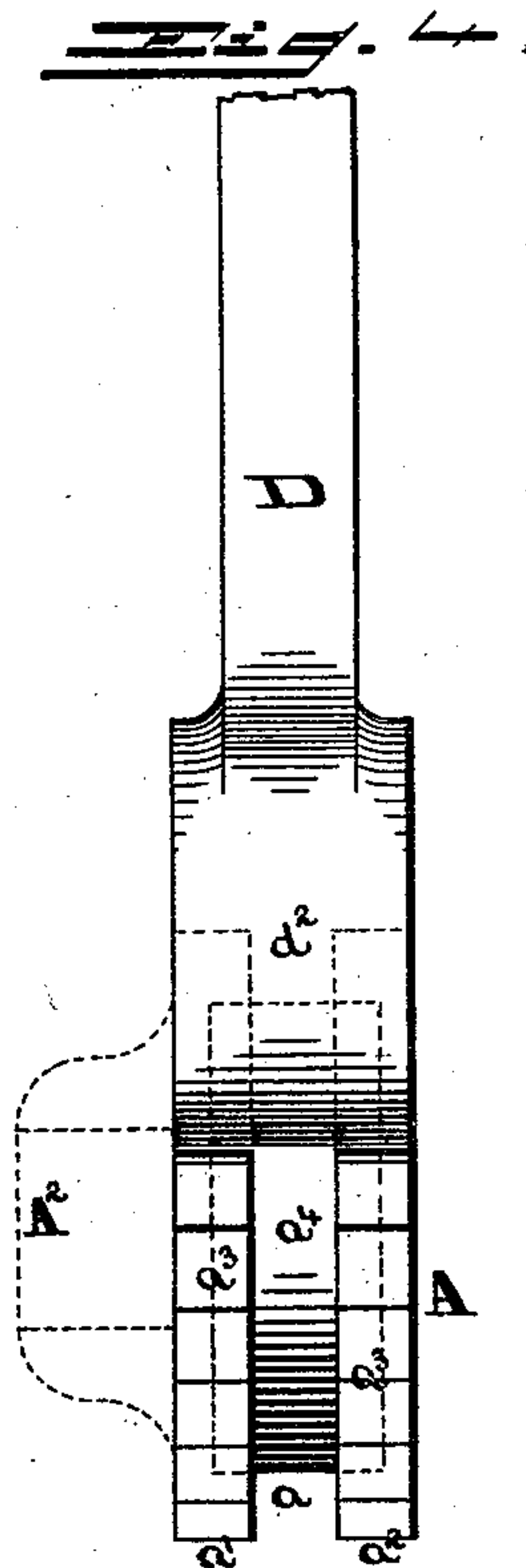
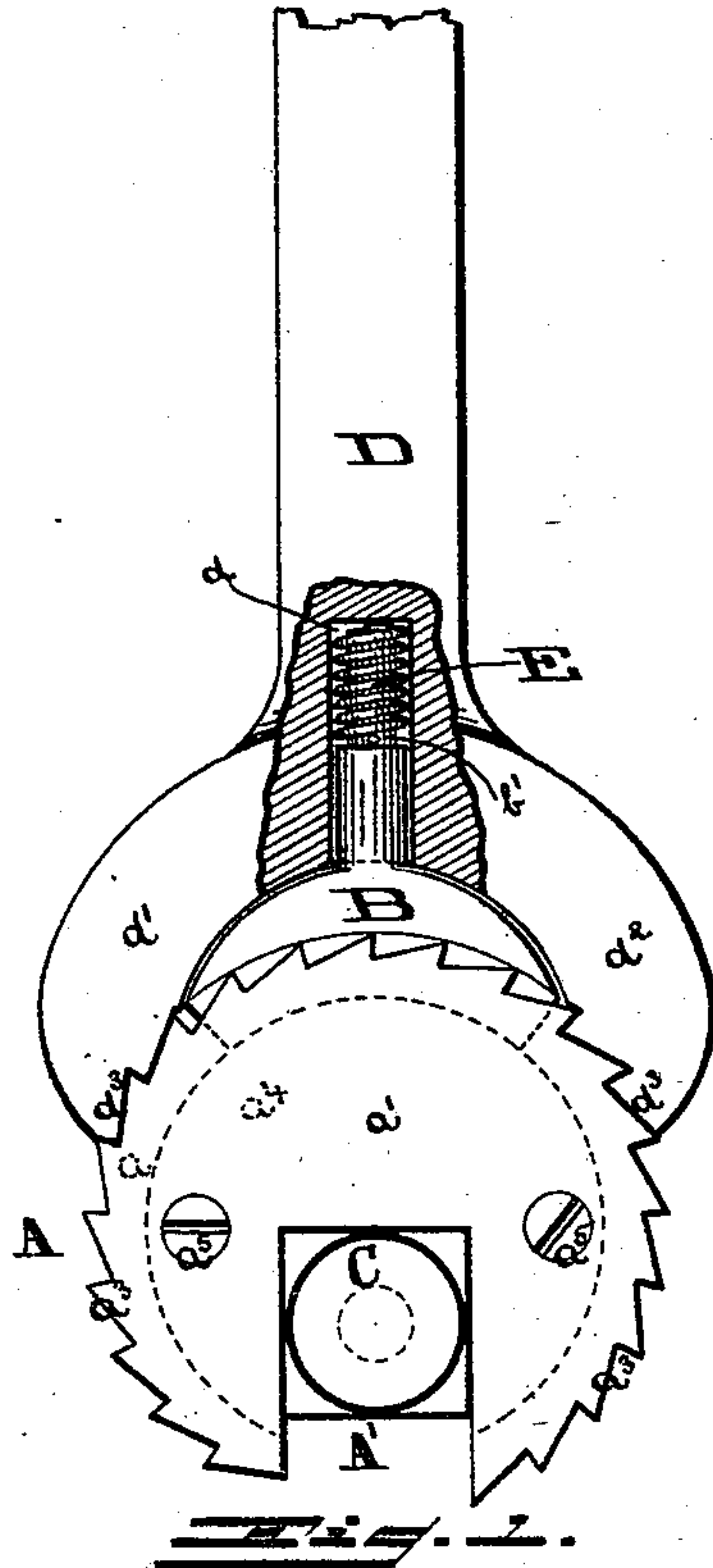
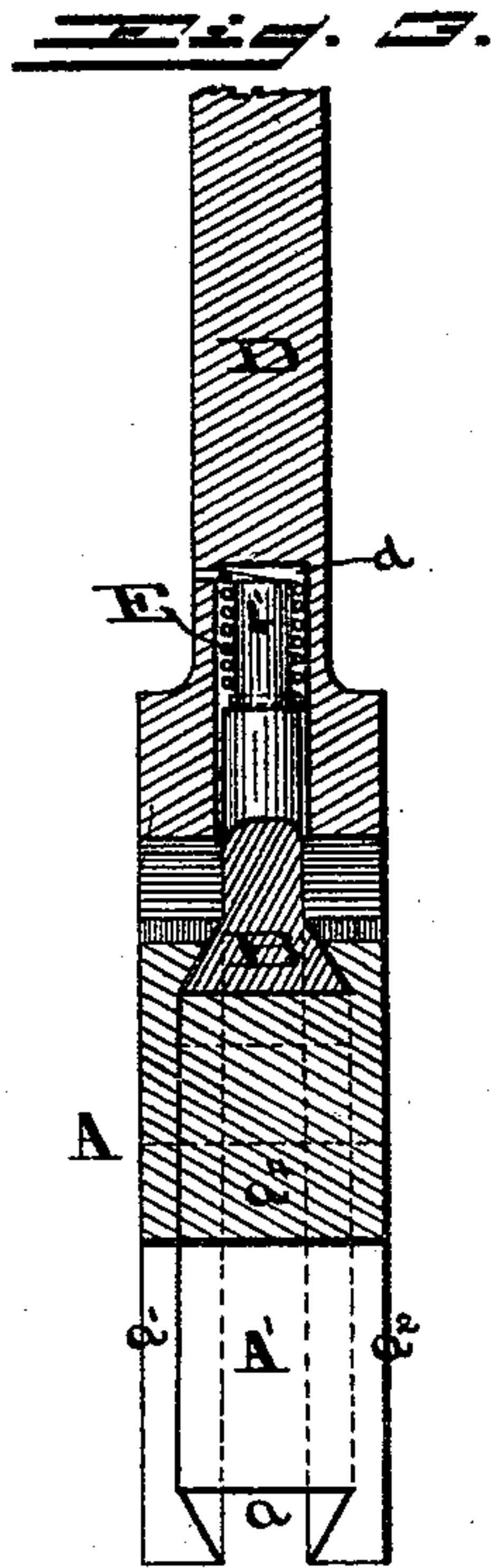


(No Model.)

J. BERNER.  
RATCHET WRENCH.

No. 455,300.

Patented July 7, 1891.



WITNESSES

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# UNITED STATES PATENT OFFICE.

JOHN BERNER, OF PHILADELPHIA, PENNSYLVANIA.

## RATCHET-WRENCH.

SPECIFICATION forming part of Letters Patent No. 455,300, dated July 7, 1891.

Application filed October 23, 1890. Serial No. 369,023. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN BERNER, a citizen of the United States of America, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Ratchet-Wrenches, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has relation to ratchet-wrenches, and has for its object to improve the construction and increase the efficiency thereof; and it consists in the details of construction and in the combinations of parts as hereinafter fully described and claimed, and as illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation, partly in section, of my invention complete and in position for use. Fig. 2 is a similar view showing a change in the relative positions of the various parts under such use. Fig. 3 is a vertical section of Fig. 1, and Fig. 4 is an edge view of the same.

Having reference particularly to the provision of a ratchet-wheel A, with a centrally-located peripheral dovetail groove  $a$  therein, and composed of two sections  $a'$   $a^2$ , with teeth  $a^3$  on their edges, the inner faces of which sections are beveled inwardly from such edges, forming the sides of said groove, and the section  $a^2$  has formed thereon on the same side as the beveled portion, a central round boss  $a^4$ , to which is secured by the screws  $a^5$  the section  $a'$ , such boss forming the base or bottom of the groove  $a$ , in which latter and on said boss is adapted to move axially, the dovetail slide B, having its under side concaved correspondingly with the circumference of the boss  $a^4$ , such slide of course being placed in its proper position before the section  $a'$  is secured to the boss, although, should it be found desirable to cast the wheel A of one piece, said slide would obtain entrance to said groove at the ends of the latter at either side of the notch or recess  $A'$  in the edge of the wheel for the reception of the bolt-head C or nut. The upper part of the slide B terminates in a square plunger  $b$ , formed with a round elongated boss or projection  $b'$ , said plunger be-

ing adapted to slide in a square socket  $d$  in the handle or lever D, and said boss being encircled by a helical spring E, the lower end of the latter being secured in an opening therefor in the boss and the upper end being secured in a similar opening in the socket or to the handle. The lower end of the handle D is formed with two oppositely-extending depending legs  $d'$   $d^2$ , of a width equal to that of the wheel A, their extremities having formed thereon teeth  $d^3$ , corresponding and normally in engagement with the teeth  $a^3$  of said wheel, such legs, on their inner edges, being of a curvature corresponding with that of the upper edge of the slide B and normally resting nest-like, in close relation therewith, being of such distance apart as to permit of their spanning the recess  $A'$ , and while the teeth of one leg are crossing said recess those of the other leg will be in operative relation with the teeth  $a^3$ , such spanning being also accomplished by the slide B, owing to its length being greater than the width of said recess  $A'$ . Obviously the shape of the slide B prevents its displacement accidentally from the groove  $a$ , and the spring E serves to draw the handle D downwardly toward such slide and to keep handle and slide in the proper relation, consequently maintaining the teeth  $d^3$  and  $a^3$  in engagement. When, however, the handle D is thrust to the side, in order to get a new purchase on the wheel for the purpose of turning the latter, and, therefore, the bolt, in which case the boss  $a^4$  serves as a journal for the handle through the medium of the slide B on said boss, the spring E will allow the legs  $d'$   $d^2$  to recede from the periphery of the wheel A sufficiently to allow the teeth of the legs to ride over those of the wheel without permitting of the complete detachment of the handle, as shown in Fig. 2, in which position the handle is prevented from turning laterally by the square plunger registering with the similarly-shaped socket  $d$ , and after said teeth have cleared each other said spring will bring the latter into engagement again with each other. Thus the spring E serves the double purpose of keeping the teeth normally in engagement and preventing the separation wholly of the



handle from the other parts of the wrench, while the handle or lever D serves the double purpose of a lever and a ratchet.

The advantage of forming the notch A' in the edge of the wheel A, instead of having a recess or opening in the center or face of the same, is that the wrench can be placed in proper relation with a bolt-head or nut in a space no larger than the depth of such head or nut, having access to the latter from the side thereof, whereas where the recess is in the face, as aforesaid, the wrench can only have access to the bolt-head or nut from the end thereof, thus requiring a space equal to the depth of the bolt-head or nut and the width of the wrench combined. The wheel A may, however, be provided in cases where it is desired to have the bolt-head or nut flush with the surface of the place in which is located the bolt or the like—for example, in screwing the nut on the end of a vehicle-wheel axle—with a projection or boss on its side, as shown in dotted lines at A<sup>2</sup> in Fig. 3, having therein a socket for reception of such nut or bolt-head.

In cases where more than one size of bolt-head or nut is to be operated, the wrench can be double-ended, or with a wheel and its appurtenances at each end of the handle or lever, similarly to an S-wrench; or, again, a number of wheels with varying sizes of notches may be provided for each handle.

What I claim, and desire to secure by Letters Patent, is—

1. In a ratchet-wrench, the combination of a ratchet-wheel having a notch or recess in its edge for reception of a bolt-head or nut, a ratchet, and a handle or lever journaled on said wheel, substantially as specified.

2. In a ratchet-wrench, the combination of a ratchet-wheel provided with a dovetail peripheral groove and a recess for reception of a bolt-head or nut, a ratchet, a dovetail slide in said groove, and a handle or lever connected to said slide, substantially as specified.

3. In a ratchet-wrench, the combination of a ratchet-wheel provided with a notch or recess in its edge for reception of a bolt-head or nut and a dovetail peripheral groove, a ratchet, a dovetail slide in said groove, and a handle or lever connected to said slide, substantially as specified.

4. In a ratchet-wrench, the combination of a ratchet-wheel provided with a dovetail peripheral groove and a recess for reception of a bolt-head or nut, a ratchet, a dovetail slide in said groove, a handle or lever, and a spring connection intermediate the latter and said slide, substantially as specified.

5. In a ratchet-wrench, the combination of a ratchet-wheel provided with a notch or recess in its edge for reception of a bolt-head or nut and a dovetail peripheral groove, a ratchet, a dovetail slide in said groove, a han-

dle or lever, and a spring connection intermediate the latter and said slide, substantially as specified.

6. In a ratchet-wrench, the combination of a ratchet-wheel provided with a peripheral groove and a recess for reception of a bolt-head or nut, a slide in said groove, and a handle or lever provided at one end with teeth for engagement with said wheel and connected to said slide, substantially as specified.

7. In a ratchet-wrench, the combination of a ratchet-wheel provided with a notch or recess in its edge for reception of a bolt-head or nut and a peripheral groove, a slide in said groove, and a handle or lever provided at one end with teeth for engagement with said wheel and connected to said slide, substantially as specified.

8. In a ratchet-wrench, the combination of a ratchet-wheel provided with a recess for reception of a bolt-head or nut and a peripheral groove, a slide in said groove, a handle or lever provided at one end with teeth for engagement with said wheel, and a spring connection intermediate said slide and handle, substantially as specified.

9. In a ratchet-wrench, the combination of a ratchet-wheel provided with a recess for reception of a bolt-head or nut and a dovetail peripheral groove, a dovetail slide in said groove, a handle or lever provided at one end with teeth for engagement with said wheel, and a spring connection intermediate said slide and handle, substantially as specified.

10. In a ratchet-wrench, the combination of a ratchet-wheel provided with a notch or recess in its edge for reception of a bolt-head or nut and a dovetail peripheral groove, a dovetail slide in said groove, a handle or lever provided at one end with teeth for engagement with said wheel, and a spring connection intermediate said slide and handle, substantially as specified.

11. In a ratchet-wrench, the combination of a ratchet-wheel provided with a recess for reception of a bolt-head or nut and a peripheral groove, a handle or lever provided at one end with teeth for engagement with said wheel and having therein a socket adjacent to said end, a slide in said groove with a plunger-like projection in said socket, and a spring connected to the latter and the former, substantially as specified.

12. In a ratchet-wrench, the combination of a ratchet-wheel provided with a recess for reception of a bolt-head or nut and a dovetail peripheral groove, a handle or lever provided at one end with teeth for engagement with said wheel and having therein a socket adjacent to said end, a dovetail slide in said groove with a plunger-like projection in said socket, and a spring connected to the latter and the former, substantially as specified.

13. In a ratchet-wrench, the combination of



a ratchet-wheel provided with a recess for reception of a bolt-head or nut and a dovetail peripheral groove, a handle or lever provided with oppositely-disposed depending  
5 toothed legs for engagement with said wheel and having therein a socket intermediate said legs, a dovetail slide in said groove with a plunger-like projection in said socket, and

a spring connected to the latter and the former, substantially as specified. 10

In testimony whereof I affix my signature in presence of two witnesses.

JOHN BERNER.

Witnesses:

R. DALE SPARHAWK,

WM. H. POWELL.