No. 615,614. Patented Dec. 6, 1898.

P. FLOOD.

BRAKE HANDLE.

(Application filed Mar. 19, 1898.)

(No Model.)

Fig. 1.

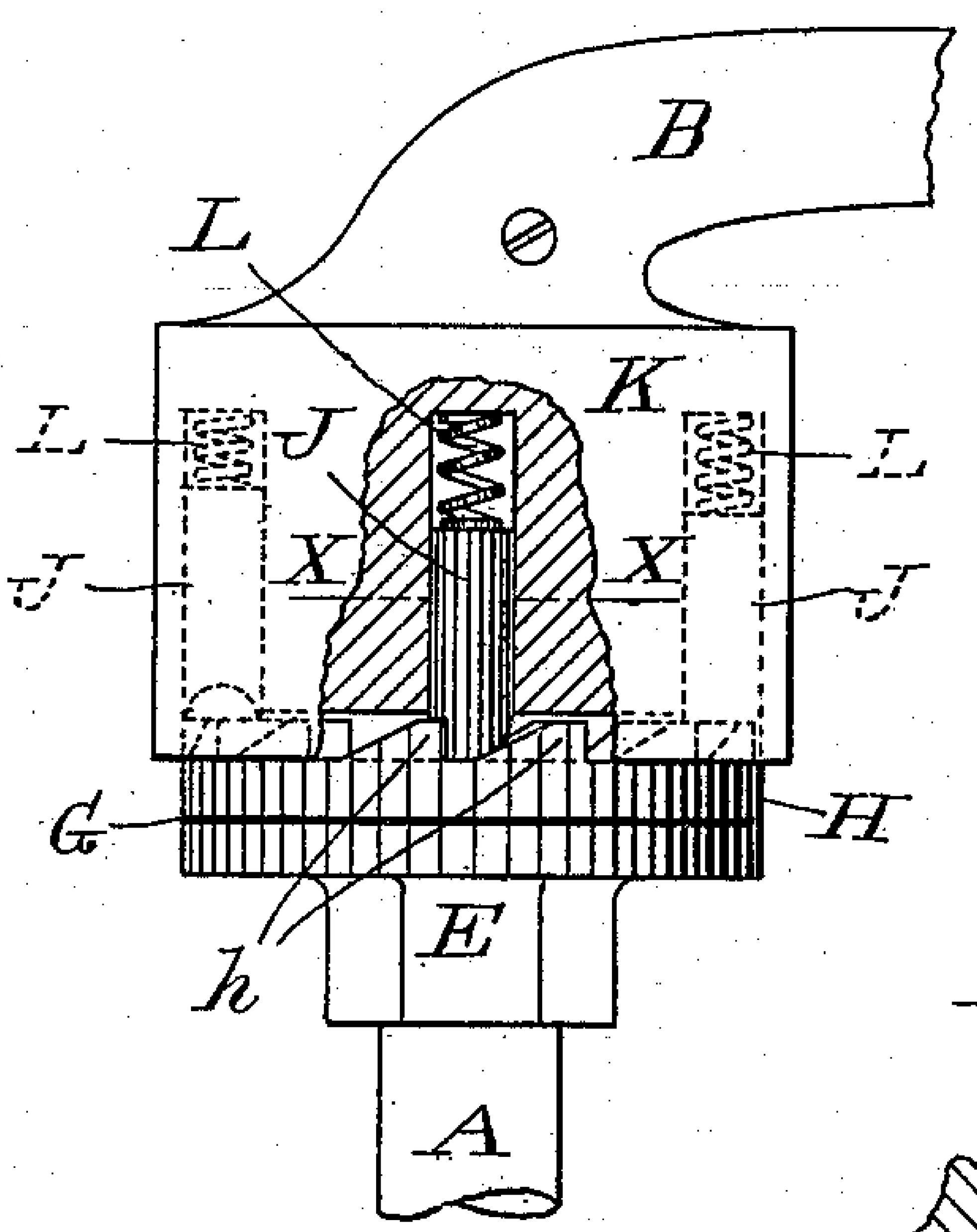


Fig. 2.

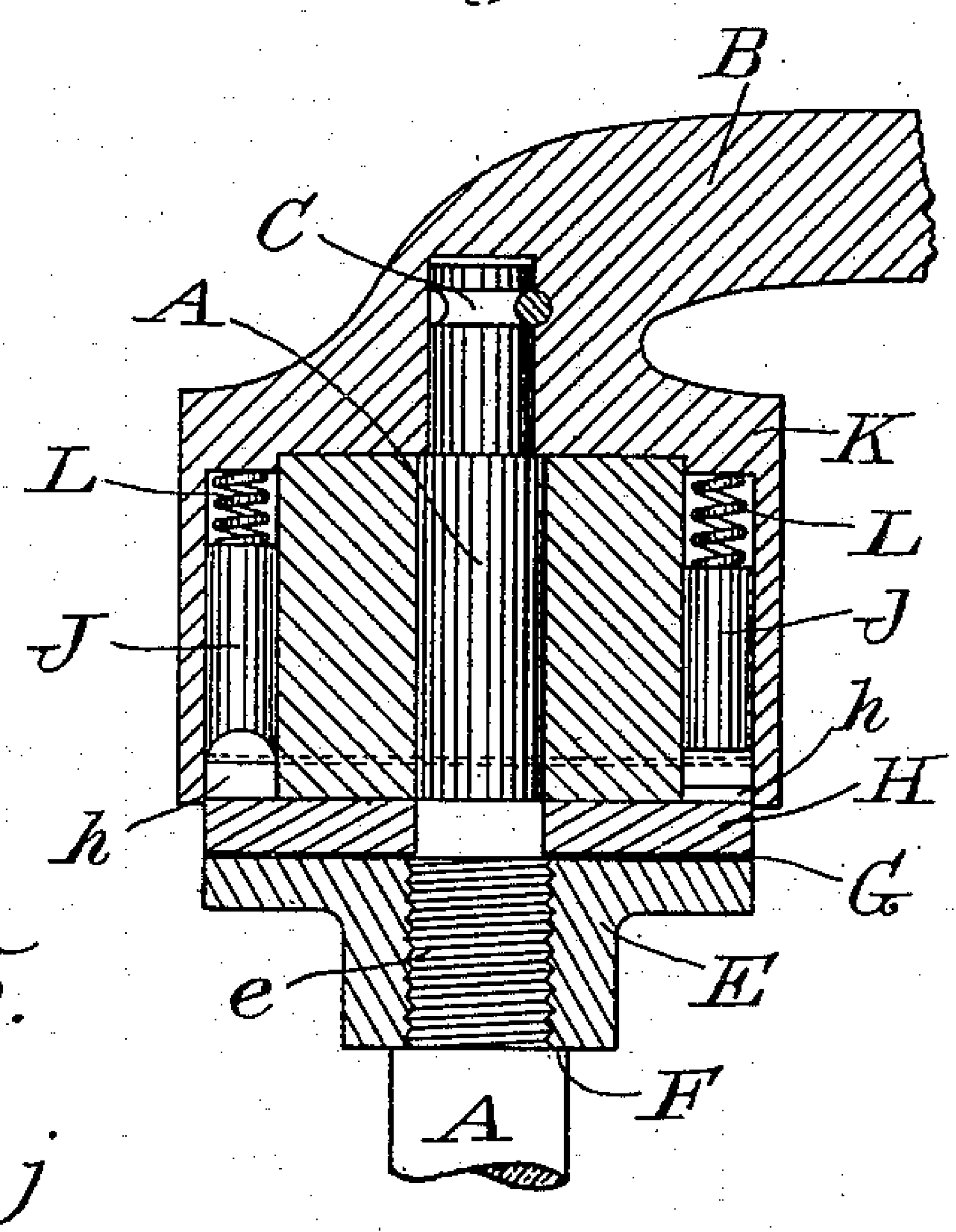


Fig. 5.

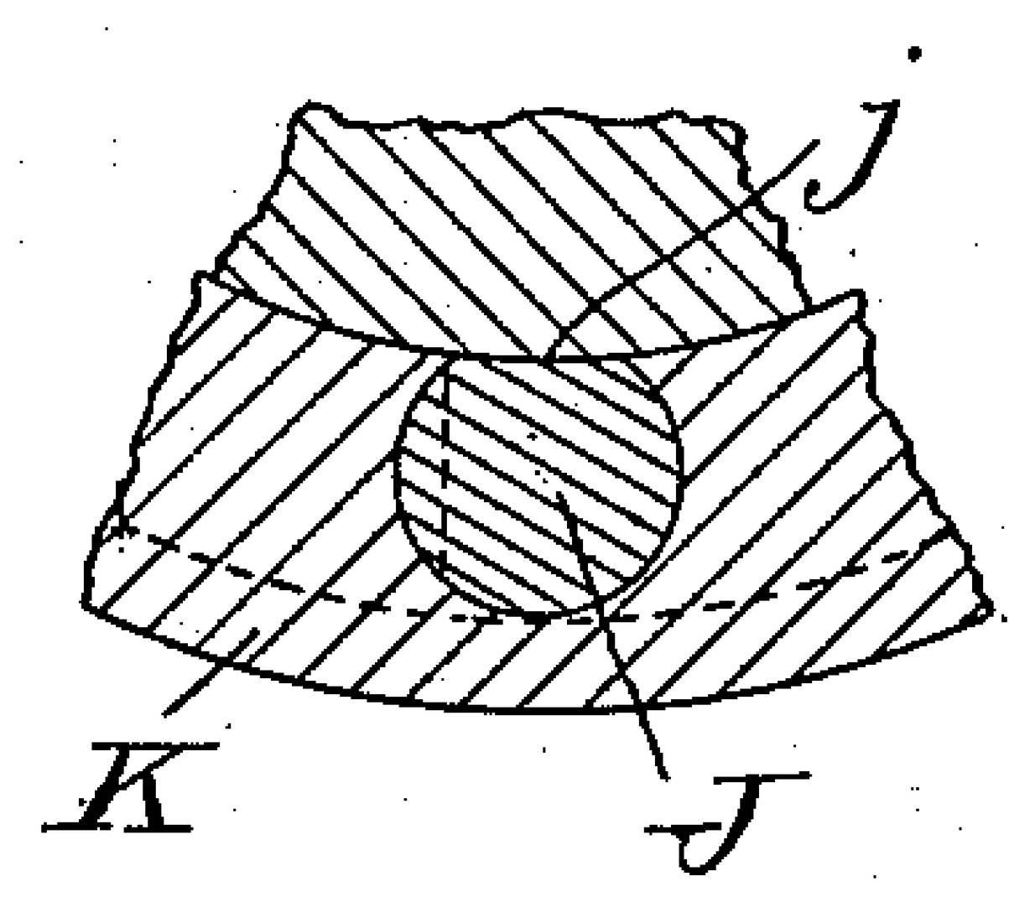


Fig. 3.

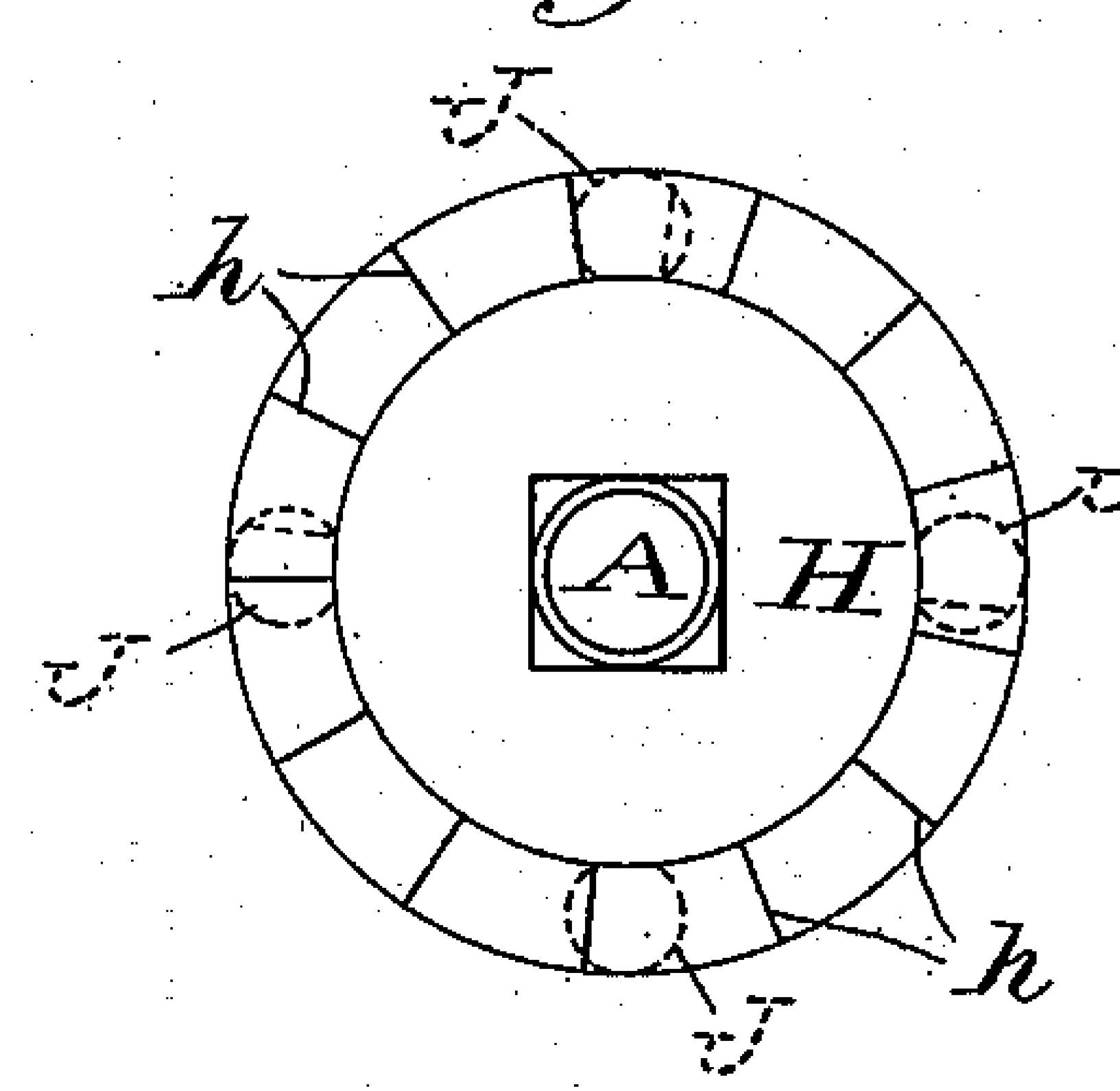
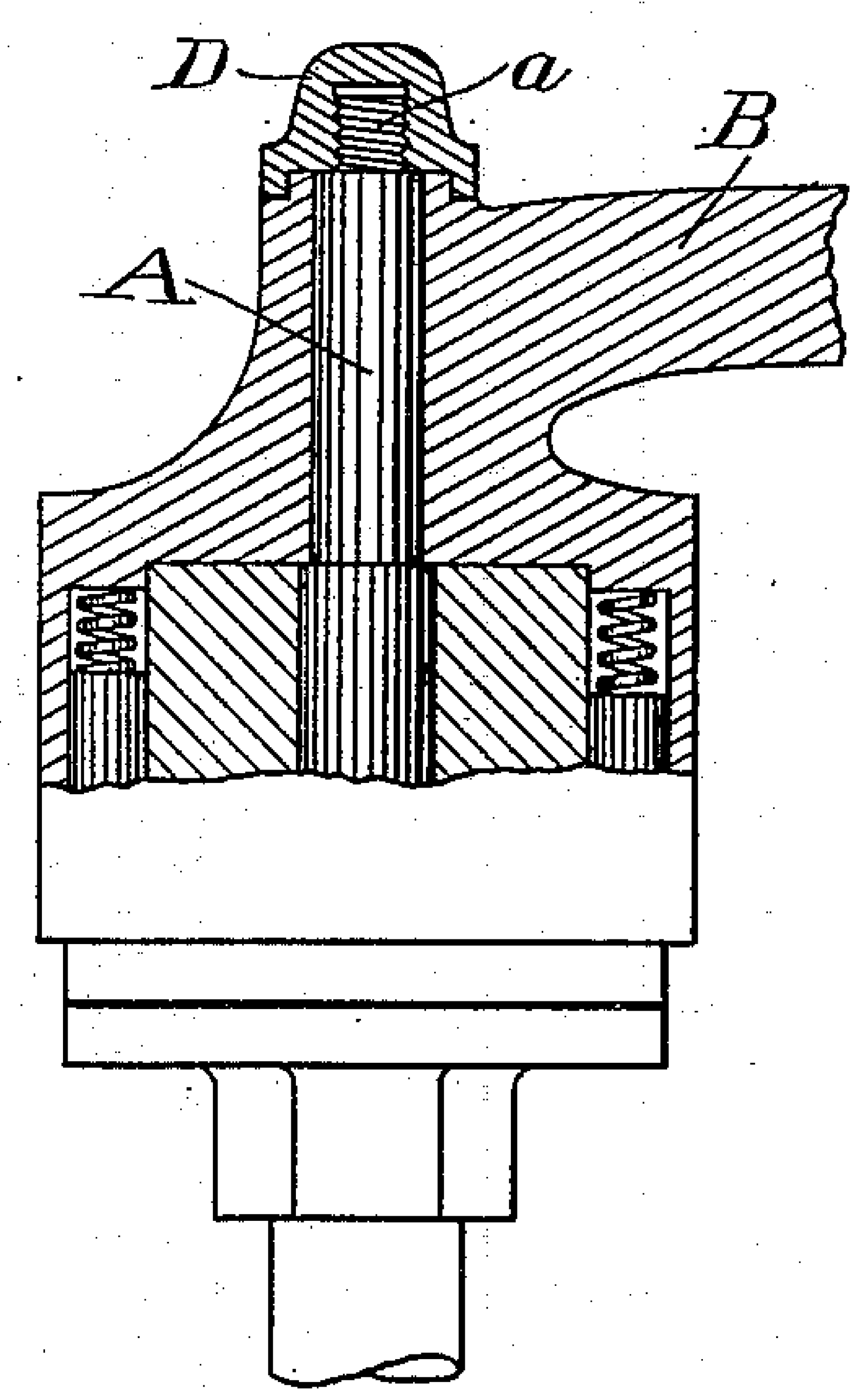


Fig. 4.



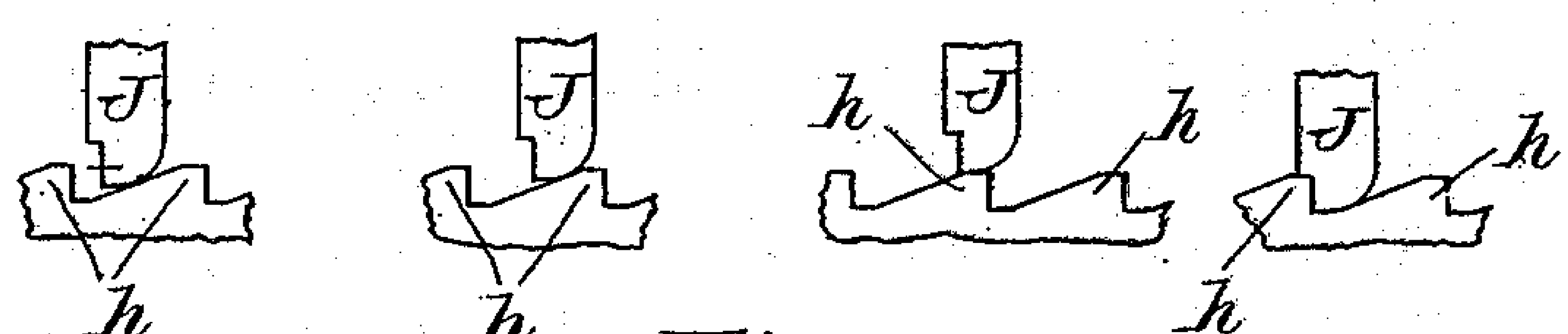


Fig. 6.

Witnesses;
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UNITED STATES PATENT OFFICE.

PATRICK FLOOD, OF ALBANY, NEW YORK.

BRAKE-HANDLE.

SPECIFICATION forming part of Letters Patent No. 615,614, dated December 6, 1898.

Application filed March 19, 1898. Serial No. 674,547. (No model.)

To all whom it may concern:

Be it known that I, PATRICK FLOOD, a citizen of the United States of America, and a resident of the city and county of Albany, State of New York, have invented certain new and useful Improvements in Brake-Handles, of which the following is a specification.

My invention relates to brake-handles particularly adapted for use on street-cars and which may be moved in one direction and operate the brake-staff or in the opposite direction, the brake-handle moving loosely upon the brake-staff.

The objects of my invention are to provide in a braking device a series of pawls and a ratchet in such a manner that but a very slight motion only may be given to the brake-handle before one of the pawls shall be in operative contact with one of the teeth of the ratchet, a plate carrying the ratchet adapted to be removed and adjusted quickly, a brake-staff arranged to be held securely and positively in connection with the brake-handle, and the elements and combinations hereinafter particularly described and claimed. I accomplish these objects by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is an elevation with a part broken away. Fig. 2 is a vertical section. Fig. 3 is a plan of the ratchet-plate. Fig. 4 is an elevation, partly in section, in a modified form. Fig. 5 is a section along the lines X X on Fig. 1. Fig. 6 is a diagrammatic view showing the position of the pawl in reference to the teeth of the ratchet.

Similar letters refer to similar parts throughout the several views.

In order that there may be a positive engagement between the ratchet and the pawls in a brake-handle of the type herein described, it is advisable to place a spring in connection with the pawl for the purpose of insuring engagement. The quick movement to which the handle is often subjected will prevent the positive connection between the pawl and the ratchet unless there is an arrangement made for keeping the pawls in such position that they are obliged to engage with the slightest movement of the handle. It is also advisable to arrange the pawls and ratchet in such a manner that the ratchet shall be of the largest diameter possible, in this way giving a better purchase for the pawl. In order to accomplish these results and thus have a brake-handle in which the "bite" is positive, I have arranged the mechanism illustrated in the accompanying drawings, in which—

A represents the brake-staff, which may be secured to the brake-handle B by means of a screw passing through the brake-handle B and engaging with a groove C in the brake-staff, near the end thereof, as shown in Fig. 2, or the brake-staff A may pass through the brake-handle B and be provided at its end with a threaded portion *a*, upon which is a nut D. The threaded portion *a* is preferably provided with a left-hand thread to prevent a loosening of the brake-staff during the operation of the brake-handle. On the brake-staff A, beneath the handle B, I place a plate E, which screws on the brake-staff, being provided with threads to engage with threaded portion *e* of the brake-handle and preferably resting upon a collar F on the staff A. On the plate E, I usually place a washer G, preferably constructed of rawhide, asbestos, or any suitable material, its function being to deaden the noise attendant upon the engaging of two metallic plates, and upon the washer is placed the ratchet-plate H, the staff A being squared to admit of the engagement of the square opening in the ratchet-plate H, as shown in Fig. 3.

For the purpose of engaging with the teeth *h* of the ratchet-plate H, I arrange a series of pawls J, arranged in openings cored out of the depending cylindrically-formed portion K of the brake-handle B, and to insure engagement between the pawls and the teeth of the ratchet I place a spring L at the end of each pawl. I arrange the number of the pawls in reference to the number of the teeth on the ratchet-plate in such a manner that they will be unequal—that is, if the number of teeth is an even number then the number of pawls should be an odd number, and vice versa—and I make the pawls equidistant from each other and the teeth equidistant from each other. I prefer to arrange thirteen teeth on the ratchet-plate and but four pawls. In this arrangement when one of the teeth *h* is in engagement with a pawl J, as shown in the

right-hand portion of diagrammatic Fig. 6, the next pawl is in the position in reference to the teeth as shown in the next adjacent portion of said diagrammatic Fig. 6, being in position to drop immediately in contact with the tooth of the ratchet, when the movement of the brake-handle would remove the pawl already engaging with one of the teeth. The positions of the other pawls are illustrated in the remaining portions of said diagrammatic figure.

In order that the pawls shall not revolve or become loose in their setting, I square one side of each pawl, as shown in Fig. 5 at *j*.

In order to decrease the expense of the manufacture of the brake-handle, instead of making the portion between the edges of the depending part K of brass I may fill that part with a cheaper material, which will answer every purpose and greatly reduce the expense in manufacture. When this construction is used, I preferably arrange the boring of the housing for the pawl, leaving a squared part on one side of the pawl to engage with the filling in the ends of the handle. I do not, however, limit myself to this manner of constructing the depending portion of the handle, since there are many ways of obtaining that result which would not materially change my invention.

By arranging the ratchet-plate in such a manner that it may be removed very quickly by being placed upon the brake-staff and kept from revolving, because of square opening engaging with square portion of brake-staff when any accident occurs, such as the breaking of a tooth, a new ratchet-plate may very quickly be put in position without delaying the car. This is an important part of my invention. By arranging for the passage of the brake-staff through the handle and securing by a nut the brake-staff to the handle I make a much more secure fitting than is done when a screw is placed in the side of the handle engaging with a groove near the end of the brake-staff, as is the common practice. In that case the handle is held on only one side of the brake-staff and the strain comes all in one portion of the brake-staff. Very often there is a wear and sometimes a breakage, from which occasions loss of time, great inconvenience, and much damage. By my arrangement (shown in Fig. 4) the brake-staff is held positively in position and is less liable to breakage or disarrangement than in the devices heretofore used, as far as I am aware.

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

1. In a brake-handle, a series of pawls, springs adapted to operate said pawls, with a brake-staff, movably secured to said handle, a ratchet-plate carried by said brake-staff, a washer beneath said ratchet-plate, with a supporting-plate secured to said brake-staff, all substantially as described and for the purposes set forth.

2. The combination of a brake-handle, a brake-staff provided at one end with a threaded portion, the brake-staff secured to said brake-handle by means of a nut engaging the said threaded portion, a ratchet-plate carried by said brake-staff, a series of pawls carried by said brake-handle, springs to operate said pawls, the number of pawls in reference to the number of teeth on said ratchet-plate being odd when the number of teeth is even, or vice versa, all substantially as described.

Signed by me, at Albany, New York, this 8th day of March, 1898.

PATRICK FLOOD.

Witnesses:
FREDERICK W. CAMERON,
MARY E. PARLATI.