

(No Model.)

2 Sheets—Sheet 1.

J. PATON.

PROTECTING DEVICE FOR ROLLING MILLS.

No. 388,440.

Patented Aug. 28, 1888.

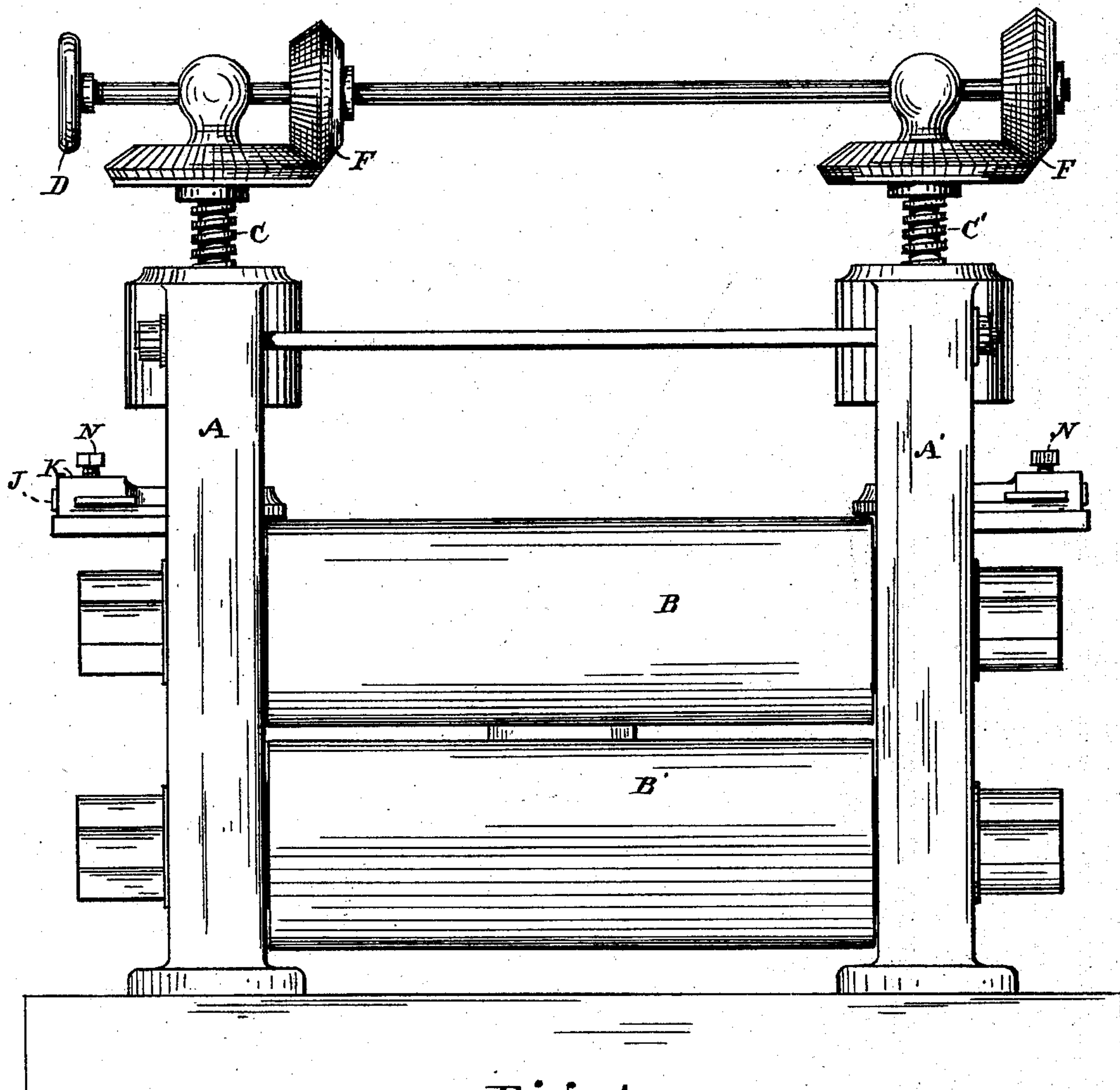


Fig. 1

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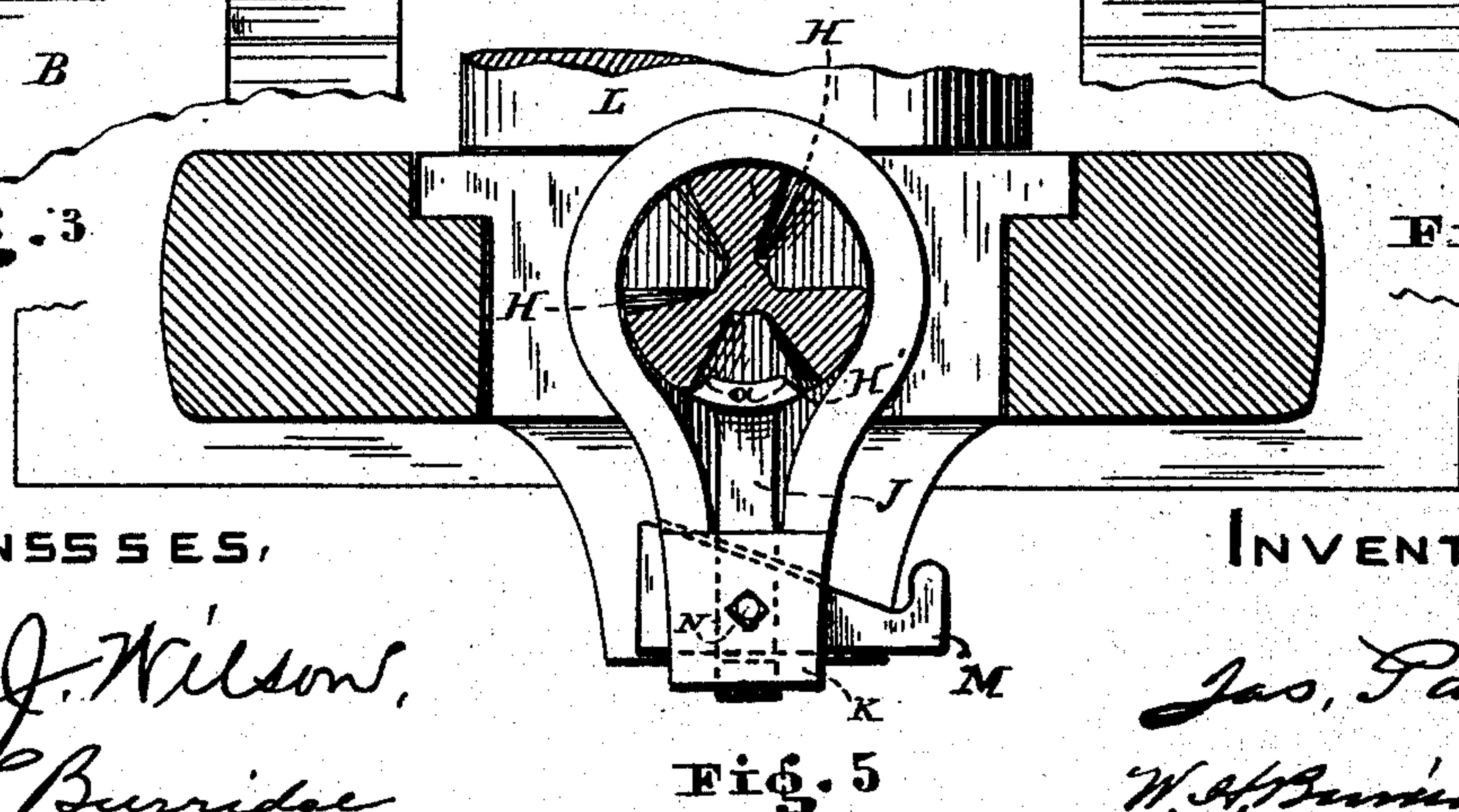
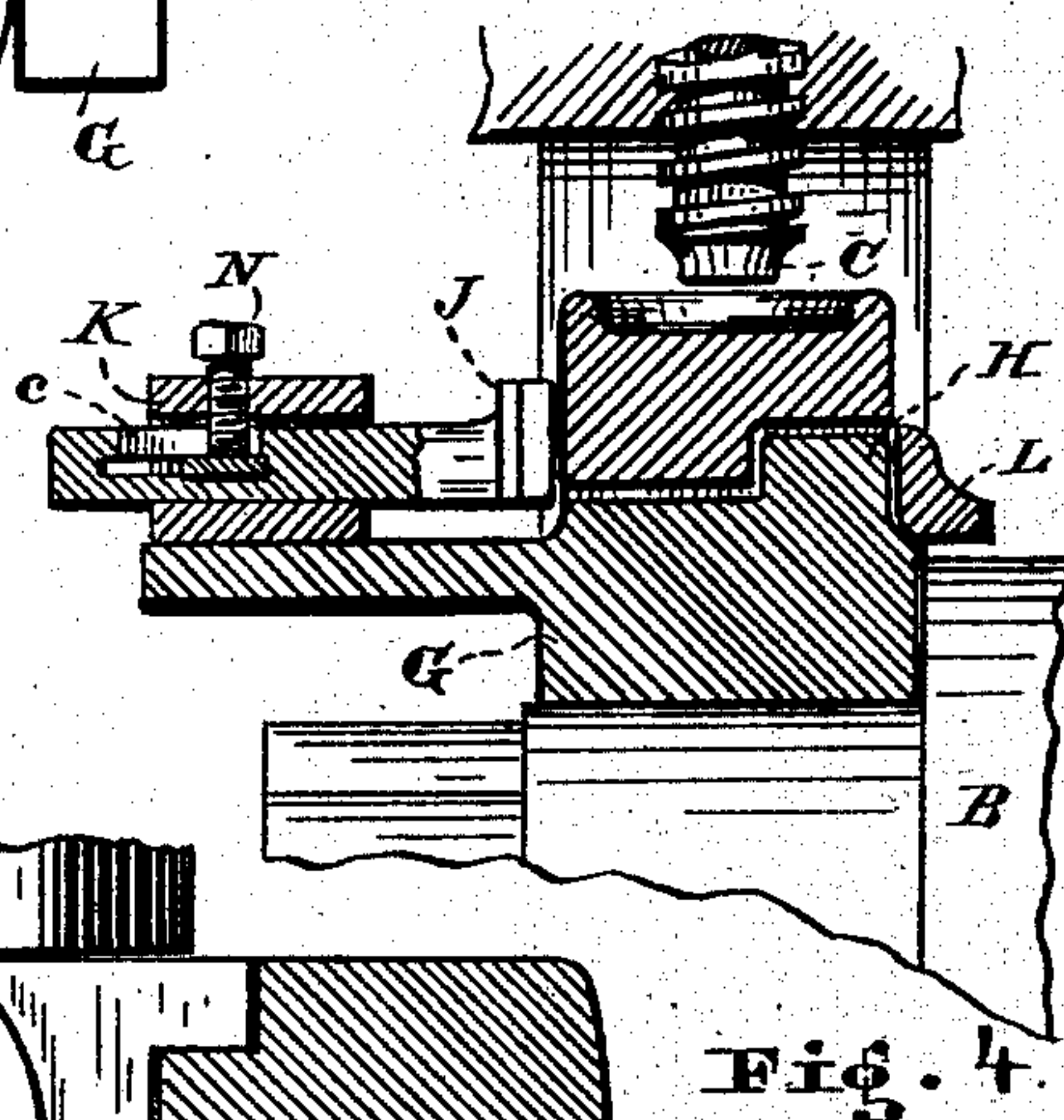
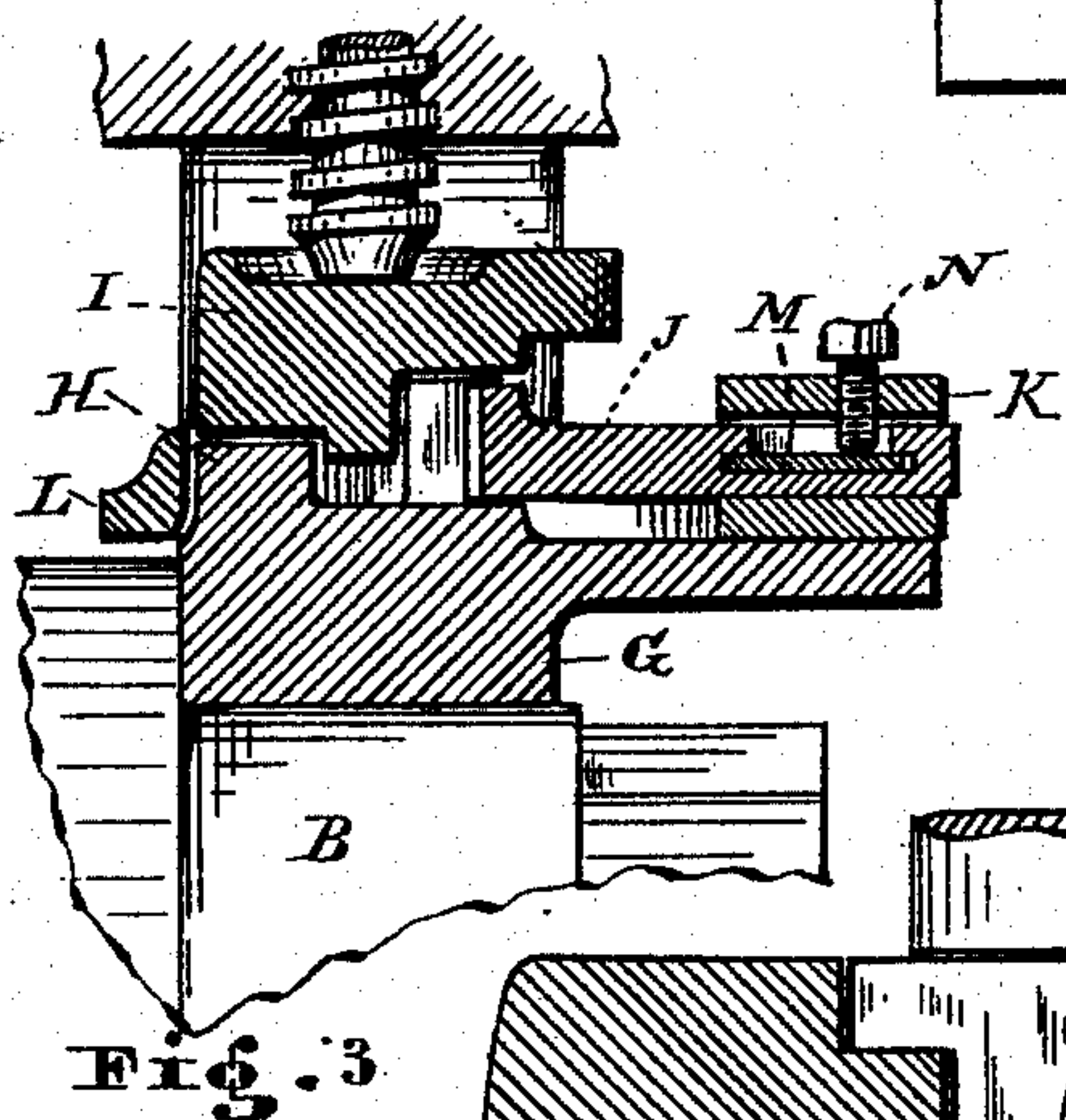
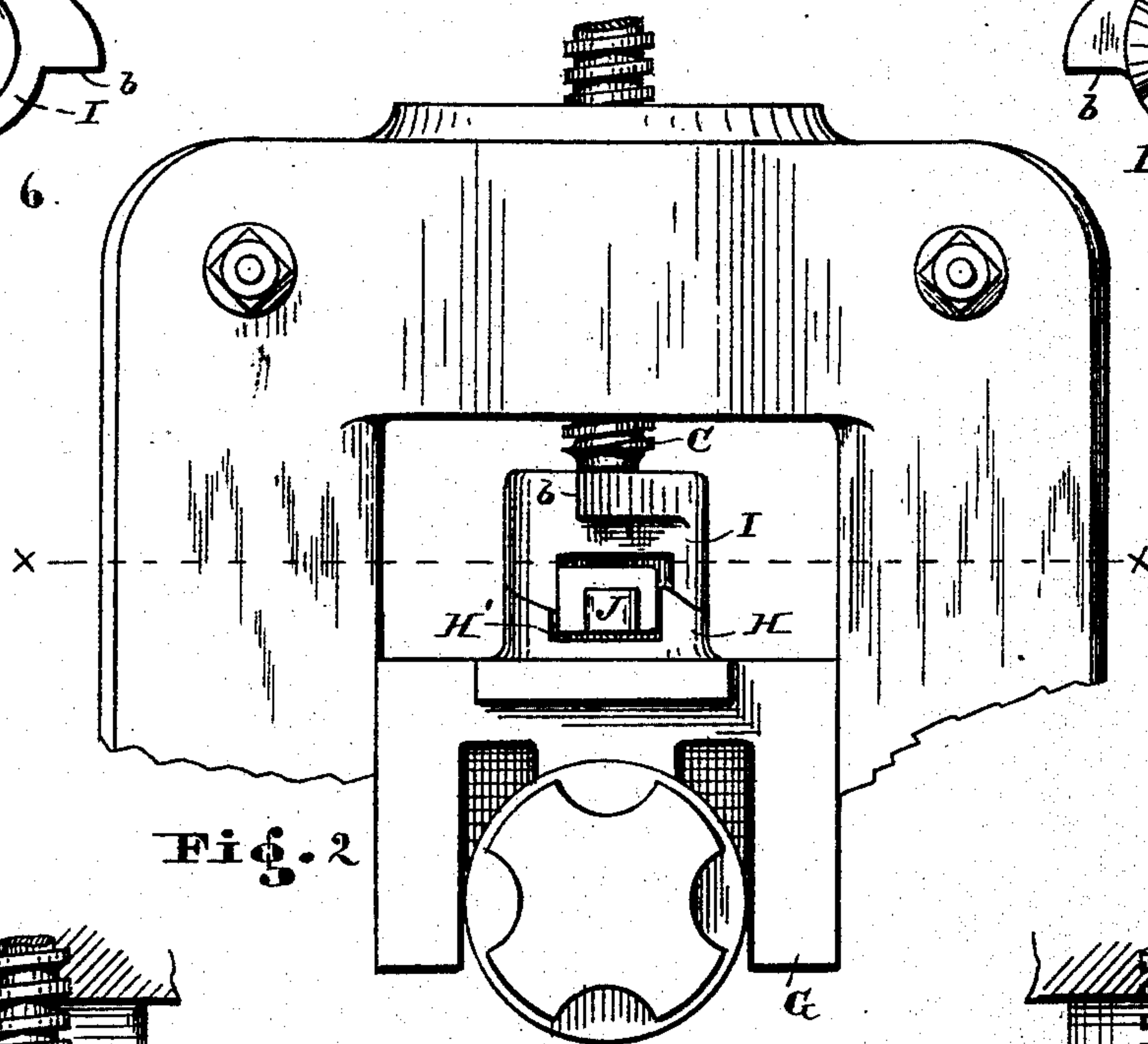
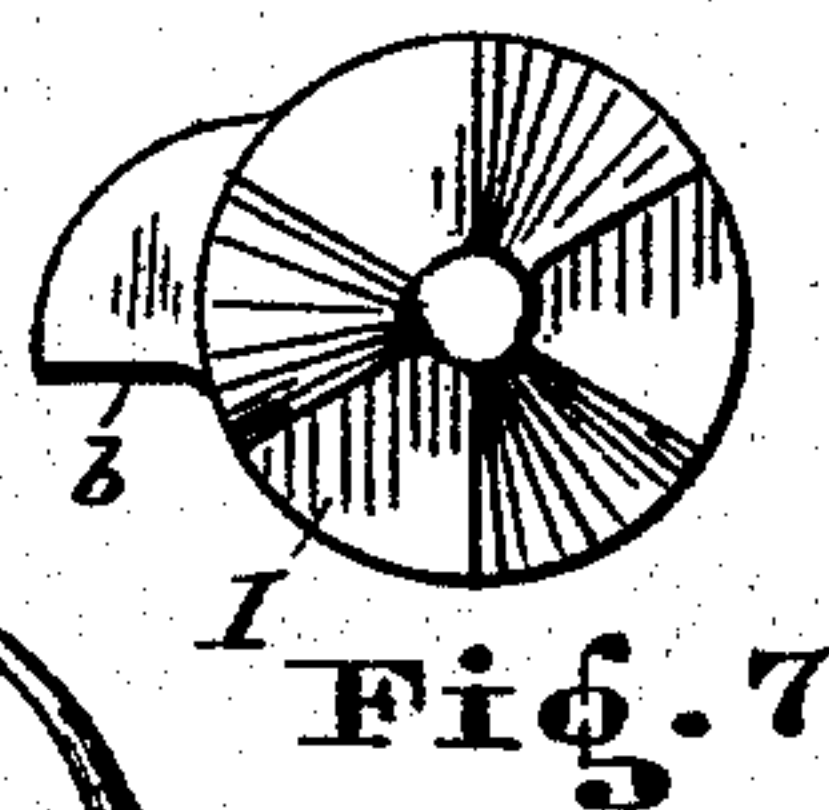
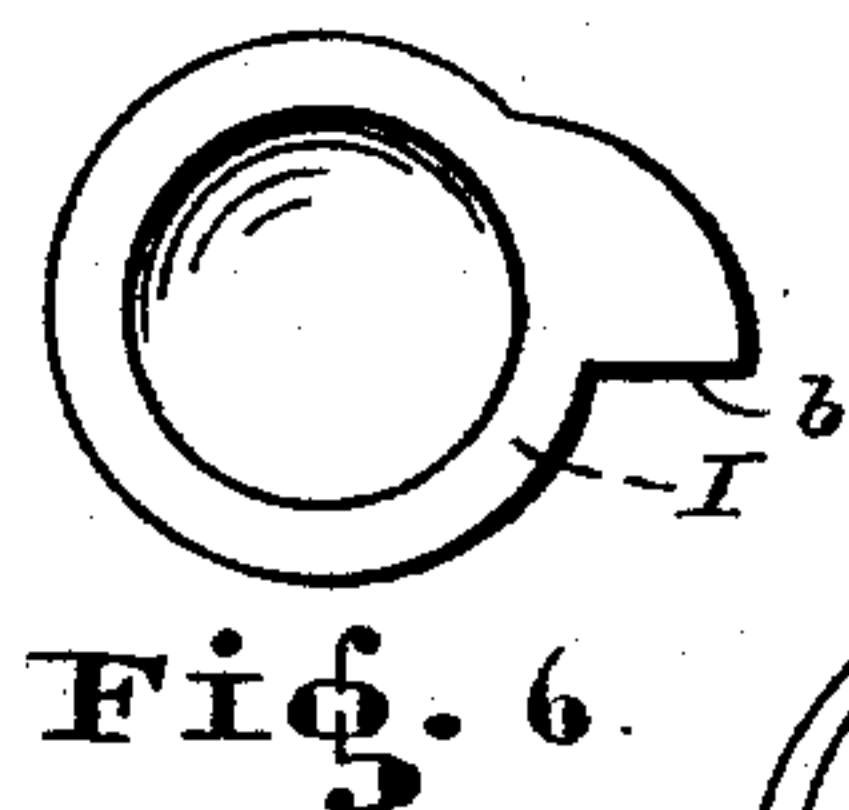
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UNITED STATES PATENT OFFICE.

JAMES PATON, OF CLEVELAND, OHIO.

PROTECTING DEVICE FOR ROLLING-MILLS.

SPECIFICATION forming part of Letters Patent No. 388,440, dated August 28, 1888.

Application filed June 28, 1888. Serial No. 278,427. (No model.)

To all whom it may concern:

Be it known that I, JAMES PATON, a resident of Cleveland, in the county of Cuyahoga and State of Ohio, United States of America, have invented a certain new and useful Protecting Attachment for Plate-Mill Rolls; and I do hereby declare that the following is a full, clear, and complete description thereof.

My invention relates to the means for relieving the rolls of plate-mills from undue strain in the event of accidents—such as the breaking down of driving-shafts or pinions—causing stoppage of the train while hot iron or steel is between the rolls.

The improvement consists of an adjusting device (in a vertical direction) interposed between the bearings of the rolls and the screws in the housing.

That the improvement may be fully understood reference will be had to the annexed specification and accompanying drawings.

Figure 1 is a front elevation of a set of plate-mill rolls provided with the attachment or device above referred to. Fig. 2 is a partial side view of said mill and a face view of said device. Fig. 3 represents a longitudinal vertical section of said device and parts of the rolls and housing, showing the different parts of said device when the rolls are at work or ready for work. Fig. 4 shows said parts relieved from contact with the screw. Fig. 5 is a horizontal section of Fig. 2 on line *x x*. Figs. 6 and 7 represent face views of a part of said device.

Like letters of reference refer to like parts in the drawings and specifications.

For illustration, a mill of two rolls only is represented in Fig. 1. The improvement, however, may be applied equally as well in a set of three-high rolls.

A A' designate the housings, and B B' the rolls, which are journaled in bearings of the usual construction within said housings.

C C' are the screws for setting said bearings or rolls, respectively. These screws are threaded in the upper part of the housings, and are operated simultaneously by means of the hand-wheel D and the intermediate sets of bevel-gearings F and F', as seen in Fig. 1. For ordinary use these means are sufficient for either raising or lowering the spindles; but

should it accidentally occur that the mill be stopped while the hot iron is yet between the rolls then pressure under which the rolls and their bearings are held apart causes so great a force against the screws that extra provisions are needed to relieve the said rolls; if not, they would become cracked or so bent as to render them useless for future service. It is of vital importance that the pressure on the rolls should be relieved immediately by simple and reliable means in order to prevent injury of the rolls, to which they are liable from the heat of the iron between them.

As seen in Figs. 2 and 3, the bearings G of the upper roll, B, have on top thereof segmental cams H, which are radially arranged so as to form segmental notches by and between said cams. Correspondingly with the cams and notches of the bearing H the under side of the cap I is formed. Thus the cams of the cap will fit into the notches of the bearing, and vice versa. The pitch or inclined face of the cams of either part is the same and sufficiently acute to cause the cap when set upon the bearing to seat itself in the notches thereof. The key J is inserted into the front notch, H', Figs. 2 and 5, to retain the cap in a position, as shown in Figs. 2 and 3—that is, having the cams of the cap bearing upon the cams of the bearing G.

The key above referred to is guided in the sleeve K of the loop L, which loop embraces the cams of the bearing G and rests upon the same and on a flange projecting laterally from the bearing G. Transversely through the sleeve K and key J extends a slot arranged, in which is the wedge M, Figs. 3 and 5. By means of the set-screw N the wedge M and key J are held in a locked condition—that is, if the wedge M is set, as shown in Figs. 3 and 5, and the set-screw N tightened, the key J will be retained in the position as indicated in said figures, and the screws C will act upon the cap I while the same is held in an elevated position by said key J.

The taper at the side of the head *a* of the key J and the taper of the wedge M will allow the key J to be forced back by the cap I if the set-screw N is loosened. Therefore if it should become essential that the rolls be released all that is necessary is to loosen up the set-screw

N and the cap will descend into the notches of the bearing G, as shown in Fig. 4, which results in obtaining clearance between the screw and cap, and in consequence thereof relief for the rolls.

Fig. 6 represents an upper face view of said cap, and Fig. 7 a view of the under side thereof. From the side of said cap projects the lug *b*, by means of which the cap could be started by the blow of a hammer—that is, if for some reason the cap should refuse to turn and descend when desired the vertical slot *c* allows the key J to slide forward and backward, while the set-screw N extends into the same to control the movement of the wedge M.

That the notches and cams of the bearing and cap may be clearly seen the loop L is omitted in Fig. 2.

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

1. In combination with a set of rolls, the face of the upper bearing provided with cams, a cap with corresponding cams arranged upon said bearing, a key inserted in one of the cavities formed by the notches thereof, and means for holding said key, with the cams bearing

one upon the other and subjected to the action of the screw in the housing, substantially as and for the purpose set forth.

2. In combination with a set of rolls, the bearing G, provided with cams, the cap I, having corresponding cams, of the loop L, supported by said bearing and surrounding the cams thereof, the key J, guided in said loop, the wedge M and set-screw N, for retaining said key within the cavities formed by said cams, substantially as and for the purpose set forth.

3. The loop L, terminating in a sleeve having a horizontal slot extending through said sleeve for the displacement of a wedge, M, said wedge acting upon the key J and the set-screw N upon the wedge, in combination with the cap I, interposed between the bearing G and the screw C, substantially as described, and for the purpose specified.

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

JAMES PATON.

Witnesses:

W. H. BURRIDGE,
B. F. EIBLER.