

(No Model.)

3 Sheets—Sheet 1.

S. NICHOLSON.  
MACHINE FOR CLEANING FILES, &c.

No. 547,445.

Patented Oct. 8, 1895.

Fig. 1

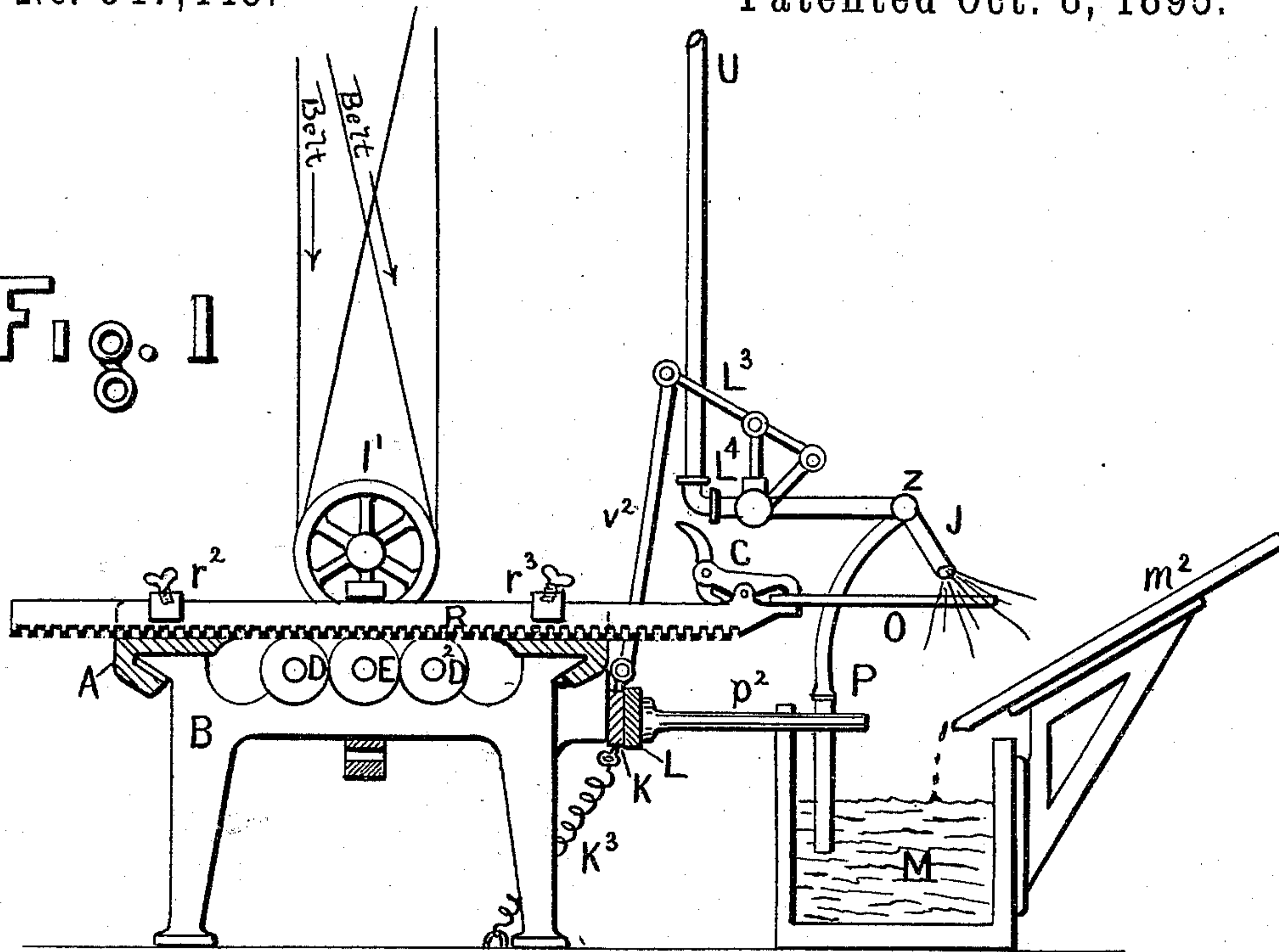
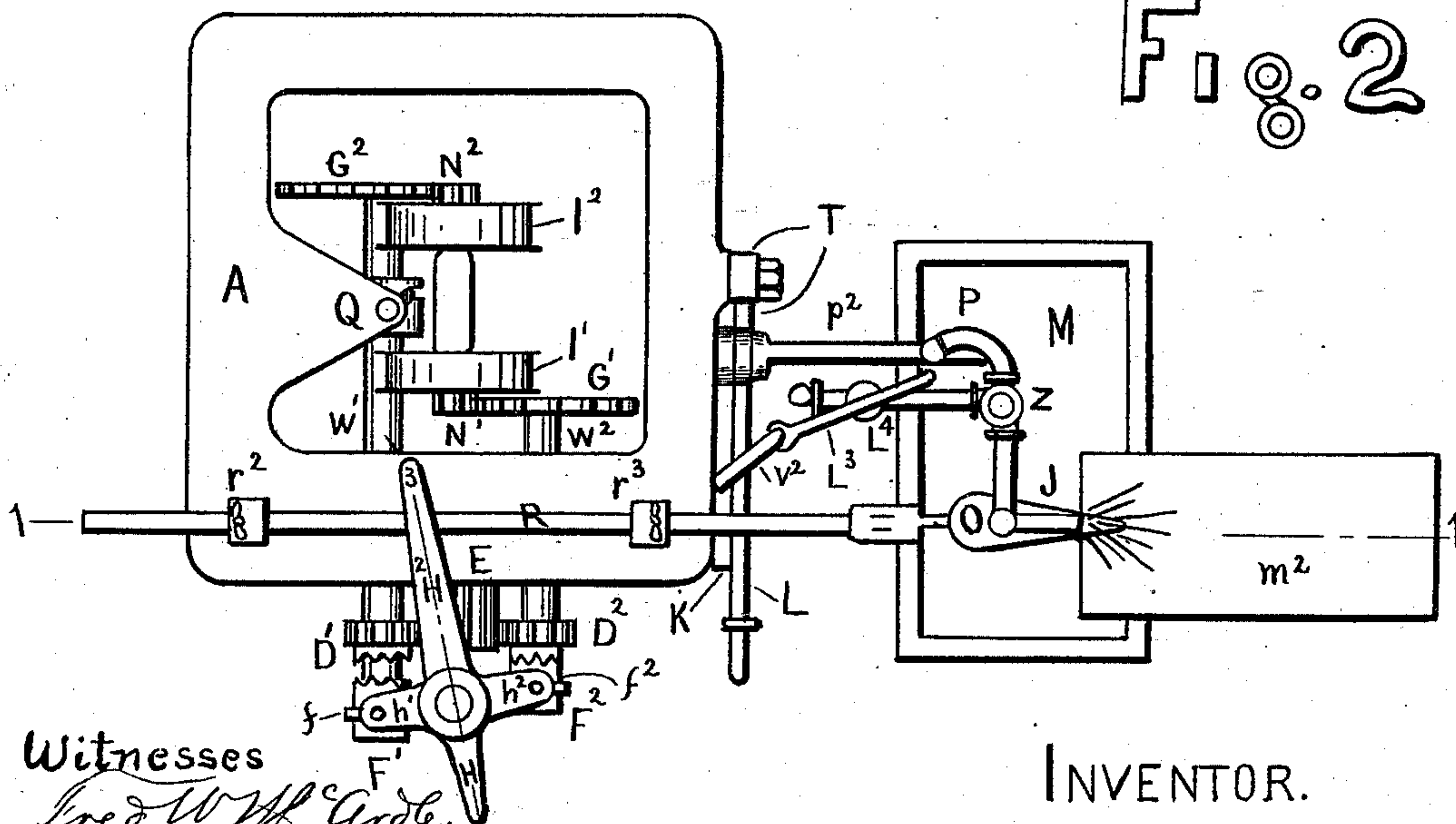


Fig. 2



Witnesses

*Edw. W. Ardy.*  
*Edw. Beach.*

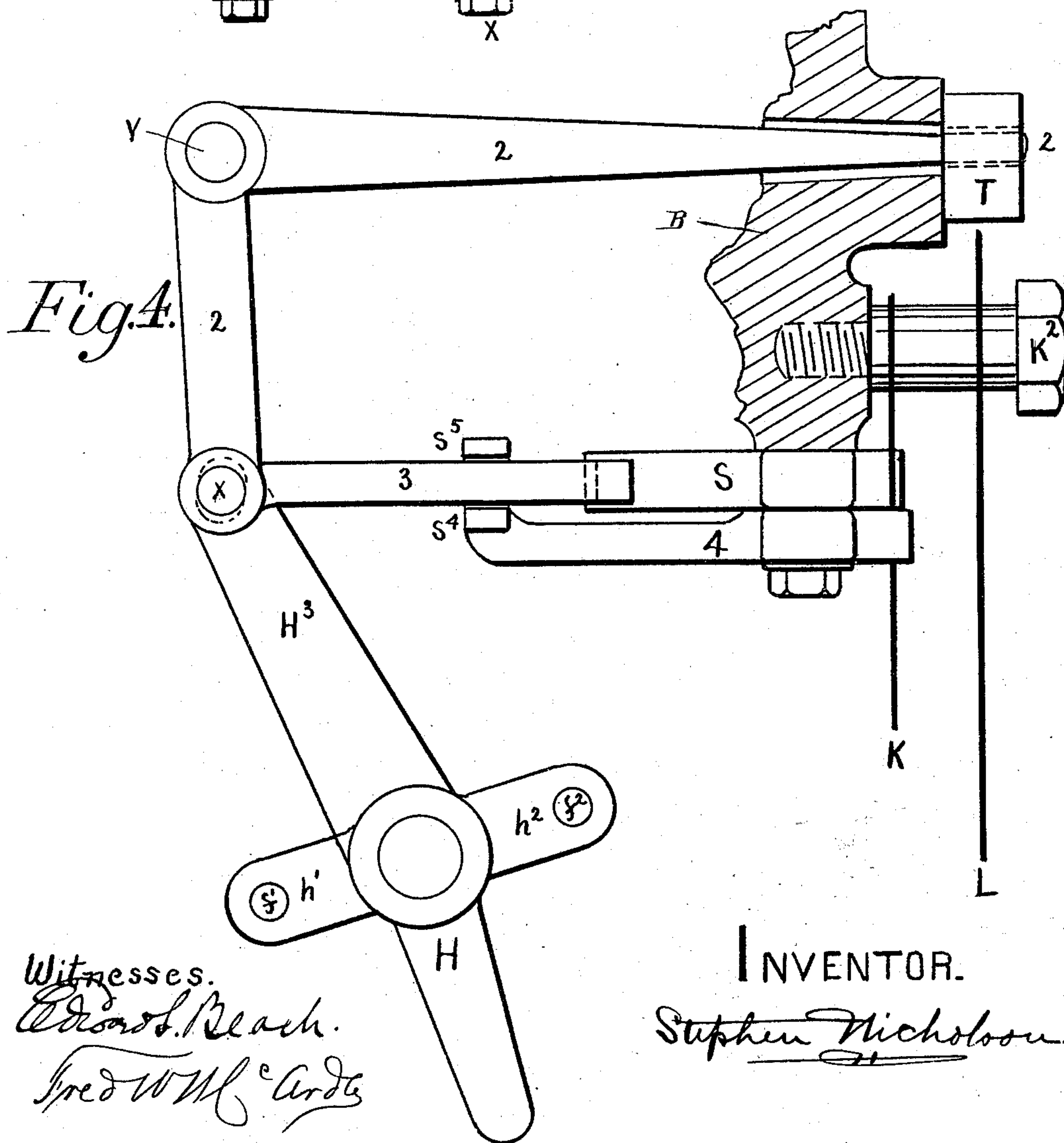
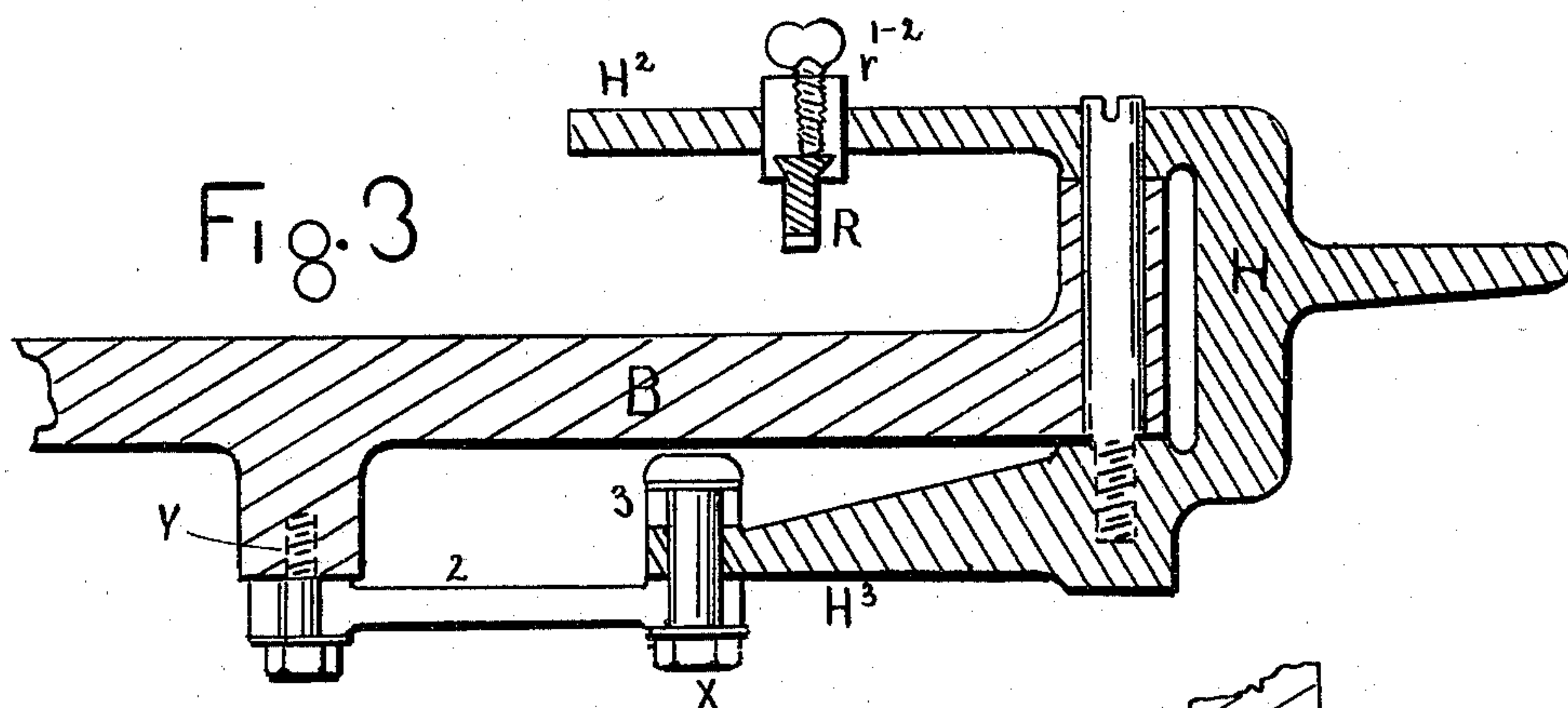
INVENTOR.

*Stephen Nicholson*

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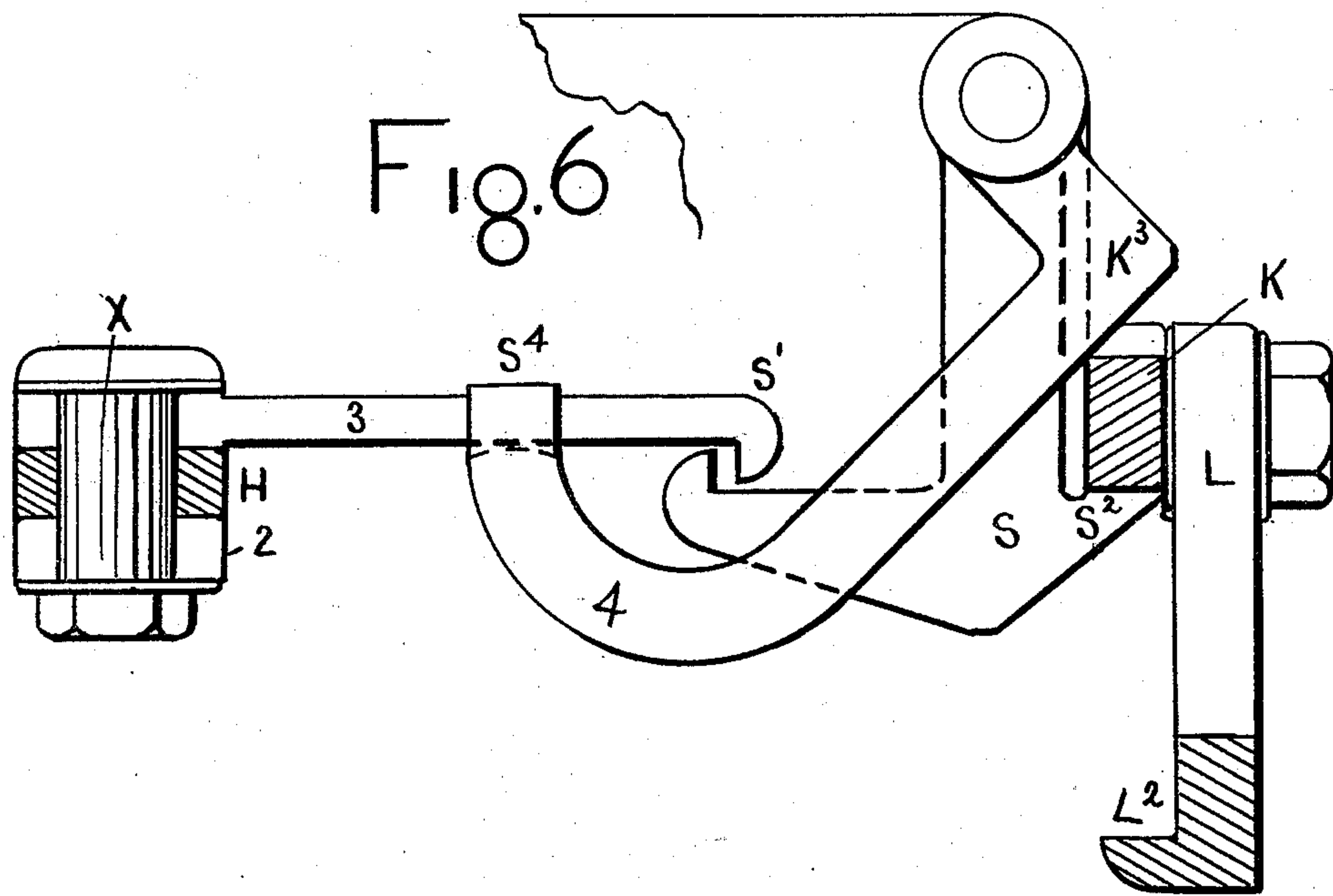
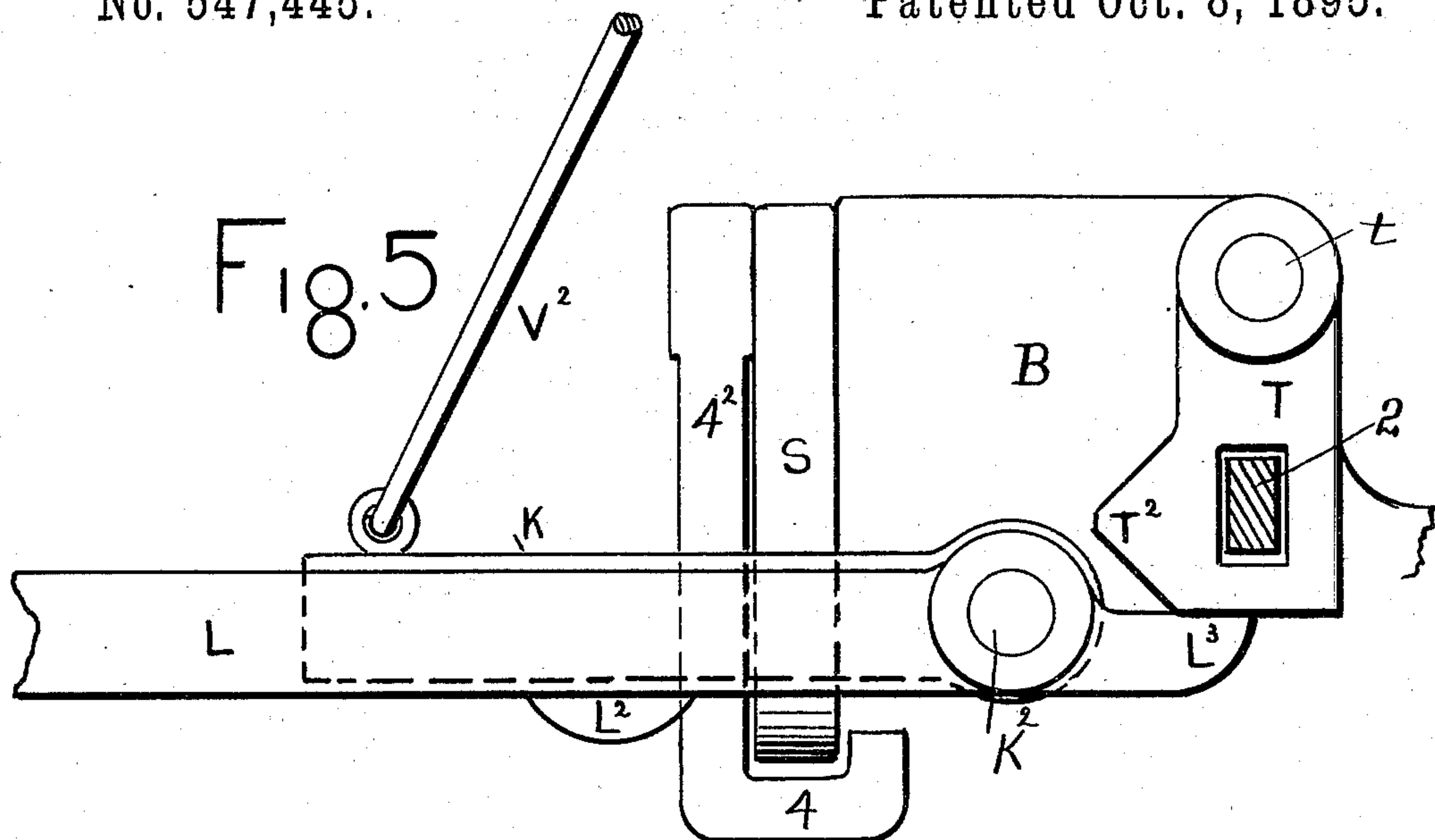
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3 Sheets--Sheet 3.

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Witnesses.

Edward L. Bevel

Fred W M<sup>c</sup> Ardly

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# UNITED STATES PATENT OFFICE.

STEPHEN NICHOLSON, OF PROVIDENCE, RHODE ISLAND.

## MACHINE FOR CLEANING FILES, &c.

SPECIFICATION forming part of Letters Patent No. 547,445, dated October 8, 1895.

Application filed May 19, 1894. Serial No. 511,870. (No model.)

*To all whom it may concern:*

Be it known that I, STEPHEN NICHOLSON, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Automatic Machines for Cleaning Files and other Articles of Manufacture, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side view, partly in section, on line 1 1 of Fig. 2. Fig. 2 is a top view of a machine containing my invention. Fig. 3 is a sectional detail on line 3 3 of Fig. 2. Fig. 4 is a plan of the reversing and unhooking levers. Figs. 5 and 6 are side and end views of the latches for holding the reversing and closing levers in place.

The object of my invention is to provide an automatic machine for presenting articles which are to be treated by subjection to jets of steam, water, soda, mud, pulverized quartz, emery, oil, air, or mixtures, or to brushes or wheels, or to any other means for cleaning, polishing, sharpening, scouring, or finishing.

In the drawings the machine is represented as arranged for finishing such articles as metal rules, knives, files, forks, spoons, mason's trowels, or any similar articles on which a jet of powdered emery or quartz or similar cutting substance is thrown by the force of steam or heated air.

Referring to Figs. 1 and 2, B represents the base, and A the carriage gibbed to the base and having a sidewise motion caused by the cam and pin Q, Fig. 2. R is a sliding rack provided with teeth on its lower edge and fitting in a groove in the carriage A. One end of this rack is provided with a clamp C, adapted to hold the article O to be treated, shown in Fig. 1 as a file held by the shank and in Fig. 2 as a mason's trowel. This rack is made to move in and out by the gear E, driven by gears D' and D<sup>2</sup>, which run loosely on the shafts W' and W<sup>2</sup>. These gears are provided with clutch-teeth, by means of which the clutches F' and F<sup>2</sup> are connected. Clutches F' and F<sup>2</sup> are keyed to shafts W' and W<sup>2</sup>, revolving with them, but free to slide lengthwise. Shafts W' and W<sup>2</sup> are made to revolve in opposite directions through gears G' G<sup>2</sup>, pinions N' and N<sup>2</sup>, attached to pulleys I' and I<sup>2</sup>, driven by straight

and cross belts, respectively. It will be readily seen that when clutch F<sup>2</sup> is engaged the rack R will move toward jet J, and when clutch F<sup>2</sup> is thrown out and clutch F' thrown in it will be moved away from jet J. These clutches F' and F<sup>2</sup> are controlled by suitable slotted pins *f* in opposite arms *h'* *h*<sup>2</sup> of the lever H. These arms and pins prevent but one clutch being engaged at a time, as shown in Fig. 2. Adjustable on the rack R are stops *r*<sup>2</sup> and *r*<sup>3</sup>, secured in any desired position by screws. It will be thus seen that the rack is set in motion in either direction by throwing either clutch F' or F<sup>2</sup> into contact with gears D' and D<sup>2</sup>, which cause the rack to move. The movement of the rack is arrested by the stop *r*<sup>2</sup> or *r*<sup>3</sup> coming against that part H<sup>2</sup> of the lever H and moving it until the clutch is disengaged.

Located in front of the machine is a box or trough M, Figs. 1 and 2, containing the substance to be thrown upon the article to be treated. This substance is fed through the pipe and flexible tube P, supported by shaft *p*<sup>2</sup>. By turning shaft *p*<sup>2</sup> the pipe is lifted to cut off the supply. The tube is attached to an ejector Z, discharging through jet or nozzle J. This ejector, as shown, is operated by steam supplied by pipe U and controlled by valve L<sup>4</sup>. The substance is thrown out and after passing the work strikes against the inclined shed *m*<sup>2</sup>, the steam or air passing up and off the shed and the substance falling back into the trough M.

It will be readily seen that when the valve L<sup>4</sup> is opened and the pipe P lowered a stream of cleansing or finishing substance is thrown upon the article as it is moved forward by the rack R. If when the rack has traversed forward sufficiently the pipe *p*<sup>2</sup> be turned and lifted, steam or air is thrown upon the article, heating it and driving off all moisture, or, if oil be used, by shutting the valve L<sup>4</sup> the flow will stop. As shown, the article is treated on the top side only. By placing a similar nozzle to J to operate on the under side two opposite sides of an article can be treated at the same time.

As shown, the ejector is fed by steam or air under pressure. This arrangement can be replaced by revolving brushes or wheels or any suitable means for treatment.



As described thus far, the machine would operate to clean or finish by throwing the clutches  $F'$  and  $F^2$  in and out by hand and by turning the shaft  $p^2$  by hand. To do this automatically, I carry the lever H forward under the base B at  $H^3$ , Figs. 3 and 4, and placing a pin  $x$  at its end, the pin passing through levers 2 and 3. Lever 2 is formed of two arms approximately at right angles, the outer end passing through the latch T and fulcrums on stud Y from the under side of base B, the latch T being fulcrumed at  $t$  to base B. (See Figs. 2 and 5.) By moving lever H the latch T is caused to move back and forth.

Lever 3, Figs. 4, 5, and 6, is provided with a hook  $S'$  at its outer end, which hook when in contact with the latch S will pull the latch S backward or allow it to swing out as the lever H is moved. Lever 3 also passes over and between projection  $S^4$  and  $S^5$  of trip-lever 4, which, when pushed back by pressing against the incline  $K^3$ , will lift lever 3 and allow it to move back without pulling latch S.

Swinging on a common pin  $K^2$  are two working levers K and L. Lever K is pulled down by a spring  $K^3$ , (shown in Fig. 1,) except when held up by latch S. To the outer end of lever K is attached rod  $V^2$ , operating lever  $L^3$ , the lifting of which opens and the lowering of which closes the valve  $L^4$ .

Lever L is longer than lever K, its outer end being formed into a handle and being also provided with a projection  $L^2$ , by means of which the raising of lever L when both levers K and L are down will also lift lever K.

In Fig. 6 lever K is shown up and held in position by latch S, while lever L is shown part way down. In Fig. 5 both levers are shown up, lever L being held in position by latch T.

The lever L is made sufficiently heavy at its handle end to cause it to drop quickly when the latch T is moved away.

Shaft  $p^2$ , Figs. 1 and 2, being connected to lever L, is caused to revolve about ninety degrees by dropping or raising lever L, thus causing the connection of the supply-pipe P with the cleaning means to be broken or made as lever L is dropped or raised.

It will be seen in Fig. 5 that the latch T has an incline  $T^2$ . This incline is pressed against by the end of the lever  $L^3$  as it is moved upward by the dropping of the handle end, causing latch T to be moved farther away, which movement in turn is communicated through lever 2 to lever H, causing it to throw in the opposite clutch.

In Fig. 4 levers K and L are indicated by the two lines K and L.

Having explained the parts in detail, I will now describe the practical working of my invention. The power being applied and the lever H so placed as to have neither clutch  $F'$  nor  $F^2$  engaged, although both revolving, the rack R will be at rest, except for a motion sidewise with the carriage caused by the cam

Q. Both levers K and L will also be down and the steam shut off. The object to be treated is placed between the clamp C and properly fastened. The lever L, lifting with it lever K, is then raised, opening the valve  $L^4$  and dipping the supply-pipe P at this operation. Holding lever L in a horizontal position, the lever H is pulled forward, bringing clutch  $F^2$  into contact with clutch-gear  $D^2$ , thus causing the rack R to advance. This motion of lever H also throws latch T toward lever L and into such a position that when lever L is released from the hand it will be held in a horizontal position. Lever L is now lifted still higher, lifting lever K, which, pushing against projection  $K^3$  of lever 4, causes the latch of lever 3 to be lifted and allows the latch S to swing into such a position that the part  $S^2$  will be under lever K. The lever L is now released from the hand, lever K being held horizontally by latch S and lever L by latch T. When the rack R has advanced sufficiently, the stop  $r^2$  pushes against the lever H, causing the clutch  $F^2$  to be thrown out and at the same time the latch T to be moved back to allow lever L to drop. In dropping, lever L lifts the supply-pipe P by turning shaft  $p^2$  and also pushes latch T still farther back, thus throwing lever 2 and lever H still farther and thereby connecting clutch  $F'$  with clutch-gear  $D'$ , whereby the rack R is set in motion backward. At the same movement of lever H which performs the above movements, the lever 3 is advanced until its end  $S'$  passes over and hooks to latch S, lever 4 having swung down when lever K was lowered to a horizontal position. The backward movement of the rack and work continues until stop  $r^3$  pushes against lever  $H^2$  and throws out clutch  $F'$ . This movement of the lever H also pulls the lever 3, which in turn pulls the latch S, which, freeing lever K, allows it to drop, thereby closing the valve  $L^4$ . The machine is now in its original position and the article or articles are removed and new work put in place.

What I claim is—

1. In an automatic cleaning and finishing machine, cleaning and finishing apparatus in combination with a work carrier and means for reciprocating it into and out of position with reference to said apparatus; and reversing its motion automatically, substantially as described.

2. In an automatic cleaning and finishing machine, the combination of a cleaning and finishing apparatus, and a reciprocating work-carrier with a mechanism substantially such as described for reciprocating the work-carrier into and out of position with reference to the cleaning and finishing apparatus and reversing the movement of the work-carrier automatically, substantially as set forth.

3. In an automatic cleaning and finishing machine, the combination of a cleaning and finishing apparatus; a transversely reciprocating carriage; a reciprocating work-support mounted on said carriage and traveling in a



path at an angle to the path of the reciprocation of the carriage; and means for moving the work-carrier into and out of position with reference to said apparatus automatically, all substantially as and for the purpose set forth.

4. In an automatic cleaning and finishing machine, the combination of a cleaning and finishing apparatus; a work-carrier; means for moving it forward; means for then liberating a lever connected with said apparatus, to control the same, and said lever, all combined and operating automatically substantially as set forth.

5. In an automatic cleaning and finishing machine, the combination of a cleaning and finishing apparatus; a work-carrier; means for moving the work-carrier in one direction and then stopping it and liberating a lever connected with cleaning and finishing appa-

ratus; said lever and means for returning the work-carrier and for liberating a second lever also connected with cleaning and finishing apparatus, said levers controlling the said apparatus, all combined and operating substantially as set forth.

6. The new and useful mechanical motion herein described, the same comprising a reciprocating work-carrier; a pair of work-levers; means for moving the carrier in one direction, and stopping it; and releasing one lever, and means for reversing and returning the work-carrier and for releasing a second lever, all substantially as set forth.

STEPHEN NICHOLSON.

Witnesses:

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L. P. SLADE.