

(No Model.)

E. & A. PRAT.

MACHINE FOR SHARPENING AND SETTING SAWS.

No. 316,568.

Patented Apr. 28, 1885.

Fig. 1.

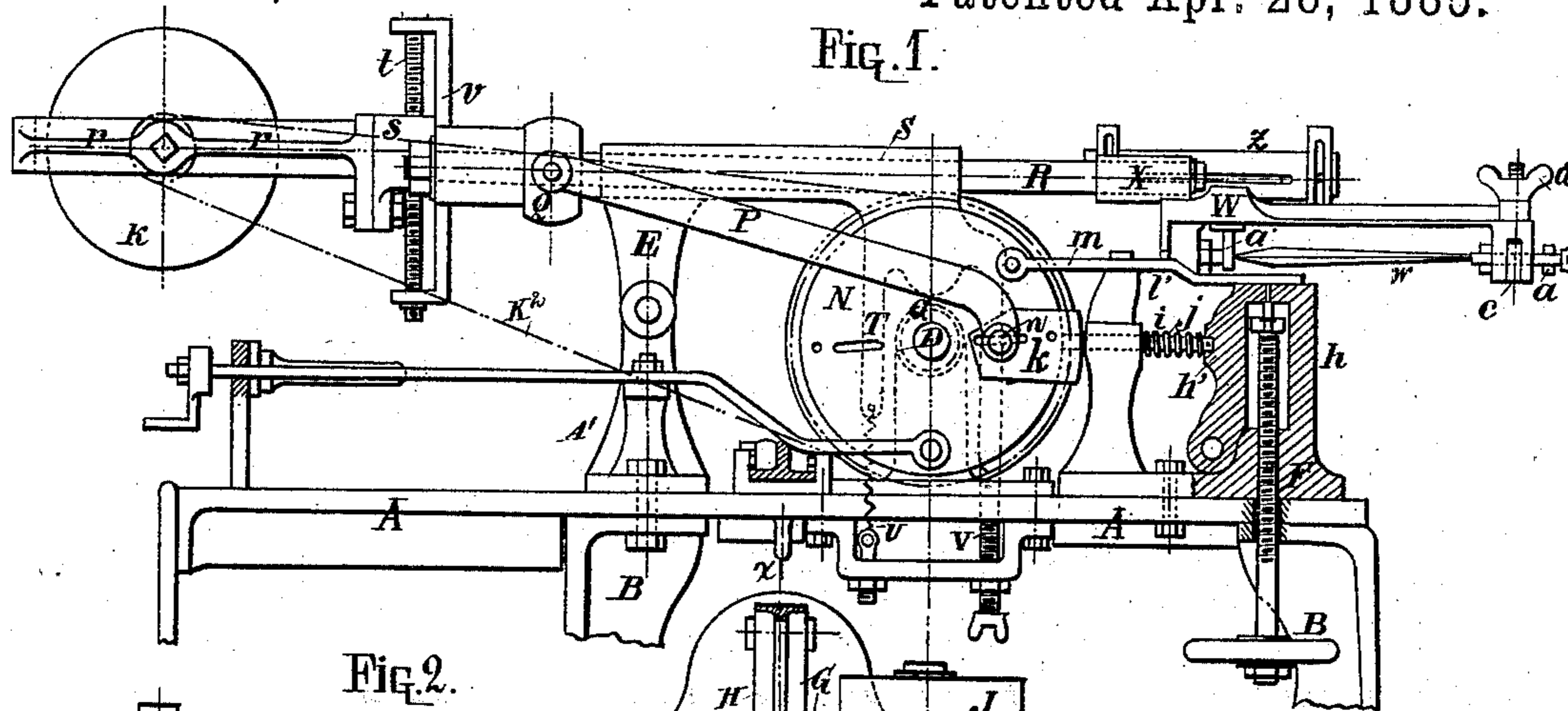


Fig.2.

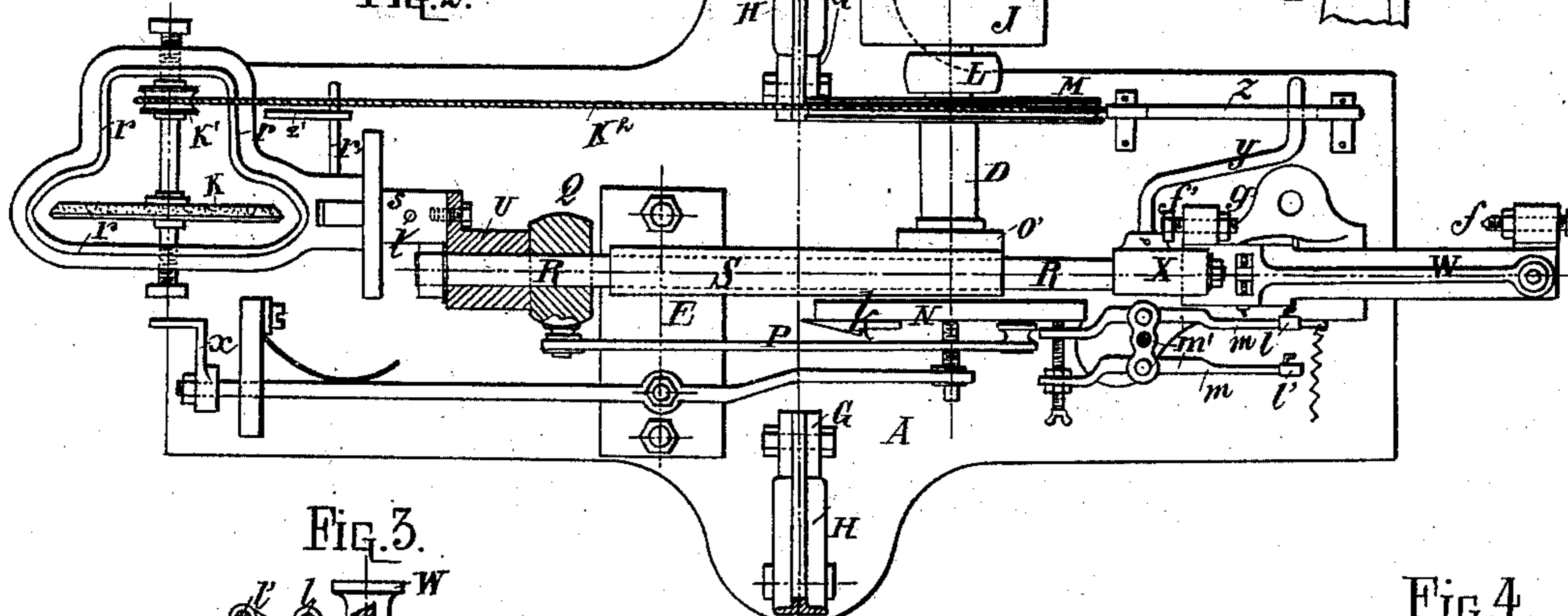


Fig. 3.

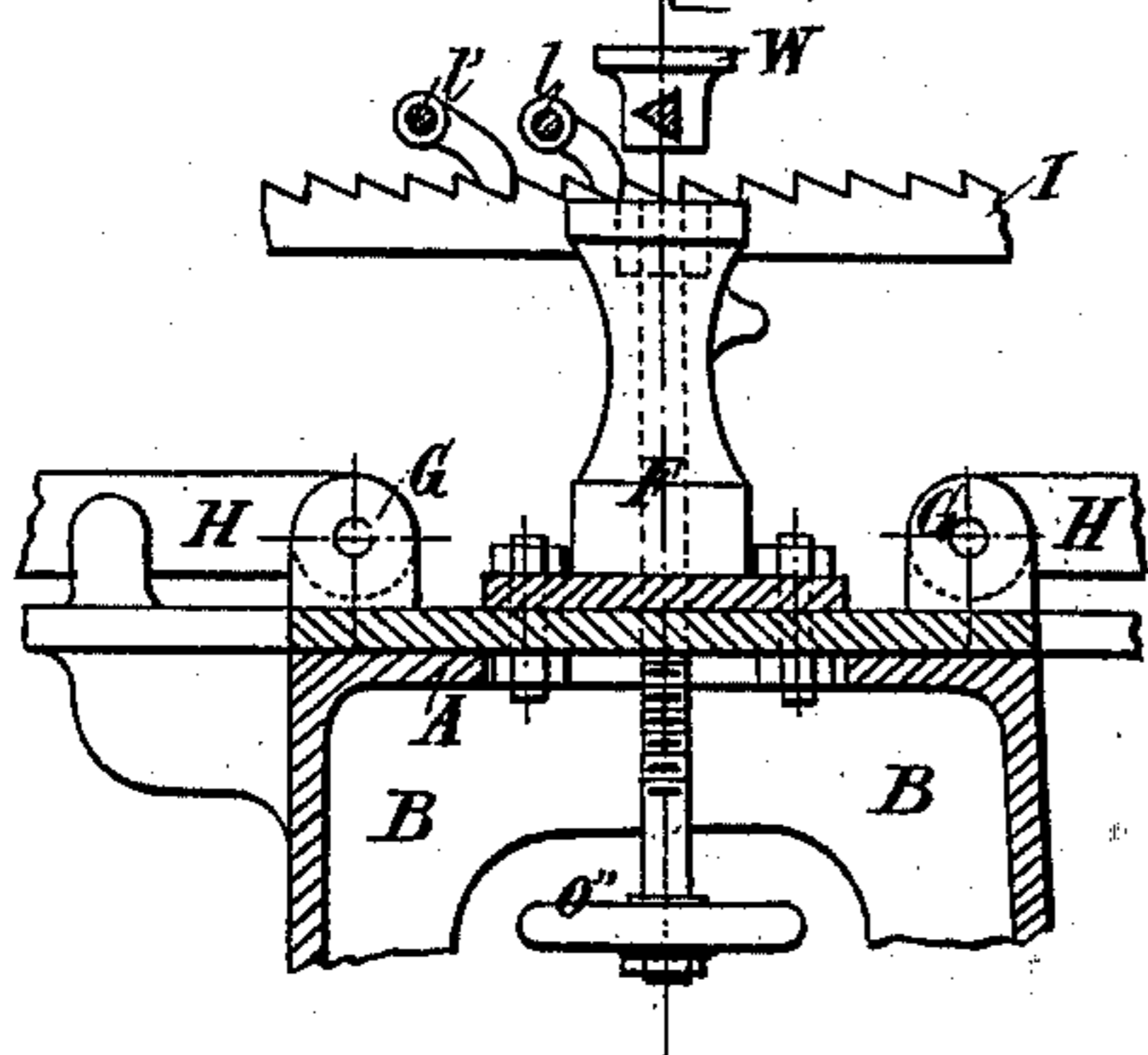


Fig. 6:

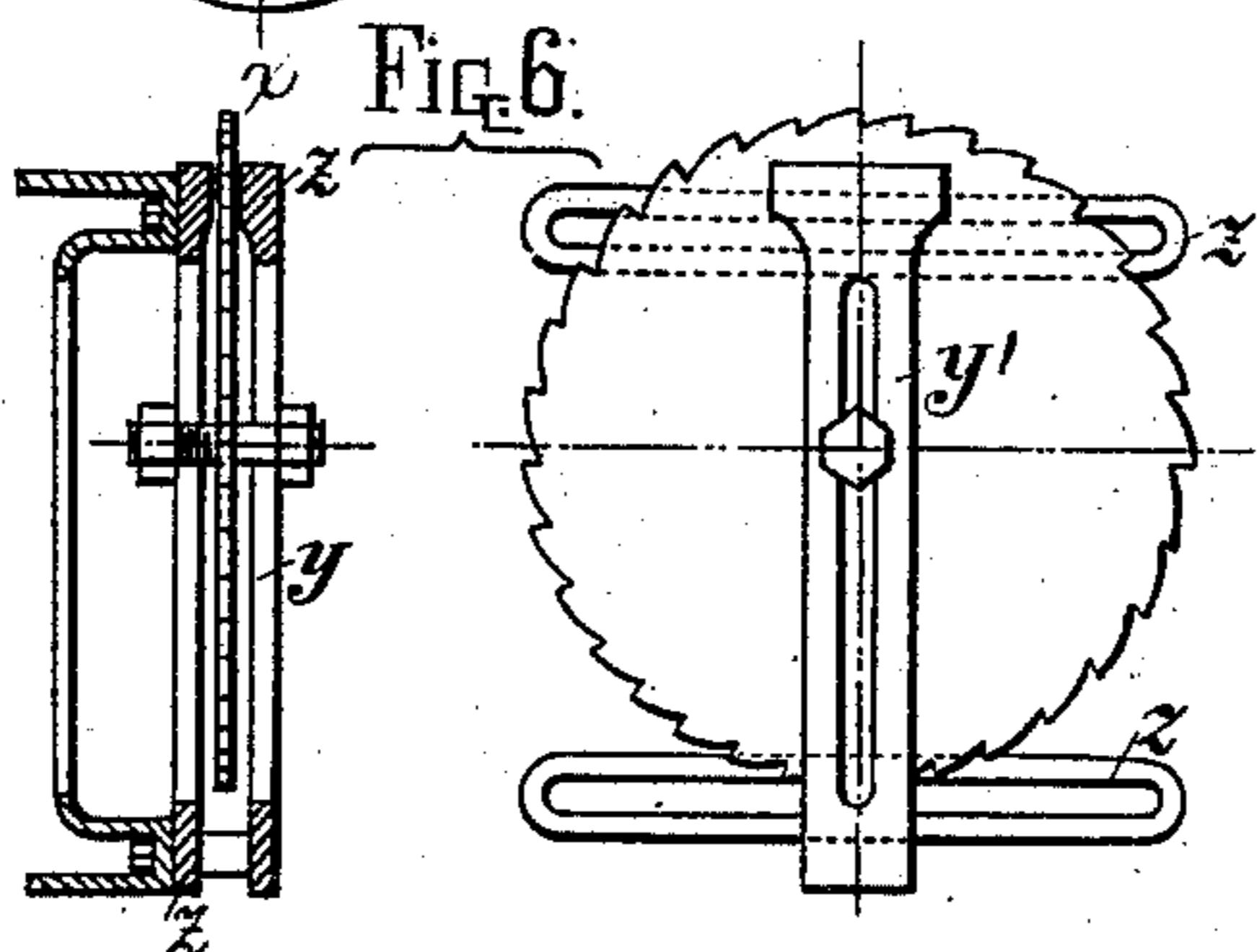


Fig.4.

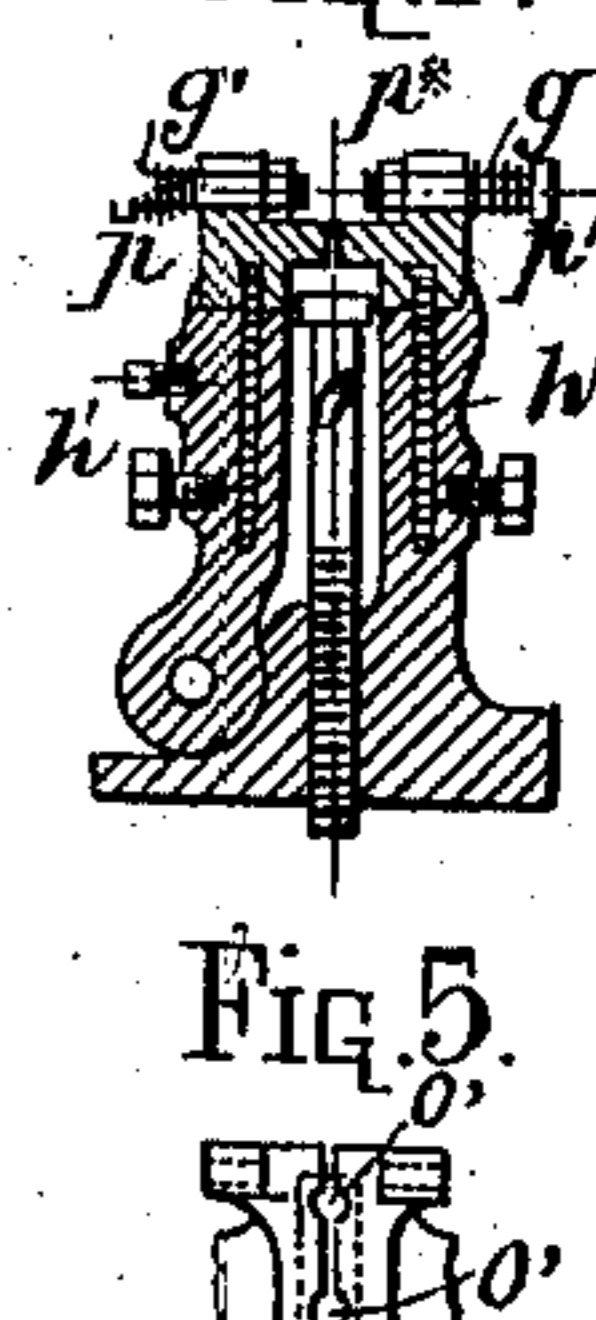
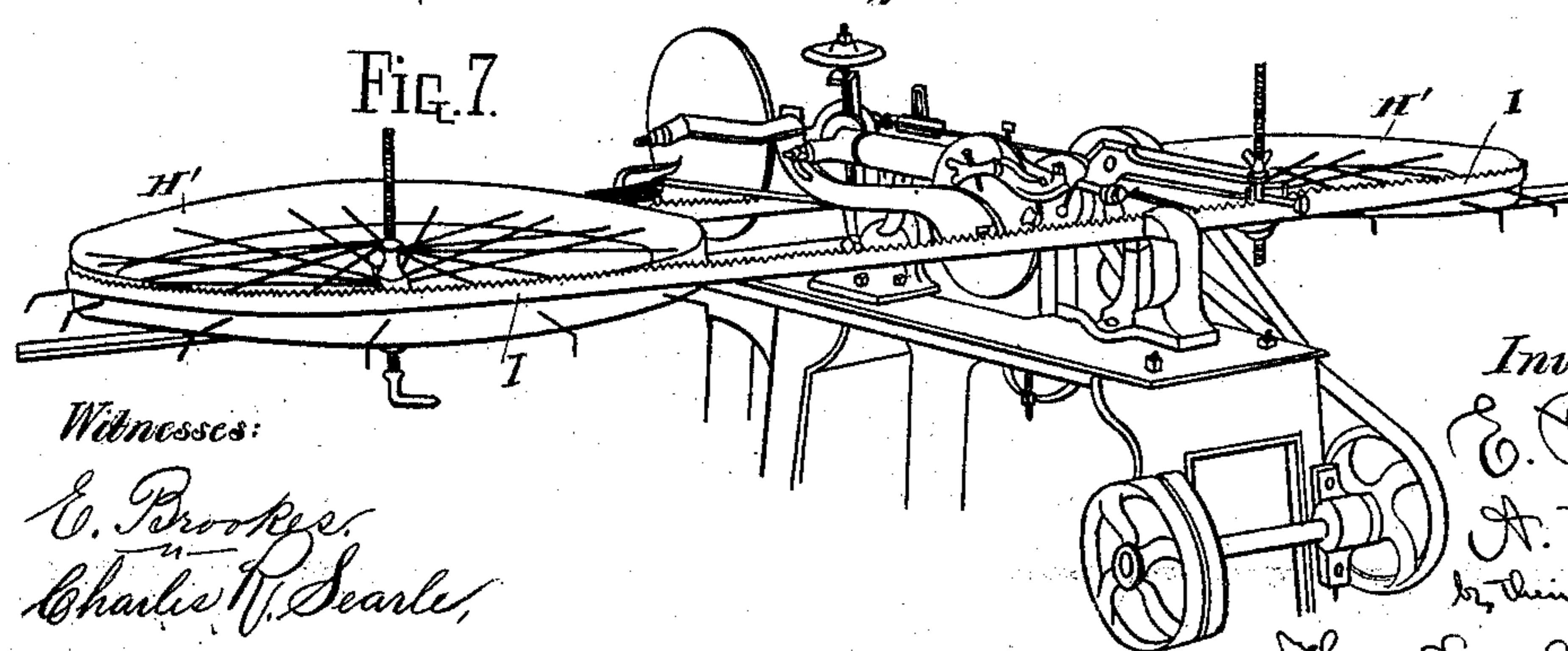


Fig. 5.



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EMILE PRAT AND AUGUSTE PRAT, OF GRENOBLE, FRANCE.

MACHINE FOR SHARPENING AND SETTING SAWS.

SPECIFICATION forming part of Letters Patent No. 316,568, dated April 28, 1885.

Application filed March 12, 1885. (No model.) Patented in France July 31, 1884, No. 163,550.

To all whom it may concern:

Be it known that we, EMILE PRAT and AUGUSTE PRAT, of Grenoble, France, have invented certain new and useful Improvements in Machines for Treating Saws, of which the following is a specification.

The machine is adapted to treat different kinds of saws—straight, circular, and band saws. It sharpens and sets the teeth. It operates automatically. Some portions of the mechanism for treating the different kinds of saws are the same for all. Other portions are specially adapted each for one kind of saw. All are combined in a single machine and driven from the same shaft. The action of the machine produces more regular and uniform results than skilled hand labor, and at a much lower cost.

The accompanying drawings form a part of this specification, and represent what we consider the best means of carrying out the invention.

Figure 1 is a side elevation, and Fig. 2 a plan view. These figures show the novel parts, with so much of the ordinary parts as is necessary to show their relations thereto. Fig. 3 is a cross-section on the line xx in Fig. 2. Fig. 4 is a vertical section through a portion, showing a modification. Fig. 5 is a vertical section showing another modification. Fig. 6 shows a vertical section, and also a view quartering thereto, showing apparatus for sawing with circular saws. The parts before shown are proper for band-saws. Fig. 7 is a general perspective view of the machine adjusted for treating band-saws. This figure shows the large horizontal wheels which serve to extend and properly present the band-saw to the sharpening and setting devices. Figs. 1, 2, and 3 show the hinged inner ends of the folding arms on which these wheels are mounted, but represent the arms as broken so as to economize room.

Similar letters of reference indicate like parts in all the figures where they occur.

A is a table, of cast-iron or other suitable material, supported rigidly on legs B. It carries near its center a stand, A', on which is hinged, by a bolt or axis, E, a frame, S, in which is supported a longitudinal slide, R, which performs the important function of traversing the sharpening devices backward

and forward across the plane of the saw, and of lifting them out of action, if required, during the movement in one direction.

D is the main shaft, supported in fixed bearings above the table A, and receiving a proper rotary motion from a belt (not represented) running upon a pulley, J. It carries a face-plate, N, a pin, n , on which connects by a link, P, with a pin in a collar, Q, fixed on R, and thus induces the regular longitudinal reciprocation of the part R and its several attachments.

W is an extension swiveling on R, and carrying a file, w , stiffly clasped between adjustable centers a , which latter are capable of being shifted, so as to receive files of various lengths and sizes, and to move each with a direct longitudinal motion properly presented to sharpen the several teeth of the saw as they are successively presented. The band-saw I, properly extended by means of the wheels H' on the hinged arms H, is traversed step by step through a clamp, F, having a fixed jaw, h , and a hinged jaw, h' . The latter is operated by a cam on the wheel N, acting through a pin, i , and spiral spring j , so as to hold the saw firmly at the moment when the file is acting thereon, and release the saw at the moment when it is to be fed forward to present a different tooth. The feed movement of the saw is given by two pawls, l l' , (see Figs. 2 and 3,) which are mounted on horizontally-swinging levers m m , turning on centers m' , and which are operated by the inclined face of the cam k , through suitable connections, indicated by a screw.

The employment of two independently-adjustable levers and two independent pawls, as shown, insures the correct feeding of the saw, even if a tooth is broken out.

Fig. 4 shows a gage, O, mounted between the jaws h and h' of the clamp F, adapted to support the band-saw by its back edge and to be set up and down for different widths of the saw, as the widths of different saws may vary, or as the same saw may vary by wearing away.

Fig. 5 shows grooves in which pieces may be inserted to serve the same purpose. The frame S and its connections tilt on the hinge E sufficiently to lift the file entirely out of engagement with the saw during the return movement. The feeding along of the saw

takes place during the period while the file is thus lifted. The lifting is effected by a cam, O', on the main shaft D, which acts on a rounded surface on the under face of S, as shown in dotted lines in Fig. 1. The arm T from the frame S receives the force of a spring, U, which is adjustable by a bolt and nut, so as to hold the frame S down with gentle force. The arm T' from the frame S meets and rests on a screw, V, which is firmly held by a jam-nut. This gages how low the file may descend, so that all the teeth of the saw I are filed evenly. The file-carrier W is connected to the rod R by a turning joint, X, and provided with a lateral arm, y, which travels in a horizontal slot in a guideway, z, which latter may be adjusted up and down, and controls the turning of the file-holder W, and consequently of the file. This allows the file to cut under to any required extent in treating teeth which require it.

G G are hinges on the table A, which connect the arms H H, on which are mounted upright studs, which support and serve as axes for large horizontal wheels H' H', provided with radial spurs or arms, adapted to receive and properly extend the band-saw I and allow it to be fed around. When the machine is not in use, or is used for treating straight saws or circular saws, the wheels H' H' may be removed and the arms H H folded upward out of the way.

The file w and the feeding pawls l l' may treat straight saws and circular saws by providing suitable means for holding and presenting such.

Fig. 6 shows provisions for holding a circular saw of small diameter and allowing it to be turned step by step, the same as the band-saw is fed.

The extent to which the slide R and its connections traverse at each revolution of the main shaft D may be varied by adjusting the pin n nearer to or farther from the axis of motion. For this purpose the pin n is set in a radial groove in the wheel N and secured in any required position therein by a nut or other suitable device. (Not shown.)

On the side of the machine opposite to the filing machinery shown we mount an emery-wheel, K, of proper form to treat the teeth of a straight saw or other saw by a grinding action. The wheel is mounted on a short shaft provided with a pulley, K', by which it may be rotated rapidly and strongly by a suitable belt.

We have represented the driving means as a simple belt, K², stretched directly between a large pulley, M, on the shaft D and the small pulley, K', on the shaft of K; but it will be understood that any ordinary or suitable provisions may be made—as by an intermediate pulley carried on links extending between the parts—for driving the emery-wheel continuously and maintaining the action of the parts, notwithstanding the traversing motion of the

emery-wheel and its connections to and from across the saw.

The saw may be held in the manner shown in Fig. 6, or in any other convenient manner.

Z is a lever turning horizontally on a fixed center and actuated by the cam k on the face of the wheel N, or by another cam set opposite to k, for which the slot is clearly shown in Fig. 1. This lever Z may feed the saw forward step by step by means of the pawl x, engaging in the teeth of the saw, as may be preferable with circular saws, or engaging in any suitable teeth provided in a holding device. (Not shown.)

The emery-wheel K and its connections are supported in a frame, r, which is mounted on the reciprocating slide R by means of a screw, t, operated by a hand-wheel. (Not shown.) This screw and its frame v allow the frame r to be raised and lowered within wide limits to adapt its work to saws of different widths or differently held.

The entire frame r and its attachments may be turned into an inclined position, being governed by a lateral arm, r', which traverses in a guide, z'. (See Fig. 2.) This, with the tilting motion on the axis E, induced by the cam O, enables us to attain the exact position of the emery-wheel desired during its cutting action, and also to allow the wheel to be fully lifted out of engagement during the return motion. This is obviously important, not only to avoid acting during the return motion, but to avoid the obstruction of the feed-motion of the saw. The capacity afforded by our device for turning the emery-wheel into inclined positions as it sinks enables us to grind teeth of various hook forms as easily as plain triangular teeth.

The proper set of the teeth, alternately inclined to one side and the other of the plane of the saw, is effected at the same or a different period by a slight addition to the mechanism at a few points. We will describe it as effected at a different period by a separate and specially-adjusted operation of the machine. For this purpose two cams, k, are fixed on the face of the wheel N, one corresponding to the cam k shown, and which may be the same cam, the other similar thereto, and set by means of a suitable bolt inserted and firmly locked in the opposite radial slot (shown in Fig. 1) on the said wheel. This will give two feed movements of the saw for each revolution of the shaft D, each being completed before the slide R completes its movement in one direction or the other.

The file-carrier W, reciprocated strongly by the means before described, effects the setting of the teeth alternately to one side and the other by striking them through the medium of nicely-adjusted pins p p', mounted in an attachment, p*, mounted on the clamp F, as shown in Fig. 4. These pins are held gently apart by springs g g, and the saw, held in the nearly-closed jaws h h' adjacent, is stopped, first with a tooth in position, which is struck

by the pin p , and thus inclined to the left, and next with the next tooth in position, which is struck by the pin p' and inclined similarly to the right. The pins p p' are actuated alternately by the adjustable stops f f' , set in the position represented in the file-carrier W.

It will be understood that the means for holding the several kinds of saws may be varied for holding and feeding saws to be set, as well as to be sharpened; also, that the machine may have various ordinary and suitable devices (not shown) for lubricating and contributing to the successful working. The feed-levers m and their pawls l l' are kept to their work by gentle springs.

We attach importance to the fact that our grinding-wheel K is carried on the same slide R as the file w , for the reason not only that it increases the capacity of the machine without serious increase of its complication or cost, but also that the weight of the wheel K and its connections counterbalances the weight of the file-carrier and its connections, and allows the whole to be tilted easily by the cam O' and the spring U.

Modifications may be made in the forms and proportions of the details within wide limits. Parts may be used with some success without the whole. We prefer the whole used together and ready to apply to the different kinds of work as required.

The frame y z' , for holding and feeding circular saws, may be kept under the table, or in any convenient place near at hand, when treating other kinds of saws.

We claim as our invention—

1. The slide R and means for reciprocating it, and also for tilting it automatically, and the file-carrier W and emery-wheel carrier r , combined and arranged to serve substantially as herein specified.

2. The regulating-stop V, in combination with the frame S, reciprocating slide R, hinge E, and cam O', all arranged to serve as herein specified.

3. The adjustable sets f f' , carried on the reciprocating slide R, in combination with the file-carrier W, and with means for feeding and holding a saw so as to present its teeth suc-

cessively thereto, and with intermediate pieces, p p' , adapted to set the teeth, as herein specified.

4. In a machine for treating saws, the file-carrier W, fitted on the reciprocating slide R, with liberty to oscillate thereon, in combination with the slideway z , mounted on the fixed framing or table A, and with means, as O', for tilting the slide R and its attachments, as herein specified.

5. In a machine for treating saws, the arms H H, hinged at G G to the table A, in combination with the wheels H' H', adapted to carry a band-saw, I, and means, as l l' , for feeding the saw so as to present its teeth successively to sharpening or setting devices, and means, as F, for alternately holding and releasing the saw, as herein specified.

6. In a machine for treating saws, the clamp F, operated automatically so as to alternately hold and release the saw, in combination with means, as l l' , for feeding the saw step by step, and the reciprocating slide R and its attachments for treating the saw during the intervals between the feed movements, as herein specified.

7. In a machine for treating saws, the adjustable stops f f' , carried on the reciprocating slide R and its attachments, in combination with means, as l l' , for feeding forward, and means, as h h' , for supporting the saw, and arranged to set the teeth alternately to one side and the other by force transmitted from f to one tooth and from f' to the next tooth, substantially as herein specified.

8. In a machine for treating saws, the combination, with means, as l l' , for feeding forward, of the jaws h h' and gage O, the stops f f' , carried on the slide R and its attachments, and the clamp F, for holding and releasing the saw alternately, as herein specified.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

EMILE PRAT.
AUGUSTE PRAT.

Witnesses:

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C. GARDETTE.