No. 654,844. Patented July 31, 1900.

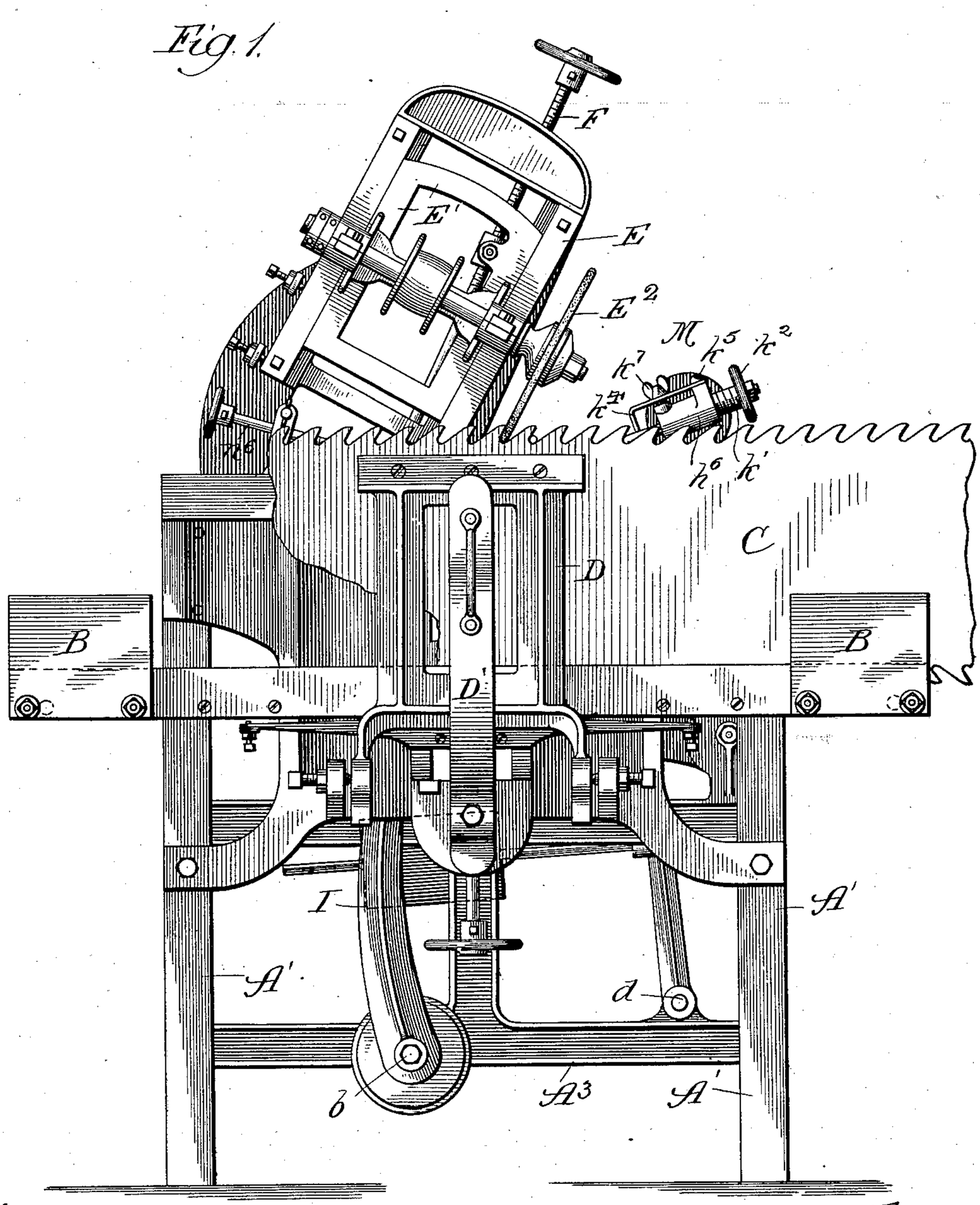
H. P. SCHOFIELD.

SAW SHARPENING MACHINE.

(Application filed Mar. 24, 1900.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.



Witnesses:
Chas. E. Gaylord,
John Enders Jr.

Inventor:
Henry P. Schofield,
By Dyrenforth, Dyrenforth & Lee,
Attys.

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Fig. 10.

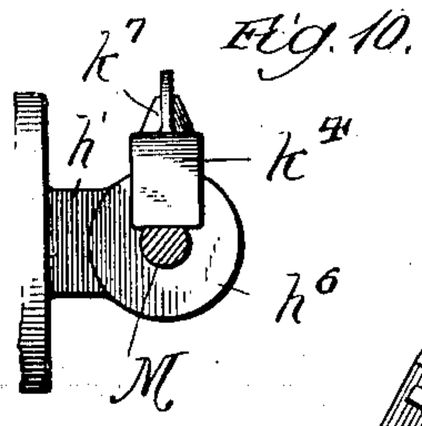

Fig. 8.

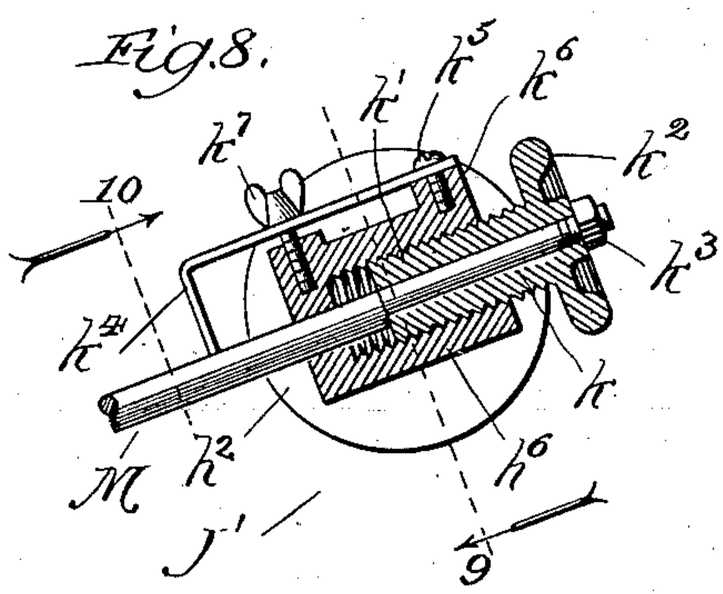

Fig. 9.

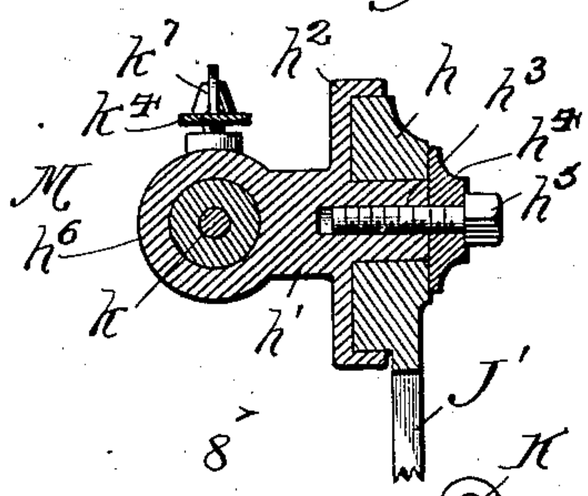

Fig. 11.

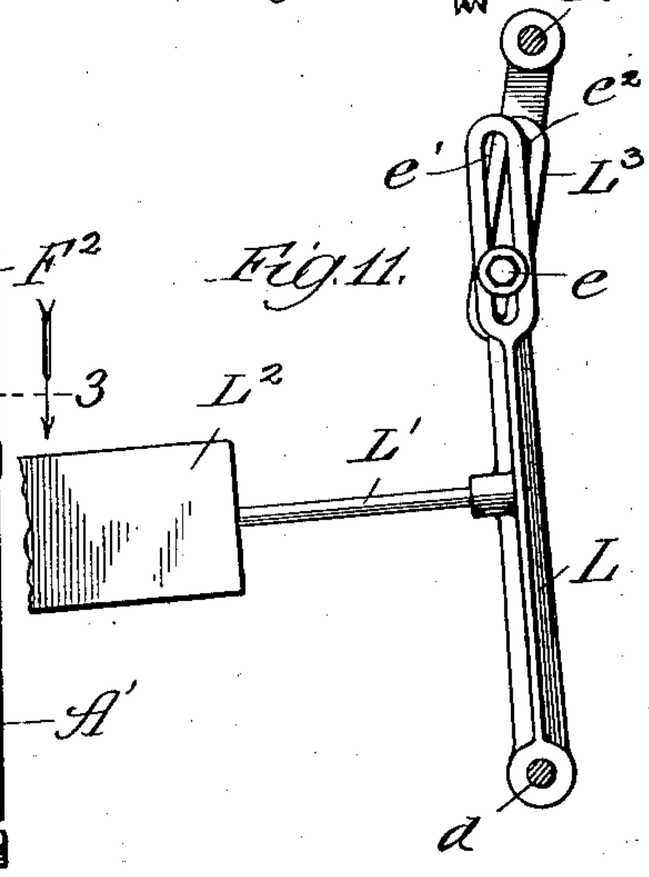

Fig. 2.

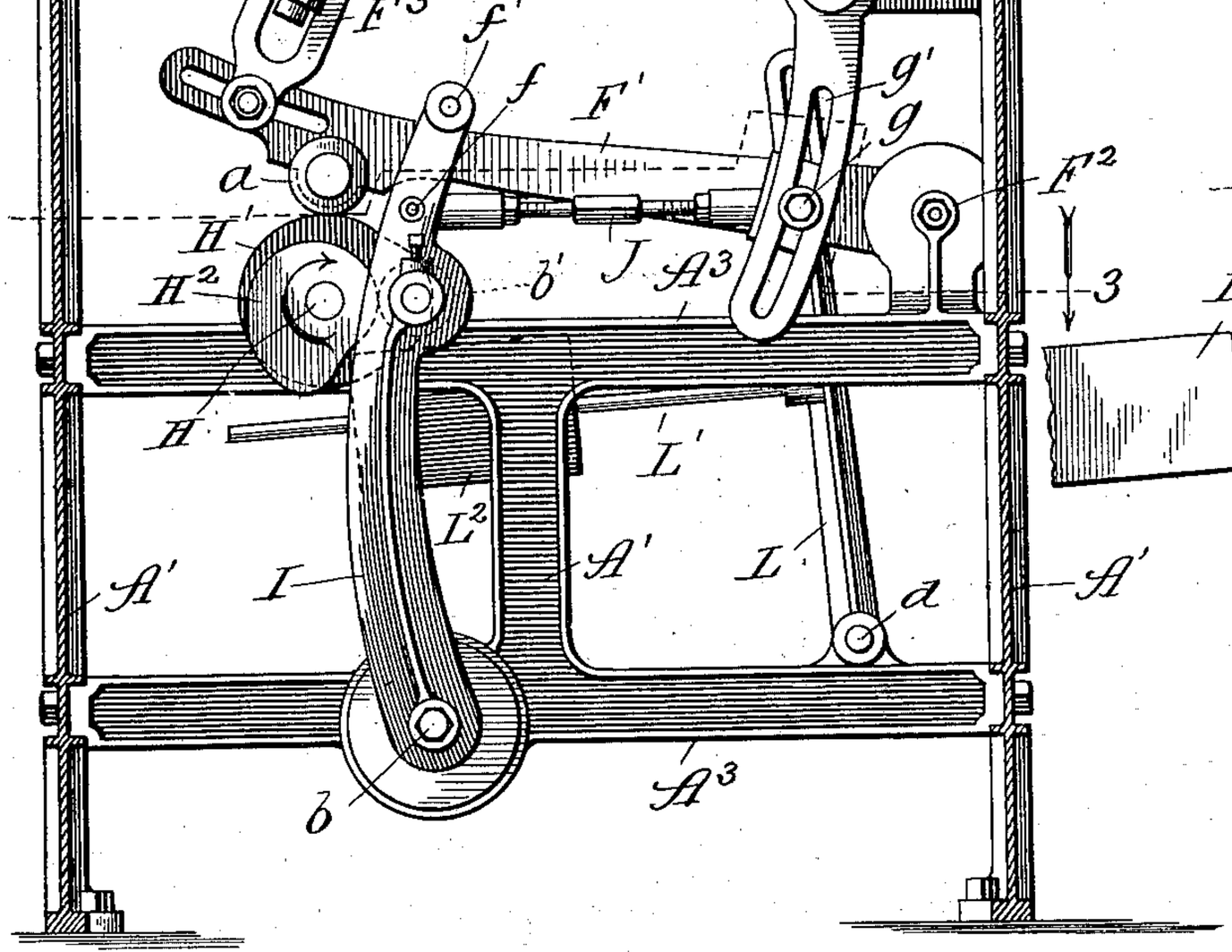

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Fig. 3.

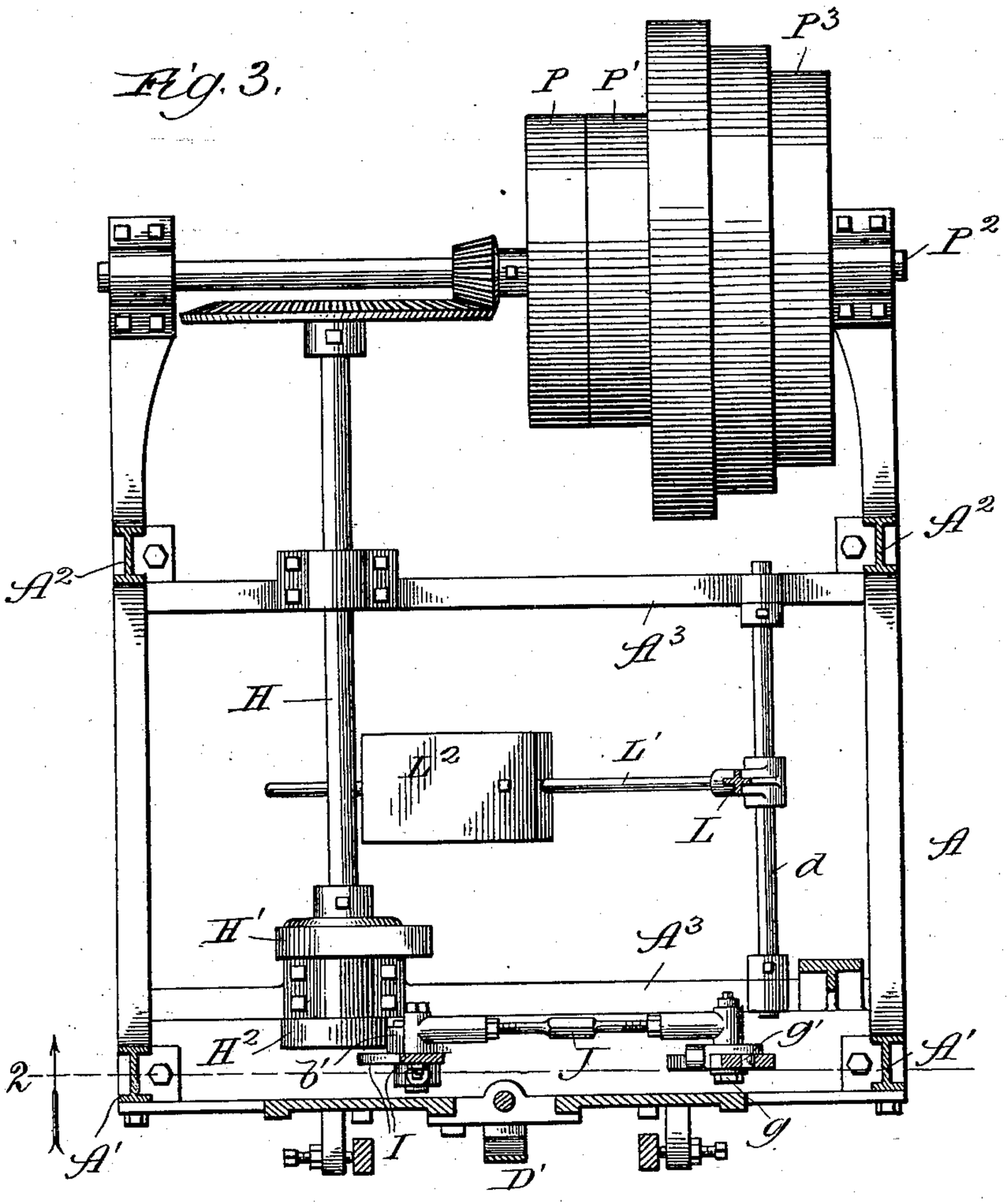
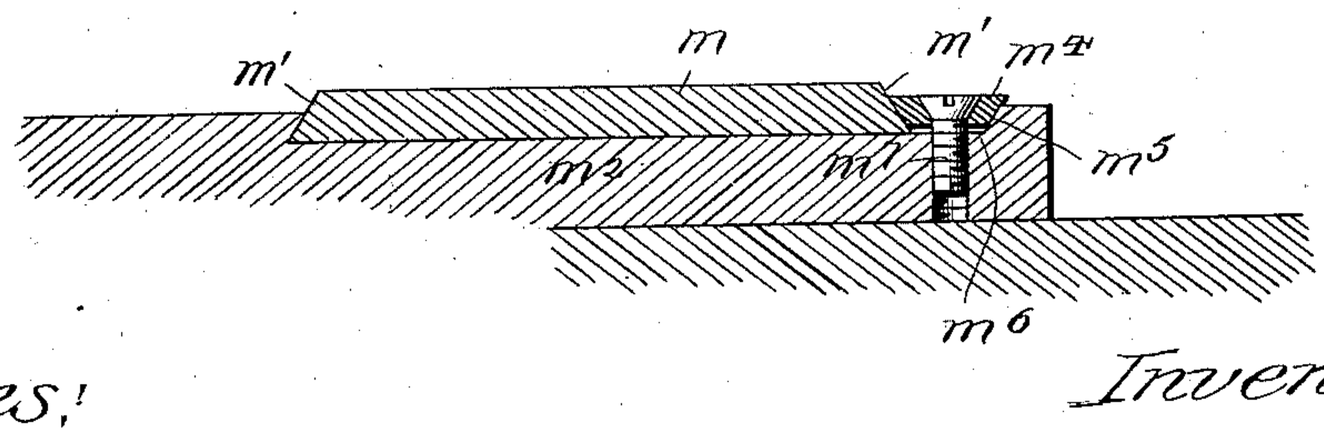


Fig. 12.



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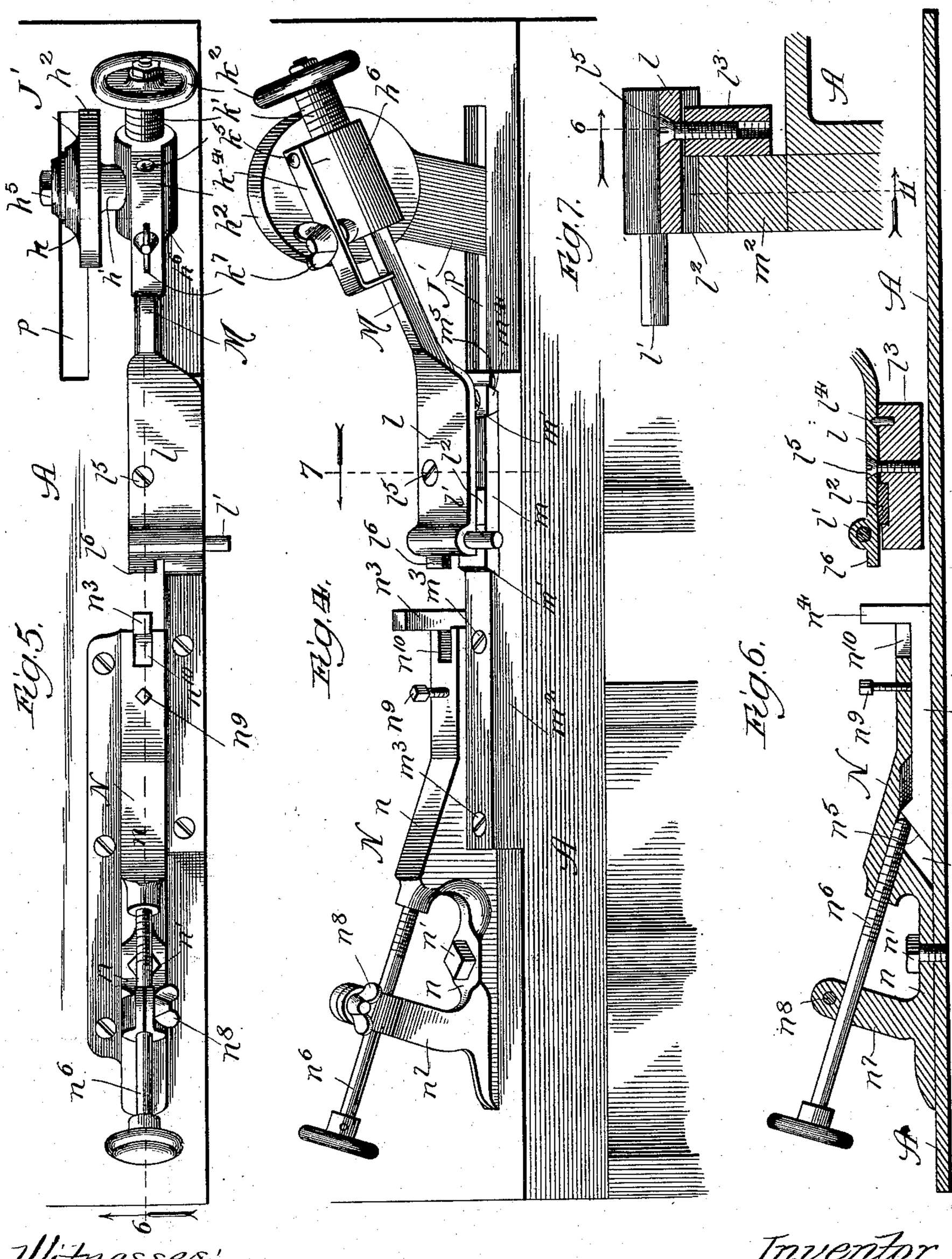

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Henry P. Schofield,
By Dyrenforth, Dyrenforth & Lee,
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UNITED STATES PATENT OFFICE.

HENRY P. SCHOFIELD, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO L. L. FILSTRUP, OF SAME PLACE.

SAW-SHARPENING MACHINE.

SPECIFICATION forming part of Letters Patent No. 654,844, dated July 31, 1900.

Application filed March 24, 1900. Serial No. 9,999. (No model.)

To all whom it may concern:

Be it known that I, HENRY P. SCHOFIELD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Saw-Sharpening Machines, of which the following is a specification.

My invention relates particularly to an improvement in saw-sharpening machines for use in sharpening band-saws; and it consists in certain improved features of construction in the mechanism for feeding the saw during the grinding operation.

My object is to provide a construction of feed mechanism wherein the parts which are peculiarly subject to wear are readily replaceable, being preferably made of hardened steel.

The accompanying drawings illustrate my improvements in connection with so much of a saw-sharpening machine as is necessary for illustration, a novel form of saw support or guide being shown, however, the same being claimed in my application, Serial No. 9,998, filed on even date herewith..

In the drawings, Figure 1 is a view in front elevation of a saw-sharpening machine of a well-known general form of construction, but equipped with the improved guide mentioned and the improved feed mechanism hereinafter described. Fig. 2 is a vertical section parallel to the front of the machine and taken as indicated at line 2 of Fig. 3; Fig. 3, a plan section taken as indicated at line 3 of Fig. 2; Fig. 4, a view in front upper perspective showing that portion of the feed mechanism which is adjacent to the saw and an adjustable stop for the same; Fig. 5, a plan view of the mechanism shown in Fig. 4; Fig. 6, a vertical section parallel to the front of the machine and taken as indicated at line 6 of Fig. 5; Fig. 7, a transverse section at line 7 of Fig. 4; Fig. 8, a broken detail showing the method of adjustment for the feed-arm; Fig. 9, a transverse section on line 9 of Fig. 8; Fig. 10, a similar section on line 10 of Fig. 8; Fig. 11, a detail of the weight-actuated device which serves to retract the feed-finger after the forward movement; and Fig. 12, an enlarged sectional detail of the block or plate upon which the arm carrying the feed-finger bears, as shown in Fig. 4.

A represents the frame of the machine; A′ A^2, uprights thereof; A^3, cross-braces thereof; B, a support or guide for the saw; C, a fragment of the saw; D, a pivoted guide-plate; D′, a pivoted spring or hasp for yieldingly holding the guide B against a saw; E, an adjustable frame or guide for the grinding-wheel gate; E′, the grinding-wheel gate; E^2, the grinding-wheel; F, an adjustable connecting-rod pivotally joined to the grinding-wheel gate; F′, a rock-arm pivoted on a standard F^2 and provided with a cam-engaging roller *a*; F^3, adjustable connection between the lower end of the connecting-rod F and the free end of the rock-arm F′; H, a rotating shaft equipped with a cam H′ for actuating the gate-moving mechanism and with a cam H^2 for actuating the feed mechanism; I, a rock-arm pivoted at its lower end at *b* through the frame and provided with a roller *b*′, engaging the cam H^2; J, an adjustable connecting-rod joining the upper portion of the rock-arm I to the lower end of a pivoted feed-lever J′; K, a rock-shaft pivoted in the frame in bearings *c* and to which the feed-lever J′ is fixed; L, a rock-arm pivoted to the frame at its lower end at a point *d* and provided with a branch arm L′, having an adjustable weight L^2; L^3, a link fixedly secured to the shaft K and having bolt connection *e* with a slot *e*′ in the upper end of the arm L, the arm L^3 being itself provided with a slot e^2 to make the bolt *e* adjustable thereon; M, an adjustable feed-arm having pivotal connection with the upper end of the feed-lever J′; N, an adjustable stop for said feed-arm; P P′, tight and loose pulleys on a shaft P^2, through which power is applied to the machine from any suitable line-shafting, and P^3 a cone-pulley which has indirect connection with the grinding-wheel gate—as, for instance, shown in the reissue patent to Filstrup, No. 11,733, granted April 11, 1899.

No features of novelty are claimed in the present application except those relating to the feed mechanism and the adjustable stop for the feed-arm.

The rock-arm F′ serves when actuated by

the cam H′ to move the grinding-wheel gate in the ordinary manner. The cam H² serves, through the medium of the roller b', the rock-arm I, the connecting-rod J, and the feed-lever J′, to move the feed-arm M in a direction to advance the saw toward the left in Fig. 1. The weight L² serves, through the medium of the rock-arm L and the link L³, to rock the shaft K in a direction to throw the upper end of the lever J′ toward the right, and in consequence, through the medium of the connecting-rod J, to move the upper end of the rock-arm I toward the left, thereby holding the roller b' always firmly in contact with the cam H². The connection between the rod J and the rock-arm I is a bolt f, and, as shown, the rock-arm projects above this bolt and is provided with a perforation f', with which the rod may be joined, if desired, to vary the throw. The connection between the rod J and the lower end of the lever J′ is a bolt g, carried by the end of the rod, and a slot g', with which the lever is provided, thereby permitting adjustment.

As shown in Fig. 9, the upper end of the lever J′ is provided with a circular head h, while the feed-arm M, as shown in Figs. 5 to 9, inclusive, is adjustably connected with a pivotal connecting member h', having a vertical face which contacts with the vertical face of the head h, a circumferential flange h^2, which houses the head h, a stud h^3, which projects through a perforation in the head h and is connected to said head by a washer h^4 and screw h^5, and a cylindrical or sleeve-like portion h^6, with which the stem of the feed-arm M is adjustably connected. The stem of the feed-arm M passes through the sleeve h^6 and has a reduced portion k, which passes through an adjusting-sleeve k', having threaded connection with the interior of the sleeve h^6 and provided with a knob or head k^2 for adjustment. A nut k^3 connects the reduced portion of the stem with the sleeve k^2. The stem of the arm M is of a general circular cross-section, as shown in Fig. 10; but with a flat upper surface, upon which bears a down-turned end of a spring k^4, the rear end of which is connected by a screw k^5 to a boss k^6 on the sleeve h^6. A screw k^7, passing through the spring k^4 a short distance from the screw k^5 and into the sleeve h^6, serves to cause the free end of the spring to bear upon the flat surface of the stem M and lock the stem against movement. With this construction it is only necessary to loosen the screw k^7 to permit the sleeve k' to be turned in or out, thereby causing the arm M to move with it the reduced portion k of the arm M, permitting the sleeve k' to rotate readily upon it.

The front portion of the arm M consists of a flattened horizontal part l at an angle to the stem of the arm, a hardened replaceable steel pin l', affording a feed-finger, a hardened-steel bearing-block l^2, which slides upon the upper surface of the front end of the machine-frame, a hardened-steel block l^3, recessed, as shown in Fig. 6, to receive the block l^2 and connected to the part l by a pin l^4 and a screw l^5, and a stop-engaging lug l^6 at the extreme end of the flattened portion l. The surface upon which the block l^2 bears comprises a hardened-steel block m, having beveled ends m'. This block is securely fastened to a larger block m^2, secured to the upper face of the front end of the frame by screws m^3. The block m is secured to the block m^2 by having one of its beveled ends project beneath a corresponding beveled surface in the block m^2 and its other beveled surface beneath the corresponding beveled surface on a block m^4 let into a recess in the block m^2 and having a second beveled surface m^5, which engages a corresponding beveled surface m^6, all as clearly shown in Fig. 12. A screw m^7 passes through the block m^4 and into the block m^2, and the block m^4 rests upon its inclined surfaces and does not bear at its lower surface on the bottom of the recess in which it is placed. It will thus be seen that when the screw m^7 is turned down the block m^4 serves as a wedge to force the block m against the projecting beveled surface of the block m^2 at the opposite end of the block m.

The stop N comprises a part n, secured to the upper surface of the front end of the frame by bolts n' and provided with a channel n^2, an adjustable stop n^3, moving in the channel n^2 and provided at one end with a stop-finger n^4 and at the opposite end with a beveled surface n^5, an adjusting-screw n^6, having threaded connection with a perforation in the part n and bearing at its lower end against the beveled surface n^5 of the movable stop n^3, a perforated and split lug n^7, through which the shank of the adjusting-screw n^6 passes, a screw n^8 for locking the adjusting-screw n^6 in any given position, and a set-screw n^9 for securing the stop n^3 in any given position. As shown, the front end of the part n is provided with a slot n^{10}, in which the vertical heel or lug n^4 of the adjustable stop moves.

From the foregoing description it appears that the stop n^3 is adjustable and replaceable; that the feed-arm M is readily adjustable and provided with the replaceable hardened-steel bearing-strips l^2 and l^3, the former of which is subject to a great deal of wear, as it bears upon the horizontal block m, and the latter of which is subject to great wear, as it bears upon the vertical rear surface of the block m, and, finally, that the lever-and-link mechanism for moving the feed-arm M is readily adjustable. It further appears that the pivotal connection between the feed-arm M and the upper end of the lever J′ is protected by the flange h^2, projecting over the head h.

In operation the saw is fed across the front of the machine through the guide B by the feed mechanism described, while the grinding-wheel is caused to grind the teeth one by one as it is moved along their surfaces by the grinding-wheel gate in the usual manner. In the operation of feeding the saw it will be

observed that a force is exerted upon the feed-finger l', tending to turn the free end of the feed-arm toward the saw and that a reacting force between the block m^2 and the block l^3 preserves the feed-arm in proper alinement and prevents a binding force from being exerted at the pivotal connection at the upper end of the feed-arm-actuating lever.

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

1. In a saw-sharpening machine, the combination with a frame, a grinding-wheel gate, a grinding-wheel, and mechanism for moving the grinding-wheel gate and turning the grinding-wheel, of feed mechanism comprising a rock-arm, a rotating shaft provided with a cam engaging said rock-arm, a rock-shaft, a lever connected with said rock-shaft, a connecting-rod joining said lever to the rock-arm engaging said cam, a feed-arm pivotally connected with the free end of said lever and provided with a feed-finger, a pivoted arm, a weight connected therewith, and connecting means between said pivoted arm and said rock-shaft, whereby said weight tends to rotate said rock-shaft to retract the feed-arm and cause the rock-arm engaging said cam to remain in contact with said cam, substantially as and for the purpose set forth.

2. The combination in a saw-sharpening machine, of a frame, a rock-shaft pivoted therein, a feed-lever connected with said rock-shaft to rotate therewith, a feed-arm pivotally connected with the upper end of said lever and provided with a feed-finger, a rotating shaft provided with a cam, a rock-arm bearing against said cam, a connecting-rod joining said rock-arm to the lower end of said lever, a weight-bearing arm pivotally connected with the frame, and a link or arm connected with said rock-shaft to rotate therewith, and having sliding connection at its free end with said weight-bearing arm, substantially as and for the purpose set forth.

3. In a saw-sharpening machine, having a frame, a grinding-wheel, means for moving the grinding-wheel, a guide for a saw, and a feed-arm and means for actuating said feed-arm, said feed-arm being provided with a feed-finger-receiving perforation, a replaceable hardened-steel pin l' affording a feed-finger, substantially as and for the purpose set forth.

4. In a saw-grinding machine, the combination with a frame provided at its front end with a bearing-block for a feed-arm, of a feed-arm provided with a feed-finger and with a bearing-block resting upon said block on the frame, and provided also with a block bearing against the inner vertical surface of the block on said frame, and means for actuating said feed-arm, substantially as and for the purpose set forth.

5. In a saw-grinding machine, the combination with a frame provided at its front end with a bearing-block for a feed-arm, of a feed-arm provided with a feed-finger with a replaceable horizontal bearing-block, and a replaceable vertical bearing-block serving to hold said horizontal bearing-block in place, substantially as and for the purpose set forth.

6. In a saw-sharpening machine, the combination with a frame provided at the upper surface of its front end with a projecting inclined surface, a replaceable bearing-block provided at its ends with inclined surfaces, one of its ends contacting with said first-mentioned inclined surface, and a securing-block provided with an inclined surface bearing upon the inclined surface of the adjacent end of the bearing-block, a feed-arm provided with a feed-finger and moving upon said bearing-block, and means for actuating said feed-arm, substantially as and for the purpose set forth.

7. In a machine for sharpening saws, the combination with a frame provided at the upper surface of its front end with a projecting beveled surface, a bearing-block provided with two upwardly-converging end surfaces, and a securing-block provided with two downwardly-converging end surfaces, one of which engages the adjacent inclined end of the bearing-block, and the other an inclined surface on the frame, a feed-arm provided with a feed-finger and sliding upon said bearing-block, and means for actuating said feed-arm, substantially as and for the purpose set forth.

8. In a machine for sharpening saws, the combination with a frame provided at its front end with a bearing-surface for a feed-arm, a feed-arm resting at one end on said bearing-surface and provided with a feed-finger, an arm for actuating said feed-arm, a member pivotally connected to said last-named arm and provided with a perforation for the stem of the feed-arm, an adjusting-sleeve having threaded connection with said pivotal connecting member and provided with a perforation through which the stem of said feed-arm passes, means for securing the stem of said feed-arm to said adjusting-sleeve to permit the sleeve to rotate on said stem, and means connected with said pivotal member and bearing upon said stem for securing the feed-arm in a given position, substantially as and for the purpose set forth.

9. In a saw-sharpening machine, the combination with a frame provided at its front end with a bearing-surface for a feed-arm, a feed-arm sliding upon said bearing-surface and provided with a feed-finger, a feed-lever for actuating said feed-arm, a pivotal connecting member for joining said feed-arm to said actuating-lever, said pivotal member being provided with a perforation for the stem of the feed-arm, an adjusting-sleeve k' having threaded connection with said pivotal connecting member and secured rotatably and non-movably longitudinally upon the stem of said feed-arm, and a spring k^4 secured to said pivotal connecting member and bearing against the stem of said feed-arm, substantially as and for the purpose set forth.

10. In a saw-sharpening machine, the combination with a frame provided at its front end with a feed-arm bearing, a feed-arm sliding upon said bearing and provided with a feed-finger and provided with a stem having a flattened upper surface and a reduced outer end, an actuating-lever for said feed-arm, a pivotal connecting member between said actuating-lever and said feed-arm provided with a perforation through which the stem of said feed-arm projects, an adjusting-sleeve on the reduced end of said stem and connected therewith by a nut thereon and having threaded connection with said pivotal connecting member, a spring attached to said pivotal connecting member and bearing at its free end on the flattened surface of said stem, and a screw for tightening said spring upon said stem, substantially as and for the purpose set forth.

11. In a saw-sharpening machine, the combination with a frame provided at its front end with a feed-arm bearing, a feed-arm M sliding upon said bearing and provided with a feed-finger, a feed-arm-actuating lever provided with a circular head h, and a connecting member h' carrying said feed-arm and pivotally joined to the center of the head h and provided with a flange h^2 inclosing said head, substantially as and for the purpose set forth.

12. In a saw-sharpening machine, the combination with a frame provided at its front end with a feed-arm bearing, a feed-arm M sliding upon said bearing and provided with a feed-finger, a feed-arm-actuating lever provided with a circular head h, a connecting member h' carrying said feed-arm and provided with a stud h^3 projecting through the perforation in the head h and provided also with a flange h^2 embracing the head h, and means for securing the member h' to the head h, substantially as and for the purpose set forth.

13. In a saw-sharpening machine, the combination with a frame provided at its front end with a bearing for a feed-arm, a feed-arm sliding upon said bearing and provided with a feed-finger, means for actuating said feed-arm, and an adjustable stop against which said feed-arm strikes comprising a member fixedly secured to the frame and affording a guide, a movable member in said guide and projecting into the path of said feed-arm at one end, and provided at the opposite end with an inclined surface, and an adjusting-screw bearing upon said inclined surface, substantially as and for the purpose set forth.

14. In a saw-sharpening machine, the combination with a frame provided at its front end with a bearing for a feed-arm, a feed-arm sliding upon said bearing and provided with a feed-finger, means for actuating said feed-arm, and an adjustable stop comprising a member n fixedly secured to the frame and provided with a guideway, and at the rear end of said guideway with a threaded perforation, a member n^3 moving in said guide and provided at one end with a feed-arm-engaging head and at the opposite end with an inclined surface, and an adjusting-screw projecting through said perforation and against said inclined surface, substantially as and for the purpose set forth.

15. In a saw-sharpening machine, the combination with a frame provided at its front end with a bearing for a feed-arm, a feed-arm sliding upon said bearing and provided with a feed-finger, means for actuating said feed-arm, and an adjustable stop comprising a fixed member n provided with a guide, a threaded perforation and a split lug n^7, a movable feed-arm-engaging member n^3 provided at one end with an inclined surface n^5, an adjusting-screw projecting through said threaded perforation and through said split lug n^7, and a screw n^8 serving to lock the adjusting-screw n^6, substantially as and for the purpose set forth.

16. In a saw-sharpening machine, the combination with a frame provided at its front end with a bearing for a feed-arm, a feed-arm sliding upon said bearing and provided with a feed-finger, means for actuating said feed-arm, and an adjustable stop comprising a fixed member n, a movable feed-arm-engaging member n^3 provided at its front end with a head n^4 and at its rear end with a head provided with an inclined surface n^5, an adjusting-screw n^6 passing through the perforation in the member n and bearing upon said inclined surface, a slotted lug embracing the stem of said adjusting-screw, a screw n^8 for tightening said lug upon the stem of the adjusting-screw, and a screw n^9 passing through the perforation in the member n and bearing upon the movable member n^3, substantially as and for the purpose set forth.

HENRY P. SCHOFIELD.

In presence of—
D. W. LEE,
A. D. BACCI.