(No Model.) 2 Sheets—Sheet 1.

H. F. JENKS & W. H. BUTMAN.

SAW SETTING MACHINE.

No. 328,035. Patented Oct. 13, 1885.

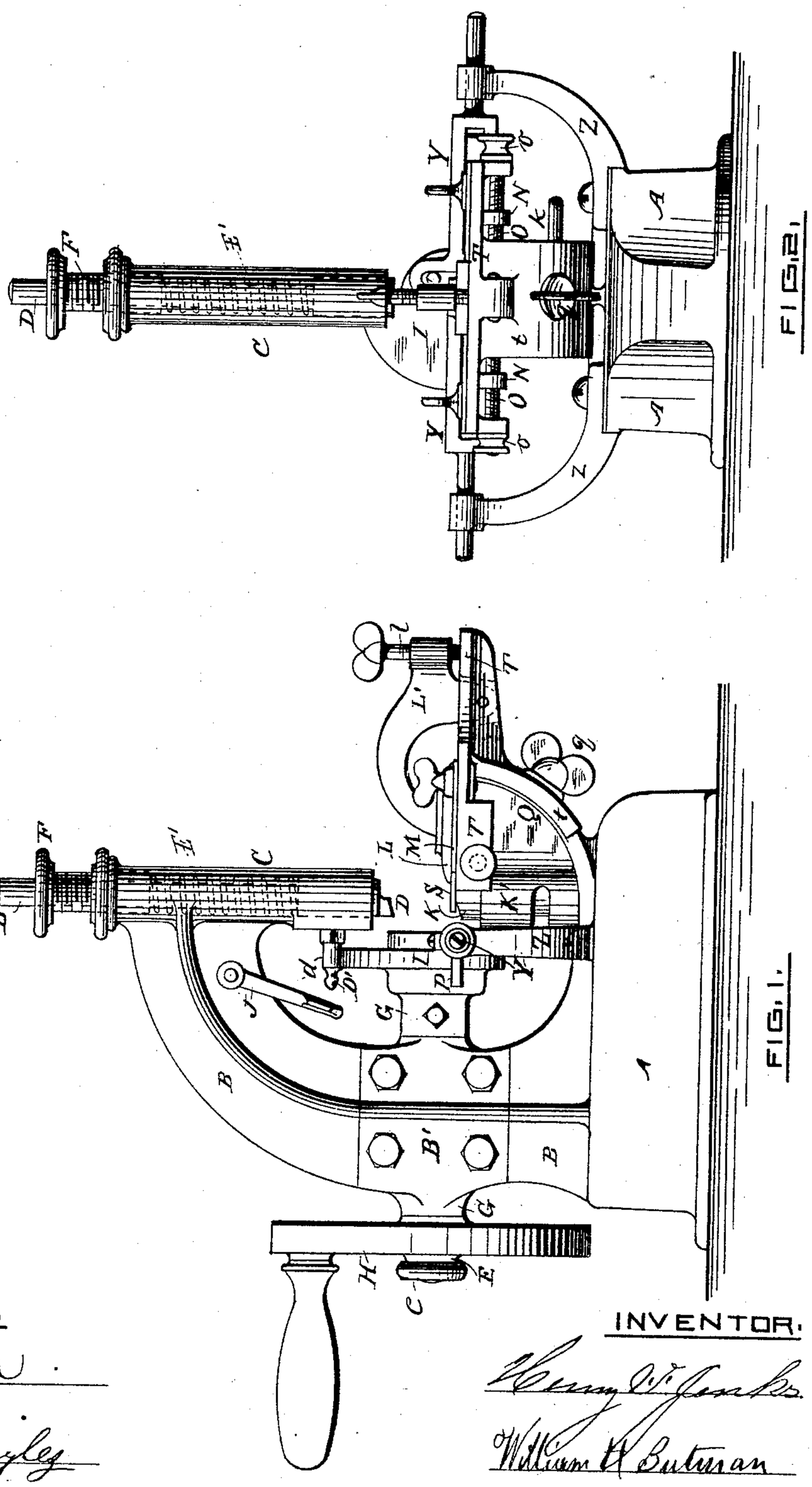

FIG. 2.

FIG. 1.

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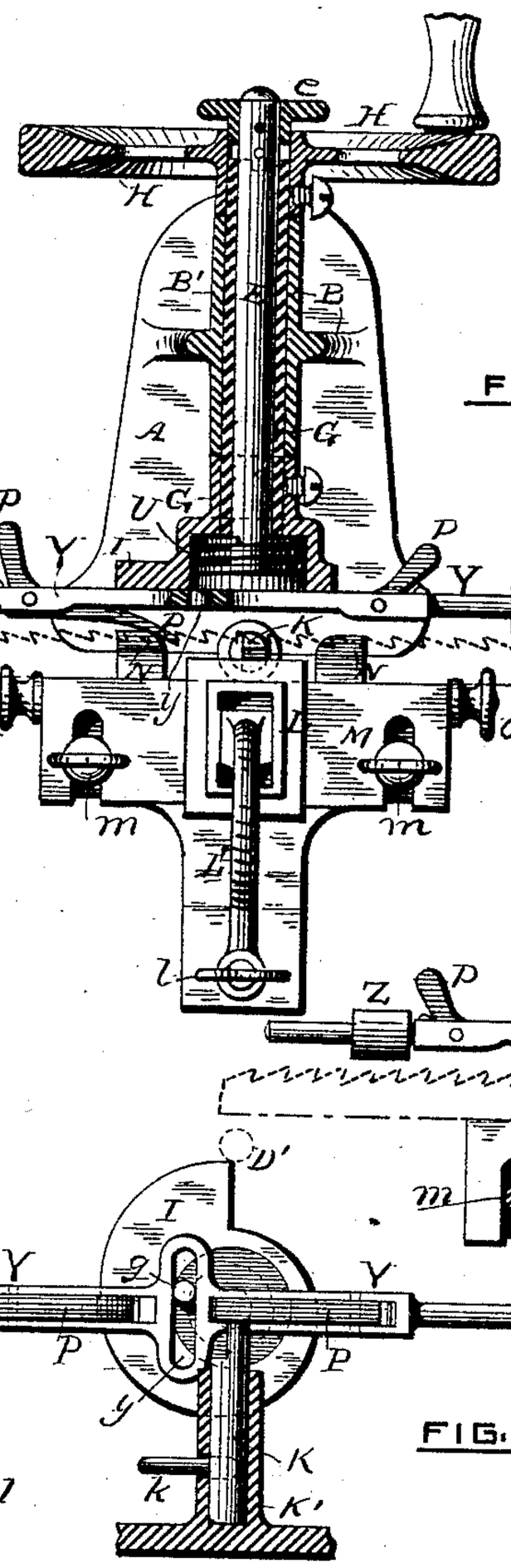

FIG. 3.

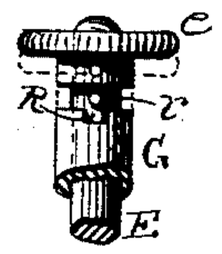

FIG. 8.

FIG. 7.

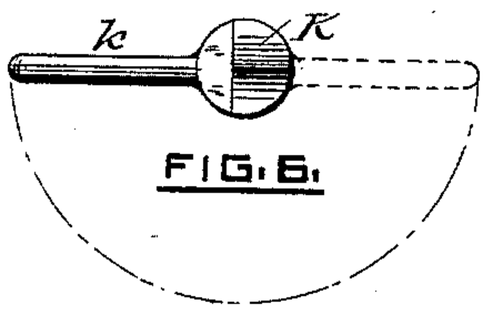

FIG. 6.

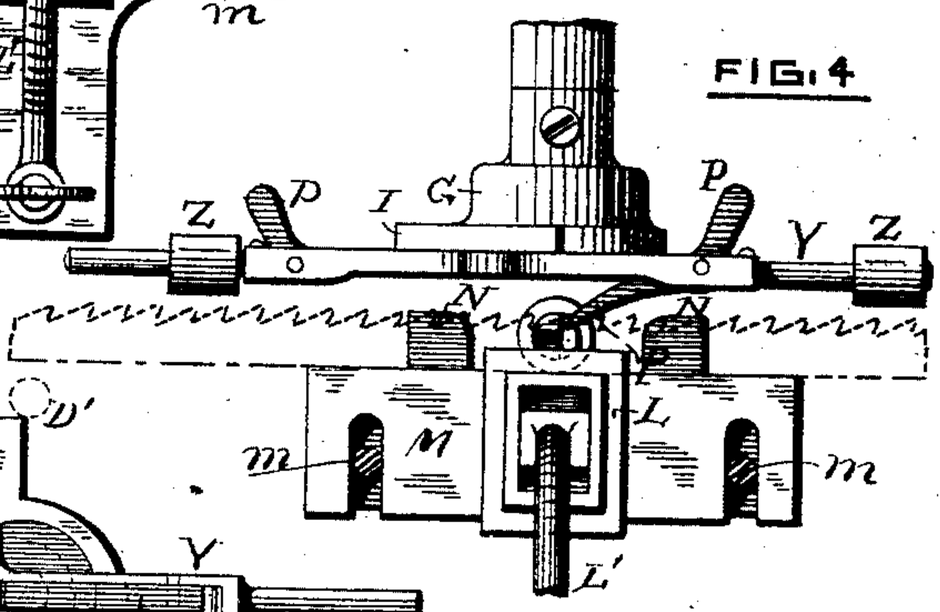

FIG. 4.

FIG. 5.

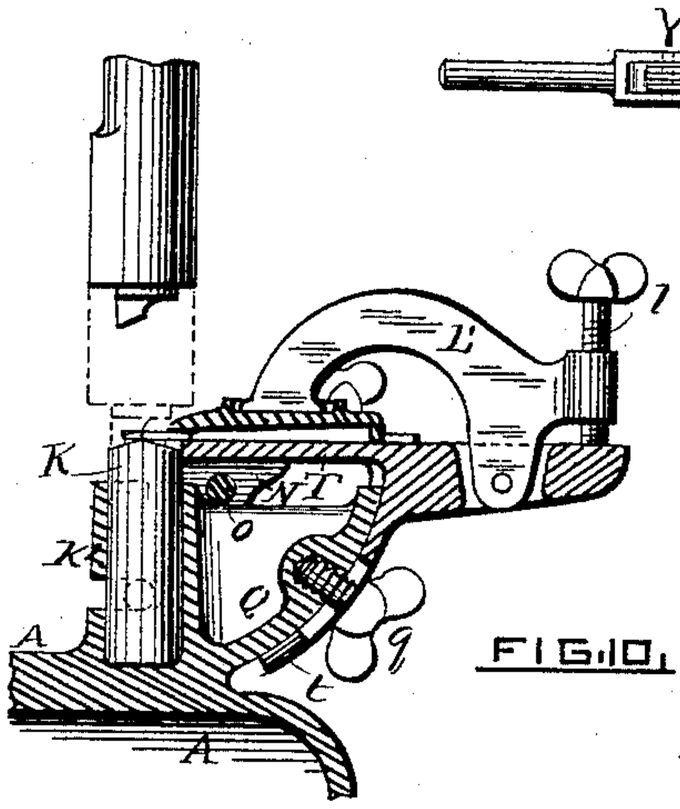

FIG. 10.

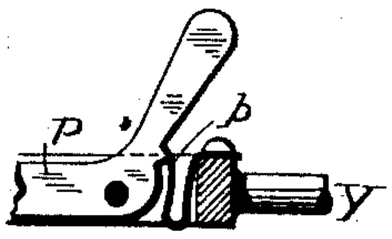

FIG. 9.

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UNITED STATES PATENT OFFICE.

HENRY F. JENKS AND WILLIAM H. BUTMAN, OF PAWTUCKET, RHODE ISLAND.

SAW-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 328,035, dated October 13, 1885.

Application filed June 11, 1884. Serial No. 134,511. (No model.)

To all whom it may concern:

Be it known that we, HENRY F. JENKS and WILLIAM H. BUTMAN, of Pawtucket, Providence county, Rhode Island, have invented a certain new and useful Improvement in Saw-Setting Machines, of which the following is a specification, reference being had to the accompanying drawings, making part hereof.

The object of this invention is to provide a compact machine for automatically setting the teeth of saws of various kinds. The machine is made adjustable in various particulars to provide for a wide range of work, as will be explained.

Our invention consists in the devices and combinations of devices set forth in the appended claims.

In the drawings, Figure 1 is a side elevation, and Fig. 2 a front view, of our machine. Fig. 3 is a horizontal section through the driving-shaft, showing the lower portion of the machine in plan. Fig. 4 represents the work-table and adjacent parts by which the saw is held and moved forward. Fig. 5 is a vertical section through the support of the semi-rotary anvil, showing also the saw-moving devices and the cam which lifts the hammer. Fig. 6 is a top plan of the anvil, and Fig. 7 a bottom view of the hammer. Figs. 8 and 9 are details, which will be explained. Fig. 10 is a vertical section illustrating the adjustable table and saw-clamp.

The machine has a suitable base, A, which may be secured by bolts and screws to a bench or bed-plate.

A standard, B, preferably cast in one with the base, and curved, as shown in Fig. 1, has at its upper end a depending vertical arm or sleeve, C, which contains the vertically-reciprocating hammer, D, and a spiral spring, E′, by which the blow or stroke of the hammer is effected. The tension of the spring, and the consequent fall of the blow, is regulated by the adjusting screw-nut F. The spring bears upon a shoulder of the hammer, and a reduced portion of the hammer extends up through the spring and nut.

The driving-shaft G is journaled horizontally in the standard B, and furnished with a removable bearing, B′, as indicated in Fig. 1.

A crank-wheel or driving-pulley, H, adapts the machine to be driven by hand or by power.

A cam, I, at the inner end of the shaft G lifts the hammer D by means of a stud, D′, projecting from the hammer through a slot in the sleeve C, the stud being provided with an anti-friction roller, *d*, which bears upon the face of the cam. (See Fig. 1.)

A hook or link, J, depending from the standard B, engages with the stud D′ when it is desired to hold the hammer dormant.

The anvil K, upon which the saw-teeth are set, is placed immediately beneath the hammer, and is provided with a projecting lever, *k*, by which it may be turned half round in its vertical socket K′, for a purpose which will be explained. The face of the anvil is beveled each way from the center, and the head of the hammer is oblique, to fit one side thereof.

The saw S rests while under treatment upon the table T, which is made adjustable in a short arc upon the fixed quadrant Q, and is secured, when adjusted, by a thumb-screw, *q*, which passes through a slot in the curved arm *t*, extending down from the table, as best shown in Figs. 1 and 10. By the adjustment thus secured the saw is held in a plane more or less oblique to that face of the anvil to which the tooth struck by the hammer is made to conform, and hence this adjustment provides for more or less set to the teeth.

The back of the saw is guided and kept at the distance from the anvil which will bring the teeth beneath the hammer by a guide-plate, M, lying upon the table, and slotted to receive the adjusting-screws *m*, to provide for various widths of saws.

The saw is held firmly to the table by the clamp-plate L and pivoted arm L′, with its thumb-screw *l*, (see Figs. 1 and 10;) but this pressure is not such as to prevent feeding the saw forward for successive action of the hammer on alternate teeth. This feeding is accomplished by the reciprocating stroke of yoke Y, mounted in two arms, Z, and carrying two pawls, P, pivoted in said yoke, and provided with springs *p*, Fig. 9, which hold them in position to engage with the saw-teeth, or to be dormant, as desired. The yoke has at its center a vertical recess to receive a crank-

pin, *g*, at the inner end of the shaft, G, by which connection the rotary motion of the shaft reciprocates the yoke and its pawls P, thus advancing the saw-blade as desired. (See Figs. 2, 3, and 5.)

The saw-teeth are to be alternately deflected in opposite directions; hence in the passage of the saw over the anvil alternate teeth are acted on, setting half the teeth while moving in one direction, and the remainder on the reverse movement after turning the saw over and inserting the same end first. The yoke with its pawls P has a movement for this purpose equal to the full space occupied by two teeth of the largest saws on which the machine is designed to operate.

In order that with smaller teeth the pawl shall engage only the alternate one, although making a complete reciprocation past three or more teeth of a small saw, we provide two lugs, N, threaded to engage with a threaded shaft, O, having cylindrical bearings beneath the table, and provided at each end with a milled head, *o*, to turn it by. Rotation of this shaft causes the lugs to move toward or from the anvil, since the shaft is formed with a right and a left hand thread, as shown in Fig. 2.

The lugs N project as far or slightly beyond the points of the saw-teeth, and when the spring-pressed pawl retreats after its forward stroke and has passed two teeth it is carried and held out of engagement with the succeeding ones by the lug N, so that at the next forward stroke it shall engage with the tooth next but one to that on which the hammer last acted, and bring it into position beneath the hammer, as will be clear from Figs. 3 and 4, in which the saw, the anvils, and the pawls are seen reversed.

The anvil K is cut away at one side and made semi-rotary, as best shown in Figs. 5 and 6, in order to give the pawls a free movement from either side nearly to the center of the anvil to deposit squarely thereon the tooth about to be set. The lever *k*, by which the anvil is rotated, projects through a semicircular slot formed in the walls of the socket K′. At each end this slot is slightly depressed to retain the lever *k* by gravity.

One further adjustment of the machine is made—viz., of the feeding apparatus with relation to the cam and hammer stroke, so that when the saw, anvil, and pawls are reversed the hammer may descend while the active pawl is retracted and not while it is beneath the hammer. This is accomplished, as best shown in Figs. 3 and 8, by placing within the driving-shaft G a shaft, E, capable of a sliding and a rotary movement independent of the shaft G. This shaft E carries the crank-pin *g*, which actuates the feed-pawls and their yoke Y. A slight longitudinal movement of said shaft E, effected by the terminal nut or button *e*, disengages the pin *r*, fixed in the inner shaft, from the recess R in the driving-shaft, as indicated in Fig. 8, when a half-turn of the former shaft within the latter changes the relative position of the pawl and the cam. The two shafts again engage by their pin and recess, the spring U tending to keep them in engagement. (See Fig. 3.)

The operation will be clear without further details. The saw is introduced endwise between the table-top and the clamp-plate, as indicated in the drawings. The guide-plate is adjusted according to the width of the saw to bring the teeth over the working-face of the anvil and in proper relations to the feed-pawls. One pawl is thrown back and held dormant by its spring *p*, while the other engages with a tooth, which it carries forward and deposits on the anvil. The lugs N are so adjusted as that the reciprocation of this pawl will cause it to engage only with alternate teeth. Continuous rotation of the driving-shaft now advances the saw two teeth at each revolution after the hammer has been raised by the cam and forced quickly down by the spring. When half the teeth have thus been set in one direction, the saw is turned "end for end" and its movement reversed, the first pawl is retired and the other made active, and the alternate teeth are set on the return movement.

Having thus described our improvement in saw-sets, what we claim, and desire to secure by Letters Patent, is—

1. In an automatic saw-setting machine, the base supporting the table and anvil and the overhanging standard B and vertical arm C, depending therefrom, in combination with the hammer adapted to reciprocate in said arm and the spring and tension-screw to adjust and regulate the force of the blow, substantially as set forth.

2. In an automatic saw-setting machine, the hammer and anvil, in combination with a saw-table adjustable in the arc of a circle and provided with suitable clamping devices, for the purpose set forth.

3. In an automatic saw-setting machine, the doubly-beveled semi-rotary anvil and the table and clamps adapted to hold the saw thereon, in combination with hammer D, beveled on its face and provided with the stud D′, and the cam and spring serving to actuate the hammer, substantially as set forth.

4. In an automatic saw-setting machine, the reciprocating yoke Y, carrying two feed-pawls adjustable with relation to the saw-blade, so that either pawl may engage therewith while the other is dormant, substantially as set forth.

5. In an automatic saw-setting machine, the semi-rotary anvil K and the reciprocating feed-pawls, in combination with the shaft E, adjustable within the driving-shaft, for the purpose set forth.

6. In an automatic saw-setting machine,

the table T, in combination with the slotted guide-plate M, provided with adjusting-screws *m*, and the clamp-plate L with suitable tightening means, for the purposes set forth.

7. In an automatic saw-setting machine, the reciprocating feed-pawls, in combination with the lugs N, adapted to be adjusted with relation to the saw-teeth to provide for engagement of the pawl with the alternate teeth, substantially as set forth.

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WILLIAM H. BUTMAN.

Witnesses:
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WM. R. SAYLES.