(No Model.)

3 Sheets—Sheet 1.

F. HERHOLD & J. E. MILLS.

SAW GUMMER.

No. 330,399. Patented Nov. 17, 1885.

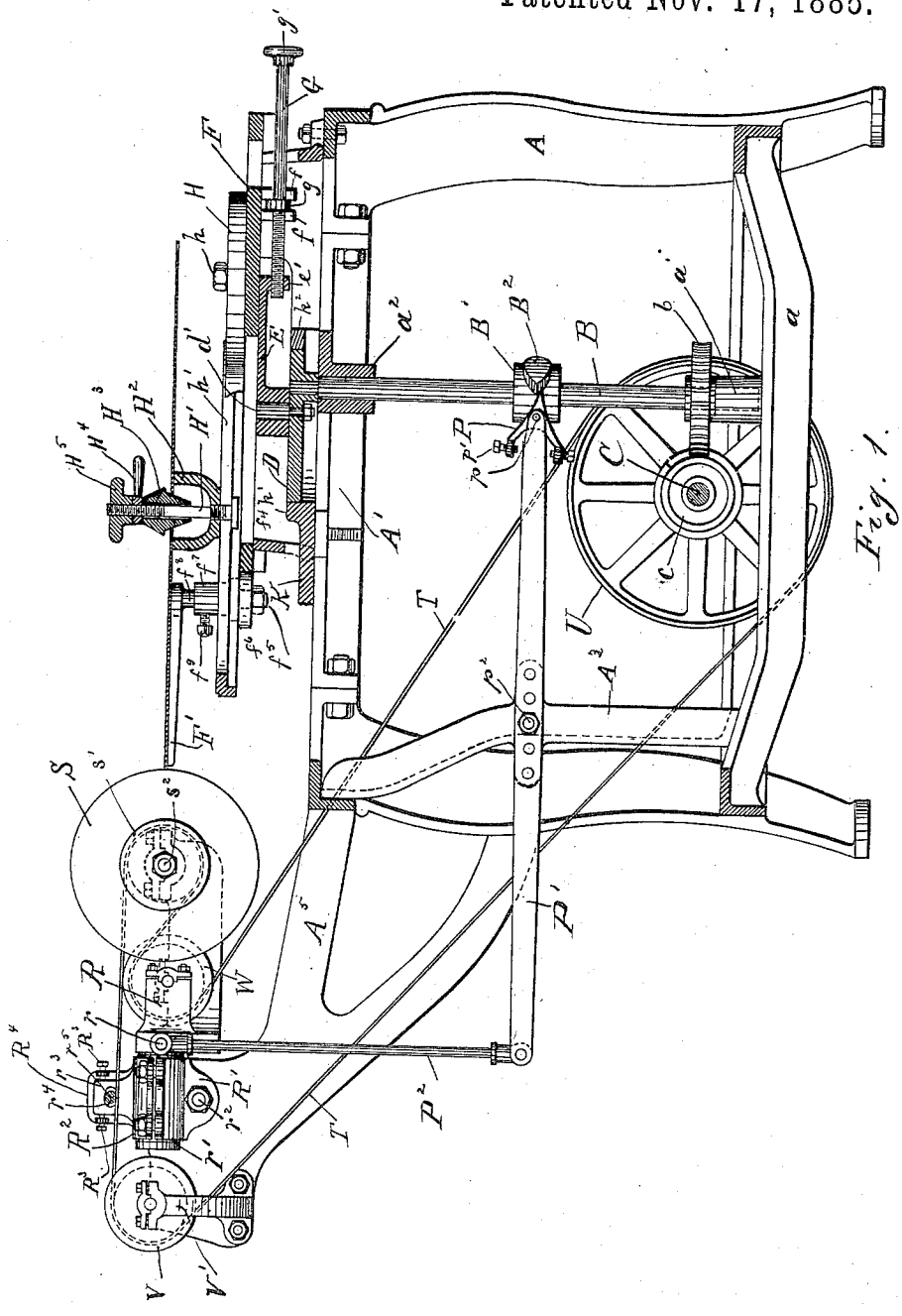


Fig. 1.

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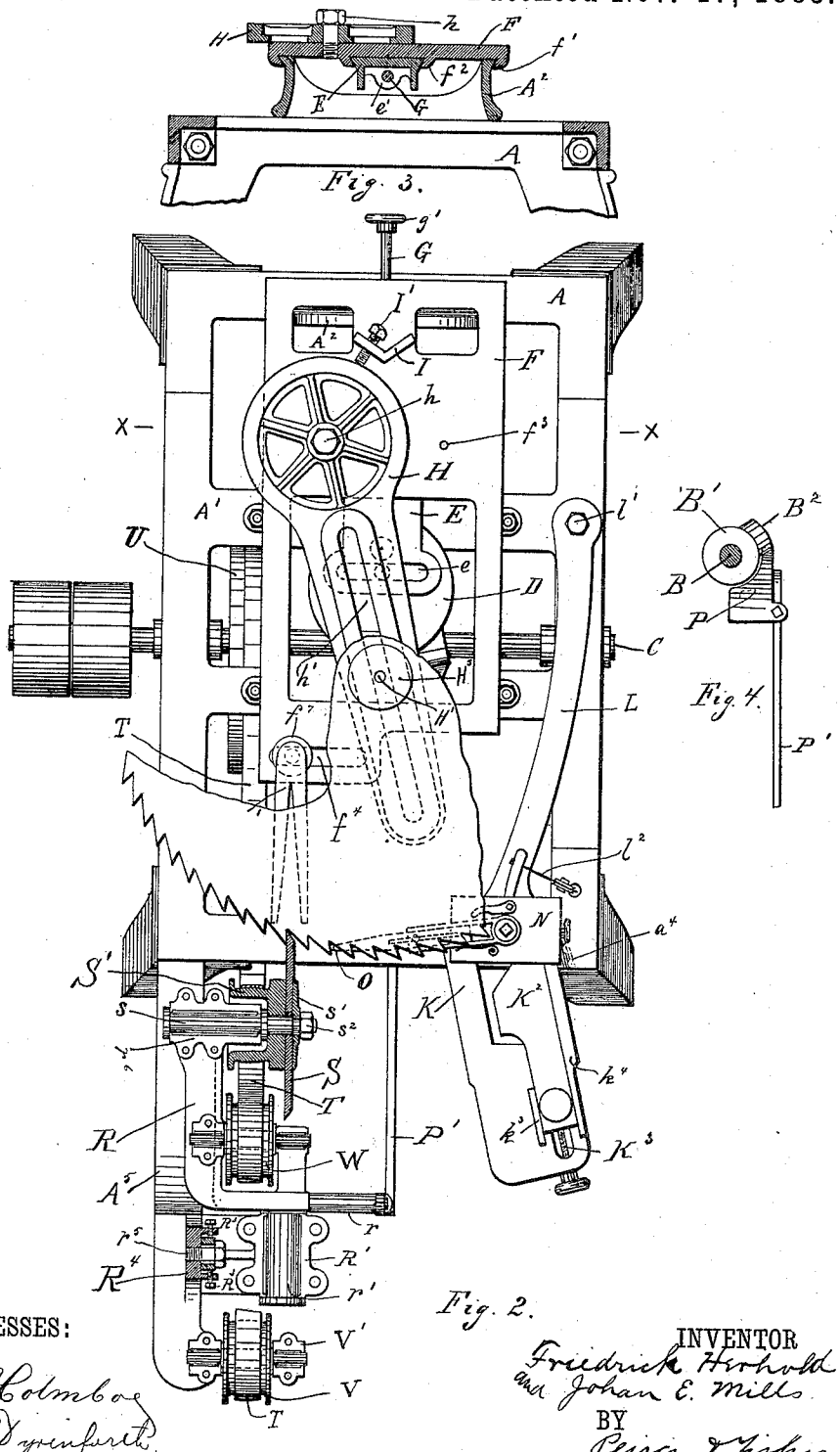


Fig. 2.

Fig. 3.

Fig. 4.

WITNESSES:

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(No Model.) 3 Sheets—Sheet 3.

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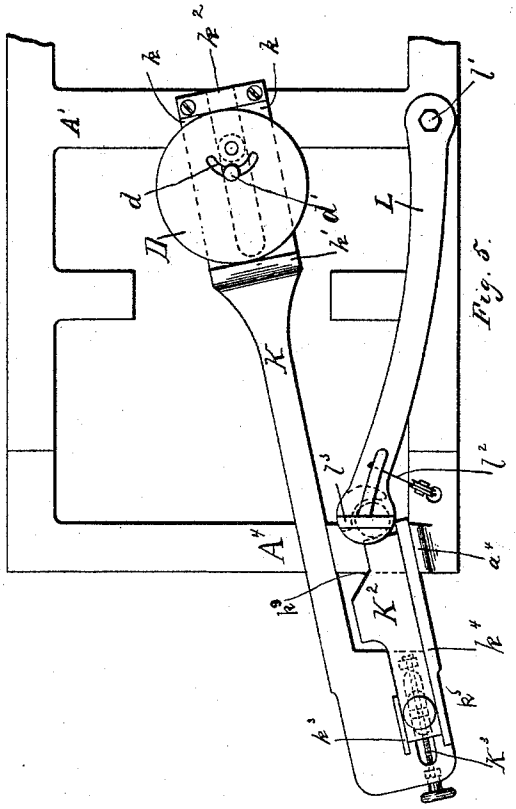


Fig. 5.

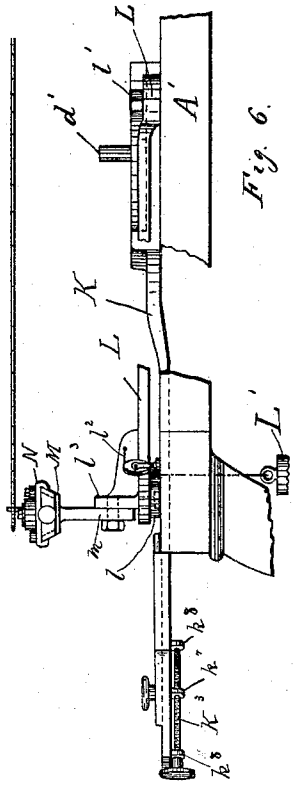


Fig. 6.

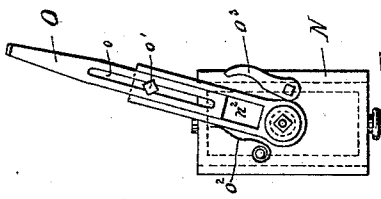


Fig. 9.

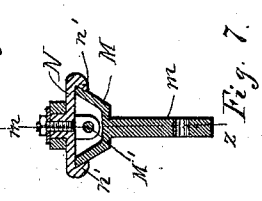


Fig. 7.

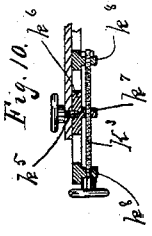


Fig. 10.

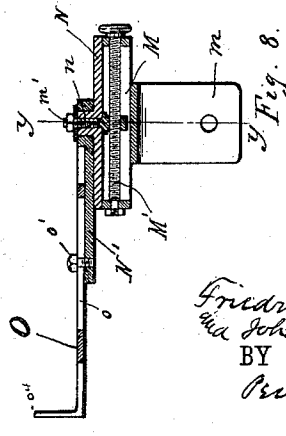


Fig. 8.

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UNITED STATES PATENT OFFICE.

FRIEDRICH HERHOLD AND JOHAN E. MILLS, OF CHICAGO, ILLINOIS; SAID MILLS ASSIGNOR TO SAID HERHOLD.

SAW-GUMMER.

SPECIFICATION forming part of Letters Patent No. 330,399, dated November 17, 1885.

Application filed May 2, 1884. Serial No. 130,181. (No model.)

To all whom it may concern:

Be it known that we, FRIEDRICH HERHOLD and JOHAN E. MILLS, residents of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Saw-Gummers, of which we do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

Figure 1 is a view in vertical longitudinal section parts being shown in elevation. Fig. 2 is a plan view with parts broken away and parts shown in section for better illustration. Fig. 3 is a view in vertical transverse section on line *x x* of Fig. 2. Fig. 4 is a detail sectional view through the vertical shaft, showing the cam-sleeve and arm in elevation. Fig. 5 is a detail plan view of the vertical shaft eccentric and the yoke-arm and swinging arm of the saw-turning mechanism. Fig. 6 is a detail view in side elevation of the mechanism for turning the saw. Fig. 7 is a detail view in vertical section on line *y y* of Fig. 8. Fig. 8 is a detail view in vertical longitudinal section on line *z z* of Fig. 7. Fig. 9 is a detail plan view of the saw-turning arm and standard shown in Figs. 7 and 8. Fig. 10 is a detail view in longitudinal section through the end of the pattern-block.

Like letters of reference denote corresponding parts in the various views of the drawings.

Our present invention consists in certain details of construction that will be hereinafter fully described, and particularly defined in the claims at the end of the specification.

A designates the main frame of the machine, the cross-bar *a* of which is furnished with the journal-block *a'*, in which rests the lower end of the upright shaft B, carrying the worm-wheel *b*, that derives motion from the worm *c* on the main drive-shaft C. The upper portion of the shaft B is journaled in the cross-plate a^2 of the frame-top A', and upon its end has fixed the eccentric wheel D. Through the curved slot *d* of this wheel D is bolted the pin *d'*, that enters the long slot *e* of the plate E. This plate is connected to the main table F by means of the adjusting-rod G that enters a threaded perforation in the flange *e'* of the plate E, and has fixed thereon the collar *g*, that is held between the depending lugs or stops *f* of the table. The rear end of the rod G is provided with a small hand-wheel, *g'*, by which the plate E and table F may be readily adjusted with relation to each other when a slight advance of the saw with respect to the grinding-wheel is to be effected. From the top A' of the main frame rises the table-support A^2, over the sides of which, as seen in Fig. 3, fit the flanges *f'* of the main table F, that rests thereon, and from the under side of this table depend the beveled flanges f^2, within which are held, in a manner free to move, the correspondingly-beveled edges of the plate E. In the top of the table F are formed the threaded perforations f^3, either of which will receive the journal-bolt *h*, by which is held the saw-carrying arm H. A double bracket or standard, I, having perforations in each of its sides, receives the set-screw I', by which the position of the arm H is determined. Within the long slot *h'* in the arm H is carried the headed bolt H', that projects through the cup-shaped bearing-block H^2, upon which the saw is held by means of the double conical hub H^3, the jam-nut H^4, and set-nut H^5. By forming the hub as a double cone it can be reversed to adapt it to the different sizes of saw-center holes, and by changing the position of the bolt H' in the slot *h'* saws of different diameters may be readily presented to the action of the grinding-wheel. In the front portion of the table F is formed the slot f^4, which receives the bolt f^5, that carries the washer f^6, and serves to secure in proper position above the slot the journal-block f^7, that sustains the journal f^8 of the forked brace-arm F', the position of which is determined by the set-screw f^9. The purpose of thus forming the brace-arm is to enable it to better sustain the saw on each side of the grinding-wheel, and hence permit the wheel to act with greater certainty and less noise.

By means of the slot f^4 and adjusting devices shown, the position of the brace-arm with reference to the grinding-wheel can be varied, slight adjustments of the brace-arm being found desirable to suit different forms of saw-teeth.

As will be readily understood by those

skilled in the art, the position of the saw-carrying arm H upon the table F will depend upon the shape that is to be given to the interdental spaces of the saw.

The above-described mechanism is that which serves to properly sustain the saw and give thereto the necessary reciprocating motion, as will hereinafter more fully appear.

The mechanism by which the rotation of the saw is effected to bring its interdental spaces successively in front of the grinding-wheel will next be described. On each side of the hub of the main eccentric D fits the forked portion *k* of what is designated the "yoke-bar" K, that slides within a suitable seat in the part A^4 of the main frame, and between the shoulder *k'* and end plate, k^2, of the yoke-bar fits the eccentric D. The free end of the yoke-bar is provided on its upper surface with the ribs or flanges k^3 and k^4, the latter bearing against the rib a^4 of the top of the main frame. Between the ribs or flanges k^3 and k^4 is held the pattern-block K^2, through which passes the threaded bolt k^5, provided with a clamp-nut, and having its lower end within a threaded perforation in the slide-block k^6, the lug k^7 of which is adapted to receive the adjusting-rod K^3, journaled in the depending lugs k^8 of the yoke bar. The end portion, k^9, of the pattern-block is made cam-shaped, for a purpose to be presently explained, and against this portion bears the friction-roller *l*, carried by the free end of the swinging arm L, that is pivotally connected to the main frame at *l'*, and has connected therewith, by the cord l^2, the weight L', that serves to keep the arm normally in retracted position. It will thus be seen that when the eccentric D is revolved the yoke-bar K will be reciprocated, and the cam-face of the pattern-block bearing upon the roller *l* will swing the arm L, the extent and character of the movement of this arm being dependent upon the shape of the pattern-block. From the end of the swinging arm rises the bracket l^3, to which is bolted the shank *m* of the standard M, through the dish-shaped upper portion of which (see Fig. 8) extends the adjusting-rod M', passing through a threaded perforation in the lower end of the bolt *m'*, that enters the threaded hub or enlargement *n* in the slide-plate N, the flanges *n'* of which clasp the inclined sides of the standard M in such manner as to permit the free movement of the slide-plate without danger of displacement. Over the hub *n* fits the perforated end of the arm-rest N', that is held in place on the hub by means of the washer and set-nut. Within the upper side of this arm-rest is formed the seat n^2 for the turning-arm O, through the long slot *o* of which projects the set-screw *o'*, by means of which the arm can be held at different positions in its seat. By thus adjusting the turning-arm within its seat its length can be varied to accommodate saws of different diameters, and by mounting the arm-rest upon the hub *n* it can be readily swung, by the spring o^2, into position for use, and can be there held by means of the clamp-lever o^3 on the top of the slide-plate N. Slight adjustments of the turning-arm, such as are required at different times in the cutting of the same saw, can be effected by means of the adjusting-rod M'. The extreme end of the turning-arm O is bent upward, as shown at o^4, to strike against the teeth of the saw.

To the upright shaft B is keyed the cam-sleeve B', that has formed upon its periphery the double-faced cam B^2, within the path of which projects the double cam-block P, which is cut away, as shown in Fig. 4, to partly encompass the sleeve B', and is pivotally connected by the pin *p* to the lever-arm P'. From this construction it will be seen that as the upright shaft B revolves the lower face of the cam B^2, bearing upon the upper face of the cam-block P, depresses the lever P', and upon passing from the cam-block causes it to turn upon its pivot-pin *p*, and thus throws its point upward into such position that in the next revolution the upper face of the cam will bear upon the lower face of the cam-block, and will elevate the lever. The lever P' is thus alternately raised and lowered, for a purpose to be presently explained, the extent of its movement being controlled by the set-screws *p'*, that are in the rear ends of the cam-block and above the lever. A bolt, p^2, pivotally connects the lever P' with the standard A^3 of the main frame, and to the end of this lever is jointed the rod P^2, the upper end of which is pivotally connected to the arm *r* of the wheel-sustaining casting R. This casting R is provided with a wrist-pin or journal, *r'*, that is held within the journal-bearings R' R^2 in such manner as to permit the castiug to be freely turned or rocked laterally by the movement of the lever P'. The bearing R' is pivotally connected to the bracket A^5 of the main frame by the bolt r^2, and the upper portion, r^3, of the plate of this bearing is provided with the slot r^4, through which passes the screw or pin r^5, so that the casting can be set at different angles longitudinally, its position being determined by the set-screws R^3 on the standard R^4 of the bracket A^5. Upon the laterally-extended front end of the casting R are the journal-bearings r^6 for the spindle *s* of the grinding-wheel S, and upon this spindle is carried the pulley S', against the end of which the grinding-wheel is securely clamped by means of the broad washer *s'* and nut s^2. Motion is imparted to the pulley S' by means of the belt T, that passes over the pulley U on the main drive-shaft, the pulley V, journaled in a suitable bracket, V', and the pulley W, journaled in the casting R, as seen in Figs. 1 and 2.

The operation of the machine is as follows: Motion being imparted to the main drive-shaft C is communicated therefrom to the grinding-wheel by the drive-belt. At the same time the upright shaft B is caused to revolve. By the revolution of the shaft B the eccentric D is turned, and a reciprocating movement is given thereby to the saw through the medium of the plate E, the table F, the saw-sustaining

arm H, and connecting parts. This reciprocating movement serves to present the saw to the action of the grinding-wheel, in order to cut one interdental space and to withdraw it therefrom until the saw is turned a sufficient distance to bring the next space in proper position to be cut. As all saws do not have the same shaped teeth and interdental spaces, the swinging saw-sustaining arm and adjusting mechanism are employed in order to present the saw to the grinding-wheel in proper position for cutting different styles of teeth and spaces. As the eccentric D withdraws the saw from the grinding-wheel, it at the same time causes the yoke-bar K to move backward, which bar in turn, by its pattern-block K^2, forces the swinging lever L forward and causes the arm O to bear upon a tooth of the saw and turn it a sufficient distance to bring the next space before the grinding-wheel. The shape of the pattern-block employed is determined by the character of the teeth and spaces of the saw being cut, and the curved slot *d* of the eccentric D allows the adjustment of plate E on the eccentric, so as to properly time with relation to each other the reciprocating and rotary movement of the saw. The successive elevation and depression of the lever P′ by the cam B^2 on the upright shaft causes the automatic tipping of the grinding-wheel necessary to give the proper bevel to the edges of the teeth and interdental spaces of the saw.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a saw-gummer, the combination, with the upright shaft B, of a single eccentric, D, mounted thereon, the saw-supporting arm in suitable connection with said eccentric, and a saw-turning arm, also in suitable connection with the same eccentric, D, substantially as described.

2. In a saw-gummer, the combination, with the upright shaft B and the single eccentric D thereon, of the plate E, the table F, and the arm H, for supporting the saw, and the yoke-bar K, the swinging arm L, and an arm for turning the saw, all substantially as described.

3. In a saw-gummer, the combination, with the slotted adjustable table F, of the brace-arm F′, having a journal adjustably held within the slot of the table, substantially as described.

4. In a saw-gummer, the combination of the upright shaft B, the eccentric D, the plate E, mounted on the eccentric, the table F, the arm H, the yoke-bar K, the swinging arm L, and an arm for turning the saw, substantially as described.

5. In a saw gummer, the combination, with a suitable arm-rest and a screw-rod for adjusting the same, of the saw-turning arm adjustably mounted in the arm-rest, substantially as described.

6. The combination, with the standard M, of the slide-plate N, adjustably mounted thereon, the arm-rest N′, pivotally held upon the slide-plate and having a seat, n^2, therein, the slotted turning-arm O, adjustably held in the seat of the arm-rest, and a set-screw, *o*′, substantially as described.

7. The combination, with the upright shaft having the cam B^2 thereon, of the lever P′, the pivoted cam-block P, the arm for rocking the grinding-disk, and suitable connecting mechanism, substantially as described.

8. The combination, with the main frame, of the adjustable bearings R′ R^2, and the devices for adjusting the same, the wheel-sustaining casting R, the wrist-pin *r*′, extending in the radial direction of the grinding-wheel, the grinding-wheel, the driving-pulleys, and mechanism for oscillating the wheel-sustaining castings, substantially as described.

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JOHAN E. MILLS.

Witnesses:
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JAMES H. PIERCE.