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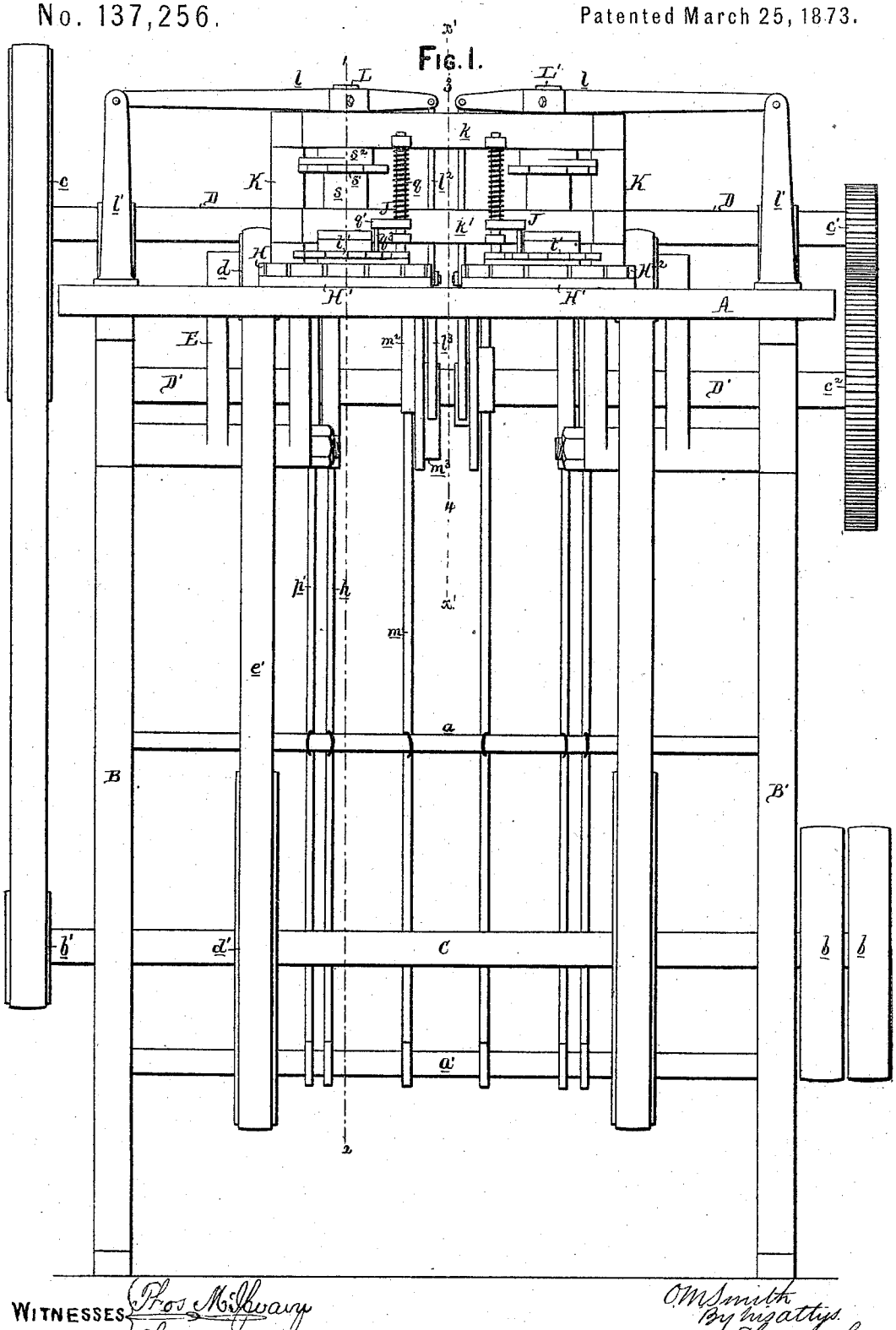
O. M. SMITH.

Machines for Cutting Nicks in Umbrella Runners.

No. 137,256. Patented March 25, 1873.

Fig. 1.



WITNESSES Thos McElvany
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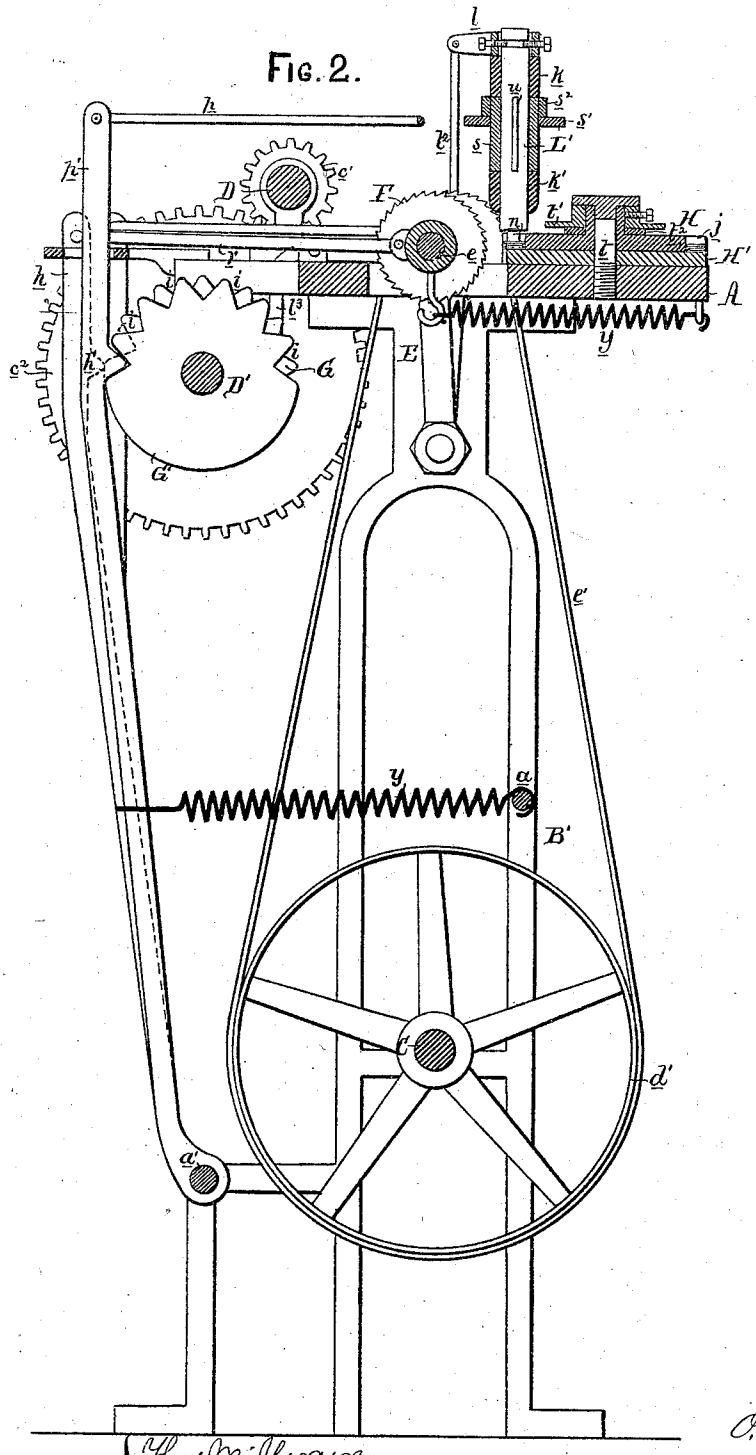
FIG. 2.



WITNESSES { Thos. M. Ilgram
Harris Smith

O. M. Smith
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Howson & Howson

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FIG. 4

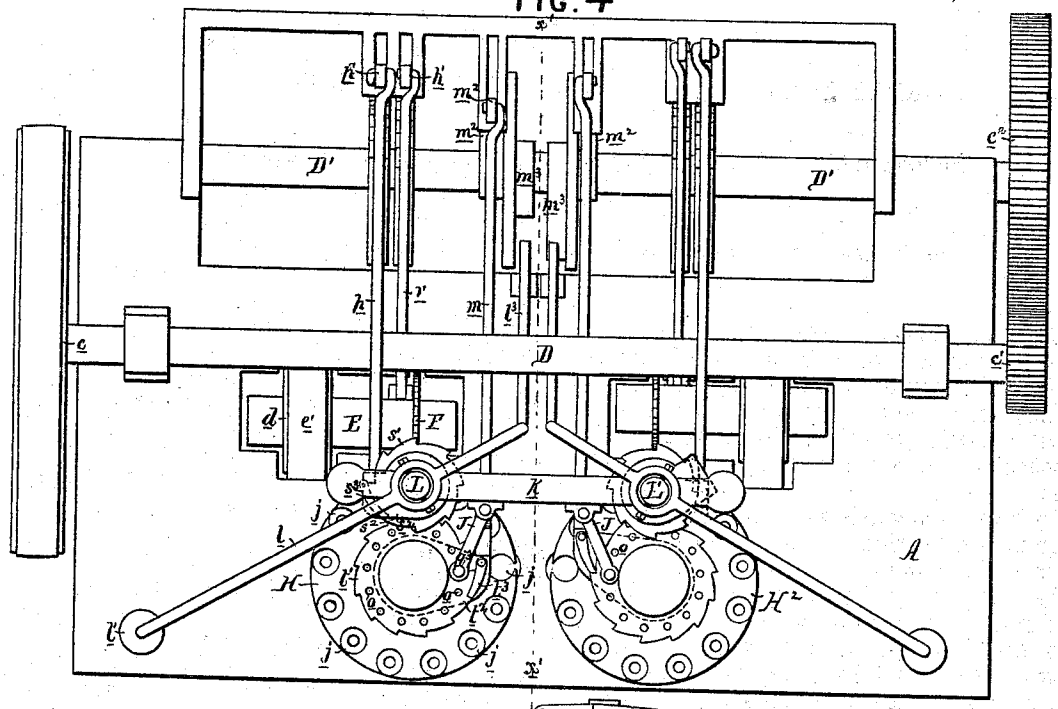


FIG. 3.

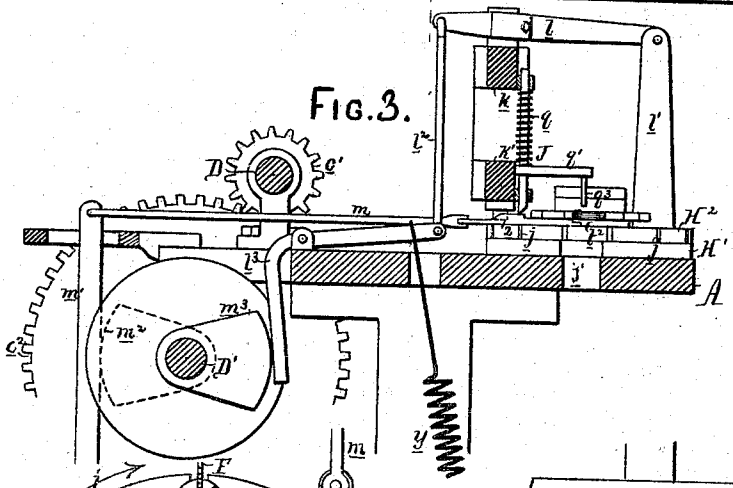


FIG. 5.

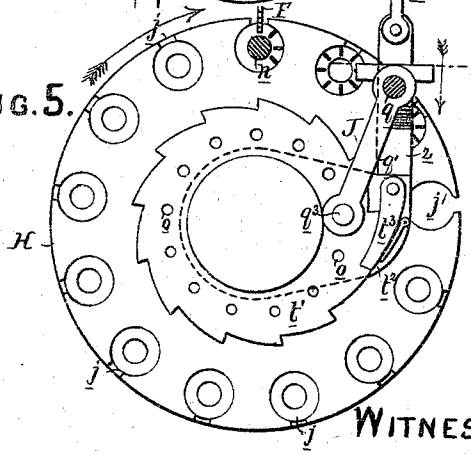
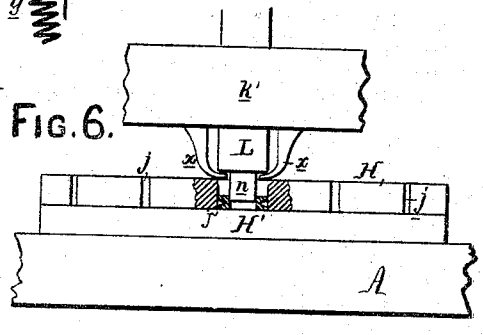


FIG. 6.



WITNESSES { Thos. McElwain, Harry Smith }

O. M. Smith, By his Attys. Howson & Sons

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UNITED STATES PATENT OFFICE.

ORREN M. SMITH, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR CUTTING NICKS IN UMBRELLA-RUNNERS.

Specification forming part of Letters Patent No. **137,256**, dated March 25, 1873.

To all whom it may concern:

Be it known that I, ORREN M. SMITH, of the city and county of Philadelphia, State of Pennsylvania, have invented a Machine for Cutting Nicks in Umbrella Runners and Notches, of which the following is a specification:

My invention consists of improvements in a machine for cutting radial recesses or nicks in umbrella runners and notches, the said machine being too fully described hereafter to need preliminary explanation.

In the accompanying drawing, Figure 1, Drawing No. 1, is a front view of the machine; Fig. 2, Drawing No. 2, a transverse section of the same on the line 1 2, Fig. 1; Fig. 3, Drawing No. 3, a transverse section on the line 3 4, Fig. 1; Fig. 4, a plan view; and Figs. 5 and 6, enlarged detached views of parts of the machine.

The table A of the machine is supported by opposite frames B and B′, connected together by longitudinal braces *a a′*. In bearings in the lower portions of the frames turns a longitudinal driving-shaft, C, one end of which is furnished with fast and loose pulleys *b b*, and to the opposite end is secured a smaller pulley, *b′*. A shaft, D, turning in suitable bearings on the table A, has at one end a pulley, *c*, receiving motion by a belt from the pulley *b′* on the driving-shaft, and at its opposite end a pinion, c^1, gearing into a cog-wheel, c^2, on a shaft, D′, turning in bearings in the frames B B′. Vibrating arms E, hung at their lower ends to a horizontal spindle on the inner side of the frame B, Fig. 1, carry at their upper ends a spindle, *e*, to which is secured a saw or cutter, F, and also a pulley, *d*, the latter receiving motion from a pulley, *d′*, on the driving-shaft through the medium of a belt, *e′*. The arms E are connected by means of a rod, *r*, to the upper end of an arm, *h*, hung at its lower end to the frame, and having near its upper end a projection, *h′*, caused by a spring, *y*, to enter, successively, a series of depressions, *i*, formed in a portion of the periphery of a cam-disk, G, on the shaft D′. Upon the table A, in front of the saw F, is a horizontal disk, H, turning upon a vertical axis, *t*, and resting upon a similar permanent disk, H^1, the said movable disk having in its periphery a series of circular recesses, *j*, arranged at regular distances apart, for receiving and retaining the runners and notches to be operated upon. A ratchet-wheel, t^1, having as many teeth as there are recesses in the disk H, is secured to a boss on the said disk, and to a plate, t^2, turning on the said boss, is hung a pawl, t^3, adapted to the teeth of the ratchet-wheel. Two vertical standards, K K, Fig. 1, are secured to the top of the table A, and are connected together by upper and lower cross-bars *k k′*, and in openings in these bars slides a vertical mandrel, L. The ratchet-wheel t^1 for rotating the disk H is provided with a retaining and releasing device, J, consisting of a vertical rod, *q*, sliding in bearings on the cross-bars *k k′*, and having a projecting arm, q^1, to which is secured a pin, q^3, adapted to one of a series of openings, *o*, in the face of the ratchet-wheel. The rod *q* is squared in its lower bearing to prevent it from turning. The retaining device J is maintained in a depressed position by a spring wound spirally around the rod *q* between its upper bearing and the arm q^1, and is raised by means of a sliding inclined block, *z*, connected at one end to the pawl-plate t^3, and at its opposite end, by a rod, *m*, to a bar, m^1, acted upon by a cam, m^2, on the shaft D′. On the lower end of the mandrel L is a cylindrical projection, *n*, arranged to enter the opening in the runners or notches contained in the recesses of the disk H, and the upper end of the said mandrel is connected to, but arranged to turn freely in, an opening in a horizontal bar, *l*. The latter is jointed at one end to a post, l^1, and is connected at its opposite end, by means of a vertical rod, l^2, to a bell-crank lever, l^3, hung to the table A, and operated upon by a cam, m^3, on the shaft D′. Secured to the lower cross-bar *k′*, and embracing the projection *n* of the mandrel L, are two fingers, *x x*, for a purpose explained hereafter. (See Fig. 6.) A sleeve, *s*, to which is secured a ratchet-wheel, s^1, is passed over the mandrel L, and confined upon the latter between the cross-bars *k* and *k′*, the said mandrel having a feather, *u*, adapted to a feather-way in the sleeve *s*, so that it may slide within, but not turn independently of, the latter. Turning on the sleeve above the ratchet-wheel s^1 is a collar, s^2, to which a spring-

pawl, s^3, is hung, the latter being connected, by means of a rod, p, with the upper end of a bar, p', similar to the bar h, before referred to, and correspondingly acted upon by a notched cam, G′, similar to the disk G on the shaft D′. The bars h h' and m^1 and lever l^3 are held against their respective cams, and receive their forward movement from strong spiral springs y attached to the brace a, the cams effecting only the return movement of the said bars and levers.

All of the above-described devices are duplicated in the machine shown in the drawing, the description relating to those parts only which are situated at the left-hand side of the center line x' x' in Figs. 1 and 4, while at the right-hand of that line is a recessed blank-holding disk, H^2, similar to the disk H, and provided with a vertical mandrel, L′, and independent saw F′, all of which parts are operated independently of the disk H and its mandrel and saw, but in a similar manner, by springs and by special cams arranged for the purpose upon the cam-shaft D′.

As the operation of the several parts upon both sides of the machine is precisely alike, it will suffice to describe the manner of operating upon the blanks on one side of the machine only—on the disk H, for instance, best observed in the enlarged views, Figs. 5 and 6.

After filling the several recesses j of the disk with the blanks, in which radial recesses are to be cut by the saw, the machine is set in motion, it being supposed that the mandrel L and retaining device J are raised clear of the disk, so that, in the first place, the latter may be turned, by means of the pawl t^3 and ratchet t^1, to such a position as to bring one of its recesses, j, and the blank contained therein directly beneath the raised mandrel L. As soon as this has been accomplished the pawl t^3, its rod m, and the inclined plate z are moved forward, when the retaining device J will be depressed by the action of its spring, thus causing the rod q^3 of the same to enter one of the holes o of the disk in order to lock and prevent any further rotary movement of the latter. At the same time, or immediately afterward, the mandrel L will be caused to descend until its end n enters the central opening of the blank, as shown in Fig. 6, and becomes wedged therein, so that the said blank may be turned by means of the mandrel, after which the saw F is caused to move forward against the edge of the blank in order to cut a nick or recess in the same, and is then withdrawn, so as to permit the blank to be partially revolved by means of the mandrel in order to present another portion of its edge to the action of the saw. The latter again moves forward, cuts a second nick, and is retracted, when the blank is again turned, and a third time nicked by the saw, these alternate movements of the mandrel and saw being continued until the desired number of radial nicks, at equal distances apart, have been cut in the blank, which will complete the operation.

These nicks, it should be understood, will correspond in number with the projections of the operating-cams G and G′, and with the teeth of the ratchet-wheel s^1, by which the mandrel is turned, so that if a notch with eight nicks is to be cut these parts must each have eight projections or teeth, or ten, or twelve, as the case may be.

As soon as the notch is finished the arms h and h', Fig. 2, will be forced back by the plain portions of the cams G and G′, which will have the effect of drawing back the saw and stopping the rotary movement of the mandrel L, and, at the same time, the latter will be lifted by the action of the cam m^3, Fig. 3, the notch being detached from the said mandrel by means of the fingers x x, Fig. 6, and falling back into its recess j of the disk. The arm m, plate z, with its inclined plane and pawl t^3, will next be moved forward in the direction of their arrow, Fig. 5, which will have the effect, first, of turning the said disk, by means of the pawl and ratchet t^1, so as to bring another blank beneath the mandrel and in front of the saw; and, second, of permitting the retaining device to enter the hole o of the disk, and thus lock the latter, after which the finished blanks are carried around with the disk until they arrive at a point directly over a hole, j', in the table, through which they drop into a suitable receptacle.

The disk H′ and parts connected therewith at the right-hand side of the machine operate in precisely the same manner as the disk H, and both disks may be fed with blanks by a single attendant.

In duplex machines of this class, as heretofore constructed, both saws are secured to the same spindle, the objections to which plan are, first, that notches having the same number of nicks must be cut upon both sides of the machine, as both saws operate simultaneously; and, secondly, that, as the saws are apt to wear unequally, notches of unequal depth will be cut by the same unless the spindle be canted or inclined in order to enable one saw to cut as deeply as the other; and when this is done the notches, necessarily, are somewhat untrue. Both of these objections are overcome by making one side of the machine entirely separate and independent of the other, as in my invention, as the saws can then be moved straight forward so as to cut to any desired depth; and, by changing the cams and ratchet-wheels, one side of the machine can be used for cutting notches or runners of seven or eight nicks, while on the other side notches having ten or twelve nicks can be cut.

Instead of two disks, H and H^2, with their saws, &c., three, or even four, or a greater number of disks, might be arranged upon a single frame; but two will, in most cases, be found sufficient. Another advantage possessed by my machine over those heretofore used is, that most of the operating parts are

arranged upon the table above or at one side of the saws, instead of beneath the latter, and are not liable, therefore, to afford a lodgment for and to become clogged by the cuttings from the said saws.

I claim as my invention—

The combination of the ratchet t^1, reciprocating pawl t^3, the retainer q^3, and the inclined projection z on the pawl, whereby, on the forward and backward movements of the latter, the retainer is alternately raised and depressed, substantially as and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ORREN M. SMITH.

Witnesses:

SAMUEL W. EVANS,

GEO. E. HARVEY.