2 Sheets--Sheet 1.

J. M. SMITH.

Saw-Gumming Machine.

No. 166,727. Patented Aug. 17, 1875.

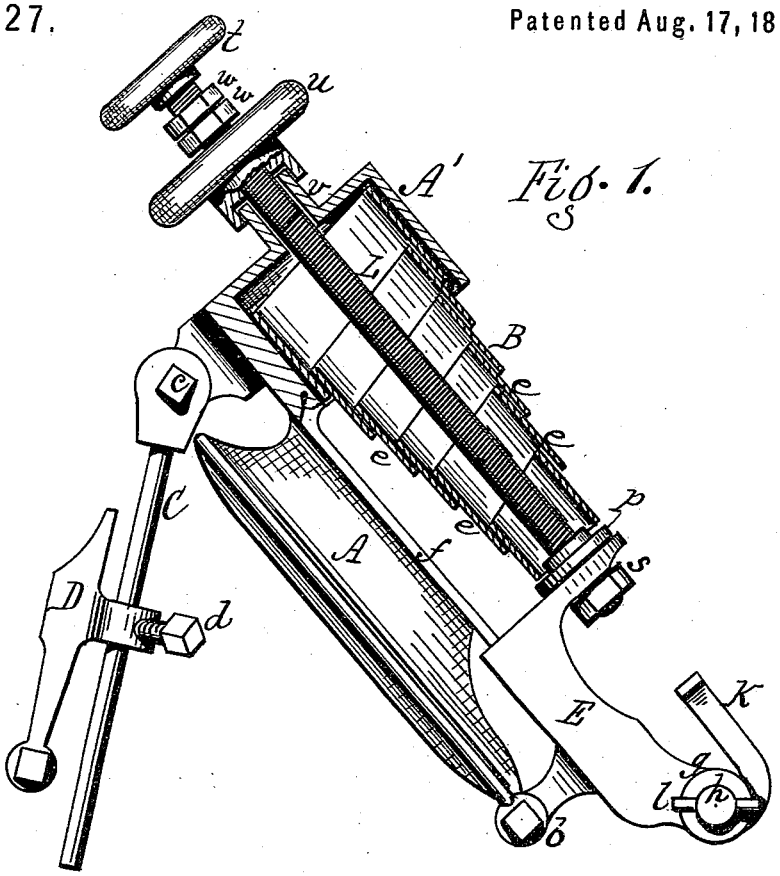
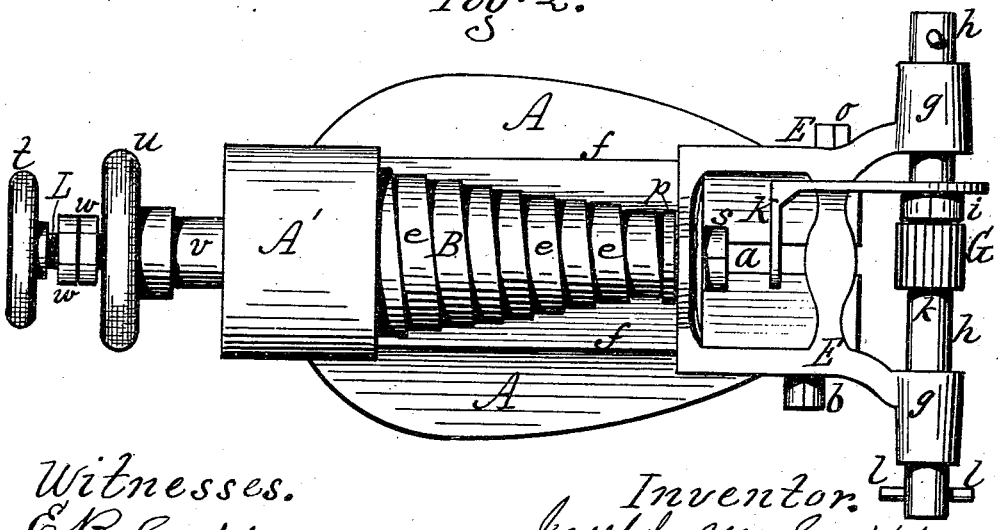


Fig. 1.

Fig. 2.



Witnesses.
E. B. Scott.
Jacob Spahr

Inventor.
Joseph M. Smith.
per R. H. Osgood,
Atty

J. M. SMITH.

Saw-Gumming Machine.

No. 166,727. Patented Aug. 17, 1875.

Fig. 3.

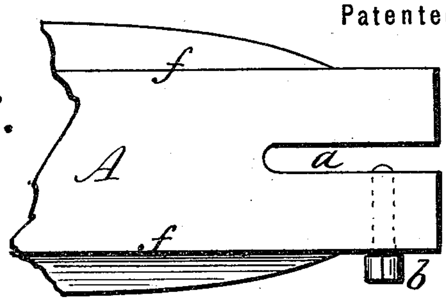


Fig. 4.

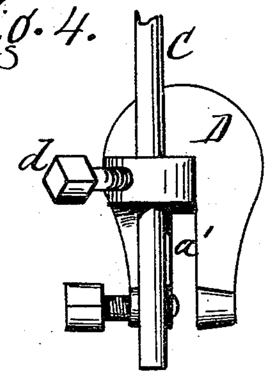


Fig. 5.

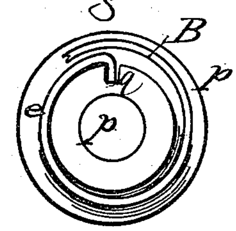


Fig. 6

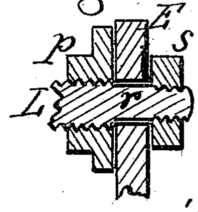


Fig. 7.

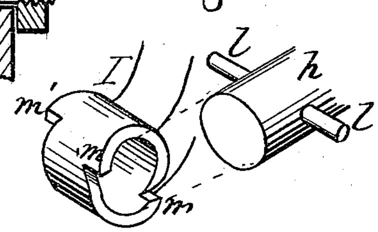
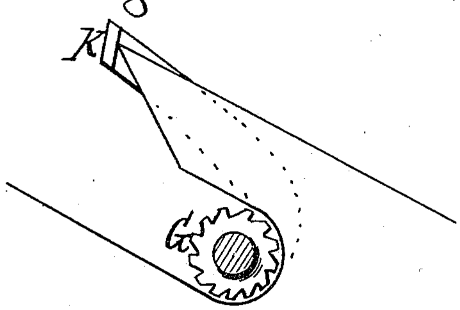


Fig. 8.



Witnesses.
E. B. Scott
Jacob Spahn

Inventor.
Joseph M. Smith,
pr R. L. Osgood,
Atty.

UNITED STATES PATENT OFFICE.

JOSEPH M. SMITH, OF ROCHESTER, NEW YORK.

IMPROVEMENT IN SAW-GUMMING MACHINES.

Specification forming part of Letters Patent No. **166,727**, dated August 17, 1875; application filed July 22, 1875.

To all whom it may concern:

Be it known that I, JOSEPH M. SMITH, of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Machines for Gumming Saws; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation, partially in section, of my improved machine. Fig. 2 is a plan of the same. Figs. 3, 4, 5, 6, and 7 are detail views. Fig. 8 is a diagram showing the method of gumming the saw.

My improvement relates to a machine for gumming saws, in which the burr or milling-head is pressed down to its work by a spring. The invention consists of the construction and arrangement of parts, as hereinafter described.

A represents the main frame, which is constructed of iron, and is provided with a slit, *a*, at its lower end, which fits over the saw, and is clamped in place by a set-screw, *b*. At its upper end it has a cylinder, A′, within which fits the upper end of the spiral coiled spring B. At its rear it has a pivoted rod, C, upon which slides the rest D, the latter also having a slit, *a′*, coincident with that of the main frame, through which the saw passes. The rod C is pivoted or attached to the main frame by a set-screw, *c*, by which means it can be swung upon the pivot to any position to fit the blade of the saw, whether circular or upright; and the rest D is also made adjustable vertically on the rod by means of a set-screw, *d*. By this means the machine is attached in any desired position, and is therefore adapted to all kinds and shapes of saws. E is a carriage, which rests and slides on ways *f f* of the main frame. At its upper end it is attached to the spring B, and at its outer end it has bearings *g g*, in which rests the shaft *h*, which carries the burr or milling-tool G. This tool is formed with the usual teeth, and it is clamped upon the shaft between the shoulder *k* and jam-nut *i*. The shaft *h* is driven by a crank, I, at one or both ends. The shaft, at one end, is preferably provided with pins *l l*, and the crank-eye has offsets or notches *m m* and *m′ m′* on opposite sides. This crank-eye slips loosely on the end of the shaft, and, when turned forward, the offsets *m m* engage with the pins *l l*, and transfer motion to the shaft. By slipping the crank off and putting it on the other way, the offsets *m′ m′* engage with the pins, and the shaft may be thereby held for unscrewing the nut *i*, for the purpose of changing the burr. Different-sized burrs are employed, according to the work to be done. K is a gage, which is attached to the main frame by a set-screw, *o*, which passes through a slot of the gage. This gage is of the form shown, and is bent over, so as to rest against the point of the tooth while the gumming is being done, as shown in Fig. 8. When once set to one tooth it gages the position of cut of all the rest, and forms a guide to give direction to the milling-tool in its work. The spring B is made of flat steel, and is wound of conical form, so that the leaves *e e* rest one within another, by which means, when resistance is offered at the apex, the strips are compressed one within another. By this means much range of motion is obtained, so that the spring can feed the milling-tool down to its full depth of cut by one action, and requires no re-enforcement of the screw, as in other machines of this class. A greater elasticity is produced with a shorter length of spring. The extreme lower end of the spring is bent and entered into the slot of a nut, *p*, as shown at *q*, or is attached fast to the nut in some equivalent manner. The nut itself is screwed upon a screw, L, which passes from the carriage up through the cylinder A′. The end of the screw L, which rests in the head-block of the carriage, is made plain or smooth, as shown at *r*, in order to turn freely therein; but upon the end of the screw outside the carriage is a clamp-nut, *s*, fitting upon a thread of the screw, as shown in Fig. 6.

Upon the upper end of the screw-shaft L is a hand-wheel, *t*, made fast thereto, by which the screw is turned. Between this and the cylinder A′ is another hand-wheel, *u*, which turns loosely upon the screw, and has its bearing or fulcrum against a shoulder, *v*, projecting from said cylinder. Between these two hand-wheels are two set-nuts, *w w*, which can be turned up or down on the screw to any desired position.

The operation is as follows: The machine having been clamped upon the saw-blade, as before described, the screw L is turned by the hand-wheel *t* down, to bring the burr or milling-tool in position for work. By turning the hand-wheel *t*, the two clamp-nuts *p s* are made to bind against the head-block of the carriage, thereby securing the screw and the carriage together as one fixture. Then, the spring being compressed by turning the hand-wheel *u* backward, the screw and carriage are fed down by the spring-power, forcing the milling-tool into its seat, and causing it to cut the socket in the tooth. The spring can be adjusted to a greater pressure at any time by turning the screw back by the hand-wheel *t*, thereby separating the nuts *p s*, and, consequently, forcing back the spring into itself and increasing its power. This increase can be carried to any desired extent, the nut *p* moving back on the screw and carrying the spring with it, and the more it is compressed the greater will be the pressure against the carriage. It will be seen, therefore, that the hand-wheels *t u* have two separate functions—the one compressing or winding up the spring to press with greater force, and the other serving simply to let out the spring to force the carriage down to its work. This forms an essential feature of my invention.

It will be seen that by thus increasing the power of the spring, I adapt the machine to cut greater or less depths with a single expansion of the spring, as well as to cut with varying power.

The object of the nuts *w w* is to gage the cut of the milling-tool. When the machine is once set to cut the proper depth on the first tooth, the nuts *w w* are turned down so as to strike the collar of the hand-wheel *u*. In cutting each subsequent tooth the hand-wheel is turned back till it strikes these nuts. Each tooth will therefore be cut of the same depth. In changing the machine to cut different depths, or to apply greater pressure, these nuts are adjusted with the corresponding adjustment of the screw to produce the desired result.

I am aware that a half-elliptic spring has been used in a saw-gummer, with adjusting-screws at the ends to force the cutter to place; but such is not the equivalent of my invention, since the pressure cannot be increased or decreased at pleasure, and its range of motion is short. Such I do not claim.

What I claim as new is—

1. The combination, with the carriage E and screw L, of the coiled spring B, resting at one end against a shoulder of the main frame, and connected at the other with the screw, by means of a nut adjustable up or down on said screw, whereby the spring may be compressed a greater or less degree, to vary the range of motion or the feeding pressure of the milling-head, as herein described.

2. The combination, with the screw L and spring B, of the nut *p*, made adjustable upon the screw for the purpose of compressing the spring, and the hand-wheel *u*, for releasing the said pressure, as shown and described.

3. The combination, with the screw L and spring B, of the clamp-nuts *p s*, hand-wheels *t u*, and adjusting-nuts *w w*, arranged to operate in the manner and for the purpose specified.

4. The combination with the rod C, pivoted to the main frame and adjustable to different positions on the pivot, of the rest D, provided with the slit *a'*, to receive the saw, and adjustable vertically upon the rod by means of the set-screw *d*, as and for the purpose specified.

5. The combination, with the carriage E and burr or milling-tool G, of the gage K, projecting backward over the burr, and resting against the point of the tooth, to form a gage to the cut of the burr, as herein shown and described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

J. M. SMITH.

Witnesses:
R. F. OSGOOD,
F. B. SMITH.