J. M. SMITH.

SAW-GUMMER.

No. 187,921. Patented Feb. 27, 1877.

Fig. 1.

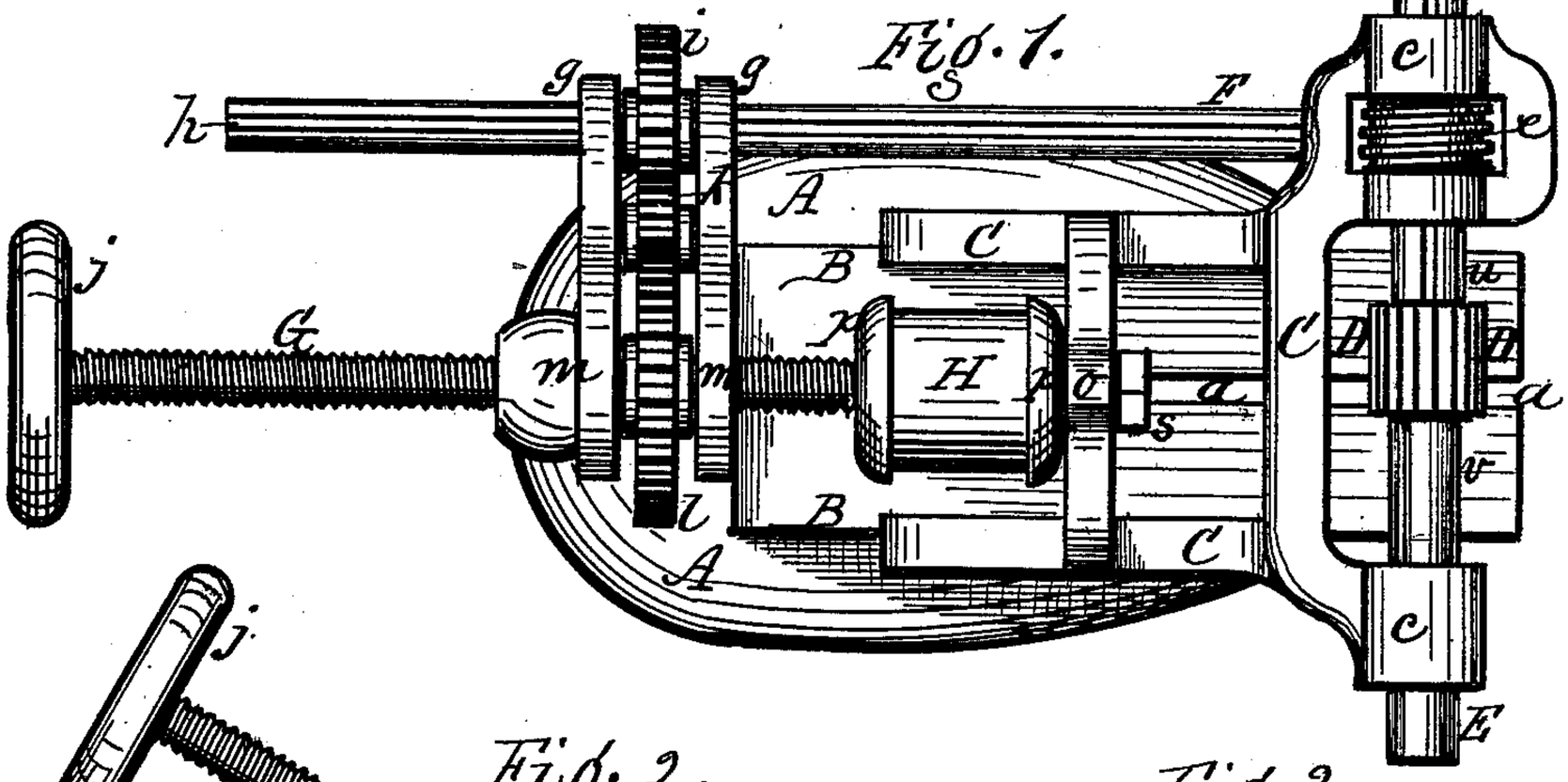


Fig. 2.

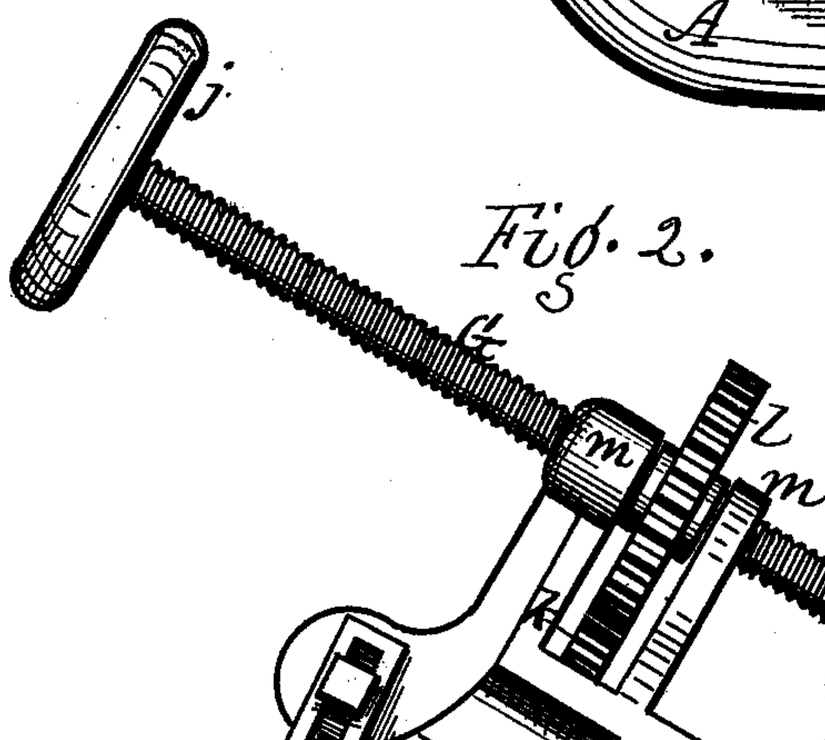


Fig. 3.

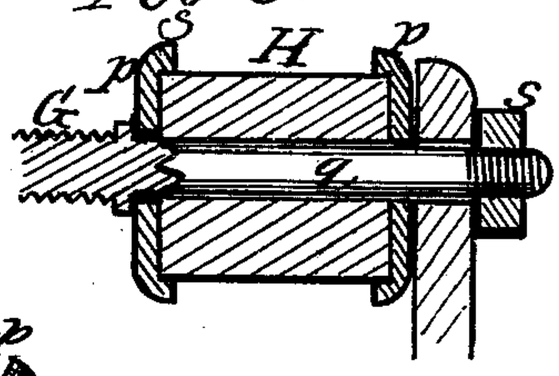


Fig. 4.

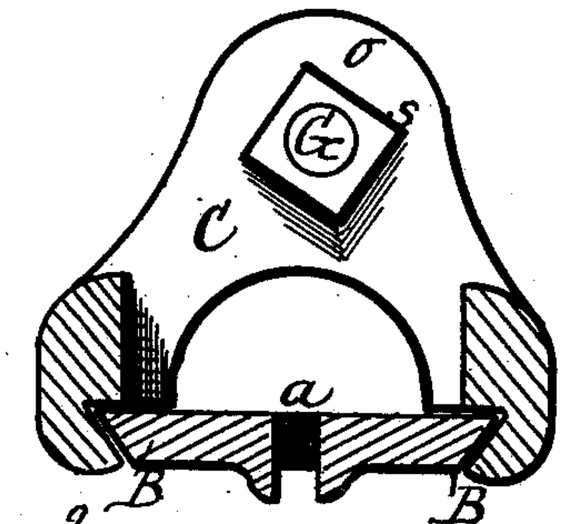


Fig. 5.

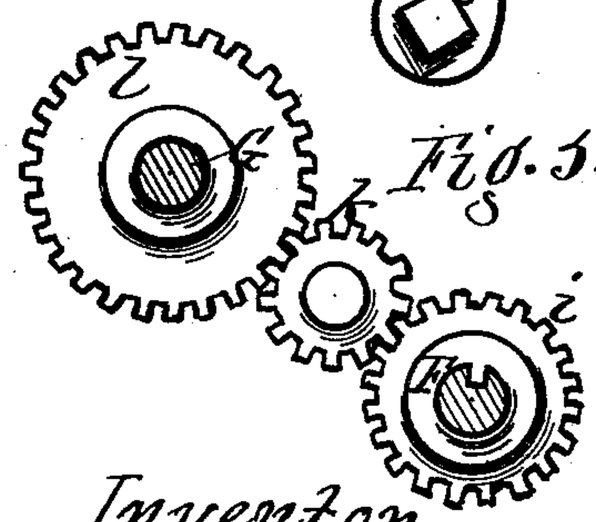
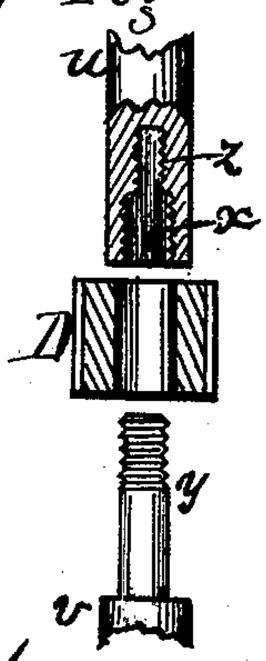


Fig. 6.



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Joseph M Smith.
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Atty.

UNITED STATES PATENT OFFICE.

JOSEPH M. SMITH, OF ROCHESTER, NEW YORK, ASSIGNOR OF ONE-THIRD HIS RIGHT TO JAMES H. LINDSAY, OF ALLEGHENY, PA.

IMPROVEMENT IN SAW-GUMMERS.

Specification forming part of Letters Patent No. **187,921**, dated February 27, 1877; application filed January 13, 1877.

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 Saw-Gummers; 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 a plan of the machine. Fig. 2 is an elevation of the same in position for work. Fig. 3 is a longitudinal section of the spring connected with the carriage and feeding-shaft. Fig. 4 is a cross-section of the machine in line *x x* of Fig. 2. Fig. 5 is an elevation of the gearing for feeding the carriage forward. Fig. 6 is a view showing the construction of the cutter-shaft.

My improvement relates to a machine for gumming saws, in which the burr or milling-tool is fed forward to its work by the same power that turns it to do the cutting.

The invention consists in the construction and arrangement of parts hereinafter more fully described and definitely claimed.

A represents a casting, which forms the frame that supports the working parts, and is attached to the saw by means of a slot, *a*, which extends part way through it longitudinally. This slot receives the saw, and the frame is held to the saw by means of a set-screw, *b*, at the front end, and a swinging slotted arm at the rear end, having at its extremity a similar set-screw, binding it to the saw.

B B are ways forming part of the frame, and C is a carriage, which slides forward and back on these ways. The carriage carries the burr or milling-head D, which cuts the slots between the teeth of the saw. The milling-head is mounted on a cross-shaft, E, which rests and turns in the bearings *c c* of the carriage. A wrench or handle is applied to the end *d* to drive the shaft. The shaft has a longitudinal groove, *w*, in which slides a worm, *e*, by which the feed-works are driven. The shaft consists of two parts, *u* and *v*, Fig. 6. The part *u* has two internal screw-threads, *x z*, of different diameters, into which screws a stem, *y*, of the other part of the shaft. The milling-head rests on the stem *y*, and when the parts are screwed together the milling-head is clamped between the two shoulders of the shaft. The two threads *x z*, of different diameters, allow screw-stems of different diameter to be inserted, thereby adapting the shaft to milling-heads of different sizes. The same half, *u*, of the shaft is always used, but the other half, *v*, is changed with different-sized milling-heads. The shaft is movable endwise by reason of the worm *e* fitting in the groove *w*, so that different parts of the milling-head may be brought to bear on the saw, thus equalizing the wear on the milling-head. The worm rests in a slot of the carriage, to keep it in place.

f is a gear beneath the machine, with which the worm engages. F is the shaft, to which gear *f* is attached. This shaft extends backward, passing loosely through bearings *g g* of the frame, and is provided with a groove, *h*. *i* is a spur-gear, resting between the bearings *g g* on the shaft F, and engaging with its groove *h* by a feather, so that while it allows free end movement of the shaft, it still turns with the shaft. *k* is an intermediate spur-pinion, engaging with *i*, and *l* is a spur-wheel, also engaging with *i*. This gear *l* rests between vertical bearings *m m* of the main frame.

G is a screw-shaft, passing through the spur-gear *l* and bearings *m m*, and attached at the front end to the rear of the carriage C by a nut, *s*, or otherwise, so as to turn freely, while at the rear end it has a hand-wheel, *j*. The screw engages with the gear *l* by internal threads in the latter, the gear thus forming a nut to the screw. It will be seen that the same power that turns the milling-head to cause it to cut imparts the forward feeding motion to the carriage through the medium of the worm *e*, shaft *f*, gears *i k l*, and the screw G, the gear *l* acting as a nut to force the screw forward. In such case the shaft F moves forward through the gear *i*. The combination of these parts, whereby the above-named effect is produced, forms one feature of my invention.

H is a spring, resting on the screw-shaft just

at the rear of the upright *o* of the carriage. It is made of rubber or any equivalent elastic material, and rests between two heads, *p p*, both of which allow the screw to turn freely therein; but the rear one is fitted against a shoulder, so as not to be pressed back longitudinally on the screw, while the front one slides freely thereon. The end *q* of the screw, on which this head slides, is made smooth, as shown in Fig. 3. If made of rubber, the ends of the spring set back into depressions in the heads, which prevents crushing out. The object of this spring is to allow the carriage C to react or fall back when the milling-head feeds too hard to its work, and also, under such circumstances, when the resistance to the milling-head relaxes, to feed or press forward again by its inherent elasticity. In fact, it forms an elastic cushion, interposed between the carriage and the feeding-screw, to prevent rigidity and stiffness.

It is necessary to grade the feed to the thickness of the saw. In a thick saw the cutting of the milling-head is slower than in a thin saw; but the feeding action is the same in both cases, unless some provision is made to allow the milling-head to react or press back under a given strain.

In this machine, when a certain pressure of the milling-head is attained, the spring H will yield back, thereby relieving the milling-head, notwithstanding the screw feeds forward with the same velocity. When the spring is fully compressed by such back action, if it is desired to give still more elasticity, the feeding-screw G can be turned backward by hand, contrary to the forward feeding movement by the automatic devices before described, and such movement relieves the spring H, allowing it to recover itself.

By this means the feed may be graded and regulated exactly as desired, while at the same time the machine is a self-feeder. The backward motion by hand neutralizes, to a certain degree, the forward motion of the feed by the gears.

On the other hand, in cutting very thin saws, where the feeding movement by the automatic devices is not fast enough, the feed may be accelerated by turning the feeding-screw G forward by hand, thereby adding such movement to the automatic feed.

The machine above described is very effective in regulating and controlling the feed, the failure to do which has caused much trouble in ordinary saw-gummers.

Having thus described my invention, I do not claim, broadly, an automatic feed produced by the same power that turns the milling-tool; but

I claim—

1. In a saw-gummer, the combination, with the carriage C and feeding-screw G, of the worm *e*, the sliding shaft F, and the gears *i k l*, connecting the said shaft F with the feeding-screw, the gear *l* forming a nut to the feeding-screw, in the manner and for the purpose specified.

2. In a saw-gummer, the combination, with the carriage C and feeding-screw G, of a set of gears connected with the screw, one of which forms a nut to the screw, and imparts a positive feeding motion to the same, the screw being arranged to turn backward by hand, to neutralize the automatic feeding motion, as shown and described, and for the purpose specified.

3. The cutter-shaft E, constructed in halves, as described, one half containing the internal threads *x z* of different diameters, and the other half provided with the screw-stem *y*, fitting therein, the milling-tool being held on the stem, and clamped between the two shoulders of the shaft, as shown and described, and for the purpose specified.

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

J. M. SMITH.

Witnesses:
R. F. OSGOOD,
CHAUNCEY NASH.