

I. G. McMILLAN.
 Metal Grooving and Swaging Machines.
 No. 215,384. Patented May 13, 1879.

Fig. 1

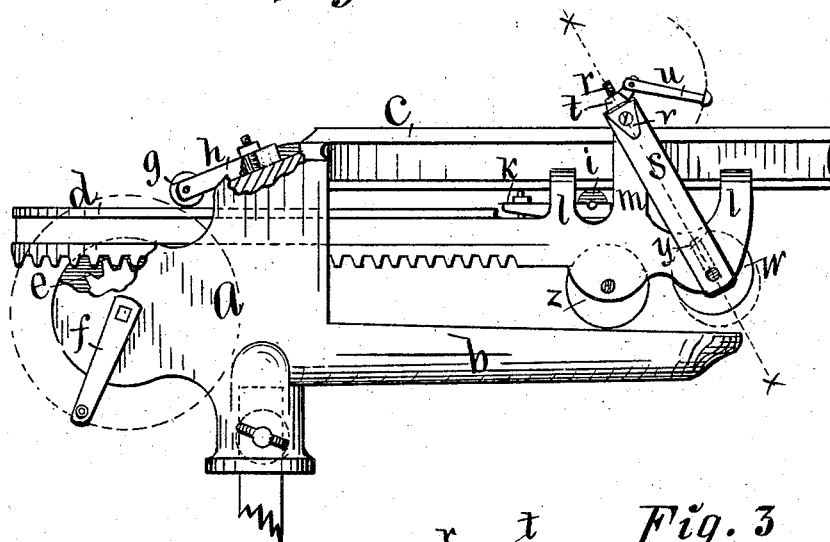


Fig. 2

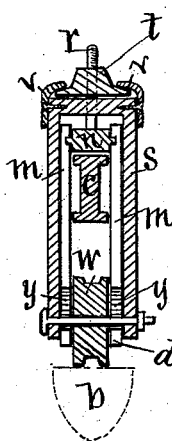
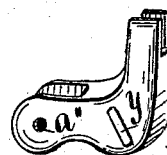


Fig. 3



Witnesses:
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UNITED STATES PATENT OFFICE.

ISAAC G. McMILLAN, OF DAKOTA, IOWA.

IMPROVEMENT IN METAL GROOVING AND SWAGING MACHINES.

Specification forming part of Letters Patent No. **215,384**, dated May 13, 1879; application filed September 21, 1878.

To all whom it may concern:

Be it known that I, ISAAC G. McMILLAN, of Dakota, in the county of Humboldt and State of Iowa, have invented an Improved Metal Grooving and Swaging Machine, of which the following is a specification.

My invention relates to that class of machines used by tanners to lock and finish a joint of pipe or other seam formed in articles made of sheet metal.

Heretofore metal seams have been grooved by a machine similar to mine, and then hammered down and flattened by means of a mallet, or by passing the seam a second time through the same machine and subjecting it to the action of a swaging-roller in place of a grooving-roller.

My improvement contemplates grooving and swaging the seam simultaneously at one operation, and in such a manner as to save time and labor, and to produce a neater and better joint.

It consists in combining and operating an adjustable grooving-roller and a stationary swaging-roller with a sliding rack and a frame having arms by means of a stirrup, a screw, and a hinged crank, as hereinafter fully set forth.

Figure 1 of my drawings is a side elevation of my complete machine. Fig. 2 is a transverse sectional view through the inclined line *xx* of Fig. 1. Jointly considered, they illustrate the construction, application, and operation of my improvement.

a represents an iron frame, of common form, having parallel arms *b* and *c*, extending forward horizontally. *d* is the sliding rack that carries the grooving and swaging rollers. *e* is a small gear-wheel, that has its bearings in the rear end of the frame *a*. It has a crank-handle, *f*, by means of which it is rotated in reverse ways, at the will of the operator, to move the rack *d*, resting upon it, alternately backward and forward, as required, to operate the grooving and swaging rollers carried on the front end of the rack.

g is an anti-friction roller, carried by an adjustable lever, *h*, that is mounted in the upper rear corner of the frame *a*, to engage the top surface of the rack *d*. *i* is a corresponding roller, carried by an adjustable lever, *k*, that

is mounted at the top and front end of the rack *d*, to press against the under surface of the arm *c*. By means of these rollers and their adjustable levers the pressure of the grooving and swaging rollers is readily regulated.

l l are bifurcated vertical extensions, formed integral with the front end of the rack *d*, to engage the arm *c*, and to guide and steady the movements of the rack and the operative rollers that it carries. *m m* are posts formed integral with the rack *d*. They extend perpendicularly above the top edge of the arm *c*, where they are connected by means of the cross-head *n* of a screw, *r*, and serve to support that screw in its inclined position. The cross-head and posts are rigidly secured to each other by means of a bolt, or in any suitable way.

s represents a small frame or stirrup, closed at its top end and open at its bottom. The screw *r* passes through the center of the closed end or top portion of the stirrup.

t is a flanged nut on the top end of the screw *r*. *u* is a lever hinged to the nut *t*, so it can be folded down inside of the vessel while grooving and swaging the seam of the same. *v v* are clasps, fixed to the top corners of the stirrup *s*, to engage the flange of the nut *t*. *w* is a grooving-roller, mounted in the lower and open end of the adjustable stirrups.

yy (shown in Fig. 2) are inclined slots formed in the front end of the rack-bar *d*, and in line with the center of the inclined adjustable stirrup *s*, to allow the axle of the grooving-roller *w* to pass through, and to rise and fall as the stirrup is raised and lowered by means of the screw *r* and its flanged nut *t*, supported by posts *m* of the rack *d*.

z is a swaging-roller, mounted in the rack *d*, and in the rear of the grooving-roller *w*, in such a manner that its position relative to the rack is never changed, and that it will rest upon the top surface of the arm *b*, and traverse the same when the rack *d* is moved back and forth by means of the operating mechanism *ef*.

In the practical operation of my invention I raise the grooving-roller *w*, carried by the stirrup *s*, by simply seizing the hinged handle *u* of the flanged nut *t*, and thereby revolving the nut on the screw *r*, supported by the posts

m. In next place the seam designed to be grooved and swaged under the rollers *w* and *z* and on top of the arm *b*. When thus placed I lower the roller *w* by means of the nut *t* and press it upon the seam. By then turning the crank *f* and wheel *e*, the rack *d*, carrying the rollers, is moved longitudinally, and the rollers are simultaneously operated to groove and swage the seam, over which they pass, and to thereby save time and labor in the manufacture of sheet-metal goods, and to produce neat and uniformly even and tight joints.

To apply my improvement to machines that are provided with one wheel only, and have no extension of the movable rack *d*, to form a slotted bearing for the adjustable wheel carried by my stirrup, I form an extension separately, as illustrated by Fig. 3, and hinge it to the front end of the rack in lieu of the part *l y*, (shown in Fig. 1,) by means of the axle of the swaging-roller *z* being lengthened to enter the bearings *a''*, formed in the attachment.

I claim—

1. In a metal grooving and swaging machine, the grooving-wheel *w*, carried by the

adjustable frame or stirrup *s*, the movable rack *d*, having slots *y y* and posts *m m*, the screw *n r*, and the nut *t*, arranged and combined substantially as shown and described, to operate in the manner set forth, for the purposes specified.

2. The stirrup *s*, having the fixed clasps *v v* at its top end, the screw *r*, fixed to the posts *m m* of the rack *d*, and the flanged nut *t*, carrying the hinged lever *u*, arranged and combined substantially as shown and described, for the purposes specified.

3. The frame *a b c*, having a gear-wheel, *e*, and an adjustable lever, *h*, carrying an anti-friction roller, *g*, in combination with a movable rack, *d*, carrying a swaging-roller, *z*, in fixed bearings, and an adjustable grooving-roller, *w*, and an anti-friction roller, *i*, on an adjustable lever, *k*, substantially as shown and described, to simultaneously groove and swage a sheet-metal seam.

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Witnesses:

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