S. F. Reynolds,

Tempering Furnace.

No. 107,541. Patented Sept. 20. 1870.

Fig. 1.

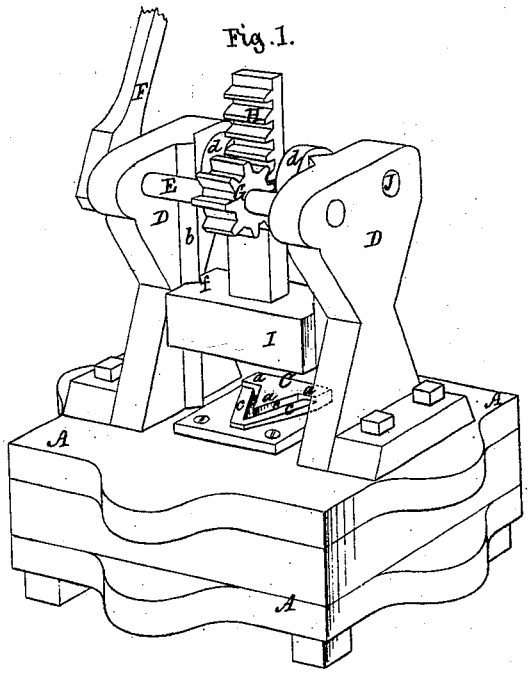
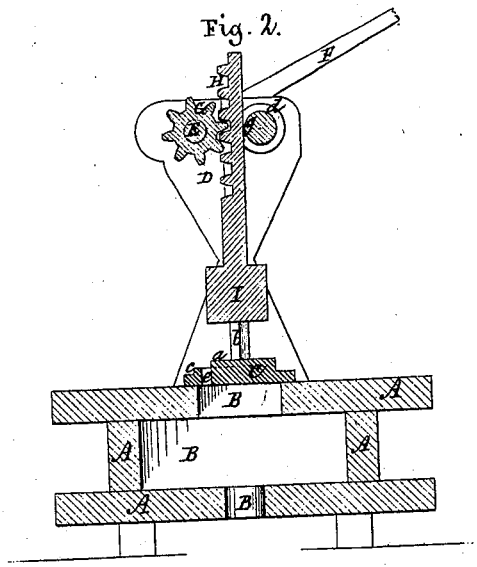


Fig. 2.



Witnesses.
H. M. Morgan
Edmund Masson

Samuel F. Reynolds.
By Atty A. B. Stoughton.

United States Patent Office.

SAMUEL F. REYNOLDS, OF AUBURN, NEW YORK.

Letters Patent No. 107,541, *dated September* 20, 1870.

IMPROVEMENT IN MACHINES FOR TEMPERING SICKLE-SECTIONS, PLANE-IRONS, &c.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, SAMUEL F. REYNOLDS, of Auburn, in the county of Cayuga and State of New York, have invented certain new and useful Improvements in Machines for Tempering Sickle-Sections, "Plane-Irons," and other articles of steel; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1 represents, in perspective, so much of the machine in question as will illustrate the invention, and

Figure 2 represents a vertical section through the same

I am aware that articles of steel have been tempered by means of a head of flowing water.

My invention consists in the manner of shielding certain portions of the article that is being tempered from the immediate action of the water, by clamping them between conforming surfaces, while the flow of water is direct upon the portions that are not so shielded, and thus give them a harder temper, while the exposed portions, in cooling, draw out or off the heat from the shielded portions.

By a machine acting or operating as hereinafter described, a fine cutlery temper can be given to such portion of the steel that are to form cutting-edges, while the other portions of the steel may be comparatively untempered or soft, and thus avoid breaking.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

A base or bed, A, incloses a water-chamber or passage, B, through which a head of water can be allowed to flow, regulated by a stop-cock or valve connected to the supply-pipe, or arranged at any suitable place in the column of water; and on this base or bed, and over the water-orifice, is placed a block, C, of the shape or form of the thing to be tempered, that shown being designed for tempering sickle-sections, and of a V-form.

The block C has upon it a flat surface, *a a*, upon which the heel and central portion of a sickle-section, or that portion which is not to be tempered, is placed, and upon which surface said portion lies, and is held, as will be hereafter explained.

Connected with this flat holding surface *a*, and on a plane somewhat below it, and parallel with its sides, is a V-shaped rib or projection, *c c*, and between this projection and the surface *a* there is a water-way, *e e*, through which the flowing water strikes the sickle-section along its sides and point, which portion of it is to form the cutting-edges, the water being guided thereon by the projections *c*, and allowed to flow off between the under side of the section or piece being tempered and the top of the projections or guides *c*, while the central and heel portion of said article is protected from the direct action of the water, but has the heat drawn from it by the flow of water against its exposed parts, thus tempering the sides, and leaving the balance not tempered.

On pillar-blocks D D, or in them, is hung a shaft, E, having upon one of its ends a lever or crank, F, by which it may be turned.

Upon the shaft E there is a spur-wheel, G, that gears into a rack, H, that is attached to a follower, I, that moves up and down between the pillar-blocks or uprights D, and guided in so doing by guide-pieces *b* and recesses *f* in the follower that receives them.

The object and purpose of this follower is to hold the sickle-section, or other article to be tempered, tight down against the block C, which is directly under it, and against the flow or pressure of the water coming against its under side, as well as to protect the portion not to be tempered against the immediate action of the water, but to draw off indirectly the heat from said protected portions, or drive it off by cooling the edges first.

If plane-irons are to be tempered, or any other straight, curved, or angular-edged cutting or abrading instrument, then the under die or block and the water-way should be made of corresponding form, or so that only that part to be tempered should be exposed to the direct action of the flowing water, while the portions not to be tempered are shielded by the holding-surfaces.

In tempering sickle-sections, whether for reapers or mowers, I proceed as follows:

The sections, being properly heated, are taken out of the fire, and the edges dipped in oil. They are then immediately placed on the die-block C, and the follower I run down tight upon the sections. The water is then let on, which strikes the projecting edges only of the section, and flows off over the projection or lip *c*.

By this mode I get great uniformity of temper, and where the cutting-edges are to be, and without loss by cracking, breaking, or warping.

In the uprights D there may be also a shaft, J, hung, with side and rear bearing-surfaces, *d g*, to hold the rack-bar H to the spur-wheel G, and to relieve friction by turning when the rack moves.

Having thus fully described my invention,

What I claim therein as new, and desire to secure by Letters Patent, in a machine for tempering sickle-sections, plane-irons, and other instruments, is—

In connection with a stream or column of flowing water, a die, having a holding-surface, a water-passage, and a recessed lip or projection, substantially as described, and for the purpose set forth.

SAMUEL F. REYNOLDS.

Witnesses:
W. P. FOX,
C. E. BARBER.