(No Model.) 3 Sheets—Sheet 1.

S. E. MOWER.

APPARATUS FOR TEMPERING.

No. 337,981. Patented Mar. 16, 1886.

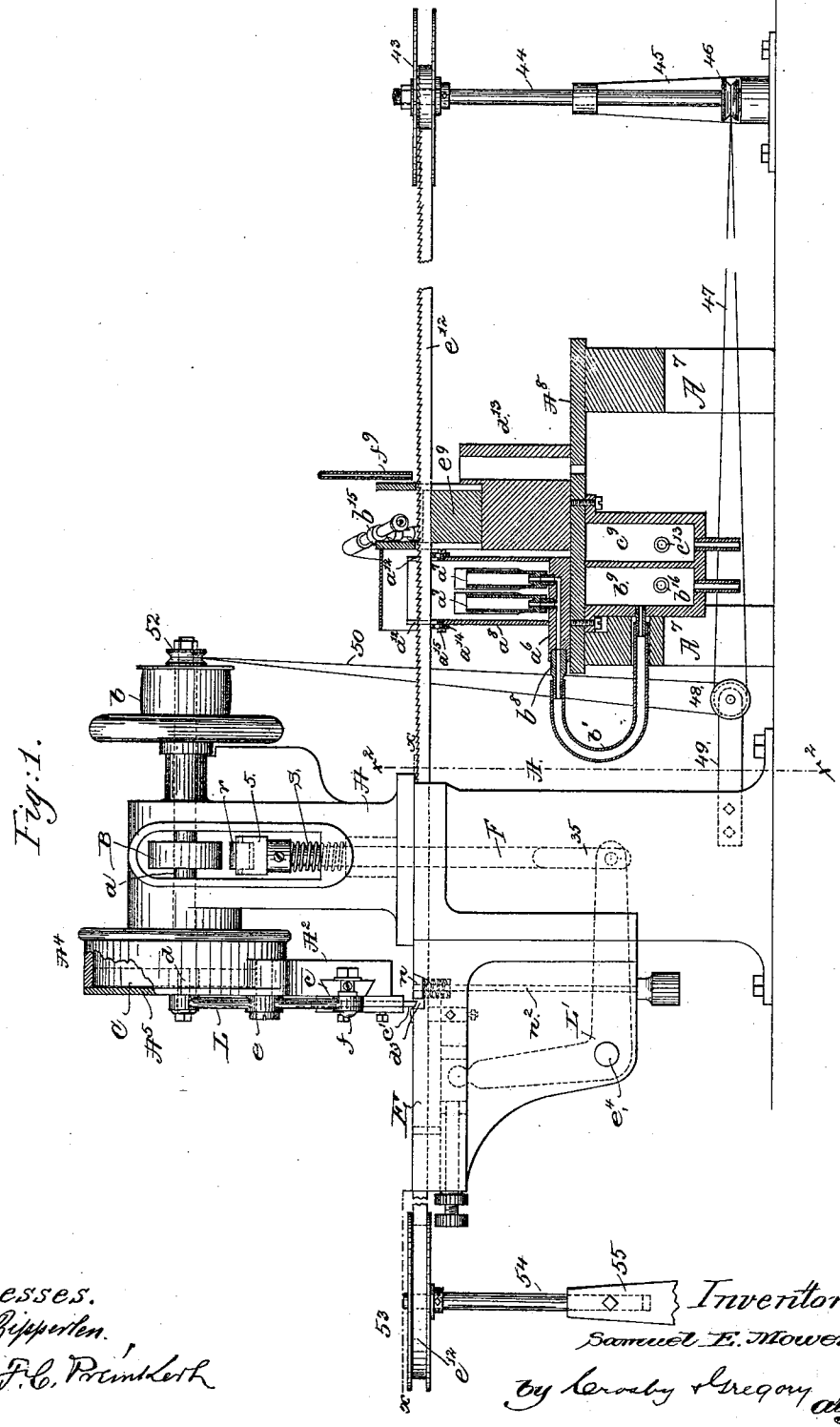

Fig. 1.

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John F. C. Brinkerhoff

Inventor.
Samuel E. Mower.
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(No Model.) 3 Sheets—Sheet 2.

S. E. MOWER.

APPARATUS FOR TEMPERING.

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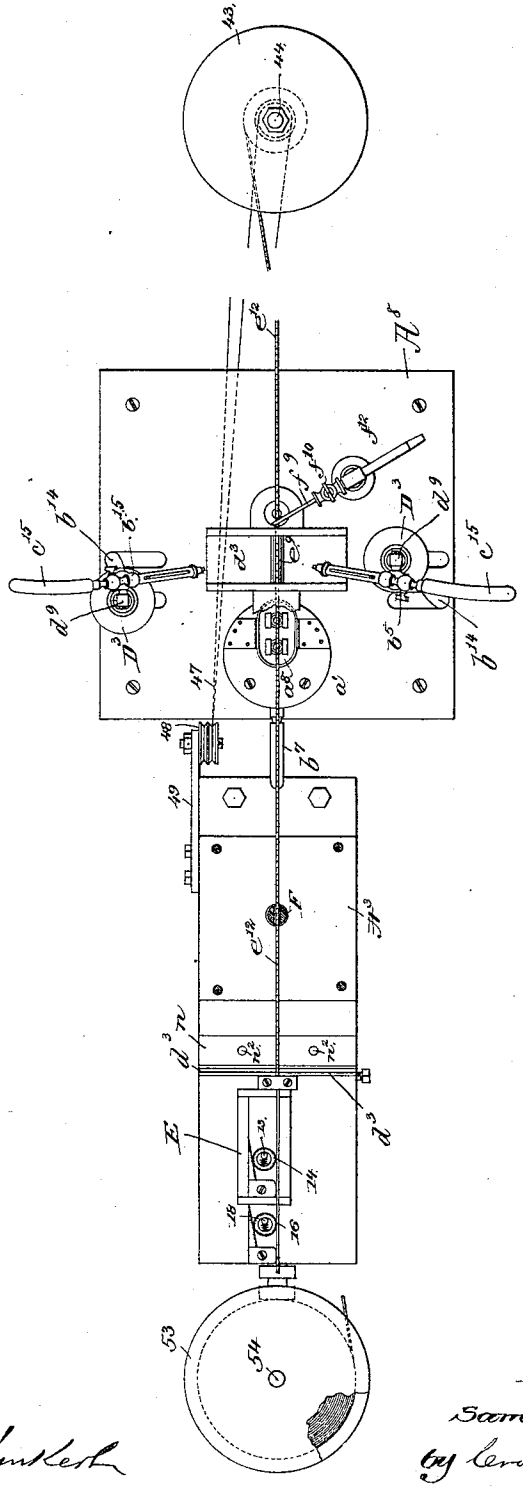

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

S. E. MOWER.

APPARATUS FOR TEMPERING.

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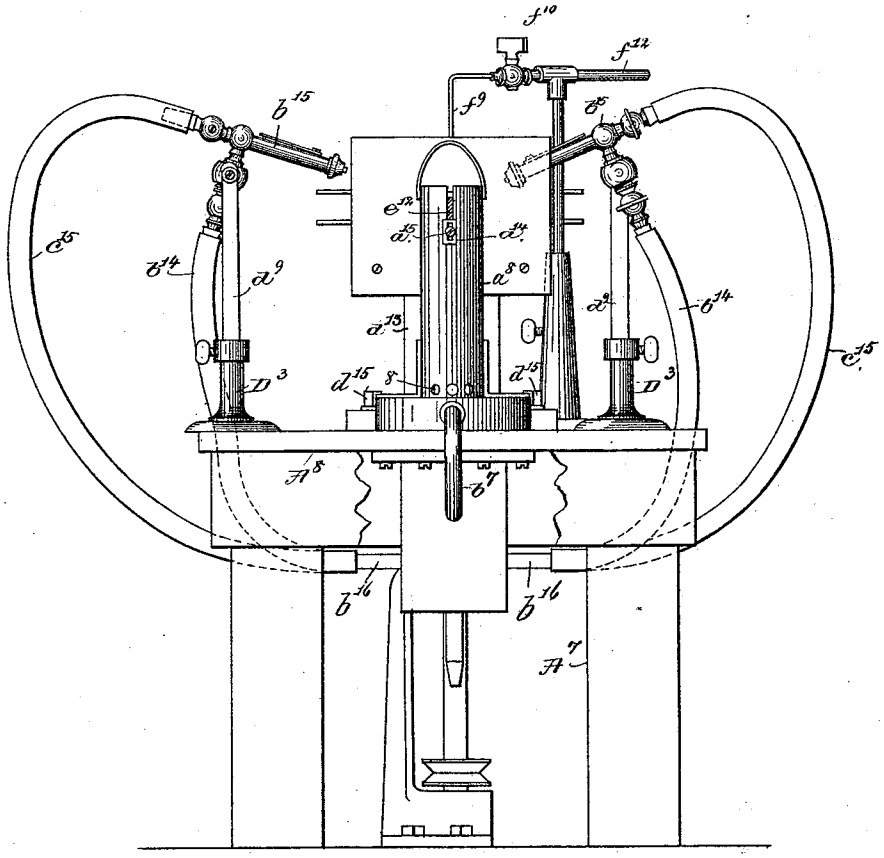
Fig. 3.



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UNITED STATES PATENT OFFICE.

SAMUEL E. MOWER, OF NEW HAVEN, ASSIGNOR TO HENRY G. THOMPSON, OF MILFORD, AND HARRY G. THOMPSON, OF NEW HAVEN, CONNECTICUT, AND ARTHUR G. THOMPSON, OF NEW YORK, N. Y.

APPARATUS FOR TEMPERING.

SPECIFICATION forming part of Letters Patent No. 337,931, dated March 16, 1886.

Application filed November 30, 1885. Serial No. 184,368. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL E. MOWER, of New Haven, county of New Haven, and State of Connecticut, have invented an Improvement in Apparatus for Tempering, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to provide apparatus by which a metal strip or band may be toothed at one edge and the toothed edge be then tempered, all in continuous operation.

In accordance with my invention, the metal strip or band is fed into a saw-making or tooth-cutting machine, substantially such as shown and described in United States joint application of Samuel E. Mower and Thaddeus Fowler, Serial No. 175,729, dated August 31, 1885, to which reference may be had. The toothed metal strip or band issuing from the tooth-cutting machine is fed through a tempering apparatus, substantially such as shown and described in United States application, Serial No. 177,414, dated September 18, 1885, to which reference may be had, and wherein is claimed a method or process of tempering a metal strip or band at one edge.

Figure 1 is a view in elevation and section of an apparatus embodying my invention, the tooth-cutting part being in elevation and the tempering part in section; Fig. 2, a plan and sectional view of Fig. 1, the section being on the line $x\ x$, and Fig. 3 an elevation of the tempering apparatus shown in Fig. 1, looking toward the right from the dotted line $x^2\ x^2$.

The column A, depending leg A^2, table A^3, forming the frame-work of the tooth-cutting apparatus, the shaft a, cam B, pulley b, cam-disk C, on the said shaft, dies d^3, clamp n, adjusting-screw n^2 for the said clamp, tooth-cutting tool c', to co-operate with the said dies, tool-carriage c, stud f, and lever L, secured thereon and provided with the stud d, entered in the groove of the cam-disk C, to effect the reciprocation of the cutting-tool carriage and its contained cutting-tool, feed mechanism E, actuating-lever L′ for the said feed mechanism, link 35 and slide-rod F, connected to the said lever, the spring S, and roller r in the head 5 of the rod F, the said roller being acted upon by the cam B, are all substantially as shown in the application, Serial No. 175,729, referred to, the operation of the parts enumerated being identical with those in the said application, and hence not herein claimed separately.

The toothed metal strip or band is fed from the tooth-cutting apparatus described into a tempering apparatus, wherein the toothed edge of the strip or band is first heated to the requisite heat and then tempered, while the back of the said strip or band remains untempered.

The frame-work $A^7\ A^8$, of suitable shape to sustain the different parts of the tempering apparatus, has attached to it a base, a^6, provided with nipples, upon which are screwed two burners, $a^7\ a^7$, located within the chamber of a jacket, a^8, (see Fig. 1,) open at its lower end, as at 8, (see Fig. 3,) for the reception of atmospheric air, the said jacket and burners constituting a preliminary heater. The base a^6 of the burner is connected by pipe b^7 and projection b^8 with a gas-supplying reservoir, b^9. The jacket a^8, at each side near its upper end, is slotted at opposite sides, as at a^{12}, for the passage of the metal strip or band e^{12}, the lower edge of the said band resting upon blocks a^{14}, slotted and held in adjusted position by screws a^{15}. The frame-work supports a second chamber, c^9, containing compressed air, and nipples or rigid pipes c^{13} therein have applied to them rubber pipes c^{15}, which are joined each to one end of a blow-pipe, b^{15}, of usual construction, each blow-pipe also having connected to it the pipe b^{14}, fitted to the short pipe b^{16}, inserted in the gas-reservoir b^9, the blow-pipe being thus provided with gas and air in usual manner. Each blow-pipe (there being two herein shown) is pivoted upon a post, d^9, made vertically adjustable in a foot, D^3, adjustably mounted upon the bed-plate A^8. The bed-plate A^8 next the preliminary heater has an upright, d^{13}, attached to it by screws d^{15}. This upright carries a guide, e^9, grooved at one edge for the reception of the band e^{12} after it emerges from the preliminary heater, the depth of the groove in the guide being such as

to enable one edge only of the band to project above the guide, the said edge so projecting receiving against its opposite sides the blow-pipe flame, which latter raises the exposed edge of the band to tempering-heat, the band immediately thereafter receiving upon it water or other tempering-fluid from a small discharge-tube, f^9, of a cock, f^{10}, supplied with water from a pipe, f^{12}, in communication with a water-supply pipe, preferably under a head or pressure. The water discharged upon the heated metal band effects the hardening of that edge which was brought to tempering-heat by the blow-pipe, leaving the main part and its opposite edge soft and untempered.

If desired, the preliminary heater may be dispensed with and the edge of the metal strip or band subjected to the action of the blow-pipes without being first moderately heated; but in practice I prefer to employ the construction shown in the drawings, and so I desire it to be understood that the band might be raised to tempering-heat by a single blow-pipe.

Herein I have shown the metal strip or band as fed to the saw-making or tooth-cutting machine from a reel, 53, supported upon an upright, 54, in a foot, 55, and as wound upon a second reel, 43, after leaving the tempering apparatus, the reel 43 being supported on an upright, 44, in a foot, 45, the said upright 44 having upon it a sheave, 46, connected by a belt, 47, with a second sheave, 48, pivoted on an arm, 49, attached to the column A of the saw-making part of the apparatus. The sheave 48 is connected by a belt, 50, with a sheave, 52, on the shaft *a* of the saw-making part of the apparatus, the reel 43 being turned by revolution of the said shaft.

I claim—

1. The combination, with one or more blow-pipes supplied with gas and air under pressure, of a guide or support to surround and protect one edge of a metal strip or band, whereby but one edge of the said strip or band is exposed to the flame of the blow-pipes, substantially as described.

2. The combination, with blow-pipes supplied with gas and air under pressure, of a guide, e^9, for a metal strip or band, a support for the said guide, and a preliminary heater, whereby the metal strip or band is heated on its way to the blow-pipes, substantially as described.

3. A blow pipe or pipes supplied with gas and air under pressure, combined with a guide to surround and protect a metal strip or band, whereby but one of its edges is exposed to the flame of the blow-pipe, and with means, substantially as described, to cool and temper that edge of the strip or band which is raised to tempering-heat by the action of the blow-pipe, as and for the purpose set forth.

4. The dies, the cutting-tool, and feeding mechanism for the metal strip or band, combined with a tempering apparatus composed, essentially, of a guide for the said strip or band, one or more blow-pipes supplied with gas and air under pressure to heat one edge only of the strip or band, and with means, substantially as described, to cool and temper that edge of the said strip or band which is raised to tempering-heat by the blow-pipes, all in continuous operation, substantially as set forth.

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

SAMUEL E. MOWER.

Witnesses:

J. O. WIRSING,

HENRY G. THOMPSON.