

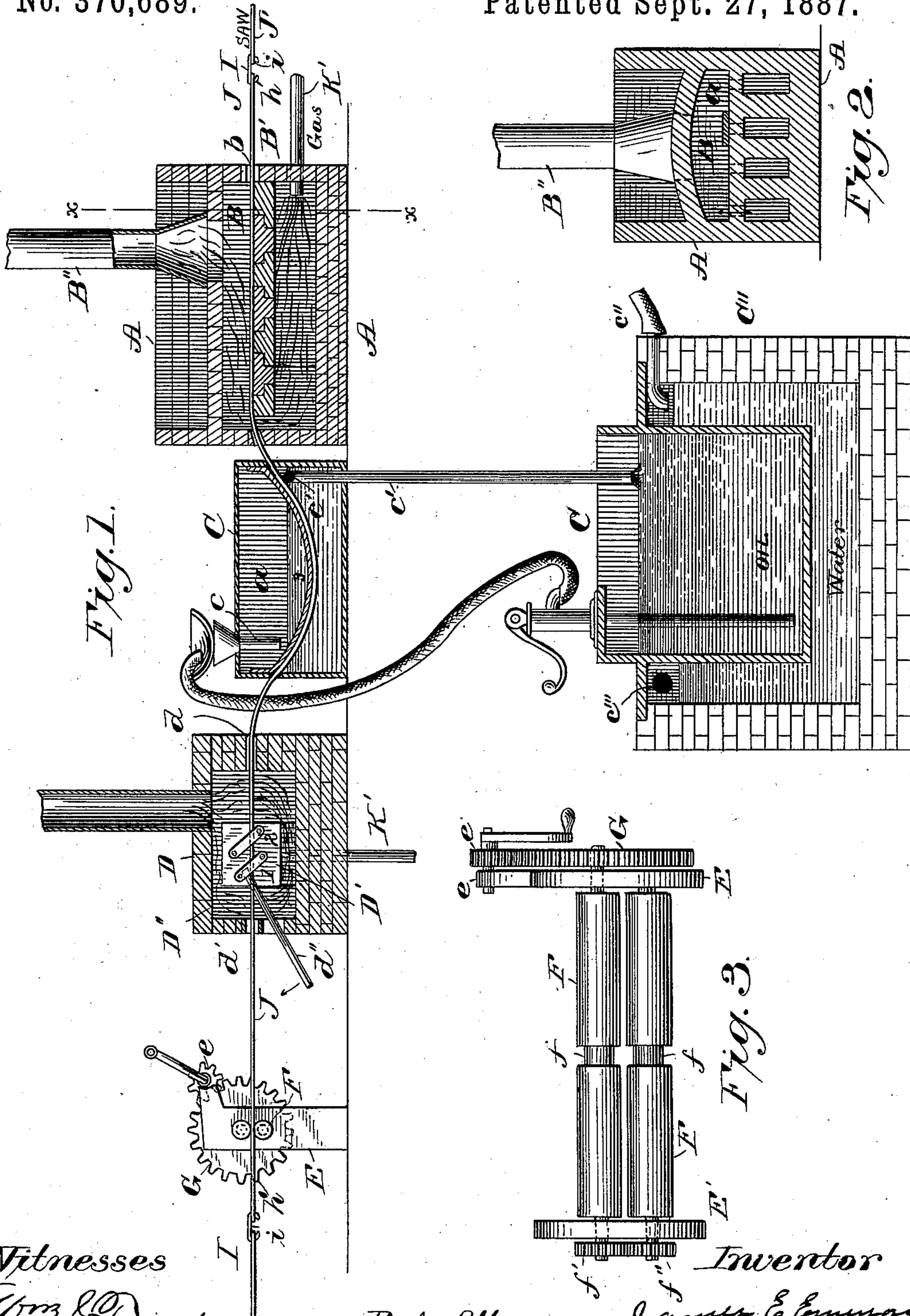
(No Model.)

J. E. EMERSON.

MACHINE FOR STRAIGHTENING, TEMPERING, AND FLATTENING BAND  
SAW BLADES.

No. 370,689.

Patented Sept. 27, 1887.



Witnesses

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# UNITED STATES PATENT OFFICE.

JAMES E. EMERSON, OF BEAVER FALLS, PENNSYLVANIA.

MACHINE FOR STRAIGHTENING, TEMPERING, AND FLATTENING BAND-SAW BLADES.

SPECIFICATION forming part of Letters Patent No. 370,689, dated September 27, 1887.

Application filed August 4, 1886. Serial No. 209,971. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES E. EMERSON, a citizen of the United States, residing at Beaver Falls, in the county of Beaver and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Straightening, Tempering, and Flattening Band-Saw Blades, of which the following is a specification, reference being had therein to the accompanying drawings.

The object of this invention is to improve machines for straightening, flattening, tempering, and truing long band-saw blades, that vary in width from two to ten inches, and is an improvement upon Patent No. 286,284, granted to myself October 9, 1883, for operating upon narrow blades of saws. It was found that the wider blades of band-saws for sawing logs into boards and planks could only be of the length of a single saw, while the saw-blades in said patent were narrow and in lengths of a hundred feet or more before being joined together so as to be in a continuous blank of thousands of feet, and wound upon revolving reels, from which reels they were unwound as the blades were drawn through the device; but as these wide blades could not be wound upon reels or spools like narrow blades, a change of construction in some of the parts had to be made to suit the width of saw-blades and the parts that operate upon them.

The invention consists in the construction and arrangement of the parts by which the improvement is made useful, as will be fully hereinafter described, and set forth in the claims.

In the drawings, Figure 1 represents a vertical longitudinal section of the device. Fig. 2 represents a cross-sectional view of the heating-furnace on line *xx* of Fig. 1; and Fig. 3 represents a side view of the grooved drawing, flattening, and truing rolls and their operating mechanism.

A in the drawings represents a heating-furnace for heating the blades of saws to be hardened, and is built of ordinary fire and other suitable brick, the interior being divided into longitudinal chambers A', that have perpendicular openings *a* into chamber B at its forward end.

B' is a floor, horizontal in position, between the chambers A' and B, and has the several openings, as *a a*, at its forward end, to allow the flame and heat to pass from chamber A' upward into chamber B, thence out through the exit or smoke-stack B'' into the open air.

*b* is an opening in the end of the furnace, its lower part being even with the top of the floor B', and through this opening the saw-blade enters the heating-chamber B, passing through and going out of it, at a cherry-red heat or any other required heat, at opening *b'* on the opposite end of the heating-furnace.

C is an oil-tank for hardening the hot saw-blades as they are drawn through it, and is similar in construction to that described in the patent cited; but the oil is fed into this tank from an oil reservoir or refrigerator, C', by means of a suitable pump, and through pipe *c*, while the hottest oil, near where the blade enters the tank C, runs off through pipe *c'* and is returned to the oil-reservoir C'. The oil-reservoir C' is kept cool by cold water or other cooling medium, which enters the basin C'' through pipe *c''*, surrounds the reservoir C', and flows off through pipe *c'''*. The barrel or supply-pipe of the pump extends nearly to the bottom of the oil-reservoir C' and draws the coolest oil therefrom, which is delivered into the oil-tank C through the pipe *c*, thus keeping up a constant change in the temperature of the oil.

It will be observed that the saw-blade enters and passes out of the tank C through openings below the guide 3, and that the level of the oil in said tank is below the openings through which the saw-blade enters and leaves the tank C. The tank C is placed as near the furnace A as possible, to prevent the blade from being cooled by the surrounding air in its passage from the furnace to the tank.

D is a tempering-furnace, in which is a flame heat to draw the temper of the blade to the right color, and has therein a flattener to flatten any side bends in the saw-blade as it is passed through the furnace, in at opening *d* and out at *d'*.

In the tempering-furnace D is the flattener, which is composed of two heavy metal heated blocks, D' and D''. The top of D' is horizontal with the floor B' of furnace A, and is perfectly



flat and smooth on its top face, upon which the saw-blade bears in passing, and  $D''$  is of the same area and has its lower face to fit closely upon the upper face of  $D'$ . These two sections of the flattener are connected together by pivoted bars 1 1 on the same principle that parallel-rules are connected, so as to keep their faces parallel. Lever  $d''$  extends inclinedly into the furnace D and engages one of the pivoted bars 1, and by forcing the lever hard against one of the pivoted bars 1 the section  $D''$  will be raised up from the lower fixed section,  $D'$ , thus allowing a saw-blade or similar article to be passed between it and the section  $D'$ .

E E' are uprights securely fixed in position to support the friction-rollers F F and resist any tendency to incline toward the furnace D in drawing the saw-blade through the device, and at the proper height to keep a saw-blade in line with the openings  $d$  and  $d'$  of the furnace is placed a pair of centrally-grooved rolls, F F, one directly over the other, each having a transverse groove,  $f$ , therein. These rollers F draw the saw-blade through the furnaces and oil-tank, complete the flattening, "true" the blade, and deliver it approximately in a plane with the openings  $d$  and  $d'$  in the furnace, instead of having it coiled around a reel, as in my patent referred to. This is necessary in wide band-saws, for the reason that they retain the heat of the tempering-furnace much longer than narrow saws, and if wound upon a reel they would set in the bent position and render hammering or reheating necessary to straighten them.

The rolls are revolved by means of a toothed pinion,  $e$ , in arm  $e'$  of upright E gearing into wheel G, that is fast on the shaft of the upper roller F, and through the medium of wheels  $f'$  and  $f''$  a revolving motion is given them in a direction to draw the saw-blade through and from the furnaces. In Fig. 1 is shown a single length of saw-blade,  $h$  to  $h'$ , having its ends punctured with holes  $i$ , which coincide with like holes in another and succeeding length, said lengths being joined by a buckle or link, I, hooked into the holes  $i$  of each of the blades, which are thus securely linked together. When the saw-blade J has reached the position shown in Fig. 1, another blade,  $J'$ , is attached to it in the manner already described. An indefinite number of blades may thus be joined, passed through the furnace A and rollers F in succession, and unbuckled. The link I is made of soft metal which is not affected by the heat of the furnaces. The grooves  $f$  in the rollers F are for the purpose of letting the buckle or link I, that connects two blades together, pass without opening the drawing-rollers, which, if opened, would stop the drawing of the saw-blade.

The operator must watch the approach of the buckle or link and open the flattener by raising section  $D'$  to let the link pass between the sections.

The furnace may be heated by coal or natural gas. Preference is, however, given to the latter. In the construction shown natural gas enters chambers A through pipes K, and is ignited in said chambers. The flame of the burning gas heats the saw-blade in the chamber B, and especially as the blade passes through the flame at the end of the floor  $B'$  on its way to the oil-tank C. Gas enters furnace D at  $K'$ .

The method involved in this invention forms subject-matter of another application for a patent, Serial No. 243,878, filed as a division of this application.

Having thus fully described my invention, what I claim is—

1. In apparatus for hardening, tempering, and flattening band saws or blades, the combination of a heating-furnace, an oil-tank, a tempering-furnace, an adjustable flattener within said tempering-furnace, and a pair of drawing and truing rolls provided with grooves or passages at right angles to the axis of the rolls and arranged approximately in the plane of the openings in the tempering-furnace, substantially as described.

2. In apparatus for hardening, tempering, and flattening band saws or blades, the combination of a heating-furnace, an oil-tank having a supply-pipe at the end through which the saw-blade passes out of the tank, and an overflow-pipe at the end through which it enters the tank, a reservoir and means for supplying cold oil to and receiving the hot oil from the tank, a tempering-furnace, a flattener within said furnace, and a pair of drawing and truing rolls, substantially as described.

3. In apparatus for hardening, tempering, and flattening band saws or blades, a tempering-furnace, in combination with a flattener having a fixed section,  $D'$ , and a movable section,  $D''$ , pivotally secured to the fixed section by bars 1 1, and an operating-lever,  $d''$ , projecting through one of the walls of the furnace, substantially as described.

4. In apparatus for hardening, tempering, and flattening band saws or blades, the combination of the furnace A, having chambers  $A'$  and B, the oil-tank C, the flattener having sections  $D'$   $D''$ , and the drawing and truing rolls F F, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES E. EMERSON.

Witnesses:

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W. W. MERCHANT, Sr.