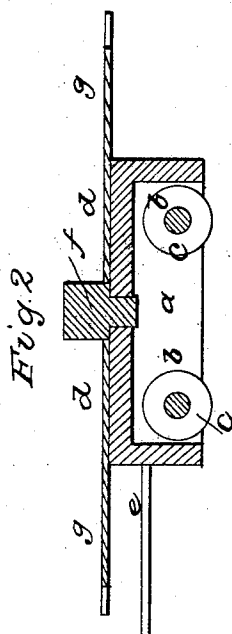
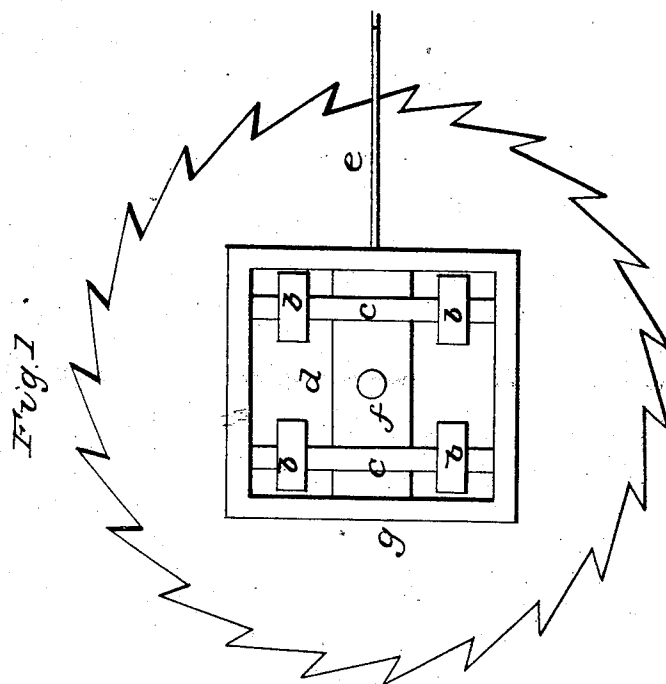


J. LIPPINCOTT.

Method of Tempering Circular Saws.

No. 62,546.

Patented March 5, 1867.



WITNESSES
A. Moore
Henry M. Burdick

INVENTOR
John Lippincott
by his attorney
W. B. Bakewell

United States Patent Office.

JOHN LIPPINCOTT, OF PITTSBURG, PENNSYLVANIA.

Letters Patent No. 62,546, dated March 5, 1867.

IMPROVED METHOD OF TEMPERING CIRCULAR SAWS.

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, JOHN LIPPINCOTT, of the city of Pittsburg, in the county of Allegheny, and State of Pennsylvania, have invented a new and useful improvement in Mode of Drawing the Temper of Saws; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a representation of a circular saw placed upon the carriage used in my mode of drawing the temper of saws, the saw and carriage being viewed from the under side.

Figure 2 is a vertical section through the centre of the saw and carriage.

Like letters designate similar parts in both figures.

It is a matter of the utmost importance in the manufacture of saws that all parts of the saw-plate should be of uniform temper; this is especially the case in large circular saws, which are difficult and expensive to make, because if the saw-plate is of uneven temper, being hard in some places and soft in others, it is very difficult to set the teeth which are too hard, and they frequently break in the operation or crumble at the points, while the teeth in the soft portion of the plate will not carry an edge or hold the set given to them. This want of uniformity in the temper of saws is a very common occurrence, and arises from the practical difficulty of drawing the temper of a steel plate of large diameter by the methods heretofore employed for that purpose.

The mode of hardening and tempering saws in general use is to heat them in a furnace and then plunge them in a bath of oil, by which the steel is hardened. This process has the effect of warping and kinking the steel plate to such a degree that its surface becomes very uneven. The hardened plate is then removed to a furnace having a level bed, on which the saw-plate is laid. It is then exposed to sufficient heat to draw the temper down to the proper point. As it is impossible to have the furnace of exactly uniform heat at all points, the saw-plate is turned round and round more or less rapidly by means of long hooked rods, operated by workmen from the open mouth of the furnace, so that no portion of the saw-plate, excepting its centre, continues for any considerable length of time in the same part of the furnace. This mode of operation would answer the purpose very well if the saw-plate touched the bed of the furnace at all points on its surface. This, however, is not the case, owing to the warped and uneven surface of the saw-plate; and as those parts of the plate which are in contact with the bed of the furnace become more rapidly heated, the temper of those parts is drawn down to the proper point before the other parts of the saw-plate, which do not touch the furnace bed, are sufficiently heated, and thus of necessity the saw-plate will be harder at some points than at others.

To remedy this defect is the object of my invention, which consists in elevating the saw-plate above the level of the bed of the furnace in such a manner that it can be rotated on its axis freely and without coming in contact, at any point at or near its circumference, either with the furnace or with the device used for supporting the saw.

Another object of my invention is to support the saw-plate in the furnace in such a manner that it can be more easily and rapidly rotated on its axis, and also be readily inserted into or drawn out of the furnace or brought to the mouth of the furnace to enable the workman to inspect its condition from time to time.

To enable others skilled in the art to use my invention, I will proceed to explain the manner in which I carry it into practical operation.

In the accompanying drawing, *a* represents a small carriage, made of iron, about three inches in height and about ten or twelve inches square, or of such diameter as to afford sufficient support to the saw-plate without extending too near its periphery. This carriage may be furnished with four wheels, *b*, fixed on axles *c*, having their bearing in the sides of the carriage or attached to the under side of the top plate *d* of the carriage. The top plate *d* should be a level surface. A long rod, *e*, attached to one end of the carriage, enables it to be conveniently operated in introducing it into the furnace and removing it therefrom, and moving it about from place to place within the furnace. In the centre of the bed-plate is a low vertical spindle, *f*, which projects upwards from the top of the carriage and serves as a mandrel to receive the saw, the eye of the saw, which is in the centre of the saw-plate *g*, receiving the mandrel or spindle *f*, and the saw-plate resting on the top or bed-plate *d* of the carriage, as shown in fig. 2. The spindle *f* may be made a separate piece from the carriage and inserted in a suitable hole in the top or bed-plate *d*.

The mode of operation is as follows: The carriage, before receiving the saw-plate, is placed inside of the heated furnace, so as to be as nearly as possible of the same temperature as the furnace. It is then drawn out, and the hardened saw-plate is placed upon it with the mandrel *f* inserted through its eye. The carriage is then wheeled back into the furnace, and the workman, by means of a hooked rod, turns the saw-plate round and round on its mandrel more or less rapidly, according to the heat of the furnace. During the process he occasionally draws the carriage to the mouth of the furnace, in order to ascertain by the appearance of the saw when it has reached the required temper. Circular saws are frequently made six feet in diameter, and by the old method of operation it was hard work for two men to turn the saw on the bed of the furnace. By the use of the carriage employed by me for this purpose, owing to the small diameter of the carriage in comparison with that of the saw, there is but a small part of its surface in contact with its support; one man can manage it with ease, and the rotation of the saw can be more constantly maintained, and thereby a much more uniform result attained. It is important to make the surface of the carriage on which the saw rests as small as is consistent with a sufficient support, so as to leave as large a portion as possible of the saw-plate towards its circumference free from contact either with the carriage or with the bottom of the furnace, because the contact of the saw-plate with either would tend to withdraw the heat from that portion of the saw more rapidly, and thus produce an uneven temper.

I am aware that steel tools, such as axes, &c., have been tempered by being placed upon a revolving metallic wheel, caused to revolve within a heated furnace, but this would not answer for circular saws, as in that case the steel tools are placed entirely within the circumference of the revolving wheel, while my object is to place the saw as far as possible outside of the carriage which supports it, and to cause the saw to revolve on and not with its support, so as to obviate the injurious effect of contact with another metallic surface of that portion of the saw-plate which necessarily touches the carriage in which it is supported.

I do not desire to limit myself to the precise mode of suspending or supporting the saw within the furnace hereinbefore described, as other devices might be used; but that which I have described I have found on trial to be very successful and convenient, as it not only secures the main object, a uniform temper in the saw-plate, but enables the saw to be more easily handled.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A platform for sustaining circular saws above the floor of the tempering-furnace, constructed to support by contact the central portion of the saw only, thus leaving the marginal portion of the saw free from contact with the platform or with the floor of the furnace, substantially as described.
2. The iron carriage, constructed substantially as hereinbefore described, for introducing the saw-plate into the furnace, supporting and adjusting the same during the process of drawing the temper, and for withdrawing it from the furnace when the tempering process is completed.

In testimony whereof, I, the said JOHN LIPPINCOTT, have hereunto set my hand in presence of—

JOHN LIPPINCOTT.

Witnesses:

W. D. LEWIS,
ALLAN C. BAKEWELL.