

(No Model.)

E. W. McKENNA.
PROCESS OF RENEWING OLD STEEL RAILS.

No. 522,228.

Patented July 3, 1894.

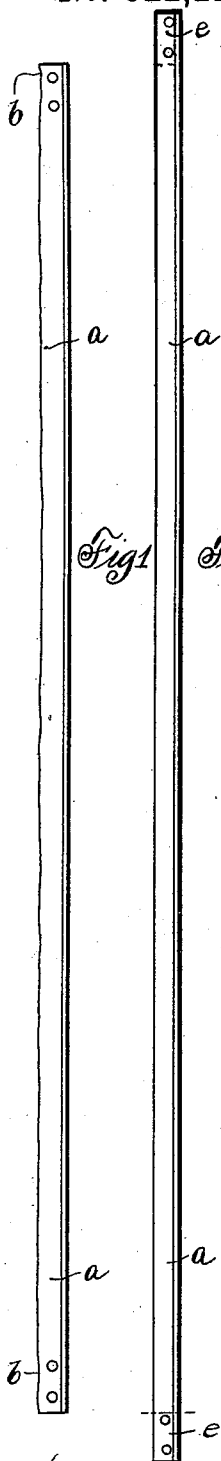


Fig. 1

Fig. 2

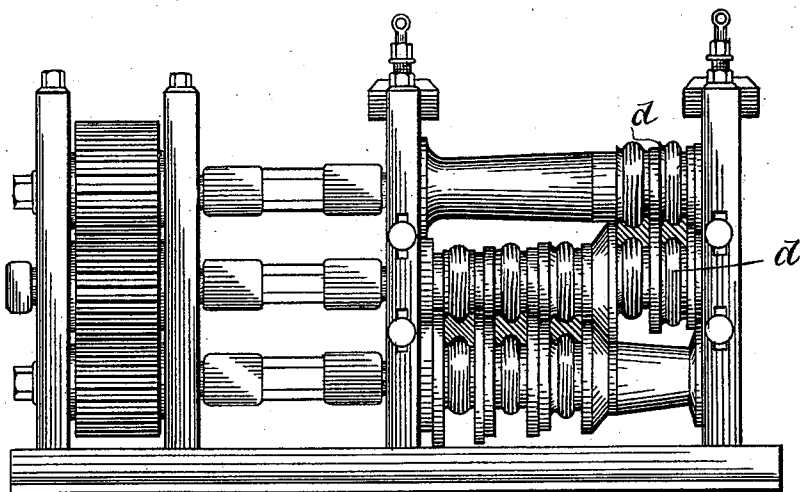
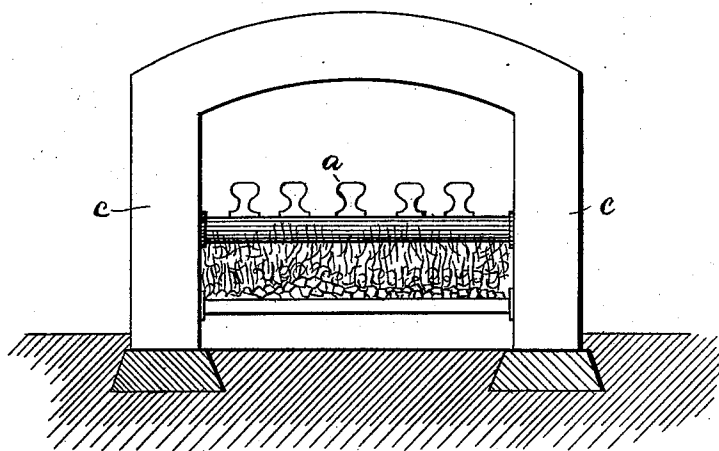


Fig. 3

Fig. 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

EDWARD W. MCKENNA, OF MILWAUKEE, WISCONSIN.

PROCESS OF RENEWING OLD STEEL RAILS.

SPECIFICATION forming part of Letters Patent No. 522,228, dated July 3, 1894.

Application filed July 26, 1892, Serial No. 441,317. (No specimens.)

To all whom it may concern:

Be it known that I, EDWARD W. MCKENNA, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a certain new and useful Improvement in Processes of Renewing Old Steel Rails, (Case No. 1,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to an improved method for renewing steel rails.

It is well known that the continuous use of steel rails results in wear, especially at the ends thereof, and that the life of a steel rail is very considerably shortened by the fact that the rail becomes worn and irregular in shape, especially at the end, through the continuous striking of the rail by the wheels in passing over it.

It has been, and is now the practice by many large railroads to renew the rails, or give them increased duration of use by sawing off the ends, after which the rails are re-laid and become serviceable for a further period of time. By this process, however, the rail is correspondingly shortened, and new bolt holes, in addition to the old ones, have to be drilled in the ends thereof to make connections with the fish plates joining the rails. Moreover, by this process of sawing off the ends merely, only the most pronounced irregularities are removed, as other irregularities in the rail resulting from the shouldering of the metal out of place, are still left.

It is the object of my invention to produce a renewed rail after removing the ends, of the same length as, or longer than the rail originally was.

Another object of my invention is to produce a renewed rail of a quality superior to that of the rail in its original condition.

Still another object is to roll out the old bolt holes and leave the renewed rail, after the ends thereof have been removed, in condition to receive new bolt holes, the same as a new rail.

Still another object is to straighten the old rail and to remove the inequalities resulting from uneven wear on the surface thereof, or from the flowage of metal, due to the impact

of the wheels upon the rail, or other causes, thus producing a rail with a surface as smooth and even as when new, and adapted to be used with new rails of the same weight as the renewed rail.

My invention is intended to take advantage of the discovery I have made, which is that when rails are taken from the track as being no longer serviceable, a very small proportion of the metal has been lost by attrition, but the rails have become unserviceable owing to the displacement of the metal by the blows of the wheels in passing over them. Therefore, in adapting these rails to further use it is only necessary to replace the metal thus displaced and to reduce the cross section slightly, keeping the rail of standard height, so that the renewed rail will be adapted to be used interchangeably with original rails.

My invention consists, briefly, in the method of passing the rail it is desired to renew, through rolls, which reduce the cross section, and, consequently, the weight per foot of the rail, as little as possible in order to straighten out the irregularities and to make up for any loss of metal by wear or other causes.

My invention consists further in the heating of the rail before the process of rolling to a temperature which will permit the manipulation thereof to secure the desired end, but not sufficient to decarbonize the steel. The heating of the rail is not, however, a necessary part of my invention, and I do not desire to limit myself to a process in which the heating of the rail is employed, as the same result may be accomplished by rolling the rails cold.

Referring to the accompanying drawings, Figure 1 shows the worn out rail, such as it is the object of my invention to treat by my process. Fig. 2 represents a rail as it appears lengthened by my process, and indicating the points at which the ends of the rail are sawed off. Fig. 3 represents the rolls through which the worn out rails are passed. Fig. 4 represents the furnace which I preferably use.

The standard length of rail is thirty feet. Furnaces for heating the steel from which the original rails are rolled are not in practice made so long. To apply the right amount of heat uniformly, or nearly so, to the rail, as is necessary in my process, when heating is used, a furnace of sufficient length to take in the

thirty-foot rail is required. The construction of this furnace, however, forms no part of my present invention, and I do not, therefore, consider it necessary to further describe it.

5 The degree of heat at which the steel is decarbonized is well known to those skilled in the art, and I do not claim the heating to a degree not sufficient to decarbonize, as my invention.

10 The rolls may be of the ordinary form. I have shown simply a three high train. The heated rail, in the process which I prefer to employ, direct from the furnaces, is presented to these rolls and is drawn through between
15 the train. Ordinarily the passing of the rail through one set of rolls is sufficient, and the rails may pass through these rolls as many times as is necessary to reduce the rail to the desired cross section. The cross section given
20 to the metal in passing through the rolls is determined by the shape of the rolls, and also by the number of passes. As is well known, this process serves to improve the quality of the steel, and by reducing a cross section to
25 the right dimensions a rail of any desired length can be produced. The ends may be sawed off either prior or subsequent to the heating and rolling steps in the process.

30 The steel rail *a*, usually thirty feet in length, shows in Fig. 1 at *b b* the depressions caused by the shock of the impact of the wheel thereon.

35 The furnace *c*, of sufficient length and proper construction to satisfactorily receive and heat the rail, is adapted to bring the rail to a temperature at which it will be more readily acted upon by the rolls *d d*, but without bringing the rails to a temperature where the carbon contained therein will be materially affected. After passing through the
40 rolls *d d* the rail assumes the increased length resulting from its reduced cross section, and the ends *e e* thereof, if they have not already been removed prior to the operation
45 of heating and rolling, may be, and preferably are, sawed off while the rail is still hot, thus producing a rail of the same length as before, or longer if desired, and of superior quality, owing to the denser and closer structure of the steel, which results from this work-
50 ing, but of reduced weight, owing to the removal of the ends.

55 It is obvious that where there has been but little wear or loss of metal in the rail, but where the irregularities in the bearing surface are due, as is generally the case, to displacement of the metal, the process of my invention would not reduce the cross section of

the rail materially, but would redistribute the metal in the rail and remove the inequalities, thus leaving the rail of the same height, practically, as it was originally, and adapting it to be used again with rails of the same weight as that of the renewed rail. But where there has been excessive wear or loss of metal by
65 breaking or chipping from the head or flange, or where the rails are considerably worn on one side, as at curves, for instance, the process of my invention would result not only in straightening and redistributing the metal
70 in the rail, but in such reduction of cross section as would make up for the metal lost from the side and head of the rail by wheel contact, or for the other reasons stated, and a renewed rail would be produced of reduced
75 cross section proportional to the metal lost, the renewed rail being properly proportioned in all its parts and so formed by manipulation to be of such pattern as to be interchangeable with rails of the various stand-
80 ards in use by railway companies.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The process of adapting old steel rails to
85 further use, which consists in heating the same to a temperature near to, but below, the point at which the carbon contained therein would be materially affected, simultaneously
90 straightening and reducing the cross section thereof equably in all its parts, but keeping the rail of the original height, and then sawing off the ends; whereby a rail of reduced
95 cross section, but of the same or greater length and the same height as the original rail is produced.

2. The process of adapting old steel rails to further use for their original purpose, which consists in heating the same to a temperature below a point at which the carbon contained
100 therein would be materially affected, straightening the rail and reducing the cross section thereof sufficiently to remove the irregularities due to wear or other cause, whereby a
105 rail is produced of a standard height, with a reduced cross section properly proportioned, and so formed as to be used interchangeably with rails of standard pattern which are approximately of the same weight as that of the
110 renewed rail, substantially as described.

In witness whereof I hereunto subscribe my name this 1st day of July, A. D. 1892.

EDWARD W. MCKENNA.

Witnesses:

GEORGE MCMAHON,
GEORGE L. CRAGG.