May 25, 1937. A. W. MALL 2,081,360

RAIL SLOTTER

Filed May 9, 1935

Fig. 2.

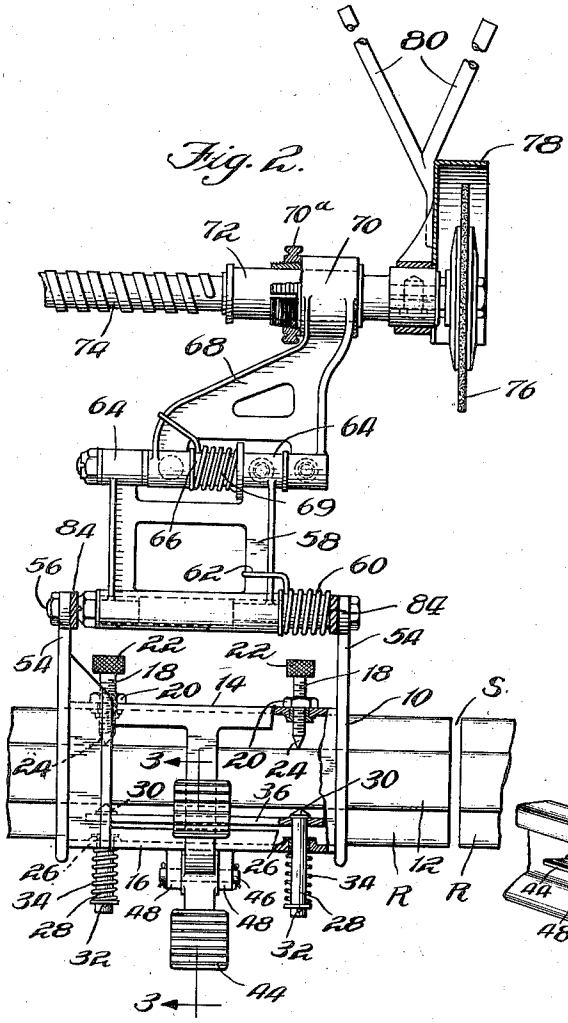


Fig. 1.

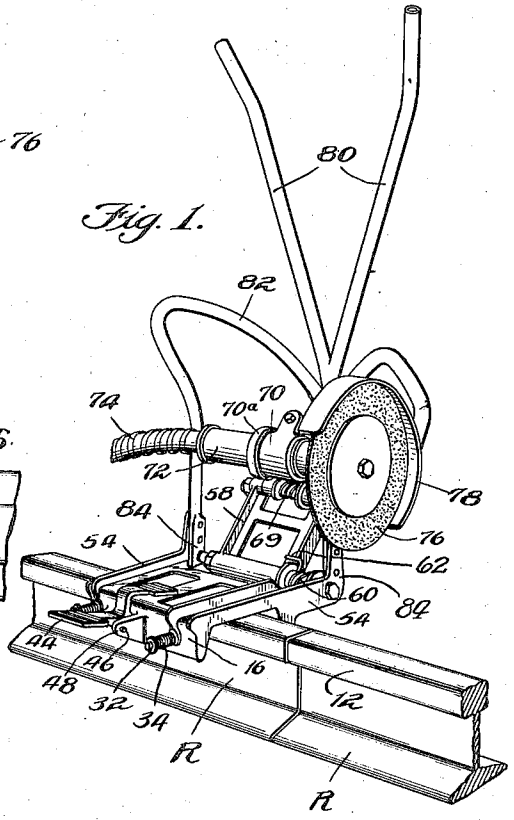
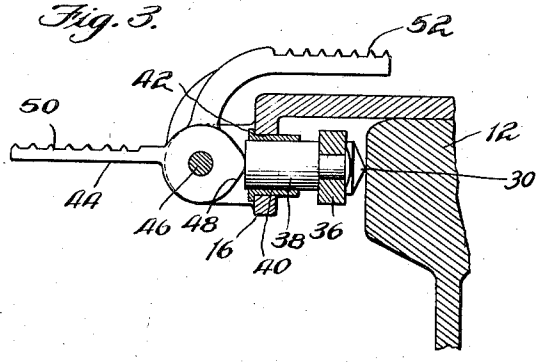


Fig. 3.



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2,081,360

RAIL SLOTTER

Arthur William Mall, Chicago, Ill.

Application May 9, 1935, Serial No. 20,649

12 Claims. (Cl. 51—241)

My invention relates to improvements in rail slotters and similar devices.

My invention relates more particularly to a device of this type adapted to be transported along a railroad track and used to grind out the joints between rail ends.

When railroad rails are in service the ends wear much faster than the rest of the rail on account of the hammering they receive as the car wheels pass over the joints or spaces between the ends of adjoining rails. When the ends of rails become worn it has been found that their life may be lengthened by building up the worn rail ends by one of the fusion welding processes and then grinding the added metal down to the original contour line of the rail. In building up the ends of the rails the joint or space between their ends is frequently filled with metal so that there is not enough space between the rail ends to allow for expansion. Heretofore, this metal has been removed from the joints by means of cold chisel or hacksaw but this method is unsatisfactory as the added metal is frequently too hard to be worked in this manner so that the process is slow, expensive, and the result only partially satisfactory.

Therefore, one of the objects of this invention is to provide a machine that will remove weld metal from rail joints in a quick, economical, and satisfactory manner.

When the steel in railroad rails is hard enough to withstand the hammering of car wheels without deforming at the ends where the wheels strike the sharp corner of the rails it has been found that the impact of the wheels frequently breaks portions from the upper corners of the rail ends thereby increasing the width of the joint to an undesirable extent. It has been found that by removing a small amount from the upper corners of the rail ends that this breakage is prevented.

Therefore, another object of this invention is to provide a machine for removing the upper corner of rail ends in a quick and economical manner.

A further object of my invention is to provide a device of the character described that is easily and quickly attached to the rail to be operated upon and one which is unusually light in weight so that it can easily be transported from place to place by one person.

A further object of my invention is to provide an improved device of the character described that can be quickly attached to a rail by a pedal lever that can be operated with one foot.

A further object of my invention is to provide a device of the character described provided with adjusting means at the grinding spindle for fine adjustment.

A further object of my invention is to provide an improved construction in a device of the character described that is easily and cheaply made, one that will give long use and will not easily become broken or out of order.

The necessity for a light weight construction that can easily be handled by one person will be realized when it is stated that the operation of grinding rail joints or slots is not permitted to interfere with rail traffic. It thus becomes necessary to remove the grinding apparatus from the rail very quickly on the approach of a train.

With these desirable characteristics and necessary limitations in mind, I have invented an improved rail joint grinder which is entirely self-contained, which is driven by a flexible shaft from a desirable source of power and which is light enough to be quickly removed from a rail by one man, yet at the same time is sufficiently substantial to retain its operating position by being locked to the rail.

Other objects and advantages will be more apparent from the following description wherein reference is had to the accompanying sheet of drawings upon which,

Fig. 1 is a perspective view illustrating my improved rail joint grinder or slotter positioned upon a rail, adjacent a slot to be ground;

Fig. 2 is a plan view thereof with the parts in an inoperative position; and

Fig. 3 is a cross-sectional view through the pedally operated locking mechanism.

In the embodiment of my invention which I have chosen to illustrate the same, I have shown the base member **10** adapted to be rigidly secured to the head **12** of a rail R which abuts the end of a similar rail R. As is customary in laying rails, a slight space S has been left between the adjoining ends of the rails R and my improved device as shown in the drawing is secured to the rail for the purpose of grinding out the space S.

The base member **10** is provided with downwardly depending rear and forward flanges **14** and **16**. The rear flange **14** may have a pair of pin members **18** positioned therethrough and located in place by the nut members **20**. Each of the pin members **18** is provided with a knurled end portion **22** and a pointed rail engaging portion **24**. The front flange **16** is provided with a pair of bushed openings **26** through which a pair of

slidably mounted pin members 28 are positioned. Each of the pin members 28 is provided with an enlarged head portion 30 and a shoulder portion 32 at its oppposite end. The head portions 30 may be pointed as shown to engage against the side walls of the head 12 of rail R. The compression spring 34 may be mounted upon each of the pins 28 between the exterior wall of flange 16 and the shoulder 32. The springs 34 normally tend to hold the pin members 28 out of engagement with the sides of the rail head 12. The pin members 28 may carry a cross bar member 36. The bar member carries a plunger 38 secured thereto and adapted to pass through a suitable bushing 40 mounted in an opening 42 in the flange 16. A pedal member 44 is adapted to be pivotally mounted upon the pivot 46 carried by a pair of arm members 48 extending laterally from the flange 16. The pedal member may be formed with a cam portion 48 adapted in the position shown in Fig. 3 to fixedly hold plunger 38 and cross bar 36 against movement.

The pedal member 44 may be provided with a pair of upper plate portions 50 and 52 which may be engaged by an operator's foot to release or to lock the cam member 48 in the position shown. The base member 10 may have a pair of horizontal arm portions 54 adapted to extend rearwardly therefrom and support a pivot member 56 upon which a vertical arm member 58 may be mounted. A coil spring 60 positioned on the pivot 56 and having an arm 62 engaging the vertical arm member 58 normally holds the same in a vertical or inoperative position. The arm member 58 may be provided with journals 64 to support a suitable pivot 66 upon which a horizontal arm member 68 is adapted to be mounted. A similar coil spring 69 normally tends to hold the arm or bracket member 68 in the position shown in Fig. 2.

The bracket member 68 carries a split journal 70 at its outer end within which a spindle housing 72 of a flexible shaft member 74 is adapted to be mounted. The spindle housing 72 carries at its outer end a grinding wheel 76 and the housing 78 therefor. A pair of lever members 80 may extend upwardly from the housing 78 so that the spindle housing 72, housing 78 and grinding wheel 76 may be swung in a vertical plane on the pivots 69 and 56.

With the above described construction it may be seen that when it is desired to grind a slot S as shown, the driven grinding wheel 76 can be swung forward to engage the slot by means of levers 80. It can further be seen that upon releasing presssure upon levers 80 due to the springs 62 and 69, the grinding disk will be removed from the slot S to the position shown in the drawing. Thus, it can be seen that with my improved construction the base member 10 can be easily mounted upon a rail adjacent a slot to be ground, positioned in place by manipulation of the cam lever 44 and the grinding operation may be performed. A hand wheel 70a having a tapped bore, threads on the split housing 70 to lock the spindle housing 72 in any desired position.

A rigid handle member 82 may be fastened to the arms 84 on the base member 10 for carrying the device when not in use and also for the purpose of providing a back limit stop to the movement of the grinding wheel and associated parts under the influence of springs 60 and 69.

With the construction I have provided, it can be seen that the apparatus being yieldingly held upon the rail by the springs 34 can easily be knocked off by an approaching train, thus avoiding possible serious damage. This is true because the pin members 28 are carried on a cross bar member 36 which is rigidly held at its center by the cam portion 48 of foot pedal 44 which allows pivotal spring movement of the bar member. Thus, when a train approaches from the front, the super-structure of the engine will strike the grinding wheel and handles 80 and pull the device from its fastening against the head of the rail R. Due to the fact that upon many sections of track such as those in or near the large metropolitan cities trains run every 10 or 15 minutes, this is a highly advantageous feature of applicant's machine.

While I have illustrated and described a specific embodiment of my invention, it will be understood that changes and modifications may be made in the specific structure shown and I do not wish to be limited in any particular. Rather what I desire to secure and protect by Letters Patent of the United States is:

1. A rail slotting device comprising a bass member capable of being mounted on a rail, said member having pairs of pins to contact both sides of said rail, a plate member connected to one pair of pins, a cam for moving said plate, a foot lever for operating said cam, an arm carried by said base member, a bracket carried thereby and a driven grinding wheel carried by said bracket.

2. A rail slotting device comprising a base member capable of being mounted on a rail, said member having pairs of pins to contact both sides of said rail, a plate member operatively connected to one of said pair of pins, a cam for moving said plate, a pivotally mounted foot lever for operating said cam, an arm carried by said base member, a bracket carried thereby and a grinding wheel carried by said bracket, said grinding wheel being driven by a flexible shaft.

3. A rail slotting device comprising a base member capable of being locked to a rail, a pedally operated member for releasing said base from said rail, a pivoted arm carried by said base, a bracket member carried thereby, a grinding wheel carried by said bracket member, a flexible drive therefor, manual means for normally bringing said grinding wheel into operation on said rail and spring means associated with said bracket for moving said grinding wheel away from said rail.

4. A rail slotting device comprising a base member capable of being locked to a rail, said base member having parallel downwardly depending flanges overlying the head of said rail, a pedally operated member secured to one of said flanges for releasing said base from said rail, a pivoted arm carried by said base, a bracket member carried thereby, a grinding wheel carried by said bracket member, a flexible drive therefor, manual means for normally bringing said grinding wheel into operation on said rail and spring means associated with said bracket for moving said grinding wheel away from said rail.

5. A rail slotting device comprising a base member adapted to be locked to a rail, means including a pedally operated member, spring means and a cam for releasing said base from said rail, a pivoted arm carried by said base, a bracket member pivotally mounted thereon and carried thereby, a grinding wheel carried by said bracket member, a flexible drive therefor, manual means for normally bringing said grinding wheel into

operation on said rail and spring means associated with said bracket for moving said grinding wheel away from said rail.

6. A rail slotting device comprising a base member adapted to be rigidly mounted on a rail, means for releasing said base member from said rail, said means including a pedally operated cam member, an arm carried by said base member, a bracket pivotally supported thereon, spring means between said arm and said bracket, a grinding wheel journalled in said bracket, a flexible drive therefor, and means associated with said grinding wheel for moving the same into and out of engagement with said rail.

7. A rail slotting device comprising a base member having a pair of downwardly depending parallel flanges adapted to be rigidly mounted on a rail, means for releasing said base member from said rail, said means including a pedally operated cam member, a pair of compression springs and a cross bar, an arm pivotally carried by said base member, a bracket pivotally supported thereon, a grinding wheel journalled in said bracket, a flexible drive therefor, and means associated with said grinding wheel for moving the same into and out of engagement with said rail.

8. A rail slotting device comprising a base member adapted to be rigidly attached to a rail to be worked upon, pedally operated means for engaging or releasing said base member from said rail, said means including a pair of movable pin members, a plate and a cam associated therewith, an arm carried by said base member, a bracket pivotally mounted thereon, a grinding wheel carried by said bracket, a flexible shaft for driving said grinding wheel and adjusting means associated with said shaft for axial movement of said grinding wheel.

9. A rail slotting device comprising a base member adapted to be rigidly attached to a rail to be worked upon, manually operable means for engaging or releasing said base member from said rail, said means including a pair of movable pin members, compression springs and a plate associated with the same, an arm carried by said base member, a bracket pivotally mounted thereon, a grinding wheel carried by said bracket, a flexible shaft for driving said grinding wheel and adjusting means associated with said bracket for axial movement of said grinding wheel.

10. A rail slotting device comprising a base member adapted to be rigidly attached to a rail to be worked upon, pedally operated means for engaging or releasing said base member from said rail, a bracket pivotally secured to said base member, a grinding wheel carried by said bracket, a flexible shaft for driving said grinding wheel and adjusting means associated with said bracket for axial movement of said grinding wheel.

11. A rail slotting device comprising a base member adapted to be rigidly mounted on a rail, means for securing and releasing said base member from said rail, a bracket pivotally supported from said base member, a grinding wheel journalled in said bracket, a flexible drive therefor, means associated with said grinding wheel for moving the same into and out of engagement with said rail, and means for permitting the manual moving of said grinding wheel axially, said means including a split housing and lock means associated therewith.

12. A rail slotting device comprising a base adapted to be rigidly secured to a rail, manually operable means for releasing said base from said rail, an arm pivotally secured to said base, a bracket carried thereby, a grinding wheel journalled in said bracket, a flexible drive therefor, means for axially adjusting said grinding wheel, an arm for moving the same in a vertical plane and spring means associated with said first mentioned arm and said bracket for moving said grinding wheel to an inoperative position.

ARTHUR WILLIAM MALL.