

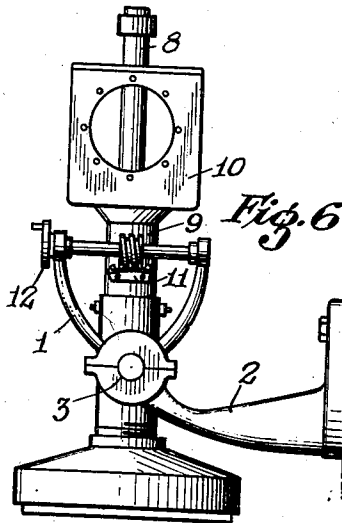
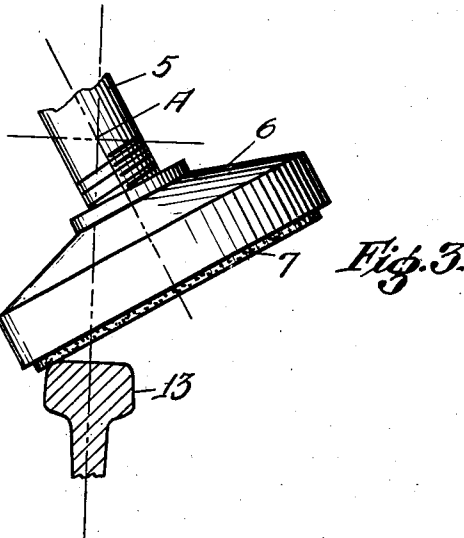
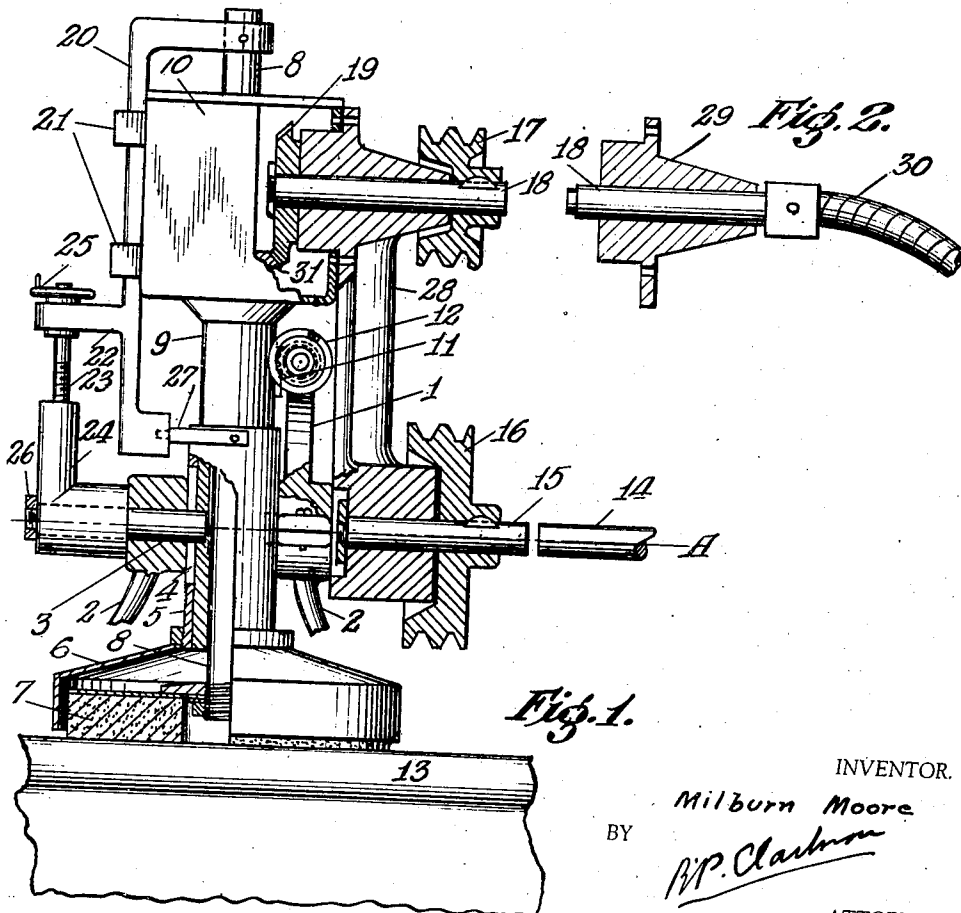
April 6, 1937.

M. MOORE
RAIL GRINDER.

2,076,089

Filed Sept. 15, 1934

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

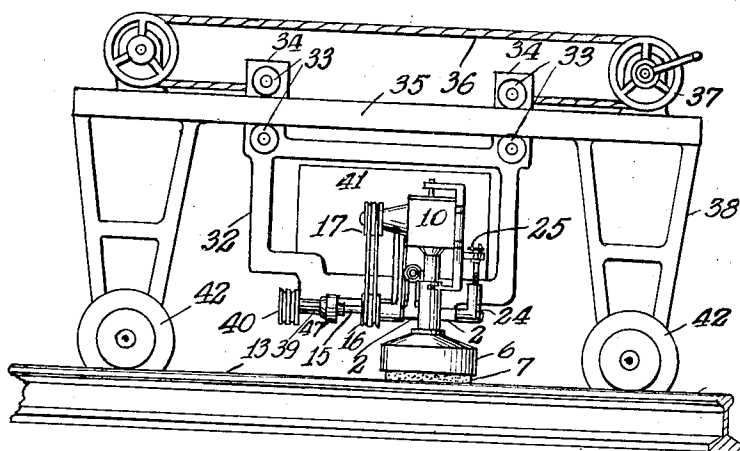


Fig. 4.

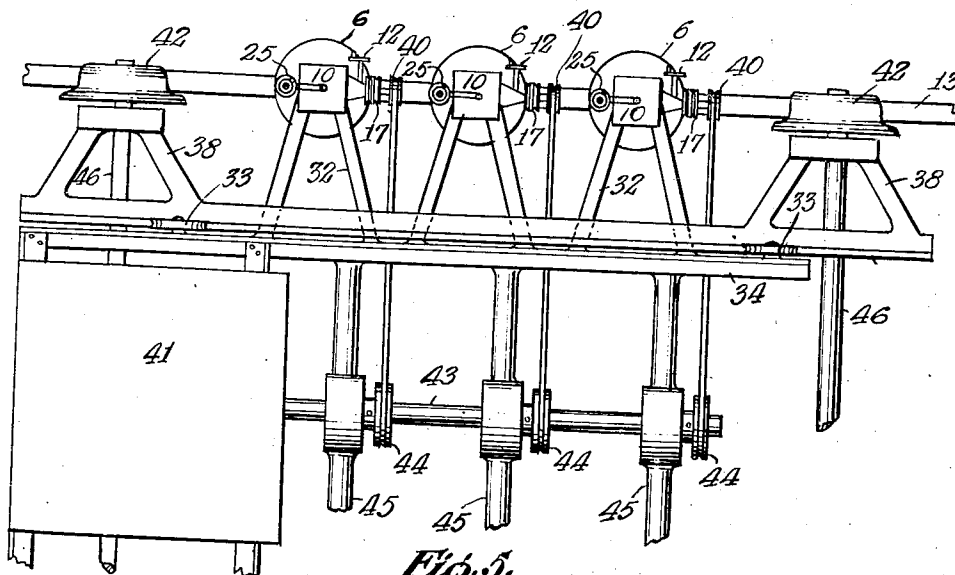


Fig. 5.

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2,076,089

RAIL GRINDER

Milburn Moore, Brooklyn, N. Y., assignor of one-half to Chester F. Gailor, New York, N. Y.

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12 Claims. (Cl. 51—178)

This invention relates to improvements in rail grinders and has particular reference to grinding devices adapted for grinding the surface of railroad tracks in place.

5 An object of the present invention is to provide a grinder of simplified construction and having features that materially contribute to economy in manufacture and which possesses marked commercial advantages over grinders for a similar purpose heretofore employed.

A further object of this invention is to provide a standardized grinding head adapted for use singly or in gangs of two or more capable of following the entire contour of the rail surface.

15 Another object of my invention is to provide a grinder simple to operate, sturdy in construction, and readily adapted to the various tasks involved in rail grinding and surfacing.

20 Still another object of the present invention is to provide a grinder adapted to use a cup wheel rotating in a plane parallel to the rail surface to be ground and adapted to be tilted to meet the various elements of the contour of the rail head and which may be reciprocated along the rail

25 surface to be ground. With the foregoing and other objects in view, as will be apparent to those skilled in the art as the description proceeds, my invention resides in the combination and arrangement of parts and in the details of construction described in this specification and particularly pointed out in the appended claims, it being understood that changes in the particular embodiment of my invention may be made within the scope of what is claimed

30 without departing from the spirit of the invention. I intend no limitations other than those of the claims. Referring now to the accompanying drawings which are furnished solely for illustrative purposes,

40 Fig. 1 is an elevational view, partly in section, illustrating a grinding head embodying certain features of my invention;

Fig. 2 is a detail illustrative of an alternative power drive;

45 Fig. 3 is a diagrammatic view illustrating a method of using the grinding head of Fig. 1;

Fig. 4 is a conventional elevational view of a grinding head mounted on a frame;

50 Fig. 5 is a plan view illustrating the use of a plurality of grinding heads mounted on the same frame.

Fig. 6 is a conventional elevational view, looking from the power shaft, with the supplementary 55 frame and drive removed.

Similar reference characters relate to corresponding parts throughout the drawings.

Referring to the illustrations, and more particularly to Fig. 1, an operating shaft 8 extends through a housing member comprising a gear housing 10 and a downwardly extending shank 9, over the lower portion of which telescopes a sleeve member 5 slotted on both sides, as at 4. Operating shaft 8 may be concentric with shank 9 and project therefrom at the lower end. Affixed to the lower end of shaft 8 may be a cup grinding wheel 7 and mounted concentric therewith is a guard 6 preferably adjustably threaded on the lower end of sleeve member 5 so that it may be set for desired visibility and protection. Cup wheel 7 is adapted to rotate in a plane parallel to the surface of rail 13 to be ground.

Sleeve member 5 and operating shaft 8 may be linked together by an arm 20 slidably engaging channel slides 21, 21, a yoke 27 making the connection between arm 20 and the sleeve 5. A bracket 22 integral with arm 20 forms a bearing member for a hand wheel 25 affixed to a screw 23 which takes in a rocker arm 24 held freely on pivot pin 3 as by a nut 26. Operation of hand wheel 25 thus raises or lowers arm 20 and thereby imparts the same motion to shaft 8 and sleeve 5 thus raising and lowering grinding wheel 7 and guard 6 together, as desired.

On the other side of the housing is a supplementary frame 28 affixed to the housing. At the upper end of frame 28 is journaled a countershaft 18 on which may be keyed a sheave 17. Also on countershaft 18 is affixed a driving gear 19 which engages a gear 31 which, in turn, slidably engages the operating shaft 8 to drive it and still permit raising and lowering of shaft 8. This is preferably accomplished by a spline or pin and slot, well known in the art.

At the lower end of frame 28 is journaled a primary power shaft 15 to which may be affixed a driving sheave 16 aligned with and belted to sheave 17. A driving shaft 14 may be connected with primary power shaft 15 as by a flexible coupling 47 (Fig. 4) or otherwise.

By the construction so far recited, shaft 15, if rotated, will rotate sheave 16 which belted to sheave 17 will operate the latter and through shaft 18 turn gear 19 which, in turn, will rotate gear 31, operating shaft 8 and grinding wheel 7.

The grinding head may be supported as by support members 2, 2, affixed to a frame, as 32 (Fig. 4). In supports 2, 2, may be pivot pins 3, 3, engaging shank 9 of the housing through slots 4, 4, of sleeve 5. The center line of pivot 55

pins 3, 3, coincides with the center line of the primary power shaft 15, this common axis being indicated at A (Figs. 1 and 3). Thus a tilting of the grinding head on the pivots to an angle as shown (Fig. 3) does not affect the driving mechanism nor change the distance between shafts 15 and 18. Hence, the grinding head may be tilted freely while operating and may thus follow the contour of the rail surface, as indicated in Fig. 3.

Preferably to effect the tilting of the grinding head, I employ a hand wheel 12 journaled in an extension 1 of the fixed support 2. Hand wheel 12 may be attached to a worm which engages a partial gear segment 11 fastened to shank 9, in the usual manner. Operation of wheel 12 will therefore tilt the grinding head on the pivot pins 3, 3, to whatever angle may be desired and this action, coupled with the raising and lowering of wheel 7 by means of hand wheel 25, makes it possible to adjust the face of wheel 7 to grind any portion of the rail head surface.

In some instances, as on heavy traffic railroads, it is required that the power plant be off the track and clear of all traffic. For such requirements, the alternative power arrangement of Fig. 2 may be used. Supplementary frame 28 is removed and fixture 29 affixed to the housing, driving gear 19 replaced on shaft 18, now journaled in fixture 29, and a flexible shaft 30 from the off-track power supply is connected to shaft 18.

Turning now to Fig. 4, a main carriage 38 on wheels 42 may be located, as desired, along the track 13 to be ground. Slidably hung therefrom is a sub-carriage 32 to which supports 2, 2, are affixed as well as a supplementary drive shaft support 39. A source of power 41, either a motor or an engine, is also mounted on sub-frame 32 and belted to sheave 40 which, through coupling 47, operates shaft 15 of the grinding head, as mentioned above.

The entire assembly of grinding head and source of power mounted on sub-carriage 32 may be reciprocated along the track 35 of carriage 38 on wheels 33, 33, affixed to supports 34, 34, integral with carriage 32. I prefer to accomplish the reciprocation by hand, as by a cable 36 taking over pulleys 37 journaled in bearings affixed to the main carriage 38. A crank may be provided to operate either of the pulleys. It will be observed, however, that carriage 32 may remain fixed in position on carriage 38 and the latter reciprocated back and forth over track 13, if desired.

Turning to Fig. 5, it will be observed that a number of grinding heads, in this instance three is shown, may be mounted on a sub-carriage 32 with a source of power 41 driving a main shaft 43, supported in bearings 45, 45, from which separate drives are taken off for each grinding head by means of pulleys or sheaves 44, 44. The main carriage, corresponding to that of Fig. 4, is supported on shafts 46, 46, on which are journaled wheels 42, 42, which may roll along the rail 13 to be ground. As in Fig. 4, a supplementary or sub-carriage 32 carries both power supply and grinding heads and may be reciprocated on wheels 33, 33, over a track 35 on the main carriage.

Preferably, when a plurality of grinding heads are employed, each is set at an angle to each of the other heads so that each wheel covers a different element of the rail contour. If a number of heads are used, the entire contour may be

covered, the grinding heads fixed in position and the whole group of heads reciprocated over the rail, or drawn over the rail in one direction, with a resulting completely finished contour at one operation.

It will be noted that the grinding head described and shown lends itself to standardized production, being self contained and complete ready for mounting singly or in gangs on a simple carriage, the grinding head being below the carriage, well out in the open and easy of access with complete visibility.

What I claim is:

1. In a grinder for railroad rails, a grinding head comprising an operating shaft, a grinding wheel operatively mounted adjacent one end of said shaft and adapted and arranged to rotate in a plane parallel to the rail surface to be ground, a wheel guard mounted concentric with said wheel, means to raise and lower said wheel and guard together, means to adjust said guard independently of said wheel, a primary power shaft at right angles to said operating shaft and operatively connected thereto, support means for said grinding head comprising pivot means axially aligned with said primary power shaft, said common axis being parallel to the rail surface to be ground, means to tilt said head about said common axis, and means to reciprocate said grinding wheel along the rail surface to be ground.

2. In a grinder for railroad rails, a housing member comprising a gear housing and a downwardly extending shank, an operating shaft coaxial with said shank and extending through said gear housing, a sleeve member external to and telescoping said shank, a grinding wheel operatively mounted adjacent one end of said operating shaft, a guard for said wheel mounted on said sleeve member, support means for said housing member comprising pivot means positioned on said shank, means to tilt said housing member on said pivot means and means to slidably adjust both said operating shaft and said sleeve member and thereby raise and lower said wheel and said guard together.

3. In a grinder for railroad rails, a grinding head comprising an operating shaft, a grinding wheel operatively mounted adjacent one end of said shaft and adapted and arranged to rotate in a plane parallel to the rail surface to be ground, a primary power shaft at right angles to said operating shaft and operatively connected thereto, support means for said grinding head comprising support members and pivot pins engaging said support members and axially aligned with said primary power shaft, means to tilt said head about the resulting common axis, and means to adjust said grinding wheel axially regardless of the position of said grinding head.

4. In a grinder for railroad rails, a plurality of grinding heads, a primary power shaft for each of said heads, separate support means for each of said heads comprising pivot means axially aligned with the primary power shaft of that head, means to tilt each of said heads at an angle to each other head, a grinding wheel for each head, means to operatively connect the grinding wheel of each head to the primary power shaft of that head, means to adjust each of said grinding wheels independently, and means to reciprocate all of said heads together along the rail to be ground.

5. A structure as defined in claim 4 in which all of said primary power shafts are axially aligned

and including means whereby to maintain the resulting common axis of alignment parallel to the rail surface to be ground.

6. In a grinder for railroad rails, a grinding head comprising a housing, an operating shaft within said housing, a grinding wheel operatively mounted adjacent one end of said shaft and adapted and arranged to rotate in a plane parallel to the rail surface to be ground, means to rotate said wheel, a sleeve member external to said housing, a guard for said grinding wheel adjustably mounted on said sleeve member, means to tilt said grinding head to a desired angle, and means to slidably adjust both said shaft and said sleeve member and thereby raise and lower said wheel and said guard together regardless of the angular position of said grinding head.

7. In a grinder for railroad rails, a grinding head comprising a housing, an operating shaft and a grinding wheel, support members, pivot pins engaging said support members and said housing, and a primary power shaft axially aligned with said pivot pins and operatively connected with said grinding wheel, the resulting common axis being parallel to the surface to be ground, whereby said grinding head may be angularly tilted on said pivot pins to follow the contour of the rail surface to be ground.

8. In a grinder for railroad rails, a grinding head including a grinding wheel, a primary power shaft adapted and arranged to actuate said grinding wheel, and support means for said grinding head comprising support members and pivot pins engaging said support members and said grinding head and axially aligned with said primary power shaft, the resulting common axis being parallel to the rail surface to be ground, whereby said grinding head is pivoted, driven, and supported along a common axis parallel to the rail surface to be ground.

9. In a grinder for railroad rails, a grinding head comprising a main housing member, pivot support means for said grinding head, a supplementary frame member affixed to said housing member, a countershaft journaled in said supplementary frame member at one end thereof, a primary power shaft journaled in said supplementary frame at the other end thereof and axially aligned with said pivot means, whereby said grinding head may be tilted at a desired

angle without changing the center distance between said shafts.

10. In a grinder for railroad rails, a grinding head including a grinding wheel, means to rotate said wheel in a plane parallel to the rail surface to be ground including a shaft on which said wheel is mounted, means to support said grinding head comprising support members and pivot pins engaging said support members and said grinding head so that the axis of said pivot pins intersects the axis of said shaft, means to adjust said grinding wheel axially, means to tilt the plane of rotation of said wheel whereby to follow the contour of the rail surface to be ground and means to reciprocate said grinding head along the rail to be ground.

11. In a grinder for railroad rails, a grinding head comprising a housing member, an operating shaft, a grinding wheel and a guard for said wheel, a support for said grinding head comprising pivot pins engaging said grinding head so that the axis of said pivot pins intersects the axis of said shaft, means to tilt said grinding head on said pins whereby to change the plane of rotation of said wheel, means to reciprocate said support along the rail to be ground, and means to raise and lower said grinding wheel independently of said support.

12. In a grinder for railroad rails, a grinding assembly including a grinding wheel and means to rotate said wheel, comprising an operating shaft on which said wheel is mounted, a countershaft in fixed relation to said operating shaft and geared thereto, and a power shaft parallel to and operatively connected with said countershaft in all positions of the latter, means to contact said wheel while rotating with each element of the rail head surface to be ground, including support members on which said grinding assembly including said wheel, said operating shaft, said countershaft, and said power shaft, may be rocked transversely of the rail whereby to tilt the plane of rotation of said wheel to permit said wheel to grind the curved contour of the rail head and to maintain the plane of rotation of said wheel parallel to the elements of the surface of the rail to be ground, means to adjust said wheel axially operable while said assembly is being rocked, and means to drive said power shaft.

MILBURN MOORE.