May 2, 1933. H. PERAZZOLI 1,906,872

RAILWAY TRACK GRINDER

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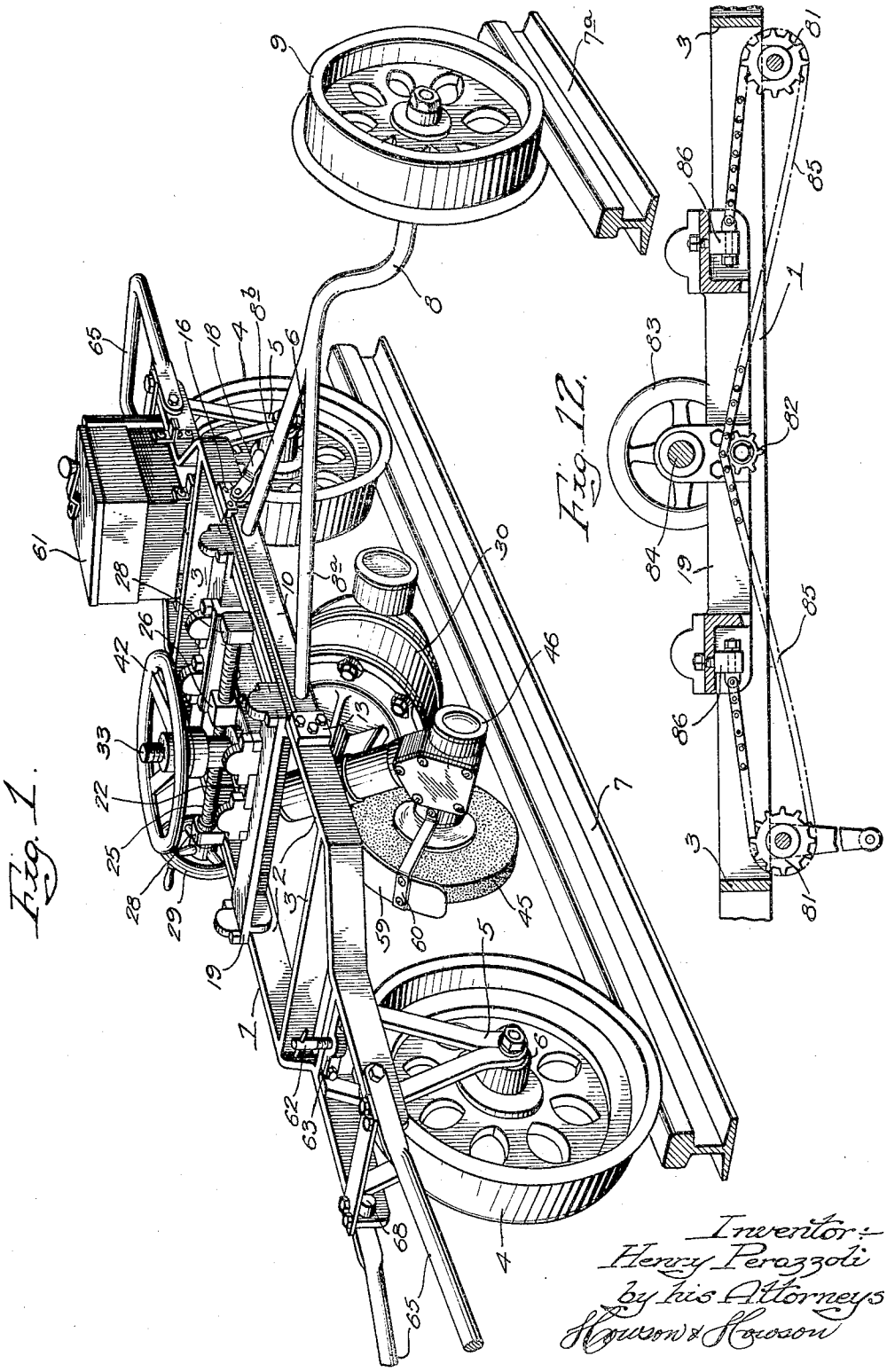


Fig. 1.

Fig. 12.

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Fig. 2.

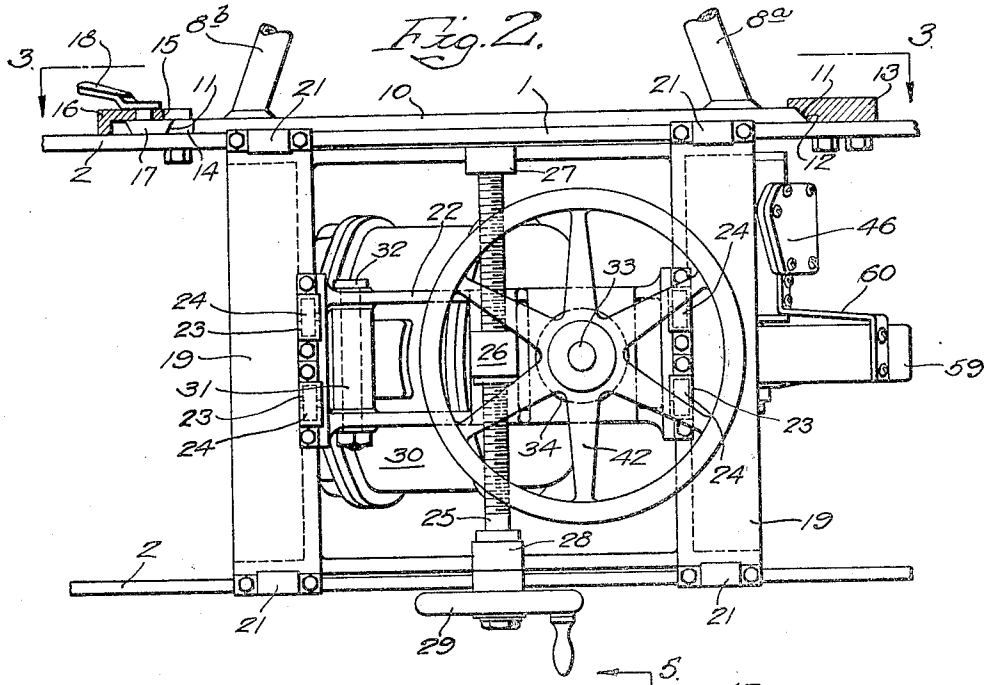
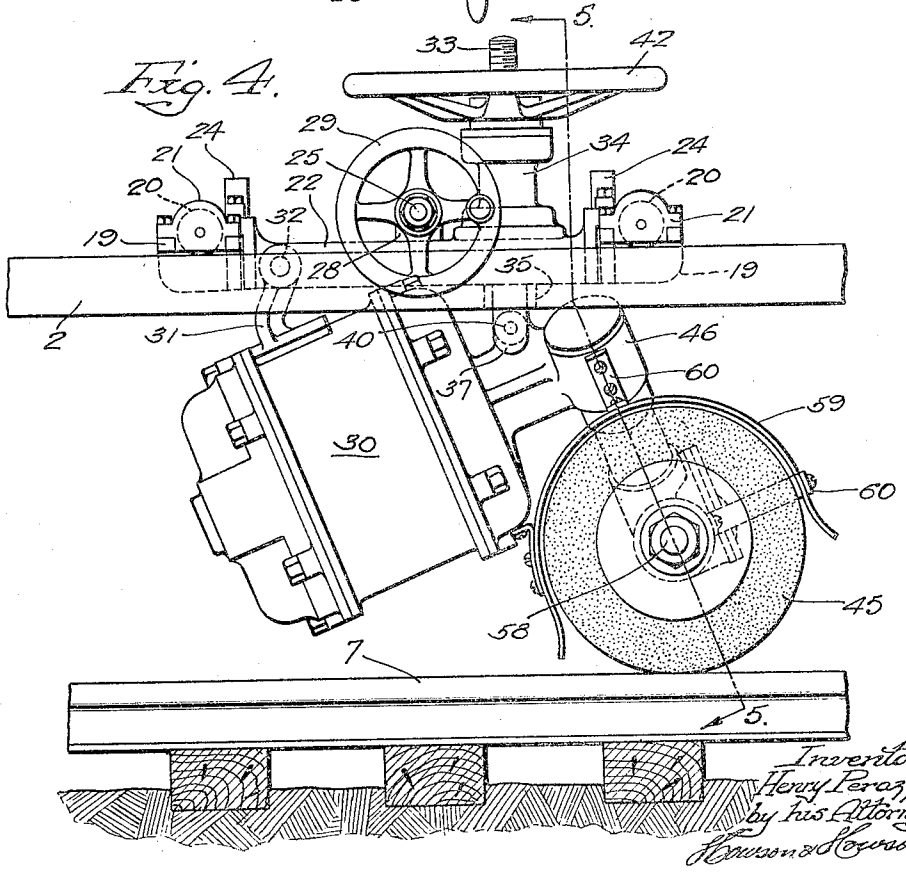


Fig. 4.



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Fig. 3

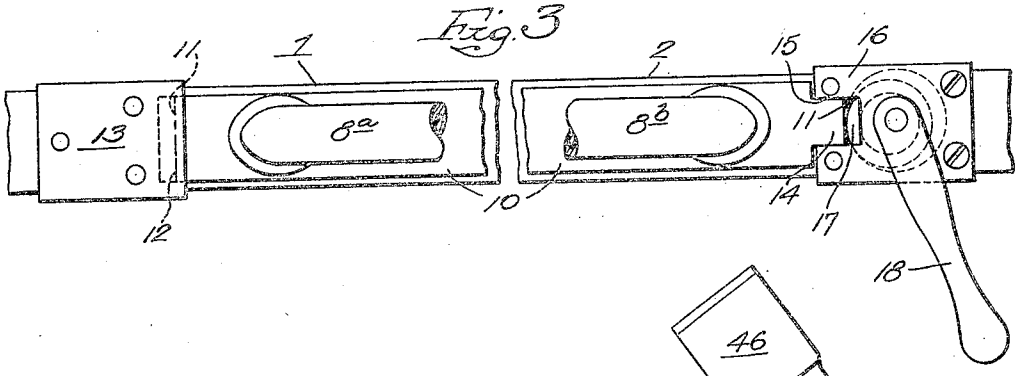


Fig. 10.

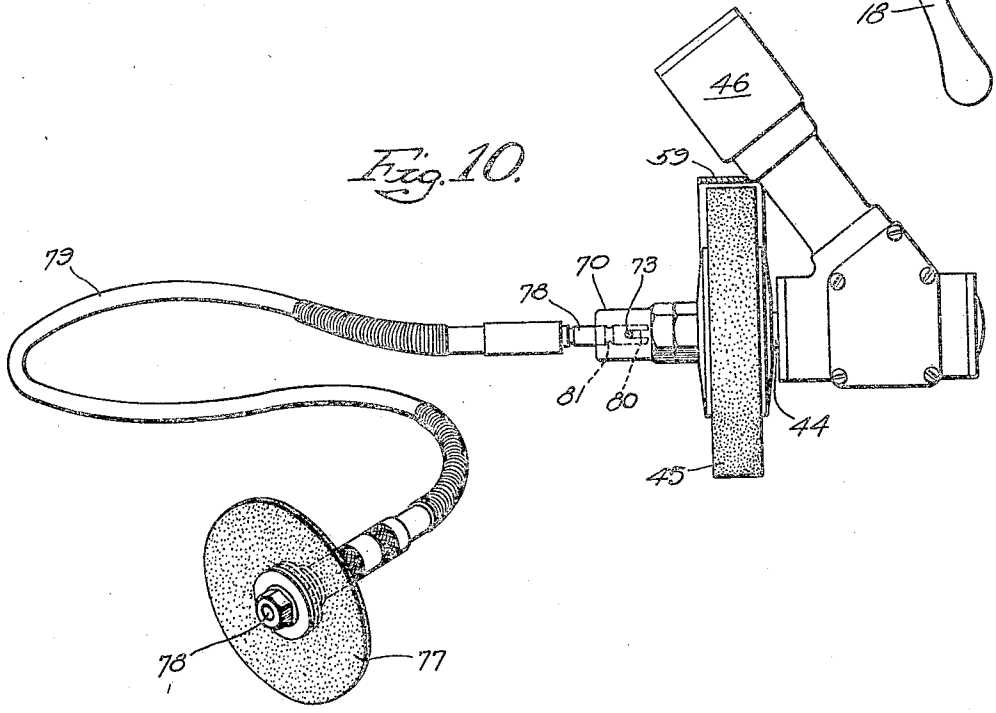
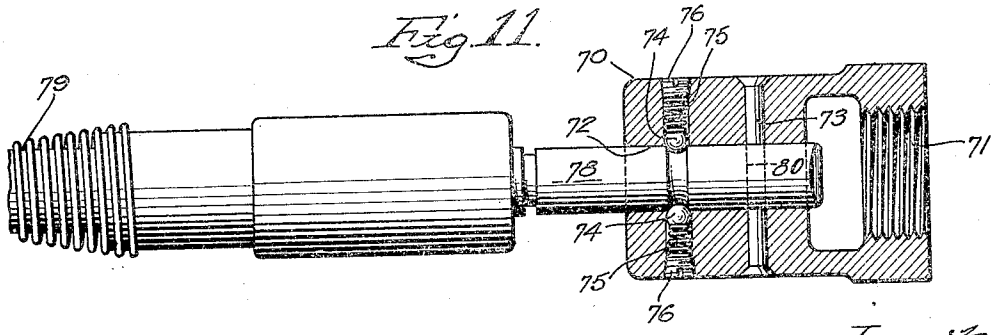


Fig. 11.



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Fig. 5.

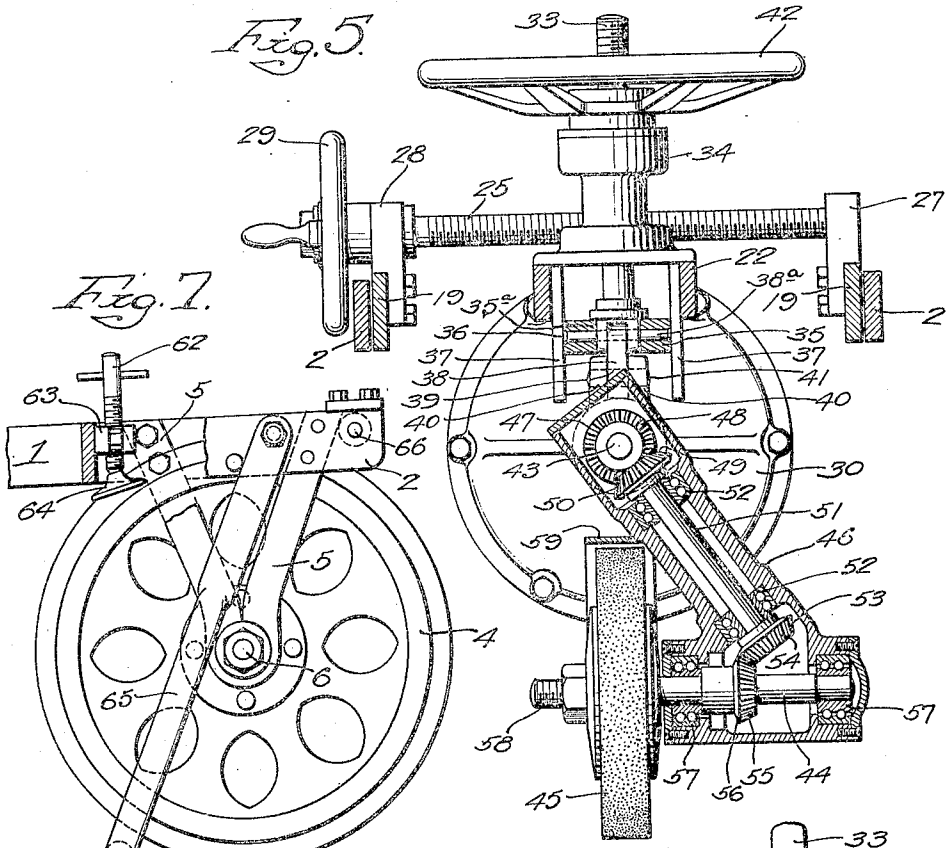


Fig. 7.

Fig. 6.

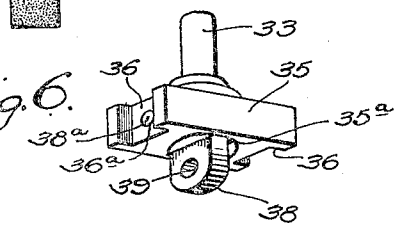


Fig. 8.

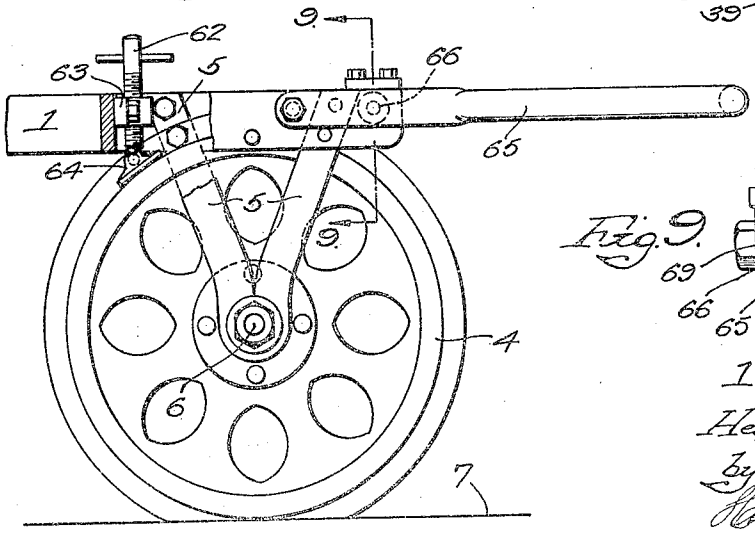


Fig. 9.

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Patented May 2, 1933 1,906,872

UNITED STATES PATENT OFFICE

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RAILWAY TRACK GRINDER

Application filed June 24, 1931. Serial No. 546,563.

This invention relates to new and useful improvements in abrasive devices and more particularly to abrasive devices constructed particularly for railway track work.

An important object of the invention is to provide a device of the stated character, which is relatively light in weight to permit the easy manipulation thereof by the operator.

Another object of the invention is to provide a device of the stated character having a single abrasive wheel suitably disposed and adjustably mounted for movement in any direction with respect to the track rail.

Another object of the invention is to provide a device having detachable means for supporting the abrasive machine when positioned on a track.

Another object of the invention is to provide a device of the stated character which may be partially dismantled to permit the removal thereof from the track and enable the said machine to be placed in a comparatively small area for transportation, storage and handling thereof.

Another object of the invention is to provide a device of the stated character, having a novel drive mechanism intermediate a source of power and the abrasive wheel.

Another object of the invention is to provide a machine of the stated character having means on the shaft of the abrasive wheel to permit connection thereto of auxiliary abrasive means for the purpose of finishing the end surfaces of the adjacently disposed track rails.

The invention further resides in certain features of the detail construction of the device which are set forth hereinafter and shown in the accompanying drawings, in which:

Figure 1 is a view in perspective of a machine made in accordance with my invention;

Fig. 2 is a fragmentary plan view of the operating portion of the machine;

Fig. 3 is a sectional view on line 3—3, Fig. 2;

Fig. 4 is a side elevation view of the disclosure of Fig. 2;

Fig. 5 is a sectional view on line 5—5, Fig. 4;

Fig. 6 is a detached perspective view showing the link intermediate the motor and a jack screw for the regulation of the vertical position of the abrasive wheel;

Fig. 7 is a fragmentary view in side elevation of the novel supporting means for the machine when not positioned upon a railway track;

Fig. 8 is a view similar to that shown in Fig. 7 showing the alternate position of the supporting means when used as a handle in the manipulation of the machine;

Fig. 9 is a fragmentary view in section on line 9—9, Fig. 8;

Fig. 10 is a detached view in elevation of the abrasive wheel, showing the auxiliary abrasive element connected thereto by means of the flexible shafting;

Fig. 11 is an enlarged view in section showing the novel method for connecting the flexible shafting to the shaft of the main abrasive element; and

Fig. 12 is a detached fragmentary view showing means for adjusting the relative position of the subframe with respect to the main frame of the machine.

Referring now to the drawings, a machine made in accordance with my invention constitutes a main frame 1 formed of a single casting and comprising the longitudinal members 2, 2 and transverse members 3, 3 the said longitudinal members 2, 2 converging inwardly with respect to each other adjacent their extremities. The main frame 1 in the present instance is mounted upon a pair of traction wheels 4, 4 by means of the downwardly extending arms 5 secured at their upper ends to the longitudinal members 2, 2 of the frame and at the lower ends thereof to the hubs 6 of the traction wheels 4. In the present instance the traction wheels 4 are both arranged to reside upon the same track rail 7, and the main frame 1 supported by the said wheels is centrally disposed on the wheels with respect to the track rail 7.

For the purpose of supporting the frame in upright position to permit successful operation of the machine, I provide a laterally

extending arm 8 terminating at its outer extremity in a third traction wheel 9 rotatably mounted on the arm 8 and adapted to reside upon the rail 7*a* of the track. In the present instance the laterally extending arm 8 adjacent the main frame of the machine comprises the diverging tubular arms 8*a* and 8*b*, which, at their extremities, are welded to a longitudinal beam member 10. In the present instance the member 10 is releasably secured to the adjacent longitudinal member 2 of the main frame 1 of the machine by forming beveled portions 11, 11 on the end surfaces of the member 10 which are adapted to reside at one end in a correspondingly formed recess 12 formed in the member 13 secured to the longitudinal side frame member 2, and at the other end a smaller tongue portion 14 is arranged to pass through a slot 15 in the member 16 secured to the side member 2 and by means of an eccentric cam member 17, the peripheral surface of which is formed to coincide with the beveled surface of the tongue 14 is pivotally mounted in the member 16 and by pivoting the handle 18, the said cam is pivoted into contact with the adjacent extremity of the member 10 and the contacting beveled surfaces of the abutting members 17 and 10 respectively normally prevents the disconnection of the beam 10 from the main frame 1 of the machine.

A subframe 19 is mounted upon the main frame 1 and is arranged to move longitudinally with respect thereto on rollers 20 which are rotatably mounted in the housings 21, the said rollers being positioned to ride upon the upper surface of each of the longitudinal side frame elements 2, 2.

A sub-subframe 22 is carried by the subframe 19 and is arranged for adjustment transversely with respect to the said subframe 19 and the main frame 1 of the machine, the said sub-subframe 22 being supported by rollers 23 similar to those described before, and rotatably mounted in the housings 24 on the sub-subframe 22 which ride upon the transverse members of the subframe 19.

Lateral adjustment of the sub-subframe 22 is accomplished by means of a screw 25 which is threaded in a block 26 forming a part of the said sub-subframe 22, the extremities of the said screw 25 being rotatably mounted at one end in a suitable socket 27 secured to the subframe 19 and at its other extremity rotatably residing in a collar 28 similarly secured to the said subframe, the said screw preferably passing beyond the collar 28 and having a wheel 29 rigidly secured thereon for the purpose of permitting the easy rotation of the screw 25. It will be obvious that by rotating the screw 25 in clock-wise or counter-clockwise direction, the threaded block 26 will be advanced or retarded accordingly thereon and respectively alter the position of the sub-subframe 22 transversely with respect to the subframe 19 and the main frame 1 of the machine.

A motor 30 is suspended from the sub-subframe 22 by means of an arm 31 joined thereto and pivotally mounted at its upper extremity upon a bar 32. The position of the motor 30 suspended from the sub-subframe 22 may be varied by means of a jack screw 33 movably residing in a collar 34 forming a part of the sub-subframe 22, the said jack screw 33 at its lower extremity terminating in a cross head member 35 having suitable grooves 36 therein adapted to slide upon the runners 37, 37 for guiding the vertical movement of the said screw, and provided with a vertical centrally disposed bore 35*a*. The cross head is further provided with a longitudinally disposed bore 36*a* extending therethrough and connecting with the vertical bore 35*a*. Connection is made between the under side of the cross head 35 and the motor 30 by means of a pivotally mounted link 38 extending vertically in the bore 35*a* and secured therein by a pin 38*a* residing in the longitudinal bore 36*a*. The link 38 extends a suitable distance below the undersurface of the cross head 35 and having a hole 39 therein, the extending portion of the said link 38 residing intermediate two upstanding shoulders 40—40 having corresponding holes therein to permit the passage of a pin 41 through the holes 40—40 and the hole 39 in the link 38. In the present instance the jack screw 33 is respectively raised or lowered by means of a hand wheel 42.

The shaft 43 of the motor 40 is connected to the shaft 44 on which the main abrasive wheel 45 is mounted by means of a V-drive substantially enclosed in a suitable casing 46. The detailed construction of the drive consists in rigidly mounting a beveled gear 47 on the outer extremity of the motor shaft 43, the teeth 48 thereof being in geared relation with the teeth 49 of a beveled gear 50 rigidly mounted upon the shaft 51 which is rotatably mounted within the casing 46 by means of the ball bearing collars 52, 52 disposed adjacent each end of the said shaft 51. A beveled gear 53 having teeth 54 is rigidly mounted on the opposite end of the shaft 51 and the teeth 54 thereof are in engagement with the teeth 55 of a similar beveled gear 56 rigidly mounted upon the shaft 44 carrying the main abrasive element 45 and which is rotatably mounted in the lower portion of the casing 46 by means of the ball bearing collars 57, 57. The end of the shaft 44 arranged to extend beyond the main abrasive wheel 45 is provided with a threaded portion 58, the purpose for which will be set forth in detail hereinafter.

The main abrasive wheel 45 in the present instance is provided with a suitable guard 59 which is rigidly secured thereabove by

the radially extending arms 60, 60 which are secured at their inner extremities to the stationary drive housing 46.

In the present instance the motor 30 is started and stopped and the speed thereof controlled by means of a control box 61 rigidly mounted adjacent one end of the main frame 1 of the machine. For the purpose of providing a brake to prevent the grinding machine from moving when in position on the railway track, I provide a novel arrangement comprising an adjustble hand screw 62 residing in the threaded collar 63 mounted upon the main frame 1 of the machine. A swivel 64 is secured in the lower extremity of the hand screw 62 the under surface of which is arranged to contact with the tractive surface of the wheels 4, 4 when the screw 62 is lowered a sufficient distance and whereby rotation of the track wheels 4 is prevented.

Another novel feature of my invention resides in the pivotally mounted handle 65 secured adjacent one end of the main frame 1 of the machine and which, when in the position shown in Figs. 1 and 8 of the drawings, is adapted for use as a handle in facilitating the movement of the entire machine, and further, by placing the said handle 65 in a position similar to that shown in Fig. 7, affords a suitable support or stand for the machine when the laterally extending support arm 8 and the wheel 9 are disconnected therefrom. The handle 65 is secured in the horizontal position by a pin 66 which is actuated by a spring 67 residing in the housing 68, the said spring 67 normally tending to force the said pin 66 into a detent 69 formed in the handle element 65 as shown in Fig. 9 of the drawings.

An important feature of my invention resides in the detachable auxiliary abrasive member for finishing the adjacent end surfaces of aligned track rails, and referring particularly to Fig. 11 of the drawings, this connection is accomplished by means of an auxiliary hub 70 having a threaded inner portion 71 therein which is adapted to be screwed on the aforementioned threaded portion 58 of the main abrasive shaft 44, (see Fig. 5). The position of the respective interlocking threads affords a suitable lock for the auxiliary hub 70 on the shaft 44. The hub 70 is provided at its outer face with a longitudinally extending aperture 72 transversely of which is disposed a cross pin 73 and the spring pressed balls 74, 74 operated by the springs 75, 75 secured in the hub by the screw plugs 76.

The connection from the previously described auxiliary hub 70 to the auxiliary abrasive member 77 is accomplished by means of a flexible shaft 78 maintained within a flexible conduit housing 79, and the rotation of the shaft 44 may be imparted to the flexible shaft 77, of the auxiliary abrasive member by inserting the extremity of said shaft inwardly of the aperture of the auxiliary hub 70, the extremity of the said shaft being provided with a slot 80 adapted to engage the cross pin 73. The shaft 78 being releasably maintained in the hub 70 by the spring pressed balls 74, 74 which, by the action of the springs 75, 75 engage the annular detent 81 formed on the auxiliary shaft 78.

To facilitate the movement of the subframe 19 on the main frame 1 I may further care to provide a novel chain and sprocket means for adjusting the position of the subframe 19 on the said main frame 1. In constructing the adjusting means I may mount a pair of sprockets 81, 81 inwardly of and on one side member of the main frame 1. I also provide a smaller sprocket 82 mounted at one side of the subframe and centrally located with respect thereto, the said sprocket being rotatable by means of a hand wheel 83 connected thereto through the shaft 84. A sprocket chain 85 is passed over the sprocket 82 and around each of the sprockets 81, the said chain having the extremities thereof secured at each end of the adjacent side of the subframe 19 as at 86. By turning the hand wheel 84 in either a clockwise or counterclockwise direction the position of the subframe 19 is correspondingly altered with respect to the main frame 1 of the machine.

It will be noted that by my invention I provide a railway track grinding machine which may be readily operated and handled by a single person, heretofore impractical, due to the bulkiness of prior machines of this character. A further feature of the invention resides in the easy removal of the machine from the railroad track in the event of an approaching train and the operator, by merely disconnecting the laterally extending support arm 8 from the main frame 1 of the machine, may place the main portion of the said machine intermediate to adjacent railway tracks supported by the handle element 65 positioned as shown in Fig. 7 until the train is passed. A machine of the character described, is relatively light in weight, which obviously makes the device attractive to traction companies, both from the standpoint of ease of handling, resulting in decrease in labor necessary and relatively inexpensive cost of manufacture because of the substantial decrease in the quantity of materials needed therein.

It should be further noted that a machine made in accordance with my invention provides a device which may be stored or transported in a relatively small area and that by provision of the detachable auxiliary abrasive member, a means is provided whereby the adjacently disposed end surfaces of track rails may be finished and which is an extremely desirable feature not available in devices of this character heretofore and

made possible only by the genius of the inventor.

While I have set forth the embodiment of my invention for the purpose of description, it will be apparent that certain modifications and changes may be made thereto without limitation, except as described in the appended claims.

I claim:

1. In an abrasive machine of the character described, for track work, comprising a frame, a laterally extending arm detachably secured to and for the purpose of supporting said main frame, a bracket mounted on the frame constituting a support for the machine in the absence of said laterally extending arm, a motor carried by the machine, and an abrasive element connected to said motor and normally disposed above one rail of the track.

2. In an abrasive machine of the character described for track work, comprising a frame, a pair of traction wheels supporting said frame and adapted for travel upon one track rail, a laterally extending arm having a traction wheel arranged for travel upon the other rail of the track, said arm being detachably secured to and for the purpose of supporting said machine, a bracket mounted on the frame constituting a handle therefor in one position and in another position a support for the machine in the absence of said laterally extending arm, a motor carried by the machine, and an abrasive element connected to said motor and normally disposed above one rail of the track.

3. In an abrasive machine of the character described for track work, comprising a main frame, a pair of traction wheels supporting said frame and arranged for travel upon one rail of the track, a laterally extending support arm having a traction wheel arranged for travel upon the other rail of the track detachably secured to the said main frame, a bracket mounted on the frame constituting a support for the machine in the absence of said laterally extending arm, a subframe carried by the main frame, a sub-subframe carried by said subframe, a motor carried by the sub-subframe, and an abrasive element connected to said motor by means of a V-drive.

4. In a abrasive machine of the character described for track work, comprising a frame, a laterally extending arm detachably secured to said frame for the purpose of supporting the latter, a bracket pivotally mounted on the frame constituting in one position a handle therefor, and in another position a support for the machine in the absence of said laterally extending arm, a motor carried by the machine, and an abrasive element connected to said motor and normally disposed above one rail of the track.

HENRY PERAZZOLI.