W. D. GHERKY & J. E. ALLEN.

GRINDING MACHINE.

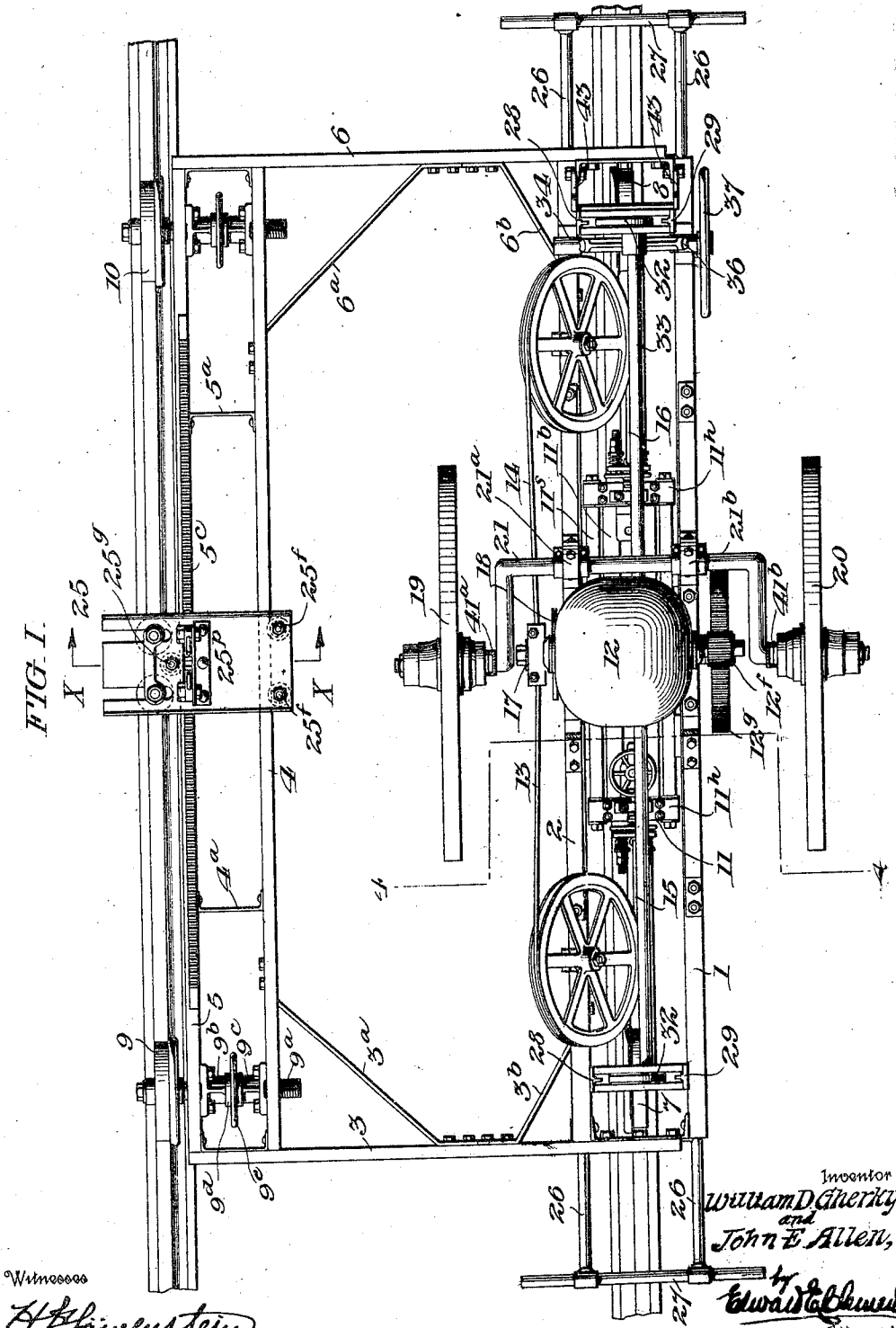
APPLICATION FILED FEB. 9, 1911.

1,032,750.

Patented July 16, 1912.

5 SHEETS—SHEET 1.

FIG. I.



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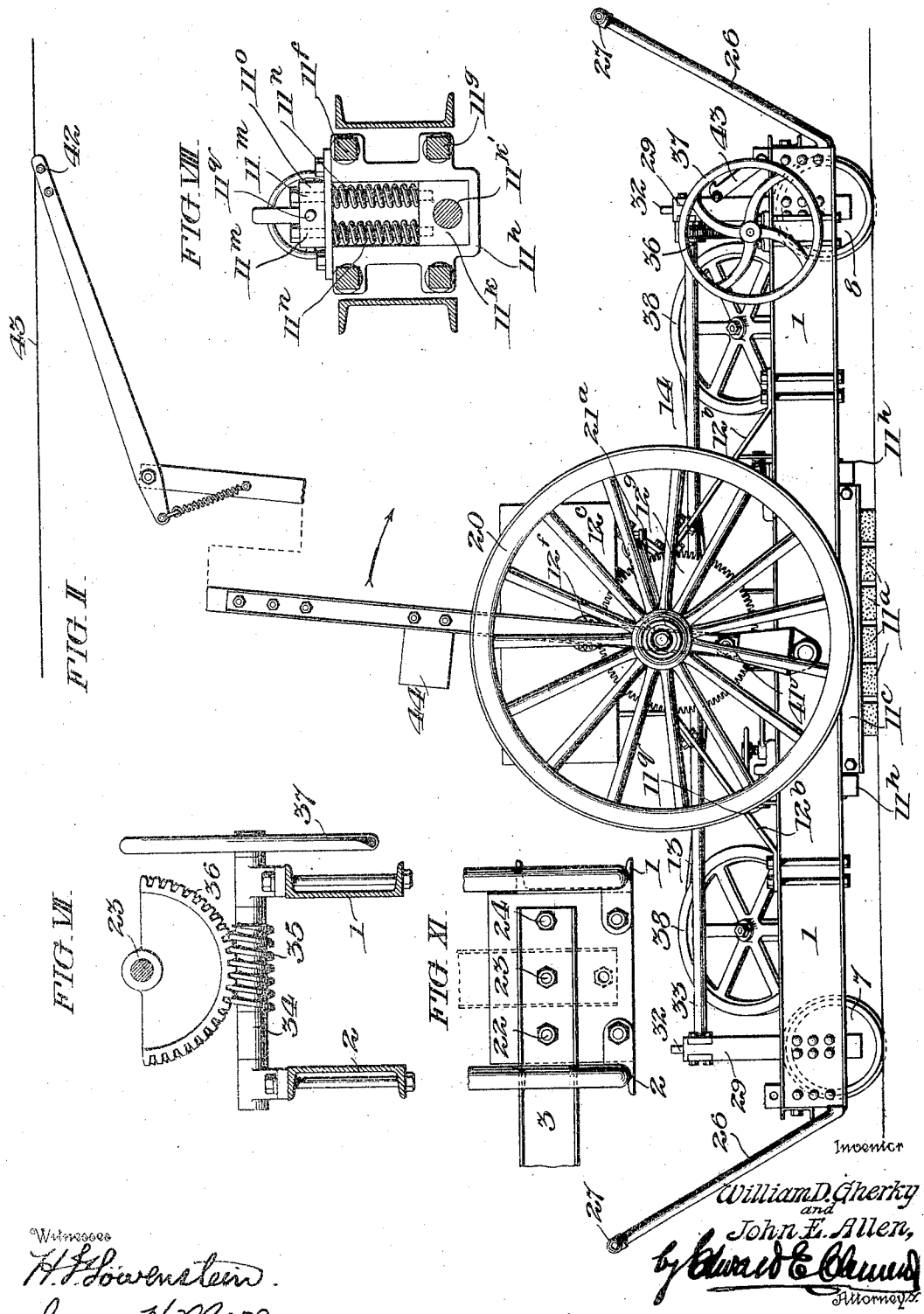

FIG. II.

FIG. VIII.

FIG. VII.

FIG. XI.

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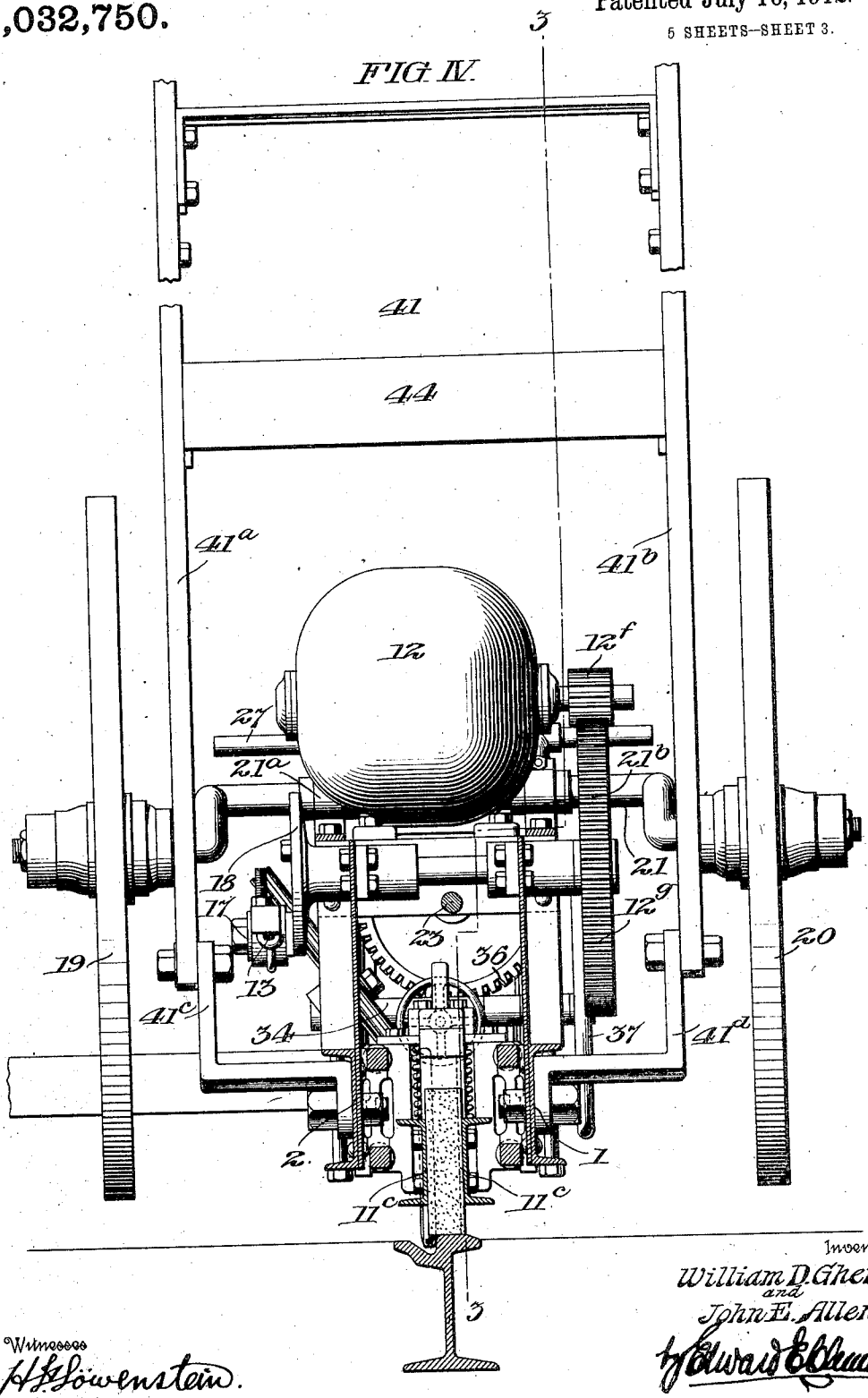
FIG. IV.



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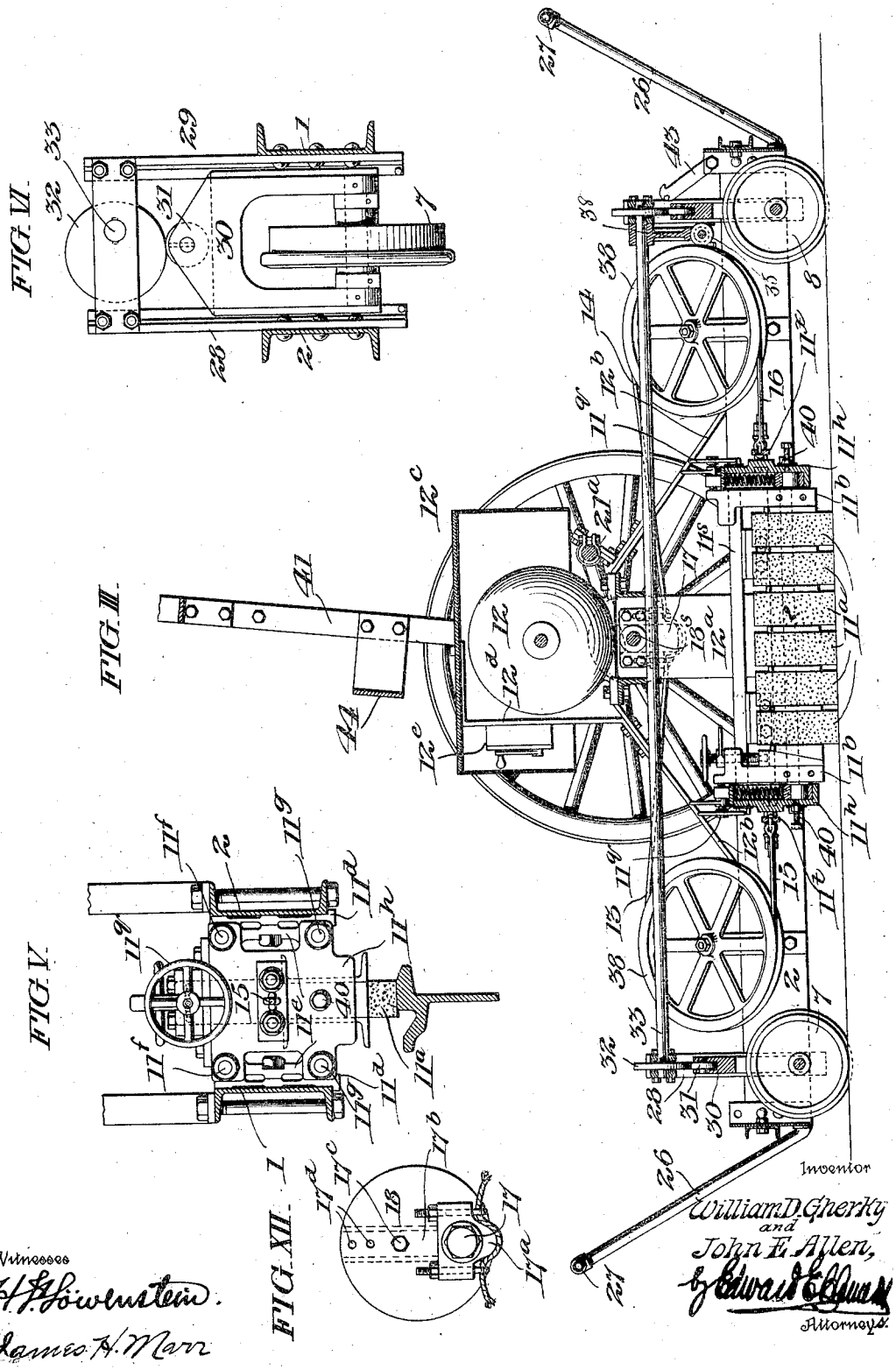

FIG. VI.

FIG. III.

FIG. V.

FIG. XII.

Witnesses

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5 SHEETS—SHEET 5.

FIG. IX.

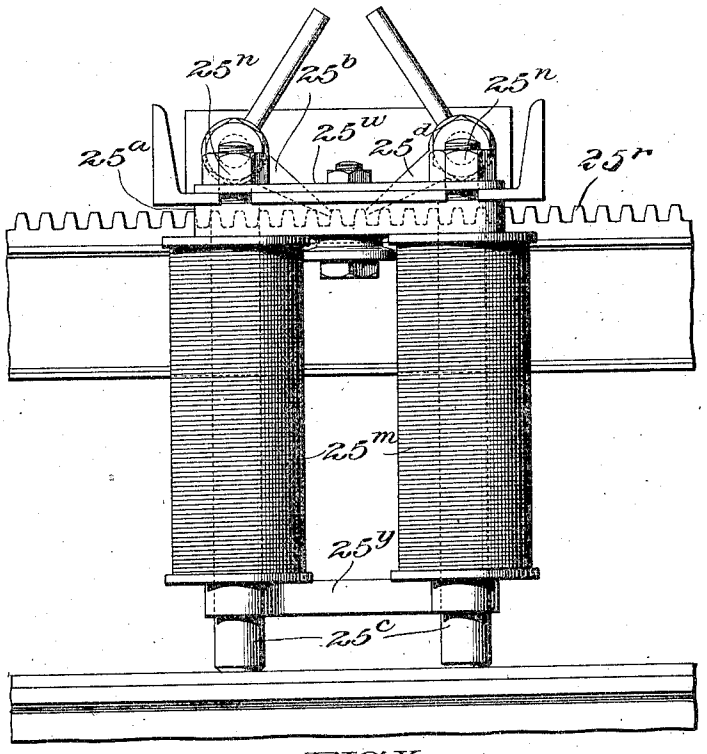
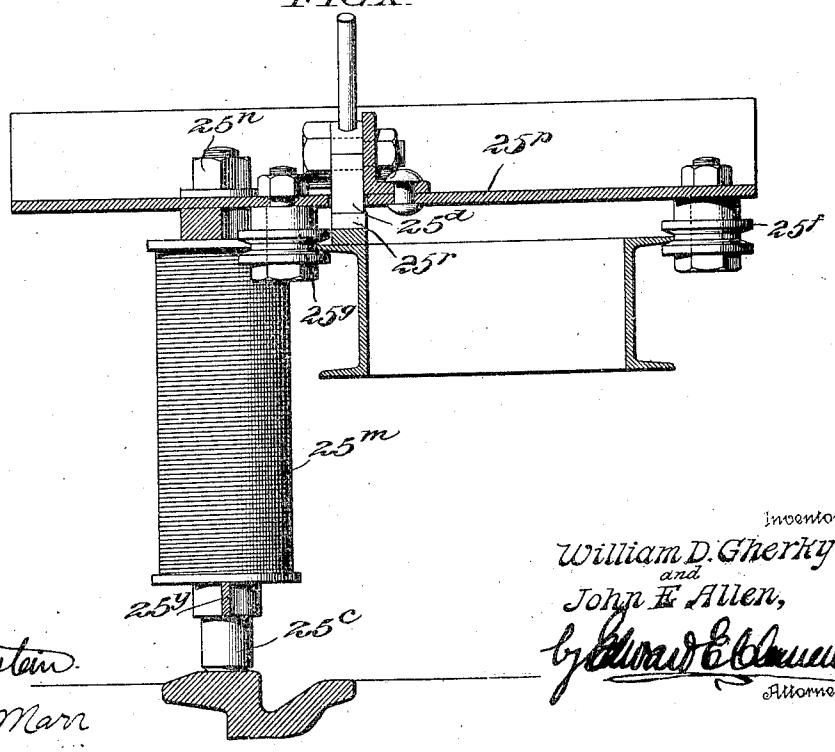


FIG. X.



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UNITED STATES PATENT OFFICE.

WILLIAM D. GHERKY AND JOHN E. ALLEN, OF PHILADELPHIA, PENNSYLVANIA.

GRINDING-MACHINE.

1,032,750. Specification of Letters Patent. **Patented July 16, 1912.**

Application filed February 9, 1911. Serial No. 607,544.

To all whom it may concern:

Be it known that we, WILLIAM D. GHERKY and JOHN E. ALLEN, citizens of the United States, residing at Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Grinding-Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

Our invention relates to grinding machines, and particularly to machines for grinding railway track rails in place. Such track rails after a certain period of continuous use develop surface inequalities and corrugations the successful removal of which requires a grinding by reciprocating motion, for reasons now well understood in the art.

The object of our invention is to produce a reciprocating grinder of high efficiency, reduced weight, and variable stroke, which shall be comparatively noiseless in operation, and capable of applying effective pressure limited only by the total weight, to the grinding body or element.

A secondary object is the production of various adjustments to meet contingencies arising in practice, which will sufficiently appear from the detailed description hereinafter.

We attain increased efficiency not only by the general construction and details to be described, but in particular by provision for a long stroke of the grinding element, with greater surface speed than has heretofore been possible. We reduce the weight by eliminating so far as possible all heavy parts from the reciprocating element, and in order to secure the necessary pressure at the grinding surface provide means for imposing the weight of the entire machine on the grinding element, without interfering with its freedom of reciprocation. We secure a variable stroke by providing an adjustment between the driving motor and the parts through which power is transmitted therefrom to the grinding element. We reduce the noise of operation by the employment of a rope drive and take-ups to prevent vibration and rattling. Further means for attaining our objects will be apparent from the detailed description.

Our invention is illustrated in the accompanying drawings in which—

Figure 1 is a plan view of a complete machine ready to grind the rail upon which it stands. Fig. 2 is a side view of the same. Fig. 3 is a longitudinal section on line 3—3 of Fig. 4, with parts shown in side elevation. Fig. 4 is a transverse section on the line 4—4 of Fig. 1, showing parts in elevation. Fig. 5 is a detail end view of the grinding element, the side members of the frame being shown in section. Fig. 6 is a detail view of one of the adjustable wheel slides or bearing blocks on the main frame. Fig. 7 is a detail view of the worm and gear for adjusting the block shown in Fig. 6. Fig. 8 is a detail of the grinding block carrier springs. Figs. 9 and 10 are side and end views respectively, on an enlarged scale, of the holding magnets, showing adjacent portions of the plate. Fig. 11 is a detail view showing the method of pivoting the outrigger on the main frame. Fig. 12 is a detail view showing the wrist plate and method of securing the driving rope to the wrist pin block.

Referring to the drawings and particularly to Fig. 1, it will be observed that the essential parts of the machine are, a main frame 1—2, an outrigger 3—4—5—6, wheels 7—8—9—10, a reciprocating grinding element generically designated as 11, a motor 12, and a rope drive 13—14—15—16 for transmitting power from the motor to the element 11. The wheels 9—10 are adjustable to suit different gages of track, the wrist-pin 17 is also adjustable to and from the center of the wrist-plate 18 so as to give a variable length of stroke to the element 11, and the wheels 7—8 are vertically adjustable so as to variably impose the weight of the machine on the grinding element. A pair of large wheels 19—20 are mounted on the opposite ends of a bent axle 21 journaled in bearings transversely alined on the main frame 1—2, the axle having a vertical bail bridging the main frame, carrying a trolley pole on one end. Stated in the same general terms, the operation of the machine is as follows: The trolley pole being used as a lever, the bail is thereby caused to lift the weight of the machine and transfer it from the wheels 7—8 to the large wheels 19—20, and the machine is placed in position on the track rails to be ground, as shown in Fig. 1. The trolley pole and bail then being thrown up, the body of the machine is lowered, and by means presently to be described its

weight is imposed through yielding intermediate means upon the member 11. The motor then being started rotates the wrist-plate 18 carrying the wrist-pin 17 in a circular path and imparts oscillatory motion to the drive rope members, whereby the grinding member 11 is reciprocated in its slides. After reading this general statement, the detailed construction and arrangement of the parts will be readily understood.

The side members 1—2 of the frame are steel channel beams connected at their ends by short vertical sections of similar channel beams bolted or riveted in place as usual in this class of construction. The outrigger members 3—6 are made of smaller channels bolted to the end pieces as best shown in Fig. 11. Three bolts are employed at each end, marked 22—23—24; and by removing the outer two bolts 22—24, the entire outrigger may be swung up on the bolts 23 as pivots, so as to occupy a position vertically above the main frame for purposes of packing and transportation.

The outer ends of the outrigger members 3—6 are connected by the parallel channels 4—5, in which are journaled the stub axles of the wheels 9—10, and of which the outer one, 5, carries a rack for a purpose to be described. As the mountings and adjustments of the two wheels are identical, a description of one will suffice. The wheel 9 is free to rotate on the stub shaft or axle 9^a, which is splined so as to slide without rotating in bearings in the flanged collars 9^b and 9^c, and is threaded to receive the threaded hub 9^d of a hand wheel 9^e by turning which the axle and therefore the wheel can be moved toward and away from the member 5 at will. Compensation is thus effected for variations in gage.

For effective grinding, it is necessary that the machine be held stationary on the rails, and for this purpose we provide an electromagnetic track brake or grip generically designated by the numeral 25. This comprises a pair of electromagnets 25^m with parallel cores 25^c, connected at their exposed polar ends by a brass yoke 25^r, and at the other end by a magnetic yoke 25^a. The upper ends of both cores are shouldered and the reduced portion threaded to receive nuts 25^n, whereby they are locked in slots in the web of a supporting channel plate 25^p. The details of these parts are best shown in Figs. 9 and 10, but the plate is shown in plan in Fig. 1. For greater security in clamping the magnets to the plate, we employ a washer yoke 25^w above the plate, thereby preventing any undue strain due to the nuts on the edges of the slots. The plate 25^p carries flanged guide wheels 25^f and 25^g, which engage the inner and outer flanges of the members 4 and 5 respectively. The plate is thus free to slide along the outrigger, or vice versa; and when it is desired to hold the machine rigid, the magnets being energized so that their poles adhere firmly to the track rail, the plate is attached to the frame member 5 by throwing down a pair of pawls 25^b and 25^d, which are pivoted on short transverse shoulder bolts in the vertical flange of an angle riveted to the plate 25^p. These pawls engage the rack 5^r in opposite directions, as clearly shown in Fig. 9.

The outrigger frame is stiffened by means of diagonal braces 3^a 3^b 6^a 6^b, and the members 4 and 5 are connected by cross braces 4^a and 5^a. This bracing is requisite to resist the racking strains due to the reversal of motion of the grinding element when the machine is locked.

At each end of the main frame oblique projecting rods are provided carrying the handle bars 27. These rods and handles 26—27 are for the purpose of guiding the machine on and off the rails, and for holding it in position. Inside the ends of the main truck frame 1—2 are the wheels 7—8, journaled in a peculiar manner so as to have a vertical adjustment, as best shown in Fig. 6. In this figure 28 and 29 designate two parallel pieces of T-iron, riveted vertically to the side members 1—2 of the frame, and forming slides for the U-shaped bearing block 30. Between the arms of the U the wheel is mounted on a short axle with adjustable interposed distance pieces or collars, for the purpose of shifting the wheel one way or the other when required, as for example in grinding curves. At the upper part or closed portion of the block 30 a small friction wheel 31 is journaled bearing against the periphery of a cam eccentrically mounted upon and rigidly keyed to a shaft 33 which extends from end to end of the frame. Assuming the wheel 7 in Fig. 6 to be resting upon the track rail, the weight of the truck and its apparatus is communicated to the wheel through the cam 32 and the roller 31. By turning the cam the truck frame may obviously be raised and lowered as desired, or to put it in another way, the wheel 7 may be raised or lowered with respect to the frame so as to take less or more of the weight in inverse ratio to the pressure exerted on the grinding element 11. The shaft 33 is common to both wheels 7 and 8, each having its own bearing block and adjusting cam as shown in Fig. 6, so that both wheels can be simultaneously raised or lowered by rotating the shaft. For ease of accomplishment of this rotation, we provide a worm shaft 34 whose worm 35 engages a segmental gear 36 fixed rigidly on the shaft 33, and is turned by means of the hand wheel 37.

The grinding element 11 employs bricks of abrasive material in a tandem row, each

set vertically, and all feeding in parallelism as they wear. The bricks are held in a frame 11^b having end pieces connected by parallel side channels 11^c. This frame is adjustable for angular grinding in the slide frame 11^a, the relation of which to the truck frame is best shown in Fig. 5. Each of the side members 1—2 has bolted to it a pair of bronze slides, and each slide is formed in two parts, 11^d and 11^e. The part 11^d is flanged to take under the edge of the side member 1 or 2, and each slide 11^e is narrower than its companion part, with opposite parallel bearing faces engaging between side rods 11^f and 11^g of the slide frame 11^b. These rods connect the end plates 11^h, and when the weight of the machine is on the work the bearing is on the lower rod 11^g but when the weight of the grinder is on the wheels then the bearing is on the upper rod. Each end piece or block 11^h is provided with a chamber in its inner face, as best shown in Fig. 8, and in this chamber are housed a slide block 11^k, with a pair of parallel strain bolts 11^m, and a pair of compression springs 11^n around the bolts. Above the part 11^h and the bolts are connected by a yoke 11^o, resting against a shoulder on each bolt, and held thereto by a nut. The springs have for one abutment the upper face of the block 11^k, and for the other the lower face of the cap plate of the part 11^h. Thus compression is between the main slide frame and the block 11^k, which can rise and fall in the chamber within predetermined limits. Each block has an opening $11^{k'}$, forming a bearing for a pintle or gudgeon on one of the end members 11^b of the brick holder. The upper part of each of these members is provided with depressions arranged in the arc of a circle whose center lies in the common axis of the gudgeons, and these depressions receive the tip of a lock-screw 11^q, controlled by a small hand wheel and held by a tailed lock-nut. These parts are best shown in Fig. 3, and it will be apparent that by slacking up the screws 11^q, the brick holder 11^b may be set one way or the other for angular grinding, and then locked by again setting up the screws. In order to prevent the bricks from falling out of the holder when lifted, as well as jam them in position while grinding, we provide interposed distance pieces, and an end wedge, forced down by a screw and hand piece.

The grinding element 11 is reciprocated on the slides 11^{d-e} by means of the rope drive already mentioned. Each end of the rope passes over an inclined idler pulley 38, and is attached to an end plate 11^h by means of a spring coupling 11^s, which takes up the slack at different points in the stroke, due to the rotation of the driving crank or wrist-pin 17. This wrist-pin and its connection to the wrist-plate 18 are best shown in Fig. 12. The wrist-pin carries a block 17^a, with vertical hook bolts, through which the rope is carried and by which it is clamped, the block turning on the pin. The pin is mounted on a slide 17^b moving across the wrist-plate radially in a dovetail slot, and locked in adjusted position by means of a screw bolt 17^c taking into any one of a series of threaded openings 17^d in the plate. By the employment of a rope drive of this character, we greatly reduce the usual noise of operation, and in furtherance of the same object, we provide take-up screws 40 in both ends 11^h of the slide frame, which bear upon the ends of the gudgeons of the brick holder so as to prevent lost motion and rattling.

The motor 12 is mounted on vertical supports 12^a secured to the side channels 1 and 2, and provided with fore and aft diagonal braces 12^b on both sides. The motor may be housed beneath a cover 12^c supported on a bracket 12^d which carries the starting box and switch 12^e. Power is communicated to the wrist plate shaft 18^s through reducing gears 12^f and 12^g.

It remains to describe the means for placing the truck on the track and removing it therefrom, a very important feature. The wheels 19 and 20, as already stated, serve for this purpose, and the bearings 21^a and 21^b of the bent axle are mounted on the diagonal motor braces. The weight of the machine however is never carried on these bearings, as the side members 41^a and 41^b of the bail 41 carry reinforced cast steel bearings for the ends of the axle as indicated in Fig. 1, and continuing beyond these bearings the lower ends of the bail are pivotally secured to brackets 41^c and 41^d which in turn are pivoted to the side members 1—2 of the truck frame. The member 41^a has bolted to it a trolley pole extension as indicated in Fig. 2 with a spring on its upper end carrying transverse brass contact rods 42 for engagement with the trolley wire 43. Current is conveyed from the wire through the trolley pole to the main switch and starting box, thence to the motor, thence to the electromagnets 25^m, the windings of which are connected at one end to their cores 25^c, and thence by contact to the track. It should be stated that the magnets may be high wound and in shunt of the motor if desired, and this is the arrangement so far preferred in practice.

The operation of our improved machine will now be clearly understood with a very brief additional statement. The flanged wheels having been swung over the rails, the trolley pole is turned up around the center 41^v, swinging the curved axle so as to turn it in its bearings, thereby lowering the truck and raising the wheels 12 and 20 from the ground. In grinding, the bricks having

been set at the proper angle and locked in position, the weight imposed thereon is regulated by turning the hand wheel 37 on the worm shaft. The adhesion of the magnet poles 25[c] to the track keeps the body of the machine in fixed position while the element 11 reciprocates. As it becomes necessary to inspect the work from time to time, one or the other of the pawls 27[b] and 25[d] in Figs. 1 and 9 is thrown up so as to leave only a one way engagement with the rack 5[r]. A ratchet effect being thus produced, the friction of the bricks on the rail will kick the machine along by successive strokes in the desired direction to expose the spot being ground. To return the machine to position, it is only necessary to throw in the idle pawl and throw out the active one when the machine will immediately kick back to its first position. Both pawls are then thrown into engagement with the rack and the grinding proceeds. If it be desired to remove the machine from the track, the bail and trolley pole are drawn down in the direction of the arrow in Fig. 2, whereby the wheels 19—20 are first lowered to the ground, and then by continued motion of the trolley pole acting as a lever, with its fulcrum at the hubs of the wheels, the entire machine is raised. The bail and pole are held down with the machine suspended from the axle 21, by engagement of hook 43 pivoted to one end of the frame, with the bridge piece 44 extending across the bail and offset therefrom so as to overlie the working parts when latched.

Having thus described our invention what we claim and desire to secure by Letters Patent is—

1. A machine for grinding railway track rails in place comprising the following instrumentalities: a truck frame, wheels journaled in said frame adapted to engage and travel upon one rail of a pair, a grinding element fitted to reciprocate in the frame and maintained in alinement by said wheels, means for reciprocating said element, an outrigger frame extending from one side of the truck into proximity with the mate rail of the pair and there provided with transverse extended slide bearings, a stub axle journaled in said bearings so as to have end motion with relation thereto, and a wheel carried by said axle adapted to travel on said mate rail, together with a hand wheel threaded on the axle and abutting against fixed portions of the bearings, whereby the axle may be slid in and out at will.

2. A machine for grinding railway track rails in place comprising the following instrumentalities: a truck frame, wheels journaled in said frame adapted to engage and travel upon one rail of a pair, a grinding element fitted to reciprocate in the frame and maintained in alinement by said wheels, means for reciprocating said element, an outrigger extending laterally from said frame into proximity with the mate rail of the pair, a wheel journaled upon the outrigger adapted to travel upon said mate rail, and means carried by the outrigger to anchor the entire machine in fixed position on the rails.

3. A machine for grinding railway track rails in place comprising the following instrumentalities: a truck frame, wheels journaled in said frame adapted to engage and travel upon one rail of a pair, a grinding element fitted to reciprocate in the frame and maintained in alinement by said wheels, means for reciprocating said element, an outrigger extending from said frame into proximity with the mate rail of the pair, a wheel on the outrigger adapted to travel on the said mate rail, an anchor or brake grip adapted to be attached to the mate rail, and means for locking the outrigger to said anchor.

4. A machine for grinding railway track rails in place comprising the following instrumentalities: a truck frame, wheels journaled in said frame adapted to engage and travel upon one rail of a pair, a grinding element fitted to reciprocate in the frame and maintained in alinement by said wheels, means for reciprocating said element, an outrigger extending from said frame into proximity with the mate rail of the pair, a wheel on the outrigger adapted to travel on the said mate rail, anchoring means adapted to engage the mate rail, and means carried by the outrigger adapted to work against said anchoring means when fixed in position, so as to move the machine along the rails.

5. A machine for grinding railway track rails in place comprising the following instrumentalities: a truck frame, wheels journaled in said frame adapted to engage and travel upon one rail of a pair, a grinding element fitted to reciprocate in the frame and maintained in alinement by said wheels, means for reciprocating said element, an outrigger extending from said frame into proximity with the mate rail of the pair, a wheel on the outrigger adapted to travel on the said mate rail, anchoring means adapted to be attached to the mate rail, and means carried by the machine adapted to engage said anchoring means and to be automatically operated during grinding to shift the position of the machine on the rails.

6. A machine for grinding railway track rails in place comprising the following instrumentalities: a truck frame, wheels journaled in said frame adapted to engage and travel upon one rail of a pair, a grinding element fitted to reciprocate in the frame and maintained in alinement by said wheels, means for reciprocating said element, an outrigger extending from said frame into

proximity with the mate rail of the pair, a wheel on the outrigger adapted to travel on the said mate rail, and means carried by the machine adapted to automatically shift the position thereof with respect to the rails in either direction at will while grinding.

7. A machine for grinding railway track rails in place comprising the following instrumentalities: a truck frame, wheels journaled in said frame adapted to engage and travel upon one rail of a pair, a grinding element fitted to reciprocate in the frame and maintained in alinement by said wheels, means for reciprocating said element, an outrigger extending from said frame into proximity with the mate rail of the pair, a wheel on the outrigger adapted to travel on the said mate rail, an electromagnet adapted when energized to grip one of the rails, a sliding connection between the electromagnet and the machine, a rack on the machine, and a pawl on the magnet mountings adapted to engage said rack so as to shift the position of the machine at will.

8. A machine for grinding railway track rails in place comprising the following instrumentalities: a truck frame, wheels journaled in said frame adapted to engage and travel upon one rail of a pair, a grinding element fitted to reciprocate in the frame and maintained in alinement by said wheels, means for reciprocating said element, an outrigger extending from said frame into proximity with the mate rail of the pair, a wheel on the outrigger adapted to travel on the said mate rail, an electromagnet adapted when energized to adhere to one of the track rails, a sliding connection between the electromagnet and the machine, a rack on the machine and a pair of movable pawls on the magnet mountings engaging said rack in opposite directions, whereby the machine may be anchored rigidly in place during grinding, and by moving one pawl or the other out of engagement with the rack the machine may be shifted in either direction at will by the drag of the grinding stroke.

9. In a machine of the class described, a frame, a grinding element carried thereby, means for driving said element, and means adapted to be automatically actuated by the action of said grinding element on the work for shifting the position of the machine at will.

10. A machine for grinding railway track rails in place comprising the following instrumentalities: a truck frame, wheels journaled in said frame adapted to engage and travel upon one rail of a pair, a grinding element fitted to reciprocate in the frame and maintained in alinement by said wheels, means for reciprocating said element, an outrigger extending from said frame into proximity with the mate rail of the pair, a wheel on the outrigger adapted to travel on the said mate rail, a pair of electromagnets adapted when energized to grip one of the rails for an anchorage, a slotted mounting plate for said magnets, means for adjustably securing said electromagnets in the slots, detachable guide wheels on said mounting plate engaging flanged members on the outrigger, a rack on the outrigger, and a pair of pawls on the mounting plate engaging the rack in opposite directions, said pawls being separately movable, whereby the machine may be automatically shifted in either direction at will by the drag of the grinding element.

11. A machine for grinding railway track rails in place comprising the following instrumentalities: a truck frame, guideways thereon, a reciprocating grinding element adapted to slide therein, driving means for the grinding element carried on the truck, and a pair of tandem wheels engaging the rail to be ground so as to aline the grinding element longitudinally thereon, each of said wheels having a vertically adjustable connection with the truck frame together with means for effecting equal adjustment of both wheels while maintaining them and the grinding element in alinement, whereby said frame may be raised or lowered with respect to the wheels in parallelism at all times with the rail, so as to impose a greater or less proportion of its weight on the grinding element with uniformity throughout its stroke.

12. A machine for grinding railway track rails in place comprising the following instrumentalities: a truck frame, a reciprocating grinding element adapted to slide therein, driving means therefor carried on the truck, and a pair of tandem wheels engaging the rail to be ground so as to aline the grinding element thereon, each of said wheels journaled in a vertically adjustable bearing block working in slides on the truck frame, and common adjusting means for raising and lowering the frame equally and simultaneously with respect to both wheels while maintaining said wheels and the grinding element in working alinement, whereby the weight of the machine may be imposed upon the grinding element in any desired degree with uniformity at all points in its stroke.

13. A machine for grinding railway track rails in place comprising the following instrumentalities: a truck frame, a reciprocating grinding element adapted to slide therein, driving means therefor carried on the truck, and a pair of tandem wheels engaging the rail to be ground so as to aline the grinding element thereon, each of said wheels journaled in a bearing block working without rotation in vertical slides on the truck frame, and a pair of cams, with a common operating shaft, acting on the re-

spective bearing blocks so as to raise and lower the truck frame with respect thereto, while maintaining a working alinement.

14. A machine for grinding railway track rails in place comprising the following instrumentalities: a truck frame, longitudinal parallel guide ways thereon, a grinding element fitted to reciprocate therein, tandem track wheels on said truck frame arranged to engage the track to be ground and maintain the grinding element in alinement therewith, a motor carried on the truck frame, a traveling member driven by the motor, and a rope drive connecting said traveling member with the driving element, whereby power is communicated for purposes of reciprocation, without the creation of sonorous vibrations, all of the working parts being disposed in substantial symmetry with respect to the longitudinal axis of the frame, passing through the guide wheels and the grinding element.

15. A machine for grinding railway track rails in place comprising the following instrumentalities: a truck frame, a carrier fitted to reciprocate only therein, a holder having vertical motion in said carrier, grinding means fitted to said holder, and compression means acting between the carrier and holder adapted to take up wear and prevent relative vibration of the parts.

16. A machine for grinding railway track rails in place comprising the following instrumentalities: a truck frame comprising a pair of longitudinal side members, slides secured to said members, a slide frame or carrier fitted to reciprocate only in said slides, a grinding brick holder fitted to have vertical motion in the slide frame, opposed abutments at both ends of the slide frame and the holder, and compression springs between said abutments, together with means to impose the weight of the truck frame and the parts carried thereby on the slide frame, and through the medium of the compression springs to communicate the same to the brick holder and thence to the grinding surface.

17. A machine for grinding railway track rails in place comprising the following instrumentalities: a truck frame, tandem wheels thereon, a grinding element adapted to reciprocate in the frame and alined by said wheels, and an outrigger pivotally secured to the frame adapted to be normally extended in a lateral direction for balancing purposes, but to be turned up vertically above the truck frame when out of use, whereby storage and packing space for the machine are economized.

18. A machine for grinding railway track rails in place comprising the following instrumentalities: a truck frame, a grinding element fitted to reciprocate therein, an electric motor on the frame, connections from said motor to the grinding element, controlling means for the motor, a pair of wheels adapted to carry the weight of the machine in transit to and from the rail surface to be ground, a trolley pole carrying electrical connections for the motor, and mechanical connections from said trolley pole to the truck frame and the said wheels whereby the pole may be used as a lever for transferring the weight of the machine from the rail to the wheels and vice versa.

19. A machine for grinding railway track rails in place comprising the following instrumentalities: a truck frame, a grinding element fitted to reciprocate therein, an electric motor on the frame, connections from said motor to the grinding element, controlling means for the motor, a trolley pole carrying a supply circuit for the motor and having a pivotal connection with the truck frame whereby it may be raised and lowered, a pair of wheels for transporting the machine to and from the rail to be ground, and connections between the pole, the truck frame and the wheels, adapted to impose the weight of the machine on the wheels when the trolley pole is down, and transfer it from the wheels to the rail when the trolley pole is raised into operative position.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM D. GHERKY.
JOHN E. ALLEN.

Witnesses:
JAMES S. CLIFFORD,
EDWARD E. CLEMENT.