Sept. 30, 1941. H. J. PERAZZOLI 2,257,480

CUTTER MECHANISM

Filed July 29, 1940 4 Sheets-Sheet 1

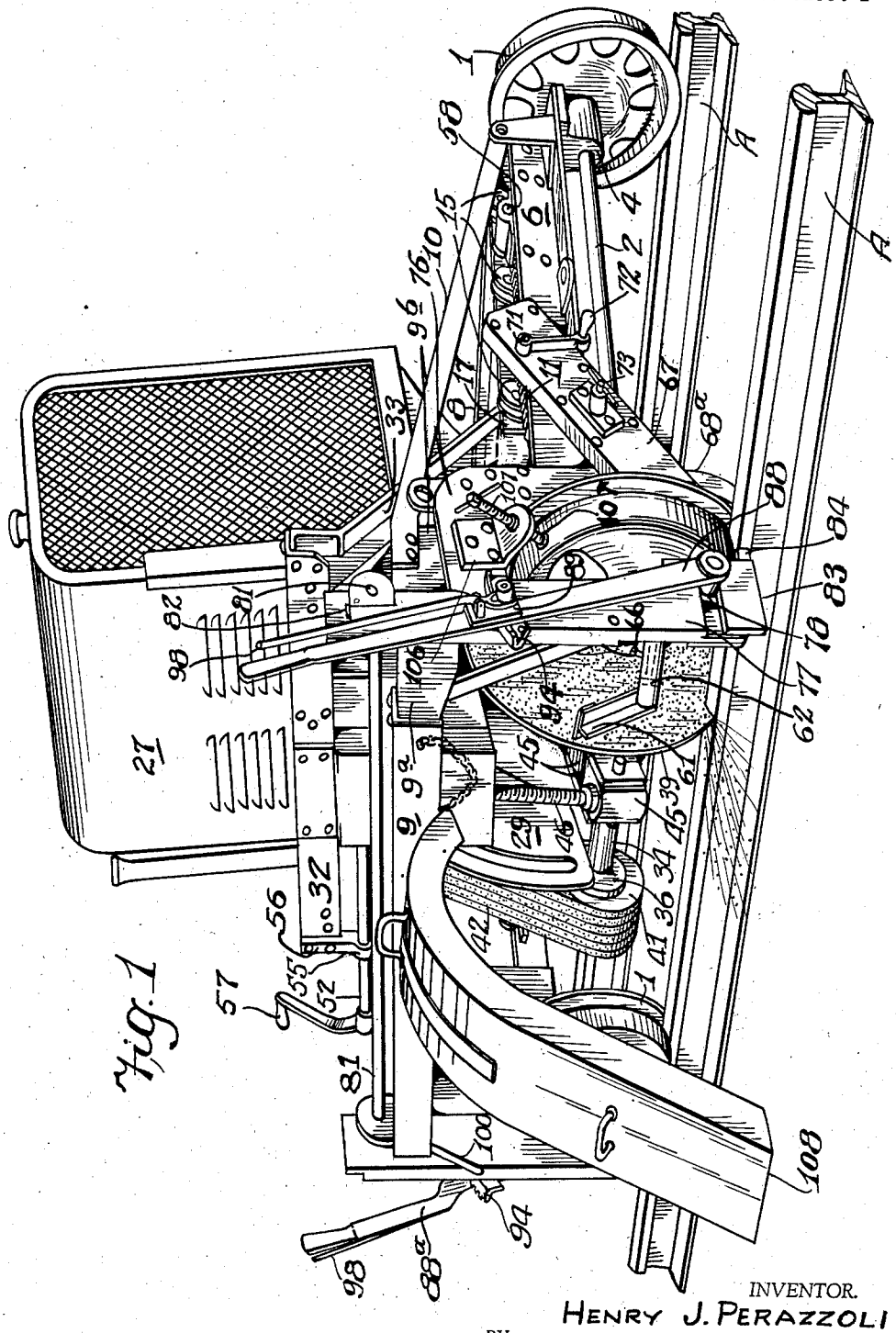


Fig. 1

INVENTOR.
HENRY J. PERAZZOLI
BY
ATTORNEY.

Sept. 30, 1941. H. J. PERAZZOLI 2,257,480

CUTTER MECHANISM

Filed July 29, 1940 4 Sheets-Sheet 2

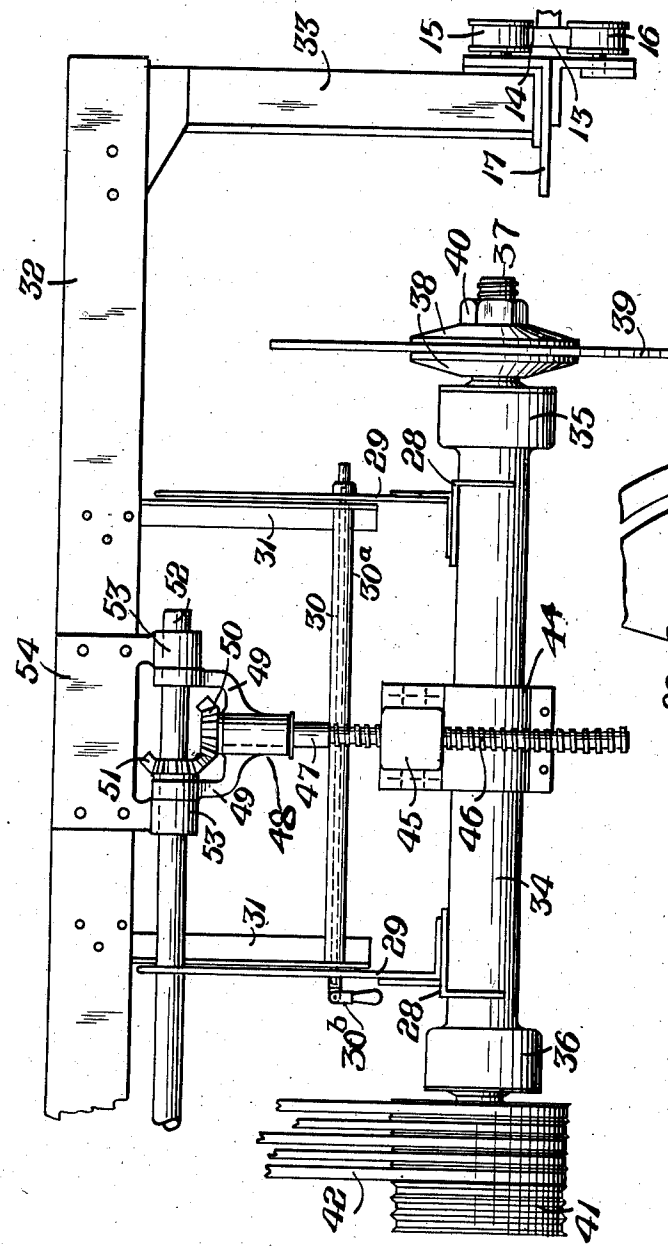


Fig. 2.

Fig. 1

INVENTOR.

HENRY J. PERAZZOLI

BY

ATTORNEY

Sept. 30, 1941. H. J. PERAZZOLI 2,257,480

CUTTER MECHANISM

Filed July 29, 1940 4 Sheets-Sheet 3

Fig. 3.

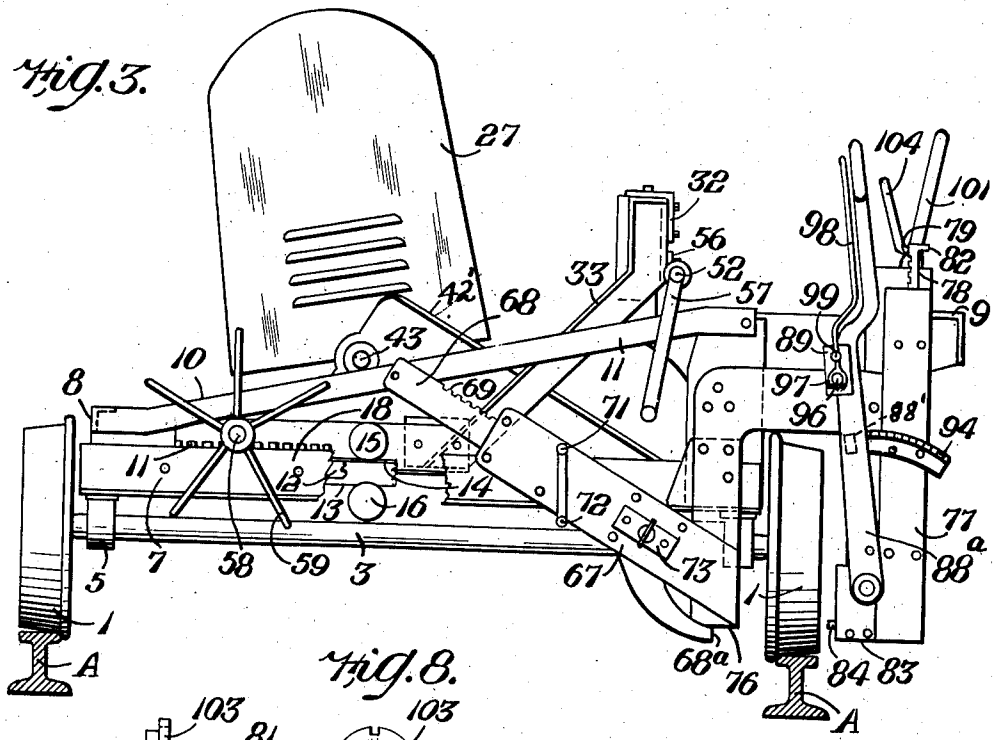


Fig. 8.

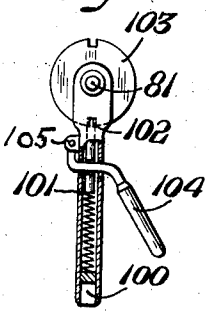
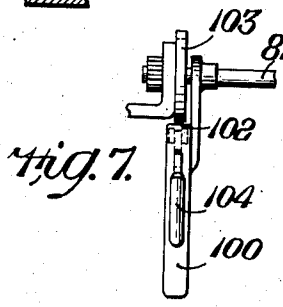


Fig. 7.



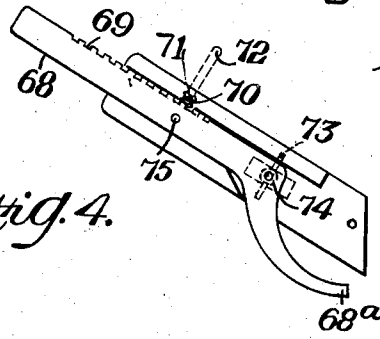


Fig. 4.

Fig. 5.

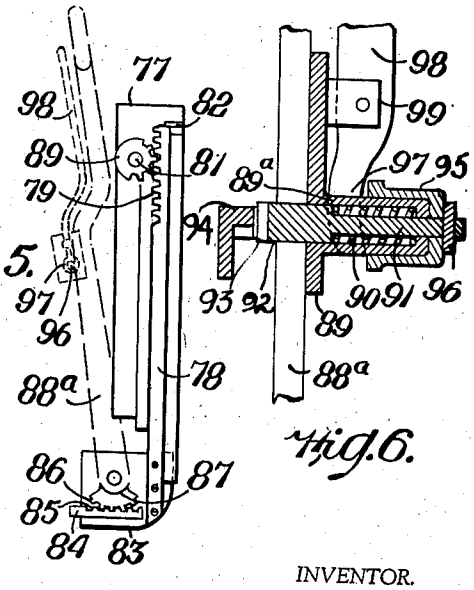


Fig. 6.

INVENTOR.

BY HENRY J. PERAZZOLI

ATTORNEY.

Sept. 30, 1941. H. J. PERAZZOLI 2,257,480

CUTTER MECHANISM

Filed July 29, 1940 4 Sheets-Sheet 4

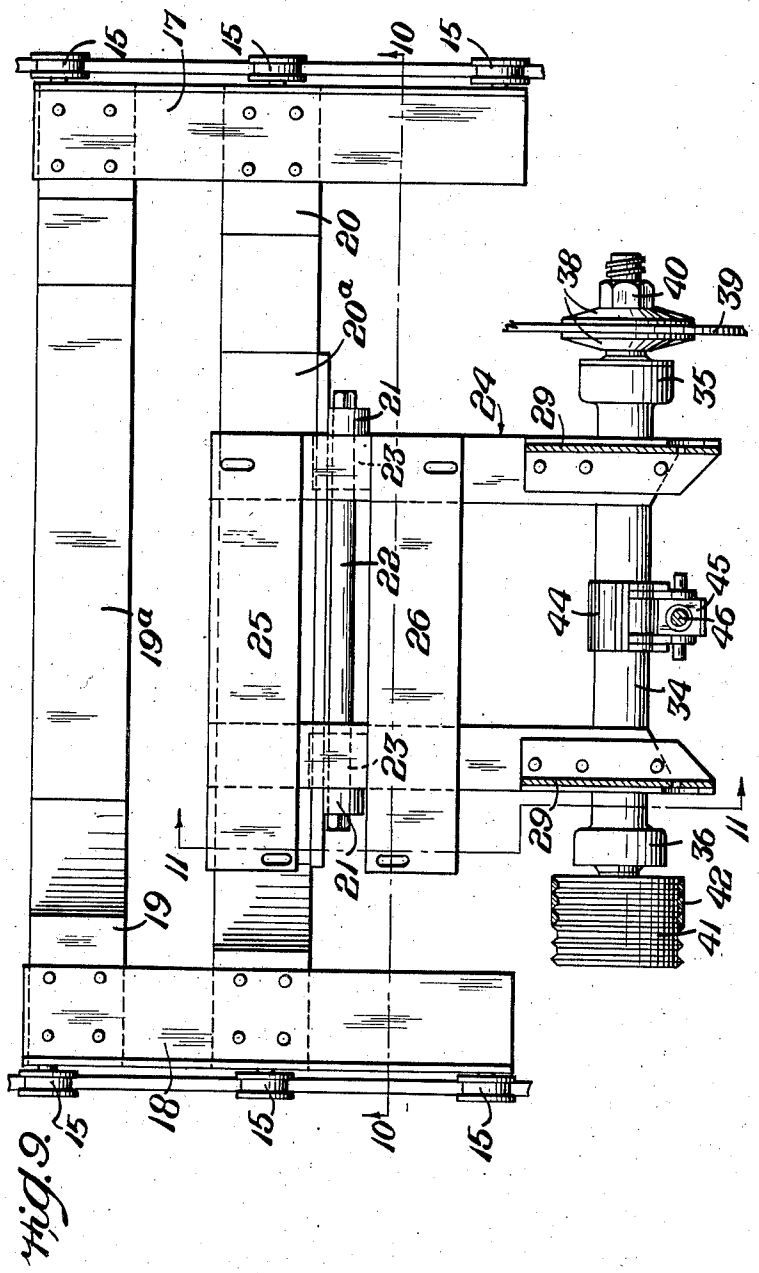


Fig. 9.

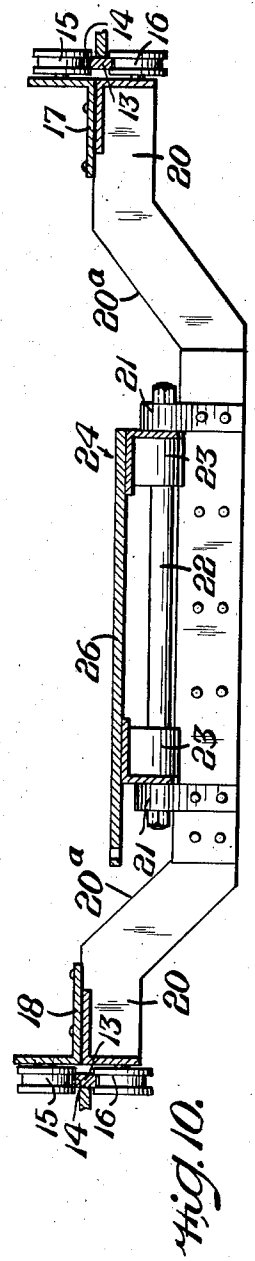


Fig. 10.

INVENTOR
HENRY J. PERAZZOLI
BY
ATTORNEY

Patented Sept. 30, 1941 2,257,480

UNITED STATES PATENT OFFICE

2,257,480

CUTTER MECHANISM

Henry J. Perazzoli, Philadelphia, Pa.

Application July 29, 1940, Serial No. 348,215

9 Claims. (Cl. 51—178)

My invention relates to cutting mechanism designed primarily for cutting off the ends of rails without removing them from the track of which they form a part, so that rail ends which have been cracked or rendered otherwise defective by use may be removed and the gaps thus caused may be eliminated by drawing together longitudinally the remaining sections of the rails without pulling out the spikes connecting the track to the ties.

My improved cutting mechanism is preferably mounted on a wheeled vehicle, of the general type of a railroad handcar, but having a frame so constructed as to present no obstruction to either lateral or downward movement of a cutter-wheel through a rail. The car body has mounted thereon a carriage which is reciprocable axially of the vehicle axles, that is, transversely of the track, and has mounted thereon a rocking carriage for carrying the cutter.

The cutter is preferably a thin disk of large diameter composed of an abrasive and a binder, and which is consequently rather brittle and readily broken by angular deflection. To minimize cutter breakage and to insure accuracy of cut, means are provided to securely lock the car frame to the rail and to feed the cutter to the work at an accurately controlled rate of movement either outwardly or downwardly, or both.

The car locking means preferably comprises a pair of diagonal slideways containing slides provided with clamping jaws for engaging the inner side of a rail, and a complementary pair of clamping jaws for engaging the outer side of a rail, preferably below the head thereof. The inclined slides are preferably provided with rack teeth for engagement by rotary pinions whose rotation advances and retracts the slides, which may be held in their track-engaging positions by spring-pressed bolts. The complementary jaws for engaging the outer face of the rail are reciprocable by an upwardly extending fulcrumed lever when such jaws have been lowered to the level of the rail web by the downward movement of a slide on which such jaws and levers are mounted. These slides may be provided with rack teeth for engagement by pinions on a common shaft extending from end to end of the car frame and provided with a handle by which the slides may be simultaneously lowered or elevated. The levers are rendered inoperative in the upper positions of the slides by the engagment thereof with brackets provided with teeth which are complementary to pawls on the levers when the slides are in their lowermost position so as to hold the outer jaws clamped against the rail web when the slides have been lowered and the levers rocked to move the jaws to clamping position.

The cutter wheel is fixed at one end of a shaft which is journalled in a sleeve mounted in a cradle, and the other end of such shaft is provided with a multiple belt pulley which is connected by a multiple drive belt with a pulley on the shaft of a source of power, such as an internal combustion engine, mounted on the cradle. The center of gravity of the cradle and its load is preferably on the opposite side of its axis of oscillation from the cutter wheel, so that the cutter wheel is biased upwardly but is movable downwardly by a screw threaded into a nut on the sleeve for the cutter wheel shaft. The screw is journalled in a bearing on the carriage and is rotatable through suitable beveled gearing and shafting to rock the cradle on its axis of oscillation to raise or lower the cutter wheel. When the cradle has been rocked to a desired position it may be locked in place by clamps which couple together brackets on the cradle and carriage.

The carriage is provided with flanged wheels which engage the upper and lower faces of rails mounted on end members of the car frame. The carriage may be translated by turning a shaft journalled longitudinally therein and having fixed thereon pinions engaging racks fixed on the car frame.

The characteristic features and advantages of my improvements will further appear from the following description and the accompanying drawings in illustration thereof.

In the drawings, Fig. 1 is a somewhat diagrammatic perspective view taken from one end of my improved mechanism; Fig. 2 is an enlarged fragmentary side elevation of parts of a carriage and cradle and parts connected therewith embodied in my invention; Fig. 3 is a somewhat diagrammatic rear end elevation of my improved mechanism with some parts broken away or omitted for the sake of clearness; Fig. 4 is a fragmentary detached view of the mechanism for clamping the inner face of a rail, with the cover plate removed to show the interior construction; Fig. 5 is a fragmentary detached view of the mechanism for clamping the outer face of the rail with the cover plate removed to show the interior construction, and a part of the mechanism in a different position from that shown in Fig. 3; Fig. 6 is an enlarged fragmentary detached transverse sectional view of the pawl and ratchet mechanism for securing the operating lever of the clamping mechanism shown in Fig.

5; Figs. 7 and 8 are enlarged fragmentary detail views taken at right angles to one another of a handle and latching mechanism for operating and locking the rail clamping mechanism, Fig. 8 being partly in section; Fig. 9 is a top plan view on a scale smaller than Fig. 2 of the carriage and cradle for supporting a source of power and cutter mechanism and advancing it to the work, part of the cutter being broken away; Fig. 10 is an enlarged longitudinal sectional view through the carriage and cradle and the end rails of the track vehicle on which they are mounted on the line 10—10 of Fig. 9; and Fig. 11 is a transverse sectional view through the carriage and cradle on the line 11—11 of Fig. 9.

In the embodiment of my invention illustrated in the drawings, flanged vehicle wheels 1 are fixed to axles 2 and 3 respectively journalled in bearings 4 and 5 depending from angle iron sills 6 and 7 of the frame or chassis of a track car adapted to run along rails A. At one end of the car the sills 6 and 7 are connected by relatively low-lying side stringers 8 having their ends welded to vertical angle iron brackets riveted to the respective sills. At the other side of the car the sills 6 and 7 are connected by an elevated angle iron stringer 9 secured to the respective sills through the horizontal brackets 9*a* and vertical brackets 9*b* each of angle cross-section. The brackets 9*b* are reenforced by inclined braces or struts 10 fixed thereto and to the remote ends of the sills 6 and 7 respectively.

Each of the sills 6 and 7 has a rack 11 along the top thereof, and a spacer 12 and rail 13 fixed to the inner face thereof, the track preferably having a detachable wearing strip 14 along the top thereof (Figs. 3 and 10).

The rails 13 at the opposite ends of the car form a runway transversely of the car on which ride the upper set of flanged rollers 15 and the lower set of flanged rollers 16 which are journalled on the end bolsters 17 and 18 (Figs. 2, 9, 10). The bolsters 17 and 18 are connected together at complementary ends thereof and at median points thereof by stringers 19 and 20 having depressed median sections 19*a* and 20*a* respectively (Fig. 9).

The stringer section 20*a* has fixed thereto a bracket 21 (Figs. 9, 10, 11) providing bearings for a shaft 22 on which are journalled the trunnions 23 of a cradle 24 having seats 25 and 26 on which are mounted suitable supports for an internal combustion engine 27. The forwardly extending arms 28 of the cradle have fixed thereto the slotted quadrants 29 (Figs. 1, 2, 9) adapted to cooperate with a headed bolt 30 passing through hangers 31 depending from the stringer 32 which is supported by inclined brackets 33 fixed to the bolsters 17 and 18 of the transversely movable carriage. The bolt 30 has a spacing sleeve 30*a* thereon between the hangers and has a locking cam handle 30*b* on the end opposite its head. The rocking of the cam handle locks the members 29 to the hangers 31.

The arms 28 have fixed therein a cylindrical housing 34 having enlarged ends 35 and 36 for the reception of anti-friction bearings in which is journalled a spindle 37 (Figs. 2, 9). One end of the spindle is threaded to receive the flanges 38 for clamping between them a cutter 39, the flanges being locked by a lock nut 40. The cutter preferably consists of a thin disk of abrasive and binder, such as silicon carbide and "Bakelite"; the cutter being of large diameter relative to its thickness.

The opposite end of the spindle 37 has fixed thereto a V-grooved pulley 41 which is connected by the V-belts 42 with a pulley on the shaft 43 of the engine 27, the belts and pulleys being guarded by a suitable shield 42'.

A collar 44 is clamped to the housing 34 between the arms 28 and has fixed thereto a swiveled nut 45 in which is threaded a screw 46 having a cylindrical upper portion 47 journalled in a bearing 48 depending from the hangers 49. The upper end of the cylindrical section 47 has fixed thereto a bevel pinion 50 which meshes with the bevel pinion 51 fixed on a shaft 52 (Figs. 1, 2). The shaft 52 is journalled in the bearings 53 of a hanger 54 secured to the stringer 32 and in the bearing 55 of a hanger 56 secured to the stringer 32. A handle 57 is fixed to the outer end of the shaft 52 which is revoluble by the handle to rotate the screw 46 and elevate and lower the housing 34 and the cradle on which it is mounted when the lock provided by the cam handle 30*b* is loosened. The cutter 39 may be thereby lowered toward or elevated from the plane of the rail A.

A shaft 58 is journalled (Figs. 1, 2) in the bolsters 17 and 18 and has teeth cut therein for engagement with the teeth of the racks 11. Spoke handles 59 are fixed to the shaft 58 so that the latter may be readily rotated to translate the carriage in and out laterally to advance the cutter 39 to or retract it from the work of cutting the rail A.

The correct positioning of the car to cut the rail A at a desired point lengthwise thereof may be determined by an indicator 61 which is fixed on a sleeve 62 which is rotatably and longitudinally movable on a shaft 63 fixed to the frame of the car. The shaft 63 contains a longitudinal keyway and a circumferential groove in which rides a set screw 66 set in the sleeve 62. When the sleeve 62 is pulled out so that the end of the set screw 66 rides in the circumferential groove, the indicator 61 will indicate the point at which the cutter 39 will act on the rail.

To lock the car against longitudinal movement during the cutting operation, it is provided at both ends with clamps for engaging the inner and outer faces of the rail web between the head and base thereof.

The clamps for engaging the inner face of the rail web each consists of a housing 67 fixed to the respective sills 6 and 7 and forming a slideway for a slide 68.

Each slide 68 has a toothed surface forming a rack 69 (Fig. 4) for the engagement of a pinion 70 fixed on a shaft 71 journalled in the housing 67 and rotatable by means of a handle 72 fixed to the shaft and the rotation of which in opposite directions advances and retracts the slide 68 so as to move the curved clamping jaw 68*a* thereto into and out of engagement with the face of the web of the rail A between the head and base of the rail. A spring biased pin 73 (Fig. 1) is slidably mounted in the front wall of the housing 67 and passes therethrough into engagement with either of the sockets 74 or 75 in the slide 68 so as to hold the slide in either of two predetermined positions to which it is movable by the rotation of the handle 72.

Each of the sills 6 and 7 has fixed thereto an inverted U-shaped bracket 76 (Figs. 1, 3) whose outer vertical arm supports a vertical housing 77 forming a slideway for a slide 78 (Fig. 5) having a toothed section forming a rack 79 which meshes with a pinion 80 fixed on a shaft 81 ex-

tending between and journalled in the housings 77. By rotating the shaft 81 the slides 78 may be simultaneously moved upward and downward, their downward movement being limited by the engagement of the heads 82 on the slides with the tops of the housings.

Each slide 78 has fixed to the bottom thereof a housing 83 forming a horizontal slideway for a horizontally moving slide 84. The upper face of the slide 84 is toothed to form a rack 85 for the engagement of the curved toothed surface of the segment 86 which projects from the periphery of a hub or sleeve 87 journalled in the housing 83. The outer ends of the respective hubs 87 have formed thereon, beyond the walls of the respective housings 83, a lever or handle 88 or 88a; the lever 88 being substantially straight and the lever 88a having an offset upper portion.

Each lever 88 or 88a has fixed thereto a bracket 89 forming a housing 89a in which is housed a spring 90 and a pin 91 (Fig. 6) having a head 92 biased by the spring through an aperture in the handle 88 on 88a and having a beveled face 93 adapted to co-act with the teeth of a ratchet 94 fixed on each housing 77 when the slide 78 and corresponding housing 83 are in their lowermost position. The pin 91 has a cap 95 and a nut 96 thereon to limit the movement of the pawl 93 and the pawl may be retracted by the engagement with the cap 95 of a yoke 97 on a release handle 98 fulcrumed on the bifurcations 99 of the bracket 89.

Each lever 88 or 88a has a boss 88' on the inner surface thereof so positioned as to engage the end of a ratchet 94 and prevent the rocking of the lever when the corresponding slide 78 is in its upper position.

The shaft 81 may be rotated to elevate and lower the slides 78 by any convenient means, such for instance as the handle 100 fixed to the shaft 81 (Figs. 7, 8). To lock the handle 100 in either the lowermost or uppermost position of the slide 78, it is provided with a slotted socket 101 in which slides a slotted bolt 102 which is normally spring biased toward a notched disc 103 mounted on a fixed bracket. The notches are so arranged in the periphery of the disc 103 that the pin 102 is biased into one of them when the slide 78 is in its lowermost position and the pin 102 is biased into the other of them when the slide 78 is in its uppermost position. To retract the pin from the notches and permit the rotation of the handle 100 and shaft 81, a bent release handle 104 is inserted through the complementary slots in the socket 101 and pin 102 and is pivotally connected with a boss 105 on the socket.

A bracket 106, fixed to the chassis frame adjacent to one of the track wheels, may have threaded therein a screw 107 which may be turned down into engagement with the adjacent track wheel to act as a temporary brake thereon.

The various racks, gears, belts and the cutter may be enclosed in usual forms of sheet metal safety shields which are omitted from some of the drawings to better disclose the structure and operation of the parts, and a detachable spark catcher 108 may be detachably mounted on the chassis frame adjacent to the cutter.

In the preferred and intended operation of my invention for the cutting of the defective or broken ends of the railroad tracks in situ, the car is moved along the track until the plane of the cutter 39 is adjacent to the point at which it is desired to cut the rail. The sleeve 62 is then pulled out on its shaft until the screw 66 registers with the circumferential groove which permits the indicator 61 to rock downward against the rail head. The car is then shifted lengthwise until the indicator registers with the exact point of the rail where the cut is to be made.

The pins 73 are then pulled out of the sockets 74 and the handles 72 turned to advance the slides 68 until the clamps 68a engage the rail webs and the sockets 75 are in registration with the pins 73 which are then seated in the sockets to secure the slides. The handle member 104 is then pressed toward the handle 100 to retract the bolt 102 from the upper notch of the disk 103 and the handle 100 is turned to rock the shaft 81 through a half revolution and thereby lower the slide 78 until the head 82 thereof contacts the upper surface of a wall of the housing 77. The clamp 84 is thereby lowered to a plane between the head and base of the rail A and the pawl 92 is likewise lowered to the plane of the ratchet 94. Each of the levers 88 and 88a is thereupon pulled outward to rock the toothed segments 86 and propel the clamps 84 against the outer web of the rail, the parts being held in clamping position by the engagement of the pawl 92 with a tooth of the rack 94.

The lock 30b is then released and the handle 57 turned so as to rotate the shaft 52, pinion 51, pinion 50, shaft 47 and screw 46. The screw 46 coacts with the nut 45 to lower the sleeve 34, together with the cutter 39, into the plane of the rail. When the cutter is sufficiently lowered, the clamp 30b is operated to lock the parts in adjusted position.

The spokes 59 are then rotated so that the teeth of the shaft 58 engage the racks 11 and thereby move the carriage along the rails 13 and advance the cutter 39 to and through the rail.

When the cutting is completed the reverse operations are performed to place the parts in their initial position, the cut-off rail section is removed, and the remaining rail sections are pulled toward one another to abut their ends without extracting the spikes securing them to the ties.

Having described my invention, I claim:

1. Cutter mechanism comprising a wheeled vehicle having a frame, an inclined slideway supported by said frame, a slide slidable in said inclined slideway and having a clamping jaw adapted to engage a member to be cut, means for moving and locking said slide with its jaw in clamping position, and a cutter supported by said frame and movable relatively thereto into engagement with a member clamped by said jaw.

2. Cutter mechanism comprising a wheeled vehicle having a frame, inclined slideways fixed to said vehicle at opposite ends of said frame, toothed slides movable in said slideways and having clamping jaws adapted for engagement with a member to be cut, toothed members engaging and operating said toothed slides, means for locking said slides in clamping position, and a rotary cutter movable latitudinally of said vehicle into engagement with a member clamped by said jaws.

3. Cutter mechanism comprising a wheeled vehicle having a frame, an upright slideway connected with said frame, a slide movable in said slideway, a lever journalled in said slide, a work clamp operable by said lever, and a rotary cutter movable relatively to said frame into engagement with work clamped by said clamp.

4. Cutter mechanism comprising a wheeled vehicle having a frame, an upright slideway con-

nected with said frame, a slide movable in said slideway, a lever fulcrumed in said slide, pawl and ratchet mechanism having complementary members respectively connected with said lever and slideway, the members of said pawl and ratchet mechanism being relatively movable into cooperating relation at one position of said slideway, means carried by said lever for limiting the rocking thereof in another position of said slideway, a work clamp operable by said lever, and a cutter movable relatively to said frame into engagement with work clamped by said clamp.

5. Cutter mechanism comprising a frame, an upright slideway connected with said frame, a slide movable in said slideway, a second slideway carried by said slide, a slide movable in said second named slideway transversely to the movement of said first named slide in said first named slideway, and means for moving the respective slides to engage said second named slide with the member to be cut, and a cutter movable relatively to said frame into engagement with the member engaged by said second named slide.

6. Cutter mechanism comprising a wheeled vehicle having a frame including end members and a side member above the level of said end members and connected therewith, a carriage including a frame having end members slidable along said end members first named and a side member connecting said second named end members above the level of said first named side member, a rocking cradle mounted on said carriage, means for rocking and locking said cradle relatively to said carriage and including a rod having a swivel connection with one thereof and a threaded connection with the other thereof, and a cutter mounted in said cradle and movable under said elevated side member first named.

7. Cutter mechanism comprising a latitudinally movable carriage having end bolsters and stringers connecting said bolsters and having depressed intermediate sections, a cradle pivotally connected with one of said depressed sections, motive mechanism mounted on said cradle and tending to rock it in one direction, a cutter mounted on said cradle and connected with said motive mechanism, and means for rocking said cradle counter to the rocking action of said motive mechanism.

8. Cutter mechanism comprising a wheeled vehicle, a cutter carried by said vehicle, and means for clamping said vehicle to work to be acted on by said cutter and comprising a toothed slide at each end of said vehicle, pinions meshing with the teeth of the respective slides, a shaft connected with both of said pinions, means for rocking and locking said shaft, and clamps movable through said slides by the rocking of said shaft.

9. Cutter mechanism comprising a wheeled vehicle having end sills and side stringers at different elevations connecting said sills, a carriage latitudinally movable on said vehicle and comprising end bolsters connected by stringers at different elevations, a rocking cradle mounted on said carriage, a spindle journalled in said cradle, a rotary disk cutter fixed on said spindle, motive mechanism mounted on said cradle and connected with said spindle, means comprising a threaded member for rocking said cradle, means for latitudinally moving said carriage, and complementary clamping mechanisms supported by said vehicle for engaging between them work to be cut and comprising toothed slides, toothed members for operating said slides, and means for locking said slides.

HENRY J. PERAZZOLI.