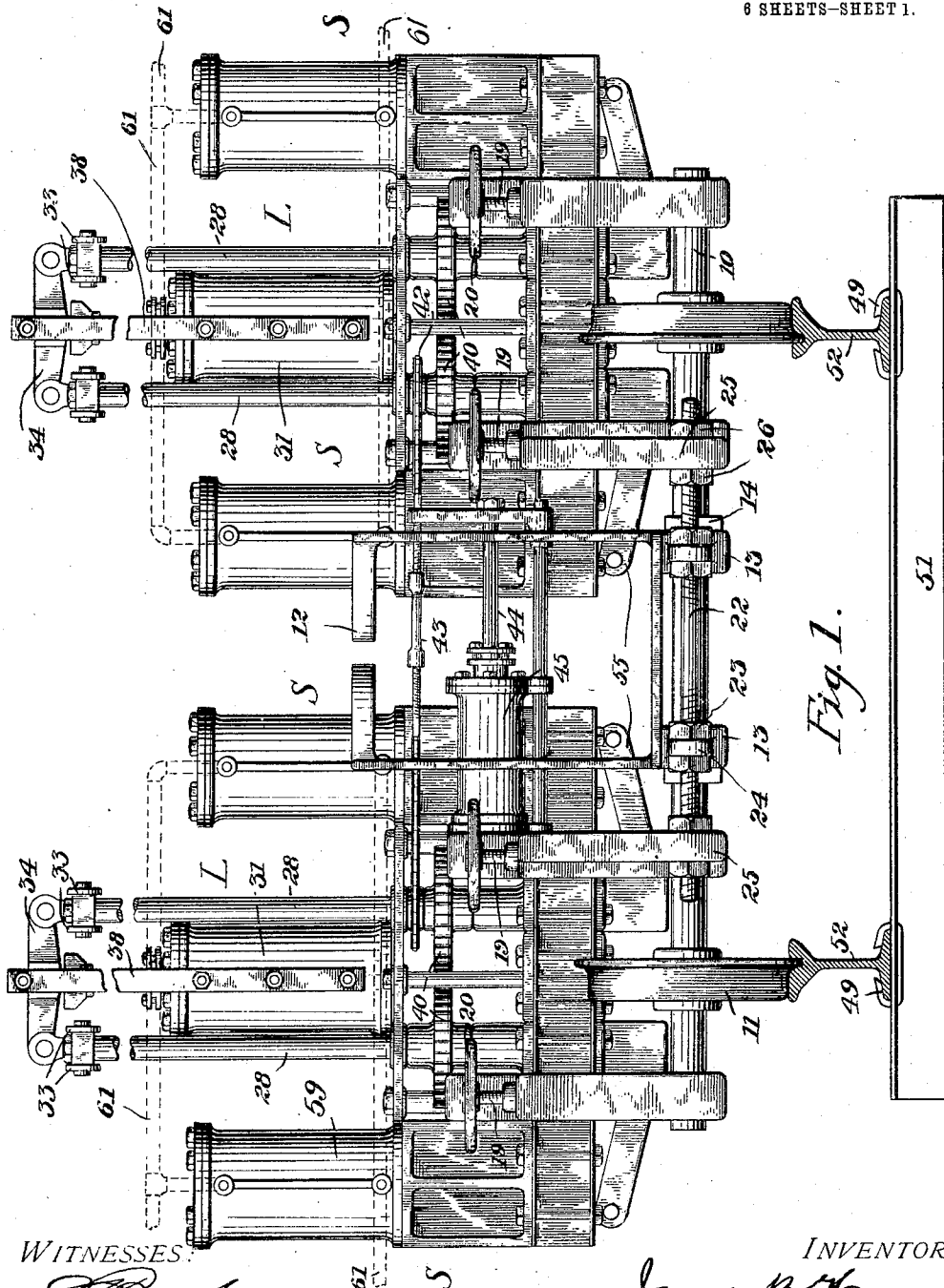


J. B. HOGE.
RAILWAY CONSTRUCTION MACHINE.
APPLICATION FILED MAY 2, 1912.

1,121,629.

Patented Dec. 22, 1914.

6 SHEETS—SHEET 1.



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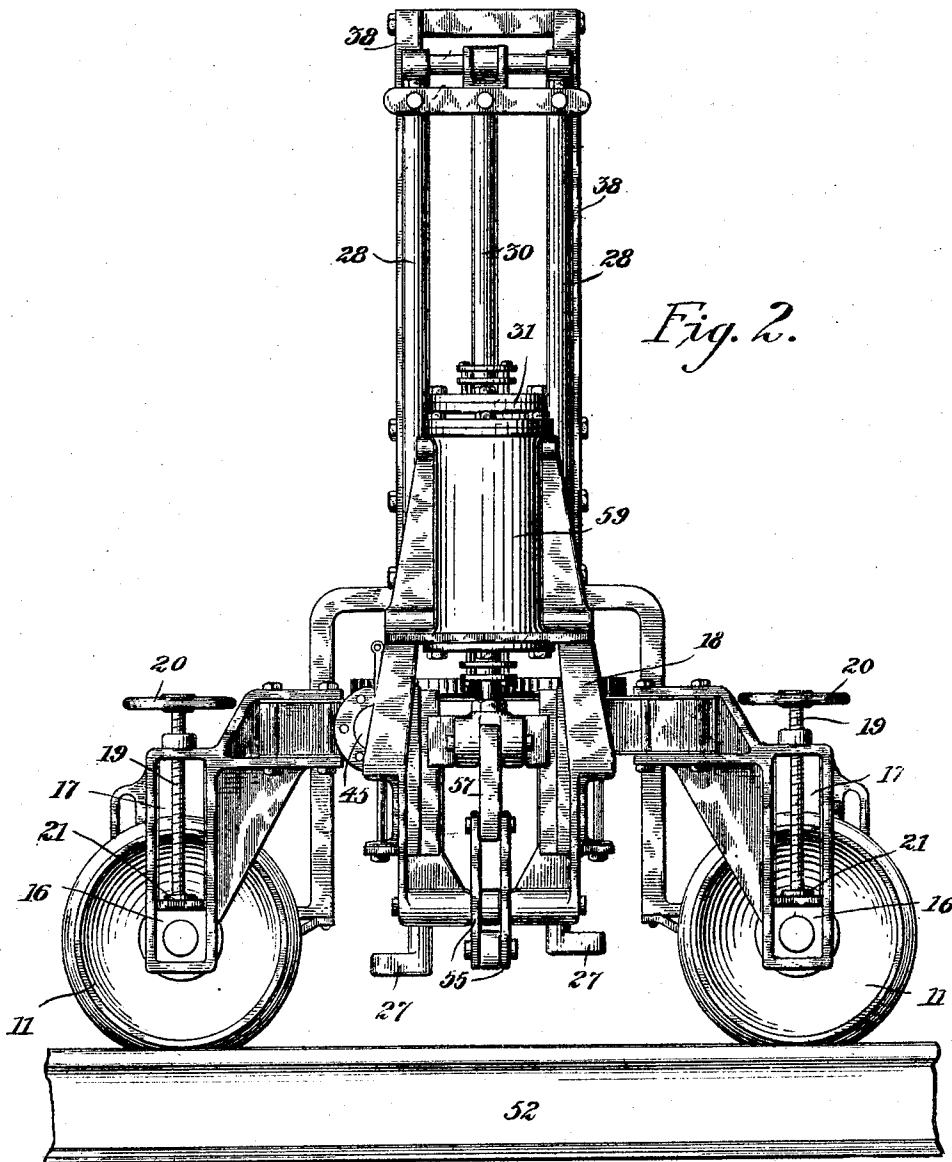
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6 SHEETS-SHEET 2.



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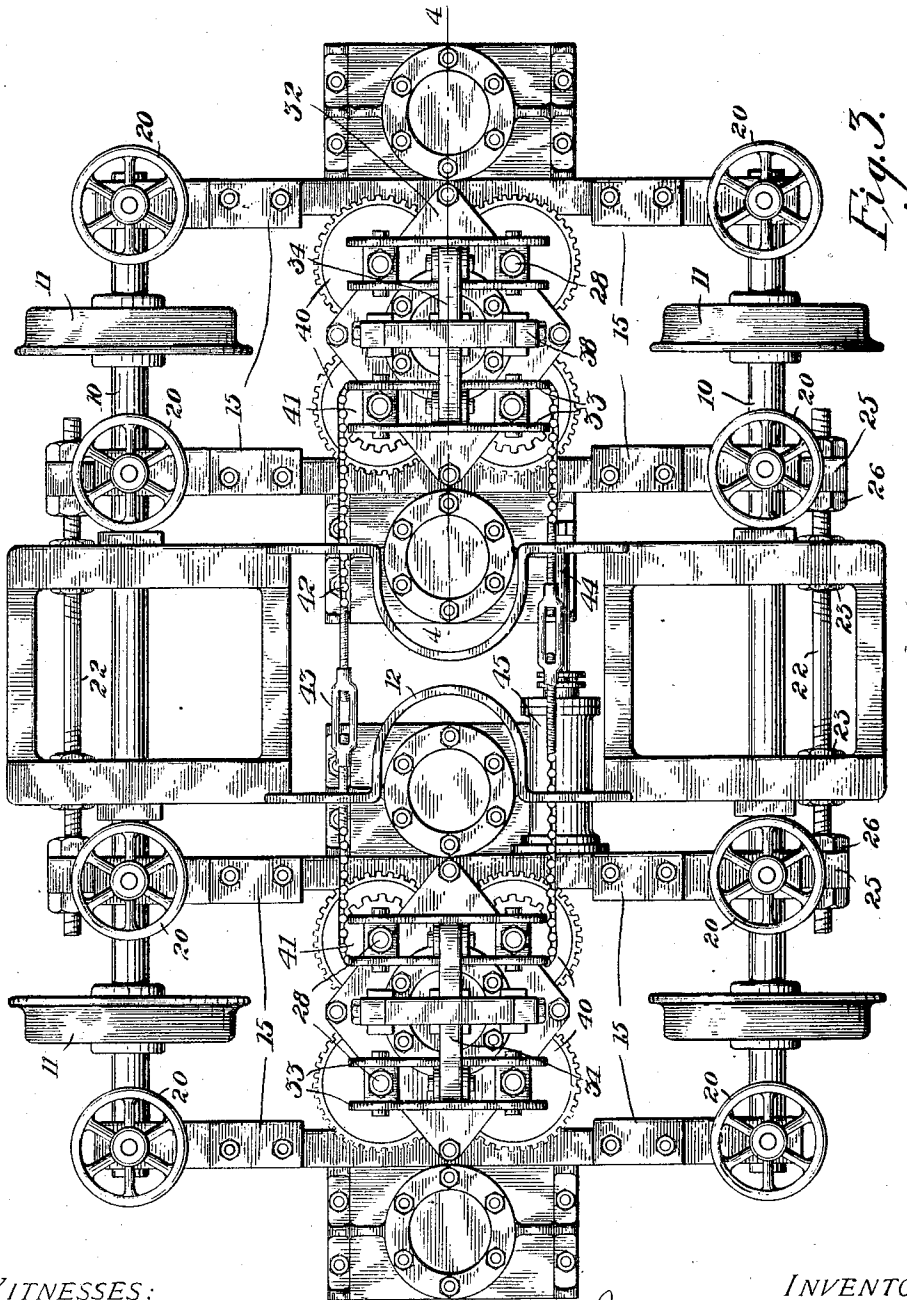
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6 SHEETS-SHEET 3.



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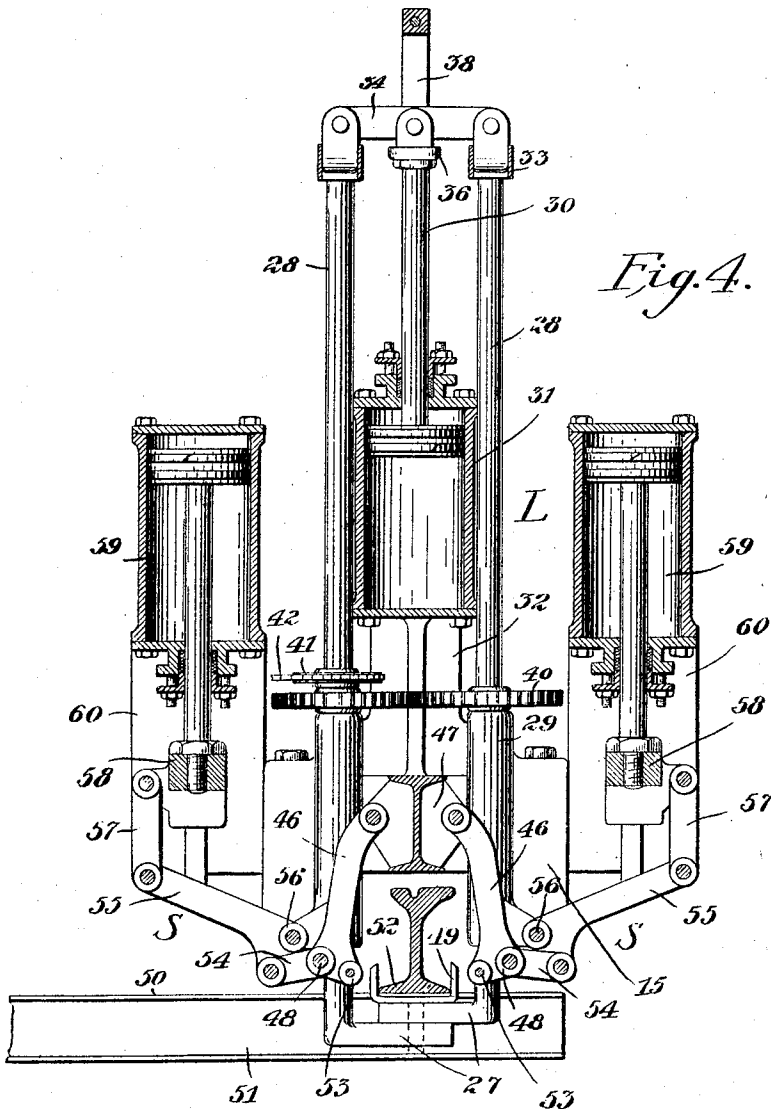
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6 SHEETS—SHEET 4.



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APPLICATION FILED MAY 2, 1912.

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6 SHEETS—SHEET 5.

Fig. 5.

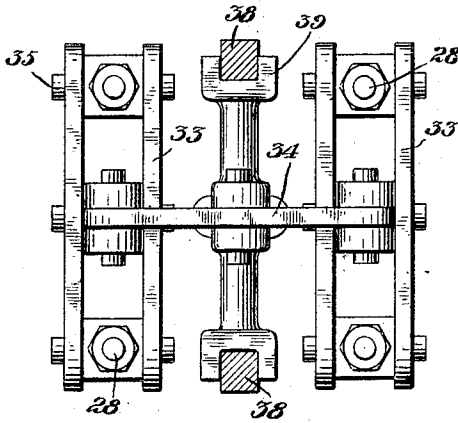


Fig. 6.

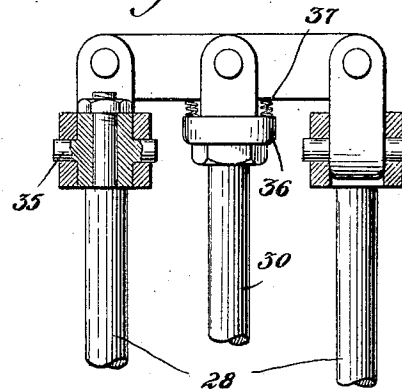


Fig. 9.

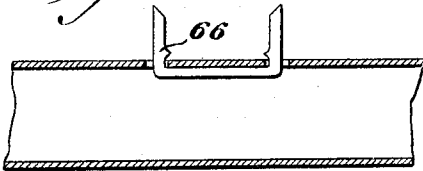
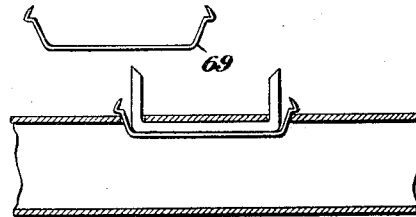


Fig. 13.

Fish-plate.

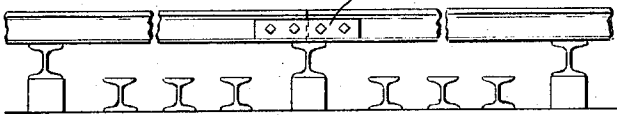


Fig. 10.

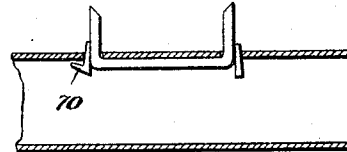
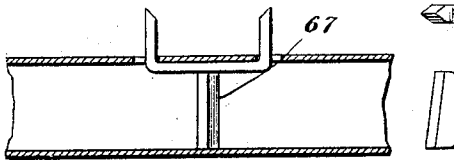


Fig. 11.

Witnesses

W. H. H. H.
W. H. H. H.

Fig. 12.

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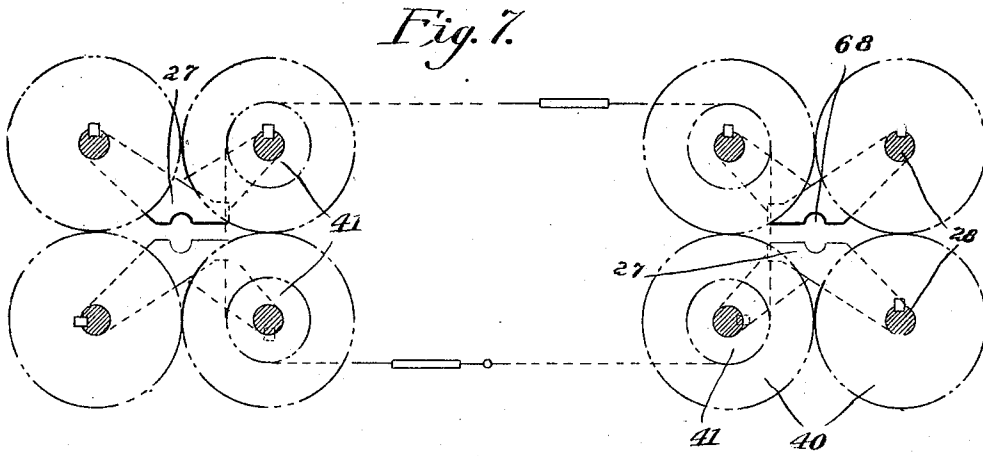
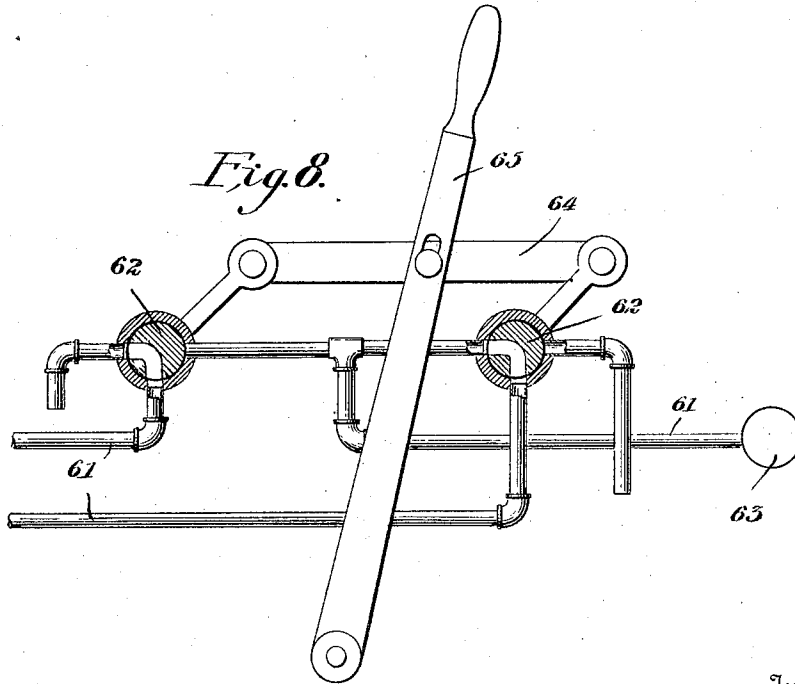
Attorney

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6 SHEETS-SHEET 6.



Witnesses
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UNITED STATES PATENT OFFICE.

JAMES B. HOGE, OF CLEVELAND, OHIO.

RAILWAY-CONSTRUCTION MACHINE.

1,121,629.

Specification of Letters Patent.

Patented Dec. 22, 1914.

Application filed May 2, 1912. Serial No. 694,664.

To all whom it may concern:

Be it known that I, JAMES B. HOGE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Railway-Construction Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to machines of the type heretofore described in my copending application Serial No. 654,526, adapted particularly for the securing of rails to metallic ties by means of metallic clips which are crimped over flanges or other projecting parts on either the rail or the ties, the rails of the track being first positioned on supports placed at intervals and the ties laid beneath them. At the outset, however, I wish it understood that my invention is not limited to an embodiment in a machine of this specific type. In other words, broadly the means used by me in the accomplishment of my invention may be given different structural forms by those skilled in the art, and may be operatively used in the same basic arrangement either in part or as a whole as may seem fit in any case.

In the accompanying drawings I illustrate my invention as embodied in a machine of the specific type above mentioned and will describe my invention with reference to these drawings.

Elementally, in terms of the mechanisms employed, the machine of my invention comprises a main frame adapted to be supported from and in gaged relation to, and moved along a trackway, an auxiliary frame associated with said main frame and adjustable with respect thereto, and rail securing mechanism carried by and adjustable with said auxiliary frame to an operative position in the plane of a rail, the said securing means consisting essentially of two devices, a tie lifting device adapted to lift a tie to and hold the same in engagement with the under side of a rail, and a rail fastening device adapted to operate on a fastening positioned in the proper relation with respect to the rail and the tie to fasten the two together as held by the tie lifting device. As now organized the machine includes devices of this character in duplicate, a set for operating on each rail of the track, and special

provision is made for simultaneous and co-operative operation of the devices, whereby both rails are simultaneously secured and rapidity of action and speed of work is assured.

The detail features of my invention and its operation will be fully comprehended from the drawings.

Of the drawings: Figure 1 is a front end elevation of the machine, Fig. 2 is a side elevation, Fig. 3 is a general plan view, Fig. 4 is a transverse section on a line at right angles to the trackway on line 4—4 of Fig. 3, Figs. 5 and 6 are a plan and elevation respectively, with parts in section of certain details of the operating connections, Fig. 7 is a plan view diagrammatically illustrating gearing connections between devices on opposite sides of the machine, and showing in detail the forms of certain parts of the lifting devices, Fig. 8 shows the system of power control, and Figs. 9 to 12 show the various fastening means which may be employed, Fig. 13 illustrates the method of positioning the rails and ties preliminary to fastening the rails to the ties.

The machine is built upon a pair of axles provided with wheels 11 (Figs. 1 to 3), and by the track wheels 11 is supported from and above in gaged relation to, and movable along a trackway. A main frame 12 connects the axles to each other. This frame is bowed upwardly to form as it were a bridge between the axles, the axles passing through end portions or lugs 13, and the frame being fixed positioned on the axles by means of adjustable collars 14 mounted on the axles, and bearing one on each side of each end of the frame 12. As shown the frame 12 is of skeleton construction, and is conformed specially to make room for the mechanisms on the opposite sides of the machine as clearly illustrated in Fig. 3, but this main frame may very readily be constructed in any other desired form.

On each side of the main frame 12 and supported directly from the axles 10 independently of the main frame 12 is an auxiliary frame 15 similar in general structure to the main frame 12. These frames 15 are also skeleton frames, and are bowed upwardly between the axles as clearly shown in Fig. 2. The axles pass through bearing blocks 16 adjustably mounted in slots 17,

one in each leg of the auxiliary frame, the legs of the frame being two in number at each end of the frame and being disposed one on each side of the plane of the track wheels 11 whereby the main body 18 of the auxiliary frame overlies the track rail in each case.

A screw 19 and hand wheel 20 threaded through the frame 15 vertically above each bearing block 16 and provided on its lower end with a swiveled head 21 adapted to bear on the corresponding block 16 is provided in connection with each bearing block 16 for the purpose of effecting vertical adjustment of the auxiliary frame. By this means the auxiliary frames may be adjusted independently of the main frame, their ends may be adjusted with respect to each other, and any leg of the frame (see Fig. 3) with respect to any other leg.

The auxiliary frames are adjustably connected with the main frame 12 by means of screw rods 22 (Figs. 1 and 3) secured by means of nuts 23 to lugs 24 to the lower outer ends of the main frame 12 and projecting through vertical slotted lugs 25 on the adjacent legs of the auxiliary frames 15. By means of the nuts 26 on opposite sides of the lugs 25, the auxiliary frames 15 may be adjusted laterally with respect to the main frame 12, which frame is fixed in position by collars 14, and when once adjusted may be clamped fixedly in position. The auxiliary frames are simply slid laterally on the axles 10 in effecting this adjustment.

Supported substantially from the middle of the auxiliary frames 15 are the rail securing mechanisms comprising the tie lifting device designated generally L (Figs. 1 and 3), and the rail fastening device designated generally S, operatively associated together (see Figs. 1, 3 and 4). As clearly shown these devices are motor operated by means of compressed air or other fluid source of power.

The tie lifting device comprises lifting claws 27 (see Figs. 2 and 4) carried on the lower ends of vertically reciprocable and rotatable rods 28. There are four of these claws in connection with each tie lifting device (Fig. 3), the rods 28 being given a rectangular arrangement, and the claws thereby operated two on each side of the longitudinal vertical plane of a track rail when the machine is in operative position. While I prefer to use this number of claws having this particular positional arrangement, I may use a greater or less number of them as will be apparent. The rods 28 are journaled in bearings 29 connected with the frames 15.

The upper ends of these rods are connected by a four point equalizing connection to the piston rod 30 of the operating cylinder

or motor 31 positioned centrally between them on bridge 32 (Fig. 4) and pointing upwardly. This equalizing connection (Figs. 3, 5 and 6) comprises pivoted link connections 33 between each longitudinal pair of rods 28, and a transverse pivot link connection 34 between the connections 33, the piston rod 30 being pivotally connected to the central portion of this transverse link 34. The pivotal connections used are of the double bearing type (Fig. 6) whereby the construction is rendered sturdy and durable, the bearing connection on each end of the pivot pins or trunnions 35 equalizing the strains at the joints themselves. With reference to Fig. 6 it will be clearly seen that the rods 28 have a swivel connection at their upper ends with the trunnions 35 whereby they may be rotated freely.

A flange 36 is provided at the upper end of the piston rod 30, and seated on this flange and bearing against the transverse link 34 are springs 37 on each side of the rod 30 acting to bias the link 34 and the pairs of rods 28 to a defined normal relative position. These springs may also be provided between the links 33 and their central trunnions 35 if desired, to maintain the rods 28 and claws 27 of any pair in defined normal relative positions.

Extending parallel to the rods 28 and fixedly secured to the sides of the cylinder 31 are guide rods 38 on which slides the cross head 39 connected with the piston rod 30 (Figs. 1 and 5). The claws 27 may be raised and lowered through the reciprocation of the rods 28 by the motor 31.

The rods 28 are rotatably geared together whereby the claws 27 may be rotated or moved laterally into engaging position. A closed train of gears 40 connects them, the gear on each rod being splined thereto as clearly shown in Fig. 7 whereby rotary motion may be given the rod without interfering in any way with its reciprocatory motion. These gears are located just above the tops of the bearings of the rods. Also mounted on each of the pair of rods 28 adjacent the main frame 12 is a gear 41 (Figs. 3 and 7). One of each pair of these gears 41 is splined on its rod 28, while the other is free to rotate on its rod.

The rail securing mechanisms on the opposite sides of the machine are symmetrically mounted, and the gears 41 on the opposite sides of the machine are linked together for simultaneous operation by means of a chain 42. Turn buckles 43 are provided in this chain for adjusting it. Connecting with one of these turn buckles 43 is the piston rod 44 of a compressed air cylinder or motor 45 mounted on one of the auxiliary frames 15 substantially parallel to the line of the chain 42 (Figs. 1 and 3). By this means the tie lifting claws on op-

posite sides of the machine may be simultaneously rotated into and out of engaging positions.

The rail fastening devices are mounted in close proximity to the tie lifting devices just described and in a common transverse plane. On each side of the machine are two units of these devices, one adapted to operate on each side of the longitudinal vertical plane of a rail, and they are located accordingly one on each side of the associated tie lifting device. Each of these units comprises a driving or fastening member 46 (Fig. 4) in the form of a toggle lever pivoted at its upper end to a central portion 47 of the auxiliary frame and adapted to have its lower end 48 moved laterally to drive a fastening. The fastening in this instance is in the form of a U-shaped metallic clip 49 passing through the flange 50 of metallic tie 51 and having an upwardly projecting end on each side of the rail flange 52. The toggle lever 46 is provided on its driving end with a roller 53 to effect the driving-in operation of the ends of the clip 49 without undue friction and without jamming.

Near its lower end the toggle lever 46 is connected by means of a link 54 with the short arm on bell crank lever 55 pivoted at 56 to the frame 15 and connected at its opposite end by means of the link 57 with the cross head 58 of a compressed air operating motor 59 seated on the bridge 60 of the frame 15.

The units of each of these fastening devices are connected by means of conduits 61 for simultaneous operation. The simultaneous control of these units on each side of the machine is effected through the control system shown in Fig. 8. The conduit 61 leads in each case to a rotary control valve 62 which is adapted to admit fluid pressure from a source 63 to the conduit 61, and exhaust fluid from the same if desired. The two valves 62 are connected by means of a link 64 to be operated by means of a common hand lever 65. This system of control may be applied simply to the pairs of units themselves, or to the entire machine, it being possible through this means to effect the simultaneous operation of all of the fastening units. For the sake of clarity, and also because the particular location of the compressed air conduits forms no part of the present invention, the system of Fig. 8 is not shown on Fig. 1, its connection with the machine being indicated in Fig. 1 by the dotted lines.

As stated in the beginning, this embodiment of my invention is adapted particularly to operate to secure together metallic railway ties and rails. According to the method practised by me, the rails are first alined and leveled on suitable supports

spaced at intervals as shown in Fig. 13, these supports preferably being metallic ties positioned by hand and blocked up or bedded in final position in earth or concrete as the case may be. These supports are perhaps 10 to 16½ feet apart. The intermediate ties are then laid beneath the rails at the proper intervals and in the proper number to support the rails. Each of these ties carries one or more fastening clips 49 at each end, the clips being projected through apertures or slots previously formed.

The clips may be held within the slots against adjustment by any suitable means, four such means being shown in Figs. 9 to 12 and 13 of the drawings. In Fig. 9 the clips are shown as having an integral lip 66 formed on each branch of the U. In Fig. 11 a wedge block 67 is used. This is the form I prefer, and when this is used the lateral extending claws 27 are provided with a recess 68 (Fig. 7) on their inner engaging faces to accommodate the wedge. Any other projecting part in connection with the fastening or the tie and rail may be accommodated in like manner. In Fig. 10 is used a spring held clip 69 of the form shown, the holes through which the clips are passed being somewhat larger than is necessary to accommodate the clip, and a strong clip 69 having its outturned ends projecting through the holes, and supporting the clip 49 by its underlying body. In Fig. 12 ordinary wedges are used, one of them being shown as provided with a heel piece 70 for the purpose of effecting removal for subsequent use if desired.

Now assuming that a metallic tie thus laid beneath a track is in a proper position, and that the machine is upon the track, and has been adjusted by means of the rods 22 and the hand wheels 20 to proper operative position, by moving the lever 65 associated with the tie lifting devices on opposite sides of the machine, the motors 31 may be operated to lower the tie lifting claws, and the machine having been positioned correctly, the claws will go down, a transverse pair on each side of each end of the tie. Then by similarly operating the motor 45, the rods 28 may be rotated and the claws moved laterally to engage the tie beneath its upper flanges. Thereupon by moving the lever 65 connected with the motors 31 in the reverse direction, the tie so clasped may be lifted into engagement with the under side of the rails and held there. By varying the pressure of the motive fluid within the motors 31 supplied from the source 63, the tie may be clamped in position with any desired degree of pressure. It will be noted that one of the transverse pairs of claws 27 (Fig. 4) underlies a clip 49, thus pressing the clip upwardly and firmly into engagement with the under side of the top tie

flange. Thereupon by movement of the control lever 65 connected with the units of the rail fastening device S on one or both sides of the machine, motive fluid may be admitted to the upper ends of motor cylinders 59, and the toggle fastening means 46 moved laterally to crimp down the ends of the clips 49 on the rail flange. It is to be noted that this crimping action, though effected by lateral movement of roller 53 on the lower end of lever 46, is effected by pressure in a substantially vertical direction in the line of the toggle lever 46, the action being essentially a wedging or toggle action between the claws 27 holding the parts together and the upper pivot of the member 46 on the frame 47. Through suitable throttling action secured through the valve 62, or other variation of the pressure of the source 63, the force applied to the driving or crimping of the end 53 of the member 46 may be made anything desired. This action having been completed, the motors 59 may be operated to return the members 46 to normal position shown in Fig. 4, and the motors 45 and 31 respectively to disengage and lift the claws 27 from the plane of the ties, whereupon the machine may move to perform the same operation upon the next succeeding tie. It is to be noted that since the fastening members 46 and their operating connections normally lie above the plane of the ties, there is no obstruction of motion from them.

Compressed air operation renders the operation both cheap and reliable, it being possible to obtain compressed air through the use of any standard air equipment for air brake systems. Such a source may be used, or else a special source may be installed upon the machine. On the other hand if desired, I may substitute electrical and other power for compressed air, using a direct motor drive. So also only one side of the machine may be operated at a time if desired, and as many only of the claws 27 may be used as are necessary.

For the purpose of securing to ties and clips of the form shown, two of the claws 27 at diagonally opposite points may be used alone with advantage, the rail being thus still supported from each side on a line making an acute angle with its vertical plane and the support being therefore symmetrically applied. Furthermore the form of the claws 27 may be changed to meet any special condition as respects the form of tie or clip used. Forms other than those shown of course, and not related thereto are not the subject of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is:—

1. In a machine of the character described, a main frame having track wheels,

an auxiliary frame adjustable with respect thereto and carried thereby, and a fastening holder and fastening driving devices together coöperatively associated and carried on said auxiliary frame.

2. In a machine of the character described, a main frame having track wheels, an auxiliary frame carried thereby and adjustable for gage with respect thereto, a rail securing mechanism carried thereby and adapted to simultaneously operate on fasteners on opposite sides of the rail, and a tie lifting device adapted to lift a tie into engagement with a rail or rails of the track and position the same for the operation of said rail securing mechanism.

3. In a machine of the character described, a main frame having track wheels and axles, an auxiliary truck frame supported directly on said axles, and adjustable with respect to said main frame, and a rail securing mechanism carried by said auxiliary frame.

4. In a machine of the character described, a main frame, an auxiliary frame supported in substantially fixed angular relation thereto, a rail securing mechanism carried by said auxiliary frame, means for adjusting said auxiliary frame vertically, and means for adjusting said frame laterally.

5. In a machine of the character described, a main frame, an auxiliary frame supported in substantially fixed angular relation thereto, a rail securing mechanism carried by said auxiliary frame, means for adjusting said auxiliary frame vertically and means for adjusting said frame laterally in each case without disturbing the angular relation of the same with respect to the main truck frame.

6. In a machine of the character described, a main frame having a pair of axles with track wheels an auxiliary frame, bearings on which said auxiliary frame is supported from the axles independently of said main frame, a rail securing mechanism carried by said auxiliary frame, and means connected with the main frame for adjusting said auxiliary frame laterally on said axles.

7. In a machine of the character described, a main frame having a pair of axles with track wheels and auxiliary frame, bearings on which said auxiliary frame is supported from the axles independently of said main frame, a rail securing mechanism carried by said auxiliary frame, and means for adjusting said auxiliary frame vertically with respect to said bearings independently of the said main frame.

8. In a machine of the character described, a supporting frame, a pair of axles on which the said frame is supported, wheels on the axles adapted to traverse a trackway, a rail securing mechanism carried by said

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frame, and shifting means for shifting said frame laterally on said axles to a position in the plane of a rail.

9. In a machine of the character described, a supporting frame, a pair of axles on which the said frame is supported, wheels on the axles adapted to traverse a trackway, a rail securing mechanism carried by said frame, shifting means for shifting said frame laterally on said axles to a position in the plane of a rail, and means for shifting said frame vertically with respect to the axles.

10. In a machine of the character described, a frame adapted to travel along a trackway, and a pair of tie lifting claws carried by said frame, and adapted to be simultaneously shifted to engage a tie at points lying vertically beneath a rail, and to be simultaneously lowered into tie engaging position, and correspondingly raised with the tie.

11. In a machine of the character described, a frame adapted to travel along a trackway, a pair of tie lifting claws carried by said frame, and adapted to be simultaneously shifted into engagement with a tie beneath a rail and to be simultaneously lowered into tie engaging position, and correspondingly raised with the tie, a power motor for shifting said claws to engaging position, and an independently controllable power motor for lowering and raising said claws.

12. In a machine of the character described, a main frame adapted to travel along a trackway, a pair of tie lifting claws carried by said frame, and adapted to be lowered to a position below a rail, there to be moved into engagement with a tie beneath a rail, and to be raised to bring the tie up to contact with the rail, and two separably operable means for moving said two claws simultaneously the first to grip a tie and then the second to raise the same into contact with the rail.

13. In a machine of the character described, a frame adapted to be supported from and moved along a trackway, a pair of tie lifting claws carried by said frame, a motor for raising and lowering said claws, and a strain equalizing connection between the two claws and the motor, and adapted to equalize the lifting strains on the individual claws.

14. In a machine of the character described, a frame adapted to be supported from and moved along a trackway, a pair of vertically reciprocable rods slidably mounted on said frame, and having claws on their ends adapted to engage with a tie beneath a rail, an equalizing connection between the upper ends of said rods, and a reciprocable operating part connecting with said equalizing connection between the said two rods.

15. In a machine of the character de-

scribed, a frame adapted to be supported in gaged relation to and moved along a trackway, a pair of tie lifting claws on each side of a vertical longitudinal plane passing through a rail when the machine is in operation, the claws of each pair being spaced to receive a tie between them, common operating means for said claws, and a four point equalizing connection operatively connecting them together and to said operating means.

16. In a machine of the character described, a frame adapted to be supported from and moved along a trackway, a pair of tie lifting claws carried by said frame, a motor for raising and lowering said claws, a strain equalizing connection between the two claws and the motor, and adapted to equalize the lifting strains on the individual claws, and springs biasing said claws to predetermined normal relative positions.

17. In a machine of the character described, a frame adapted to be supported in gaged relation to and moved along a trackway, a pair of tie lifting claws supported on said frame on a line making an acute angle with a longitudinal vertical plane including the rail when the machine is in position, and means for simultaneously lowering and raising the claws to lift a tie into place beneath the rail.

18. In a machine of the character described, a frame adapted to be supported in gaged relation to and moved along a trackway, a pair of vertically reciprocable spaced rods confined against lateral movement longitudinally of the rail and carrying claws adapted to engage and hold a tie, and a common reciprocating operating motor for said rods located between and parallel with the rods, and means connecting the rods with the motor.

19. In a machine of the character described, a frame adapted to be supported from and in gaged relation to a trackway, a tie lifting claw operatively supported from said frame and adapted to engage and hold a tie, said claw having a recess formed in one of its engaging faces to accommodate a projecting part associated with the tie at the point of engagement, and means for lowering and raising said claw.

20. In a machine of the character described, a frame adapted to be supported in gaged relation to and moved along a trackway, a pair of tie lifting claws adapted to engage a tie, and means for lowering and raising said claws to lift a tie, said claws having relative normal positions such that one overlaps the other beneath the tie when they are moved into engaging positions.

21. In a machine of the character described, a frame adapted to be supported from, in gaged relation to and moved along a trackway, vertically operable tie lifting

claws carried by the frame, means for operating said claws into and out of the plane of the trackway, and means for adjusting the positional relation of said frame to the trackway, whereby the path of movement of said claws is determined with respect to the plane of the trackway.

22. In a machine of the character described, a frame adapted to be supported from and above in gaged relation to and moved along a trackway, without disturbing said relation, a pair of rail securing devices adapted to secure rails to transverse ties beneath them, one located on each side of a vertical longitudinal plane passing through a rail when the machine is in operation, common means for operating said securing devices simultaneously to fasten a tie to opposite sides of a rail, and associated clamping means to hold rail and tie together during the operation of the securing means.

23. In a machine of the character described, a frame adapted to be supported from and above in gaged relation to and moved along a trackway, without disturbing said relation, a pair of separated depending rail securing devices adapted to secure rails to transversely extending ties beneath them, one located on each side of a vertical longitudinal plane passing through a rail when the machine is in operation, common means for operating said securing devices simultaneously to fasten a tie to opposite sides of a rail, and a clamping device associated with each rail securing device and arranged to hold the rail and tie together during the securing operation.

24. In a machine of the character described, a frame adapted to be supported from above, in gaged relation to and moved along a trackway, a reciprocally operating rail securing device adapted to secure rails to transversely extending ties beneath them operatively supported from said frame together with an independently supported approximately vertically reciprocable operating member connected therewith, and means for reciprocating the said operating member in normal operation to operate the said fastening device.

25. In a machine of the character described, a frame adapted to be supported from above, in gaged relation to and moved along a trackway, a rail securing device operatively supported from said frame and having a vertically reciprocating operating member connected therewith, said securing device being adapted to be given a normal operating position beside and adjacent to a rail, means for lowering the said device to said operating position and raising it therefrom at will, and means for reciprocating said operating member in normal operation to operate the securing device when the same is in operating position.

26. In a machine of the character described, a frame adapted to be supported from above in gaged relation to, and moved along a trackway, a rail securing device adapted to secure rails to transversely extending ties beneath them supported from said frame and comprising a lever pivoted at one end to the said frame, and adapted at its other end to operate upon a fastener at the base of the rail and independently supported operating means connected with said lever adjacent its engaging end and adapted in normal operation to swing the said lever about its pivot to perform a securing operation on a fastening.

27. In a machine of the character described, a frame adapted to be supported from above, in gaged relation to, and moved along a trackway, a rail securing device supported from said frame adapted to secure rails to transversely extending ties beneath them, and comprising a toggle lever mechanism connected at one end to the frame and having its other end adapted to operate upon a fastening at the base of the rail, and operating means connected with said toggle device for making and breaking said toggle in normal operation to cause the engaging end of the same to perform a securing operation on a fastening.

28. In a machine of the character described, a frame adapted to be supported from above, in gaged relation to, and moved along a trackway, a rail securing device supported from said frame adapted to secure rails to transversely extending ties beneath them and comprising a vertically arranged toggle lever mechanism connected at one end to the frame, and having its other end adapted to operate upon a fastening at the base of the rail, the line of the toggle when extended being normal to the head of the fastening and base of the rail, and operating means connected with said toggle device for making and breaking said toggle in normal operation to cause the engaging end of the same to perform a securing operation on a fastening.

29. In a machine of the character described, a frame adapted to be supported from above, in gaged relation to, and moved along a trackway, a rail securing device for securing rails to transversely extending ties beneath them arranged to exert vertical pressure on a fastener at the base of a rail when laterally moved, a vertically moving operating member for said fastening device, and translating connections between said vertically moving operating member and said rail securing device whereby said vertically moving member imparts in normal operation of said machine lateral motion to said securing device.

30. In a machine of the character described, a frame adapted to be supported

from above, in gaged relation to, and moved along a trackway, a tie clip crimping device carried by said frame and comprising a vertically extending lever, the upper end of which is pivoted to said frame, and the lower end of which is provided with an engaging surface operating in a horizontal plane and adapted in normal operation to crimp a rail clip through lateral movement about the said pivot and pressure exerted in the direction of its length, and power multiplying mechanism connecting with said lever near its lower end to impart in the normal operation of the machine lateral motion thereto for the crimping action.

31. In a machine of the character described, a frame adapted to be supported from above, in gaged relation to, and moved along a trackway, a tie clip crimping device carried by said frame adapted to secure rails to transversely extending ties beneath them and comprising a vertically extending lever, the upper end of which is pivoted to said frame, and the lower end of which is provided with an engaging surface operating in a horizontal plane and adapted to crimp a rail clip through lateral movement about the said pivot and pressure exerted in the direction of its length, a power multiplying lever connected with said crimping lever near its lower end, a reciprocating motor, and a link connecting said motor to said lever.

32. In a machine of the character described, a frame adapted to be supported from, in gaged relation to, and moved along a trackway, and a tie lifting mechanism adapted to lift into contact with the undersides of rails transversely extending ties beneath them, together with means for adjusting said mechanism bodily vertically to and from the road bed independently of the tie lifting operation.

33. In a machine of the character described, a frame adapted to be supported from, in gaged relation to, and moved along a trackway, and a tie lifting mechanism adapted to lift into contact with the undersides of rails transversely extending ties beneath them, together with means for shifting the tie mechanism horizontally toward and from the vertical plane of the rail independently of the tie lifting operation.

34. In a machine of the character described, a main truck frame, a pair of independently horizontally adjustable auxiliary frames mounted thereon one on each side of the frame, and a rail securing mechanism carried by each of said frames whereby said mechanisms may be independently adjusted to gage.

35. In a machine of the character described, a main truck frame, tie lifting devices one at each side of said main truck

frame, means for adjusting said tie lifting devices toward and from each other, and an adjustable common operating connection between said tie lifting devices whereby said devices may be simultaneously moved into and out of operating position.

36. In a machine of the character described, a main truck frame, and a clip crimping mechanism carried thereby and comprising a vertically extending lever pivoted to the frame at its upper end and having a clip engaging surface operating in a substantially horizontal plane whereby it is adapted to engage and crimp a clip by its lower end, a power multiplying mechanism connected with said lever approximately at its lower end and adapted to rock the same about its pivot in the crimping operation.

37. In a machine of the character described, a frame adapted to be supported from above, in gaged relation to and moved along the trackway without disturbing said relation, a pair of reciprocating rail securing devices, one located on each side of a vertical longitudinal plane passing through a rail when the machine is in operation, and common means for reciprocating said devices simultaneously to fasten a tie to the opposite side of a rail.

38. In a machine of the character described, a frame adapted to be supported from above, in gaged relation to and moved along the trackway, a rail fastening mechanism supported from the frame and vertically adjustable as a whole to and from the road bed, and horizontally adjustable toward and from the vertical planes of the rails, together with a tie lifting mechanism rigidly connected to said rail fastening mechanism and adjustable therewith.

39. In a machine of the character described, a frame adapted to be supported from above, in gaged relation to, and moved along a trackway, a rail fastening mechanism supported from the frame and vertically adjustable bodily toward and from the road bed, and a tie clamping mechanism secured to said rail fastening mechanism and adjustable simultaneously therewith.

40. In a machine of the character described, a main truck frame, a pair of independently vertically adjustable auxiliary frames mounted thereon one on each side of the main truck frame, a rail securing mechanism carried by each of said frames, and a tie lifting and clamping mechanism associated with each of said rail securing mechanisms and adjustable therewith, whereby the securing and clamping mechanisms at the opposite sides of the main truck frame are adjustable as a unit independently toward and from the plane of the road bed.

41. In a machine of the character described, a main truck frame, a tie lifting

device one at each side of said main truck frame, and an adjustable common operating connection between said tie lifting devices whereby said devices may be simultaneously
5 moved into and out of operating position.

42. In a machine of the character described, a frame adapted to travel along the trackway, a tie lifting claw carried by said frame and adapted to be shifted into engagement with a tie beneath a rail and to
10 be lowered into tie engaging position and

correspondingly raised with the tie, a motor for shifting said claw to engaging position and an independently controllable power
motor for lowering and raising said claw. 15

In testimony whereof I affix my signature in presence of two witnesses.

JAMES B. HOGE.

Witnesses:

J. ERICSSON,
N. G. COEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."