May 10, 1966 R. E. KELLER 3,250,229

TIE AND RAIL RAISING AND TAMPING MACHINE

Filed Nov. 13, 1962 4 Sheets-Sheet 1

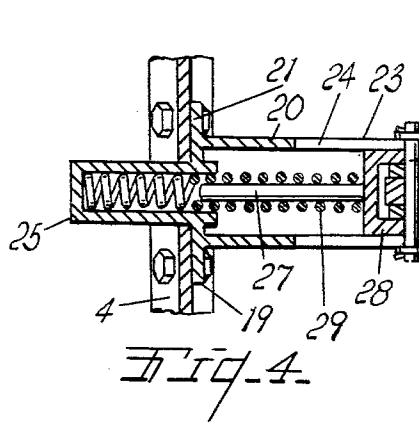

FIG. 4

FIG. 1

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TIE AND RAIL RAISING AND TAMPING MACHINE

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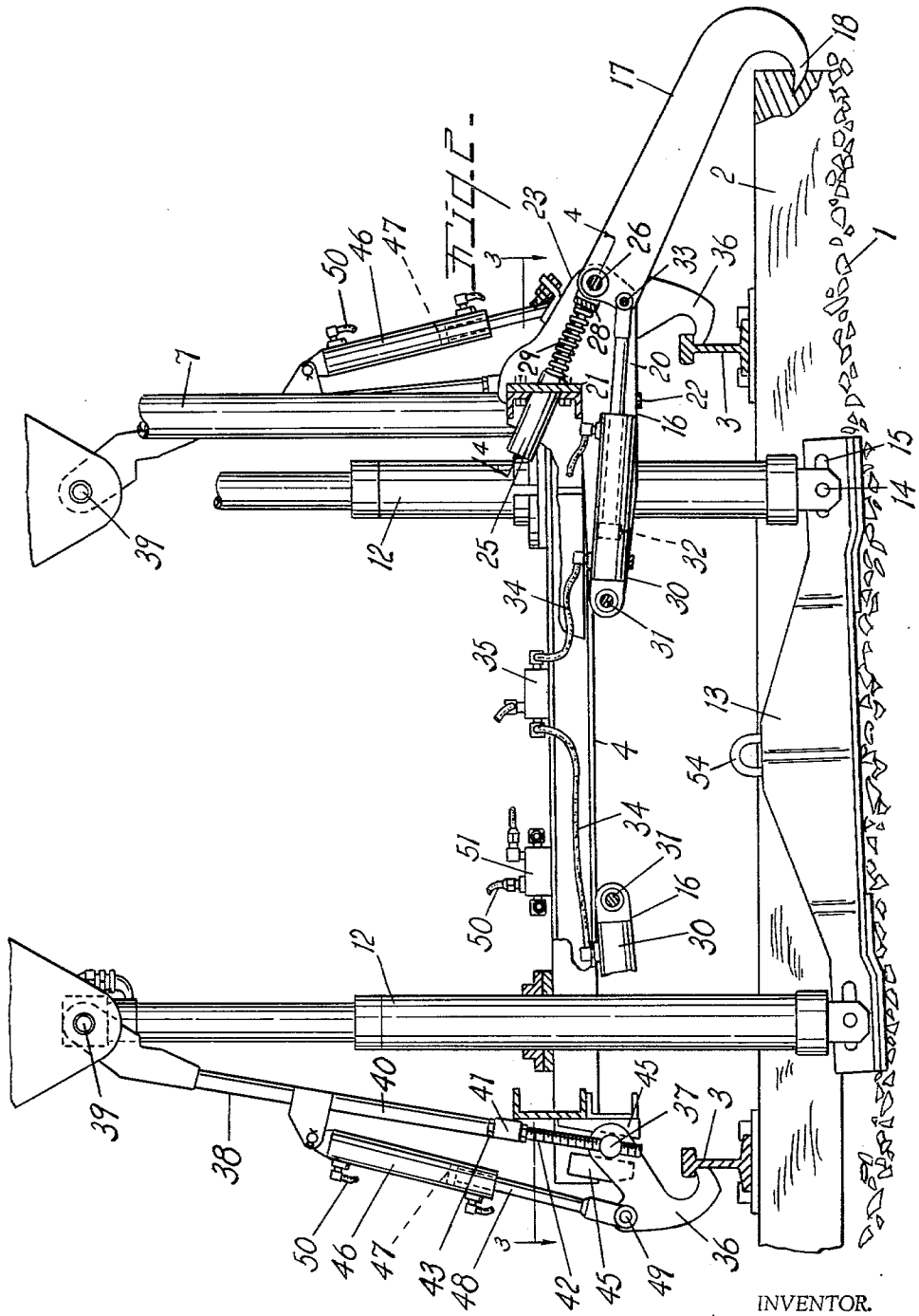

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TIE AND RAIL RAISING AND TAMPING MACHINE

Filed Nov. 13, 1962 4 Sheets-Sheet 3

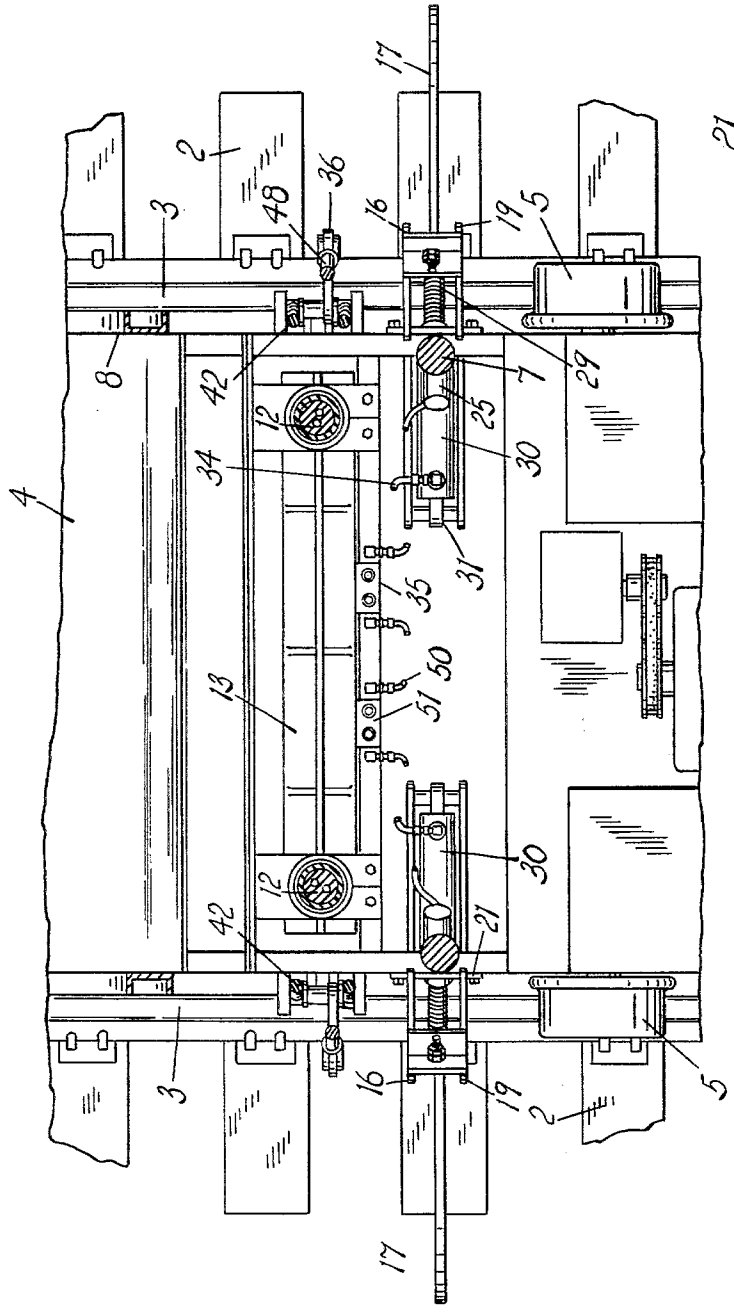

FIG. 3.

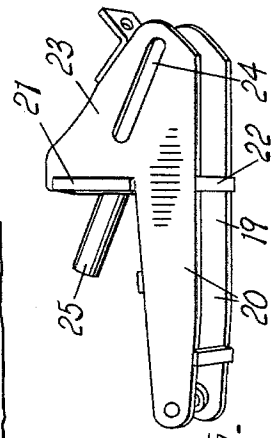

FIG. 5.

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TIE AND RAIL RAISING AND TAMPING MACHINE

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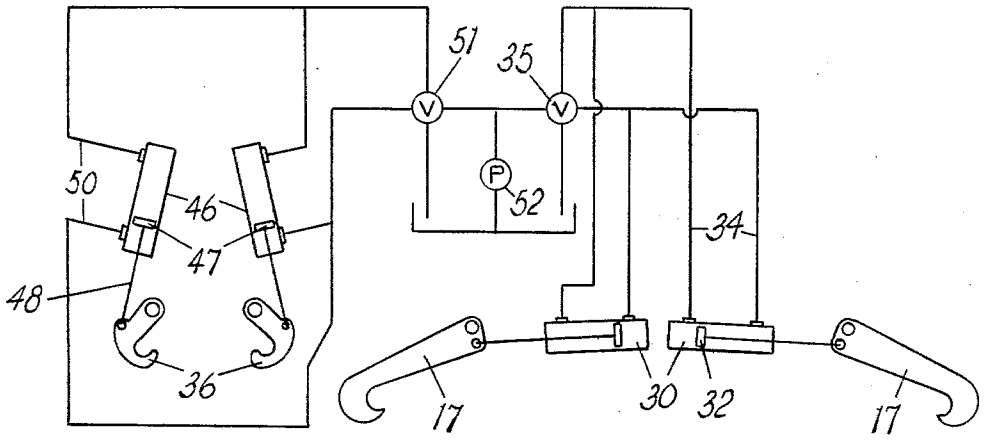

Fig. 6

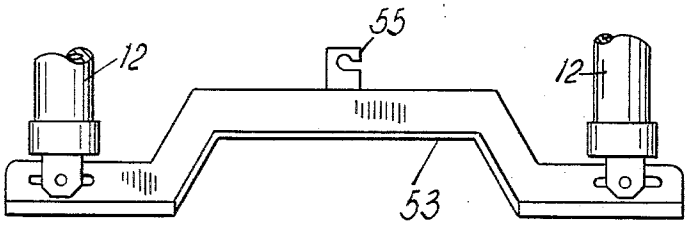

Fig. 7

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United States Patent Office 3,250,229 Patented May 10, 1966

3,250,229

TIE AND RAIL RAISING AND TAMPING MACHINE

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Filed Nov. 13, 1962, Ser. No. 237,126
13 Claims. (Cl. 104—7)

This invention relates to a machine for raising the ties and rails of a railway track and tamping the ballast while the ties and rails are in raised position. My present invention is particularly desirable for, and has been embodied in, tie and rail raising and tamping machines such as is illustrated in my U.S. Patent 2,996,016, issued August 15, 1961, for tie and rail raising and tamping machine.

The main objects of this invention are,

First, to provide a tie and rail raising and tamping machine which is highly efficient, is strong and durable and at the same time is easily and quickly operated.

Second, to provide a machine embodying these advantages including a tie raising means which automatically adjusts to ties of varying lengths and degrees of solidity.

Third, to provide a machine having these advantages which is adapted for use in widely varying track conditions.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is defined and pointed out in the claims.

A preferred embodiment of the invention is illustrated in the accompanying drawing, in which:

FIG. 1 is a fragmentary side elevational view of a tamping machine embodying my invention, parts of the machine not directly related to my invention being omitted, the tamper unit being shown in raised position.

FIG. 2 is a fragmentary view illustrating structural detils of the tie and rail clamping jaws actuated to rail and tie engaging position.

FIG. 3 is a fragmentary horizontal section on a line corresponding to lines 3—3 of FIG. 2.

FIG. 4 is an enlarged fragmentary view on a line corresponding to line 4—4 of FIG. 2.

FIG. 5 is a perspective view of the tie engaging unit bracket.

FIG. 6 is a diagrammatic view illustrating the coacting relation of the tie and rail engaging clamping jaws and the control means thereof.

FIG. 7 is an enlarged fragmentary elevational view of a modified form of a ballast engaging footpiece.

As stated, my present invention is an improvement upon, and is adapted to be embodied in, tamping machines of the type illustrated in my Patent 2,996,016, and therefore structural details of the complete tamping machine are not illustrated. Reference is made particularly to FIG. 1 of that patent as illustrating a tamping machine of the type which is desirable for use in my present invention.

In the accompanying drawing **1** represents ballast, **2** ties, and **3** the rails of a railway track. It will be understood that ballast varies as does the length of the ties and their degree of solidity, and the gauge of the rails may also vary in different tracks. The carriage, designated generally by the numeral **4**, is provided with wheels **5**, the rear wheels being commonly driven, and provided with manual control means for positioning the carriage relative to the ties to be tamped. A driving control lever is conventionally illustrated at **6**. The carriage is provided with uprights **7** provided with braces **8** and having a cross piece **10** adjacent their upper ends.

The tamper unit, designated generally by the numeral **11**, is mounted on the frame for vertical adjustment. The tamper units and adjusting means therefor are not fully

illustrated, but they are desirably of the type illustrated in my said patent and also in the Jackson Patent 2,795,198, issued June 11, 1957. The laterally spaced hydraulic jacks **12** are provided with a footpiece **13** adapted to engage the ballast between adjacent ties. The jacks are connected to this footpiece by the pins **14** engaging longitudinal slots **15** in the footpiece. This permits tilting and limited sliding movement of the footpiece relative to the jacks.

The means for controlling the jacks are not illustrated, but it will be understood that the carriage is positioned so that the jacks may be lowered to engage the ballast between ties and that properly positions the carriage for adjusting the tampers to and from tamping position. This also positions tie and rail engaging means relative to the tie to be tamped. The tie and rail engaging means are engaged with the ties and rails prior to the actuation of the jacks. That combination, generally considered, is disclosed in my issued patent.

The tie engaging units, designated generally by the numeral **16**, are duplicates and they are arranged in opposed aligned relation for engagement with the ends of a tie, see FIG. 3. Each unit includes an elongated tie engaging hook **17** having an inwardly facing jaw **18** engageable with the end of a tie, see FIG. 2.

The supporting brackets **19** include the laterally spaced plate-like member **20** fixedly connected by the crosshead **21** desirably integral therewith, as is illustrated in FIG. 4, and further connected by the struts **22**, see FIG. 5. The portions **23** of these members **20** project outwardly from the frame and they are provided with parallel longitudinal slots **24** disposed transversely of the path of travel of the carriage. The cross-head portion **21** has an inwardly projecting socket **25**, the purpose of which will appear as the description proceeds.

The tie engaging hook **17** is connected to the bracket member by means of a pivot **26** slidably disposed in the slots **24**. Means are provided for yieldingly urging the hooks outwardly relative to their supporting brackets, this comprising thrust means, here a rod **27** having a yoke **28** at its outer end embracing the inner end of the jaw and engaged with the pivot **26**. The spring **29** is arranged on the stem or rod **27** and extends into the spring supporting socket **25** which is of such length that the jaw can be moved inwardly a substantial distance and into effective clamping engagement with the end of the tie.

The jaw is actuated on its pivot and clampingly engaged with the end of the tie by hydraulic means comprising the cylinder **30** which is pivotally mounted at **31** on the bracket member and is provided with a plunger **32** and plunger rod, the plunger rod being pivotally connected to the jaw at **33** in downwardly spaced relation to its pivot **26**. The cylinder is connected to a hydraulic source by the conduits **34**, control means **35** for the two tie engaging jaw unit actuating means being indicated conventionally in FIG. 2. It will be understood that this may be manually or automatically controlled, details of the control means not being illustrated. It will be understood that it is timed with the positioning of the carriage and the actuation of the jacks, the tie engaging jaws being actuated to engaged position before the jacks are actuated.

The cooperating rail engaging units are duplicates and one is arranged to engage each rail. They comprise rail engaging jaws **36** which are pivotally mounted at **37** on the lower portion of vertically adjustable hangers **38** mounted at **39**.

In the embodiment illustrated, the hangers **38** of the rail engaging hooks include upper sections **40** pivotally mounted at **39**. The upper hanger members **40** have crosspieces **41** at their lower ends with which the threaded hanger members **42** are connected by means of the

nuts 43. These members 42 have slides 44 slidably engaged in the ways 45 provided therefor on the frame.

The jaw 36 is pivotally mounted on one of these slide members and is actuated to and from rail engaging position by hydraulic means comprising the cylinder 46 with a coacting plunger 47 provided with a plunger rod 48 which is pivotally connected at 49 to the rail engaging jaw, see FIG. 2. The cylinder 46 is provided with hydraulic connections 50 operatively connected to the control member designated generally by the numeral 51 which is connected to a hydraulic source.

In the diagrammatic view of FIG. 6, the control valves 35 and 51 are conventionally illustrated in their relationship to a source of power 52. It will be understood that the control valves 35 and 51 might be connected for simultaneous actuation to and from engaging position and in proper timed relation to the actuation of the jacks.

In the embodiment shown in FIG. 7, the tamper footpiece 53 is provided with an intermediate upwardly offset portion. This footpiece is desirable for use where ballast may be stacked up between the ties as sometimes occurs. The footpiece 13 is provided with an intermediate hanger loop 54 and the footpiece 53 with a hanger 55, the hanger means not being illustrated, but it will be understood that it is desirable to support the jack footpieces in upraised position when the tamping machine is not in use.

I have illustrated and described my invention in highly practical and desirable embodiments thereof. I have not attempted to illustrate other embodiments or adaptations as it is believed that this disclosure will enable those skilled in the art to embody or adapt my invention as may be desired.

Having thus described the invention, what is claimed as new and desired to secure by Letters Patent is:

1. A machine of the class described comprising a carriage adapted to travel on the rails of a railway track, jack means for vertically adjusting said carriage relative to each of the rails on which the carriage is disposed, tie engaging units disposed in opposed relation for engagement with opposite ends of a tie, each unit including an elongated tie engaging hook having a downwardly and inwardly facing jaw at its outer end engageable with the end of a tie, a supporting bracket including laterally spaced fixedly connected plate-like members mounted on said carriage in transverse vertically spaced relation to a rail on which the carriage is traveling, said bracket members having aligned longitudinally disposed slots adjacent their outer ends, the inner end of said tie engaging hook being disposed between the outer ends of said bracket members, a pivot for said tie engaging hook slidably disposed in said slots in said bracket members, thrust means for said jaw comprising a rod provided with a yoke at its outer end engaged with said pivot in slidably supported relation with said bracket members, a coiled thrust spring supportingly arranged on said rod, said bracket member having an integral tubular socket in which the inner end of said spring is supportedly disposed, a hydraulic cylinder disposed between said bracket members with its inner end pivotally connected thereto, a plunger rod pivotally connected to said tie engaging jaw below and in spaced relation to its said pivotal connection to said supporting bracket and provided with a plunger disposed in said cylinder, and manually controlled hydraulic power connections for said cylinder opening thereto on opposite sides of said plunger.

2. A machine of the class described comprising a carriage adapted to travel on the rails of a railway track, jack means for vertically adjusting said carriage relative to each of the rails on which the carriage is disposed, tie engaging units disposed in opposed relation for engagement with opposite ends of a tie, each unit including an elongated tie engaging hook having a downwardly and inwardly facing jaw at its outer end engageable with the end of a tie, a supporting bracket including laterally spaced fixedly connected plate-like members mounted on said carriage in transverse vertically spaced relation to a rail on which the carriage is traveling, said bracket members having aligned longitiudinally disposed slots adjacent their outer ends, the inner end of said tie engaging hook being disposed between the outer ends of said bracket members, a pivot for said tie engaging hook slidably disposed in said slots in said bracket members, springably yieldable thrust means for said jaw, a hydraulic cylinder disposed between said bracket members with its inner end pivotally connected thereto, a plunger rod pivotally connected to said tie engaging jaw below and in spaced relation to its said pivotal connection to said supporting bracket and provided with a plunger disposed in said cylinder, and manually controlled hydraulic power connections for said cylinder opening thereto on opposite sides of said plunger.

3. A machine of the class described comprising a carriage adapted to travel on the rails of a railway track, jack means for vertically adjusting said carriage relative to each of the rails on which the carriage is disposed, tie engaging units disposed in opposed relation for engagement with opposite ends of a tie, each unit including an elongated tie engaging hook having a downwardly and inwardly facing jaw at its outer end engageable with the end of a tie, a supporting bracket including laterally spaced fixedly connected plate-like members mounted on said carriage in transverse vertically spaced relation to a rail on which the carriage is traveling, said bracket members having aligned longitudinally disposed slots adjacent their outer ends, the inner end of said tie engaging hook being disposed between the outer ends of said bracket members, a pivot for said tie engaging hook slidably disposed in said slots in said bracket members, springably yieldable thrust means for said jaw, a hydraulic cylinder disposed between said bracket members with its inner end pivotally connected thereto, a plunger rod pivotally connected to said tie engaging jaw below and in spaced relation to its said pivotal connection to said supporting bracket and provided with a plunger disposed in said cylinder, and power connections for said cylinder opening thereto on opposite sides of said plunger.

4. A machine of the class described comprising a carriage adapted to travel on the rails of a railway track, jack means for vertically adjusting said carriage, a tie engaging unit including a tie engaging hook having a downwardly and inwardly facing tie engaging jaw, a supporting bracket including laterally spaced fixedly connected plate-like members mounted on said carriage in transverse vertically spaced relation to a rail on which the carriage is traveling, said bracket members having aligned longitudinally disposed slots adjacent their outer ends, the inner end of said tie engaging hook being disposed between the outer ends of said bracket members, a pivot for said tie engaging hook slidably disposed in said slots in said bracket members, thrust means for said jaw comprising a rod provided with a yoke at its outer end engaged with said pivot in slidably supported relation with said bracket members, a coiled thrust spring supportingly arranged on said rod, said bracket member having an integral tubular socket in which the inner end of said spring is supportedly disposed, and means for actuating said jaw to and from tie engaging position including a cylinder disposed between said bracket members with its inner end pivotally connected thereto, and a plunger rod pivotally connected to said tie engaging jaw below and in spaced relation to its said pivotal connection to said supporting bracket and provided with a plunger disposed in said cylinder.

5. A machine of the class described comprising a carriage adapted to travel on the rails of a railway track, jack means for vertically adjusting said carriage, a tie engaging unit including a tie engaging hook disposed transversely of the path of travel of the carriage and engageable with the outer end of a tie having a downwardly and inwardly facing tie engaging jaw, a supporting bracket

including laterally spaced fixedly connected plate-like bracket members fixedly mounted on said carriage in transverse vertically spaced relation to a rail on which the carriage is traveling, said bracket members having aligned longitudinally disposed slots adjacent their outer ends, the inner end of said tie engaging hook being slidably and pivotally supported in said slots in said bracket members, springably yieldable thrust means for said jaw, and means for actuating said jaw to and from tie engaging position including a cylinder disposed between said bracket members with its inner end pivotally connected thereto, and a plunger rod pivotally connected to said tie engaging jaw below and in spaced relation to its said pivotal connection to said supporting bracket and provided with a plunger disposed in said cylinder.

6. A machine of the class described comprising a carriage adapted to travel on the rails of a railway track and including a frame provided with uprights, jack means mounted on said carriage, a pair of rail engaging hooks supportedly and adjustably mounted on said carriage, means for adjusting said hooks to and from and supporting them in rail engaging and in retracted position comprising upper hanger members dependingly mounted on said carriage uprights and having crosspieces at their lower ends, threaded lower hanger members dependingly mounted on said crosspieces, slideways on said carriage with which said lower hanger members are slidably and guidingly engaged, means for adjusting said rail engaging hooks to and from and supporting them in rail engaging position comprising cylinders pivotally mounted on said upper hanger members in lateral outwardly spaced relation thereto, and plungers coacting with said cylinders and pivotally connected to said hooks in outwardly spaced relation to their pivotal connections to said hangers.

7. A machine of the class described comprising a carriage adapted to travel on the rails of a railway track and including a frame provided with relatively fixed uprights, jack means translatingly mounted in said carriage, a pair of rail engaging hooks supportedly and adjustably mounted on said carriage, means for adjusting said hook to and from and supporting them in rail engaging and in retracting position comprising upper hanger members dependingly mounted on said carriage uprights, lower hanger members adjustably mounted on said upper hanger members, slideways on said carriage with which said lower hanger members are slidably engaged, means for adjusting said rail engaging hooks to and from and supporting them in rail engaging position comprising cylinders supportedly mounted on said upper hanger members, and plungers coacting with said cylinders and pivotally connected to said hooks in laterally spaced relation to their pivotal connections to said hangers.

8. A machine of the class described comprising a carriage adapted to travel on the rails of a railway track and including a frame provided with an upright, jack means mounted on said carriage, a rail engaging hook supportedly and adjustably mounted on said carriage, means for adjusting said hook to and from and supporting it in rail engaging and in retracted position comprising an upper hanger member dependingly mounted on said carriage upright and having a crosspiece at its lower end and threaded lower hanger members mounted on said crosspiece, slideways on said carriage in which said lower hanger members are slidably and guidingly engaged, and means for adjusting said rail engaging hook to and from and supporting it in rail engaging and retracted positions comprising a cylinder pivotally mounted at its upper end on said upper hanger member, and a plunger coacting with said cylinder and pivotally connected to said hook in outwardly spaced relation to its pivotal connection to said hanger.

9. In a machine of the class described comprising a carriage adapted to travel on the rails of a railway track and including a frame provided with an upright, jack means mounted on said carriage, a rail engaging hook, means for supporting said hook and adjusting it to and from rail engaging position comprising a hanger member dependingly mounted on said carriage, means for laterally supporting the lower end of said hanger member and means for adjusting said rail engaging hook to and from and supporting it in rail engaging and retracted position comprising a cylinder mounted on said hanger member, and a plunger coacting with said cylinder and pivotally connected to said hook in laterally spaced relation to its connection to said hanger.

10. A machine of the class described comprising a carriage adapted to travel on the rails of a railway track and including upwardly projecting frame members, jack means mounted on said carriage and comprising a pair of laterally spaced jack members, a footpiece mounted on said jack members and having an intermediate portion therein upwardly offset to a nonballast engaging degree, a pair of rail engaging hooks, hangers for said hooks dependingly mounted on said carriage, means on said carriage for laterally supporting the lower ends of said hanger members, means for adjusting said rail engaging hooks to and from and supporting them in rail engaging position comprising cylinders mounted on said hanger members, and plungers coacting with said cylinders and pivotally connected to said hooks in laterally spaced relation to their pivotal connections to said hangers.

11. A machine of the class described comprising a carriage adapted to travel on the rails of a railway track and including upwardly projecting frame members, jack means mounted on said carriage, a pair of rail engaging hooks, hangers for said hooks dependingly mounted on said carriage, means on said carriage for laterally supporting the lower ends of said hangers, means for adjusting said rail engaging hooks to and from and supporting them in rail engaging position comprising cylinders mounted on said hanger members, and plungers coacting with said cylinders and pivotally connected to said hooks in laterally spaced relation to their pivotal connections to said hangers.

12. A machine of the class described comprising a carriage adapted to travel on the rails of a railway track, jack means for vertically adjusting said carriage relative to each of the rails on which the carriage is disposed, tie engaging units disposed in opposed relation for engagement with the opposite ends of a tie, each unit including a tie engaging hook disposed transversely of the path of travel of the carriage and engageable with the outer end of a tie, a supporting bracket for said hook fixedly mounted on said carriage and having an elongated slot therein of substantial length disposed transversely of the carriage, a pivot for said tie engaging hook slidably and supportedly engaged in said bracket, spring means yieldingly urging said tie engaging hook outwardly relative to said carriage, and manually controlled means for raising and lowering said tie engaging hook to and from tie engaging position, said means permitting sliding movement of the hook pivot in said slot so that the hook is clampingly engageable with ties of varying length and density.

13. A machine of the class described comprising a carriage adapted to travel on the rails of a railway track, jack means for vertically adjusting said carriage relative to each of the rails on which the carriage is disposed, a tie engaging hook disposed transversely of the path of travel of the carriage and engageable with the outer end of a tie, a supporting bracket for said hook fixedly mounted on said carriage and having an elongated slot therein of substantial length disposed transversely of the carriage, a pivot for said tie engaging hook slidably and supportedly engaged in said bracket, means yieldingly urging said tie engaging hook outwardly relative to said carriage, and manually controlled means for raising and lowering said tie engaging hook to and from tie engaging position, said means permitting sliding movement of the hook pivot in said slot so that the hook is supportingly

engageable with ties, the ends of which are varyingly spaced from the rail on which the carriage is traveling.

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