June 2, 1953 C. C. GRIFFITHS 2,640,435

SIDE RELEASE TABLE FOR SERVICING RAILROAD VEHICLES AND THE LIKE

Filed April 13, 1950 3 Sheets-Sheet 1

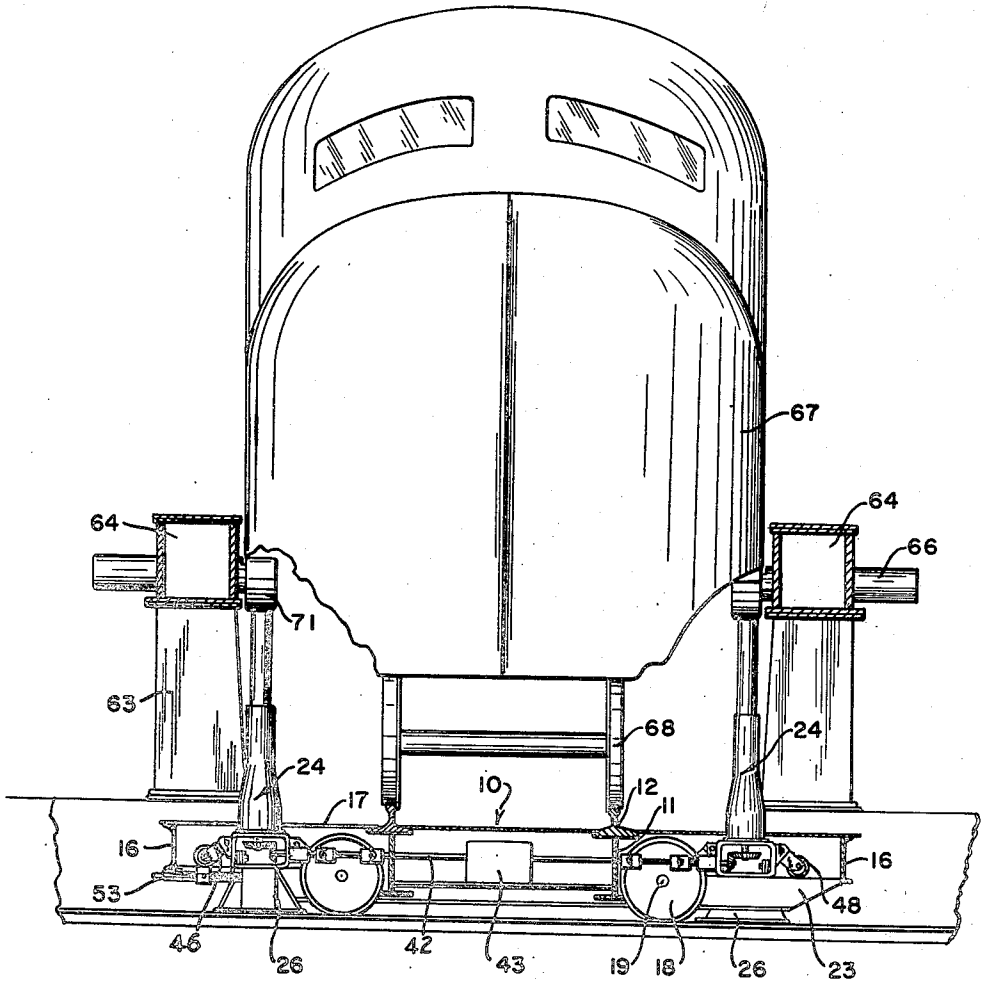


FIG. 1

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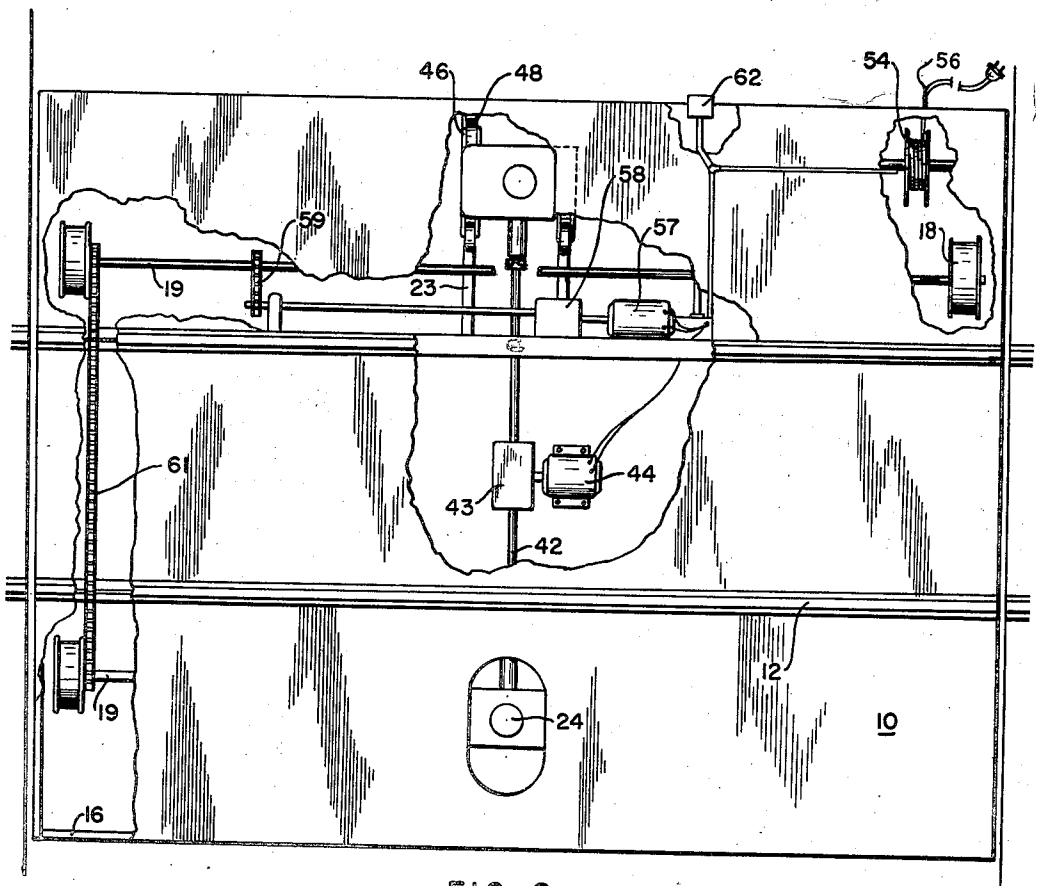


FIG. 2

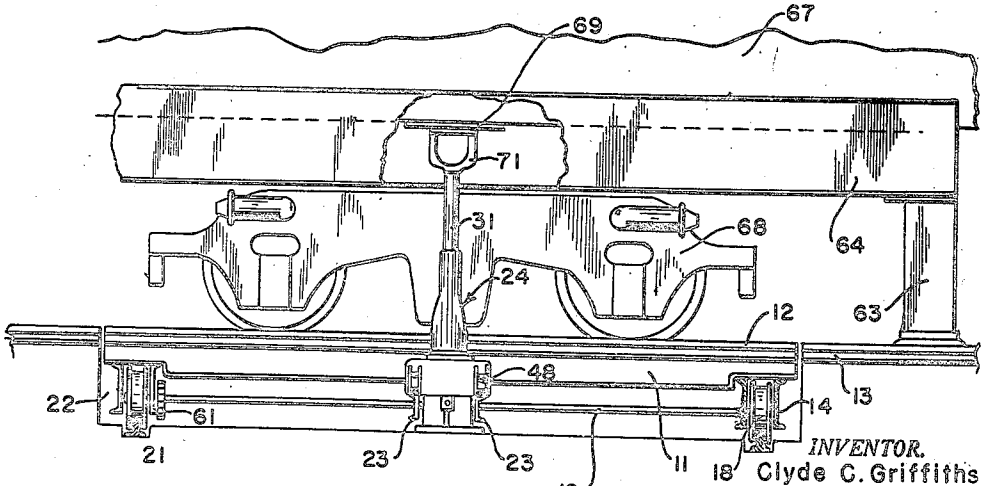


FIG. 3

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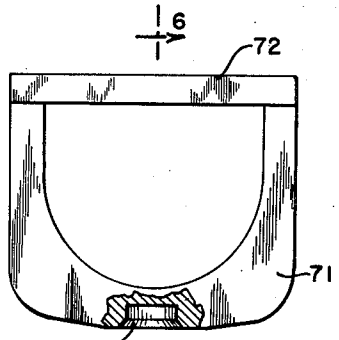


FIG. 5

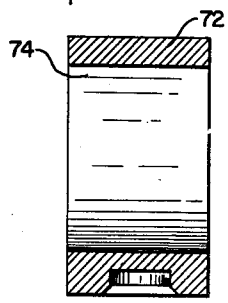


FIG. 6

FIG. 4

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SIDE RELEASE TABLE FOR SERVICING RAILROAD VEHICLES AND THE LIKE

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Application April 13, 1950, Serial No. 155,659

8 Claims. (Cl. 104—32)

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This invention is directed to apparatus for servicing the running gear of railway vehicles and the like.

In large railway shops it is customary to install drop table devices for use in removing trucks, axle assemblies, and similar sub-assemblies from railway vehicles. In most instances such installations require the construction of a relatively deep pit extending transversely to railway vehicle tracks and the provision of heavy, relatively expensive drop table apparatus for operation in the pit. Experience has shown that drop table installations are highly efficient and that their expense is well justified in a relatively large railway vehicle repair shop, provided of course that the soil conditions are such as to permit the construction of a deep pit.

There is a need, however, for simple, inexpensive, and easily installed apparatus for performing the same function, but particularly adapted for use in smaller shops, or in areas where soil conditions do not permit utilization of deep pits.

One of the important objects of my invention is the provision of an easily installed, efficient, and inexpensive apparatus of the type described, which is particularly useful in connection with fixed body supports for servicing the running gear of railway vehicles and the like. More specifically, the objects of this invention include the provision of a side release table of the shallow pit type particularly adapted to operate in conjunction with fixed body supports and incorporating means on the table movable transversely with respect to the table for lifting the vehicle body by the application of force to the vehicle jacking pads on the body; and means cooperating with the lifting means, the vehicle body, and the body support devices for releasing the lifting means after the support device has been moved into engagement with the vehicle body.

Other important objects of this invention, as well as many of its outstanding advantages will be disclosed in the course of the following description and in the appended drawings, in which:

Fig. 1 is a partially sectioned elevation of this invention;

Fig. 2 is a partially broken away plan view of my side release table;

Fig. 3 is a partially broken away, partial side elevation of this device;

Fig. 4 is a partially sectioned elevation of a jack suitable for use with my device;

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Fig. 5 is a partially broken away elevation of a stirrup adapted for engagement with the top of a jack; and

Fig. 6 is a cross section taken along the lines 6—6 of Fig. 5.

In brief, this apparatus includes a relatively light wheeled table, usually of rectangular shape, adapted for movement along rails disposed in the bottom of a shallow pit, usually constructed in the floor of a railway repair shop and extending transversely to the vehicle tracks on the floor. Rail sections are carried by the table for alignment with the tracks in such manner as to bridge the pit and permit passage of a vehicle when desired. Near the point at which the pit and vehicle tracks intersect, I provide body support devices, preferably extending over the pit and adapted to support a railway vehicle body, or the like, in elevated position.

On the table I provide a pair of telescoping jacks which extend upwardly through the table and are provided with bases, which are normally held by resilient means out of engagement with the floor of the pit. As a load is applied to the jacks, as by engagement with the vehicle body, the resilient means yield sufficiently to permit the base of each of the two jacks to come into contact with the pit floor, thus relieving the table of a major portion of the load. The jacks are movably mounted on support means extending parallel to the direction of movement of the table, thus permitting servicing of vehicles which have jacking pads in various locations. Means are also provided for moving the table while the jacks are in engagement with the vehicle body, thereby permitting transverse adjustment or movement of a truck or axle assembly in position on the table. To permit release of the jacks, stirrups are provided, each having a wall opening for engagement with the movable head of the jack and a side opening for engagement with the support arms slidably mounted in the vehicle support girders. Thus the jacks are utilized to raise the vehicle body until the arms can be moved inwardly into engagement with the stirrups, the jacks thereafter lowered and the side release table carrying the released truck or axle assembly moved transversely from beneath the vehicle.

As illustrated in greater detail by the drawings, the table, generally designated 10, includes a pair of parallel, relatively heavy I-beams 11 extending laterally across the table 10 and spaced to receive rail sections 12 in proper position for alignment with vehicle tracks 13. The beams 11 are con-

nected at each end by parallel tranverse channel members 14, which are in turn connected at their extremities by channel members 16. If desired, a floor 17 may be provided extending over the tops of the members 14 and 16.

Rail wheels 18 are secured to axles 19, which are in turn journaled in the parallel channel members 14 somewhat inwardly from the end channel members 16 and are spaced for movement along rails 21 mounted in the floor of a shallow pit 22, which extends transversely with respect to the rails 13. Approximately at the transverse center line of the table 10, I provide spaced channel-shaped jack support members 23 extending laterally between the I-beams 11 and the end channel members 16. Jacks, generally designated 24, are provided with heavy bases 26, which extend downwardly between the members 23 for engagement with the floor of the pit 22 when a load is applied to the jacks 24.

The jacks are two in number; and at least one, and preferably both, are mounted for transverse movement. Each of the jacks includes a rigid housing 27, which extends upwardly through the floor 17 and is provided with an internal plate or guide 28, which engages a lifting bar 29, the latter being polygonal in cross section and extending through an opening of corresponding shape formed in the plate 28. A telescoping jack head 31 is fitted slidably into the upper end of the housing 27 and engages the lifting bar 29 in such manner as to move upwardly and downwardly with the bar. The top of the head 31 is provided with a boss 32. The lower end of the bar 29 is threaded and engages a threaded opening formed in a bevel gear 33 supported in the housing 27 by suitable bearings 34 and meshing with a bevel pinion 36. The pinion 36 is secured to a pinion shaft 37 journaled in the housing 27 and secured at its outer end to a universal joint 38, the opposite end of the joint engaging a splined shaft 39, which is in turn secured at its opposite end to a universal joint 41. The joint 41 is also connected to a shaft 42 extending transversely of the table 10 to a gear box 43, which is driven by a suitable motor 44 mounted on the frame of the table 10.

The base 26 extends downwardly between the jack support members 23 and is resiliently supported thereon in such manner that under normal conditions the base 26 is held in raised position away from the floor of the pit 22. The strength of the resilient device is, however, such that when an appreciable load is placed on the jack head 31, the jack base 26 will be forced downwardly into engagement with the pit floor. A suitable means for mounting the jacks includes four arms 46 pivotally secured to ears 47 fixed to the housing 27 and extending laterally outwardly and downwardly in the planes of the jack support members 23. Wheels 48 are journaled to the outer end of the arms 46 and engage the jack support members 23. Springs 49 engage the housing 27 and rods 51, the opposite ends of which are secured to the arms 46. The strength of these springs is adjusted in such manner that the bases 26 of the jacks 24 are normally held upwardly away from the pit floor and between the axles 19 and the channel members 16.

A nut 52 is secured to the table 10 and receives a transversely extending threaded screw 53, one end of which preferably projects transversely beyond the channel member 16. The opposite end of the screw 53 is rotatably secured to the base 26 in such manner that rotation of the screw 53 will move the table 10 transversely along its rails 21 when the jack 24 is loaded and the base 26 is in engagement with the floor of the pit 22.

In many instances the table 10 may be moved manually along the rails 21, or by utilization of a lever and ratchet mechanism acting on the axles 19. However, if the contemplated loads are large and the distance to be traversed is relatively great, power means may be employed. For example, a spring-tensioned electric cable reel 54 may be mounted on the table 10 and receives a cable 56, one end of which may be connected to a suitable source of electric power. The cable 56 supplies current to the motor 44 and to a second motor 57 carried by the table 10 and connected to a gear box 58. The output shaft of the gear box 58 drives a sprocket and chain assembly 59 secured to one of the axles 19, the latter also being connected by a suitable sprocket and chain assembly 61. A motor control device 62 is mounted on the table and connected in suitable manner for control of the motors 44 and 57, both of which should be reversible.

Four pillars 63 resting on the floor on either side of the pit 22 support longitudinal parallel girders 64 on opposite sides of the track 13. The girders 64 extend across the pit 22 and slidably support transversely extending arms 66, which may suitably be generally cylindrical in shape, but provided with a flat upper surface to prevent rotation of the arms in the girders. The arms 66 extend inwardly towards the body of a vehicle 67 at a predetermined height selected to support the body of the vehicle 67 in the position desired for the removal of trucks 28, which in operation would be disposed upon the rail sections 12. The vehicle 67 is provided on its body structure with jacking pads 69, usually of heavy cross section and disposed for engagement with lifting devices. To permit disengagement of the jack head 31 from the vehicle and at the same time to permit lifting of the vehicle by engagement with the packing pads 69, I provide stirrups 71 having a flat top surface 72 and an opening 73 in the wall of the stirrup 71 opposite the flat surface 72, said opening 73 being shaped to engage the boss 32. A transverse opening 74 is also formed in the stirrup in the shape to receive the projecting inner end of the arms 66.

When it is desired to remove the trucks or axle assemblies from a vehicle, the latter is moved along the tracks 13 until the truck or axle assembly 68 is positioned on the rail sections 12 of the table 10. Jacking pads 69 are aligned by movement of the vehicle 67 with the body support arms 66. The jacks 24 may be adjusted in position relative to the table 10 in such manner that the jack heads 31 are in alignment with the jacking pads 69, this being possible regardless of variations in width encountered in vehicles fabricated by different manufacturers.

Before actuating the jacks 24, stirrups 71 are placed on each of the jack heads 31 with the boss 32 engaging the opening 73 in the stirrup. The jacks are then actuated by operation of the motor 44, causing the jack head 31 and the stirrup 71 to move upwardly into engagement with the jacking pads 69 and elevate the vehicle 67. As the stirrups 71 engage the vehicle body, the load forces the base 26 downwardly into engagement with the pit floor by moving the arms 46, which normally support the jack, outwardly against the pressure of the springs 49. The table 10, therefore, is not required to support a major portion of the load on the jacks 24. When the vehicle 67 has been raised to the desired eleva-

tion with the opening 74 of the stirrups in line with the arms 66, the latter are moved inwardly into the openings 74 and the jack heads 31 lowered by reverse operation of the motor 44. The jacks 24 are of such dimension that in their collapsed position they can pass beneath the girders 64, the stirrups 71 remaining in engagement with the jacking pad 69, and the arms 66 thus supporting the vehicle.

When the jacks 24 have been collapsed, the table 10, with the jacks 24 and the truck or axle assembly 68, may be moved transversely from beneath the vehicle 67 into alignment with a release track, where the truck 68 is discharged for repair and a repaired truck moved on to the table. By reverse operation the new truck is moved beneath the vehicle body and the jacks 24 actuated to bring the jack head 31 and the boss 32 into engagement with the stirrups 71. While in this position, it is sometimes necessary to vary transversely the position of the truck 68 with respect to the body of the vehicle 67. This may be accomplished without difficulty by rotation of the screw 53, which allows the jacks 24 to remain stationary, but will move the table 10 in either direction, as desired. Lateral alignment is, of course, attained by movement of the trucks 68 along the rail section 12.

From the foregoing, it is apparent that certain variations may be employed without departure from the true spirit and scope of this invention. For example, the jacks 24 may be of any desired design and either hydraulic or mechanical, as preferred, it being necessary only that they have sufficient capacity to elevate the largest vehicle to be serviced and that in their collapsed condition are sufficiently low to pass beneath the body support girders 64. Likewise, the form of body support may be varied as necessary, although the form illustrated has proven highly efficient and satisfactory in use. Other variations of a minor nature will be apparent to those skilled in the art and I do not therefore specifically bind myself to the precise details illustrated except insofar as defined in the appended claims.

I claim:

1. Apparatus for use in servicing railway vehicles and the like, as by removal of trucks and axle assemblies, and adapted for use in a structure having vehicle tracks extending along a floor, a shallow transverse pit intersecting the tracks, and body support means near the point of intersection of the tracks and pit for a vehicle comprising two pairs of wheels movable on rails extending longitudinally along the floor of a pit, a table mounted on the wheels and supporting laterally disposed parallel rail sections for transverse movement with the table into alignment with one of the tracks, a pair of jacks carried by the table and extending upwardly therefrom for lifting engagement with a vehicle body, and means on the table for actuating said jacks.

2. Apparatus for use in servicing railway vehicles and the like, as by removal of trucks and axle assemblies, and adapted for use in a structure having vehicle tracks extending along a floor, a shallow transverse pit intersecting the tracks, and body support means near the point of intersection of the tracks and pit for a vehicle comprising two pairs of wheels movable on rails extending longitudinally along the floor of a pit, a table mounted on the wheels and supporting laterally disposed parallel rail sections for transverse movement with the table into alignment with one of the tracks, a pair of jacks carried by the table and extending upwardly therefrom for lifting engagement with a vehicle body, means for moving at least one of the jacks transversely with respect to the table, and means on the table for actuating said jacks.

3. Apparatus for use in servicing railway vehicles and the like, as by removal of trucks and axle assemblies, and adapted for use in a structure having vehicle tracks extending along a floor, a shallow transverse pit intersecting the tracks, and body support means near the point of intersection of the tracks and pit for a vehicle comprising two pairs of wheels movable on rails extending longitudinally along the floor of a pit, a table mounted on the wheels and supporting laterally disposed parallel rail sections for transverse movement with the table into alignment with one of the tracks, a pair of transversely extending jack-supporting members carried by the table, two transversely spaced jacks movably carried by said members and extending upwardly through the table for lifting engagement with the vehicle body, and means on the table for actuating said jacks.

4. Apparatus for use in servicing railway vehicles and the like, as by removal of trucks and axle assemblies, and adapted for use in a structure having vehicle tracks extending along a floor, a shallow transverse pit intersecting the tracks, and body support means near the point of intersection of the tracks and pit for a vehicle comprising two pairs of wheels movable on rails extending longitudinally along the floor of a pit, a table mounted on the wheels and supporting laterally disposed parallel rail sections for transverse movement with the table into alignment with one of the tracks, a pair of spaced transversely extending jack support members on the table and a pair of jacks movable transversely along the jack support members, said jacks extending upwardly through the table for lifting engagement with the vehicle body, each of said jacks including a base disposed below the table for engagement with the bottom of the pit and resilient support means between the jack and the jack support members for maintaining said base out of contact with the pit floor except when a load is applied to the jack.

5. In an apparatus for use in servicing railway vehicles and the like on a track intersected by a shallow transverse pit, the combination of a pair of body support girders extending over the pit on opposite sides of the track, vehicle support arms movable inwardly from the girders for supporting a vehicle body, a wheeled table movable along rails in a pit and supporting rail sections for alignment with the track, a pair of jacks carried by the table each having a minimum height selected to permit movement of the table and jacks beneath said body support girders, and stirrups for removably engaging the upper extremities of said jacks, each of said stirrups having an opening transverse to said jacks for receiving said body support arms and an upper surface for engagement with the vehicle body.

6. Apparatus for use in elevating a railway vehicle and the like, of the type having jacking pads on the body thereof, into supporting engagement with generally horizontal support arms movable inwardly from fixed support girders comprising a stirrup having a flat external wall for engagement with a jacking pad on the vehicle, a first opening in the external wall of the stirrup opposite the flat surface and shaped for releasable engagement with the upper end of a

jack and a second opening transverse to the first opening for receiving the vehicle support arms.

7. In an apparatus for use in servicing railway vehicles and the like on a track intersected by a shallow transverse pit, the combination of a pair of support girders spanning the pit, inwardly extending retractable support arms carried by the girders, a wheeled table movable along rails in the bottom of the pit and supporting rail sections for alignment with the track between the girders, a pair of transversely extending jack support members on the table, a pair of collapsible jacks extending upwardly through the table, each having a collapsed height less than the height of the lower portion of said girder, each of said jacks having a base for engagement with the pit floor, arms pivoted at one end to the jack and at their opposite end to wheels engaging the jack supporting members, and resilient means between said arms and the jack for maintaining the base out of contact with the pit floor in the absence of load on the jacks, stirrups for removably engaging the upper ends of the jacks, each of said stirrups having a flat surface for engagement with the vehicle body, and transverse openings for engagement with said supporting arms, and means for moving at least one of the jacks transversely with respect to the table.

8. Apparatus for use in servicing railway vehicles and the like on a track intersected by a shallow transverse pit comprising, a table movable along the pit and carrying rail sections for alignment with the track, means for supporting a vehicle over the pit in elevated position including arms movable between engaged and disengaged position, a pair of jacks carried by the table and extending upwardly therefrom for lifting the vehicle, the collapsed height of the jacks being less than the minimum height of the support means, and a detachable member for each jack, said members each being shaped for interposition between the upper portion of the jack and the vehicle and for engagement with the arms of said support means.

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