June 26, 1934. R. C. STRAUBE 1,964,542

ENGINE MOUNTING

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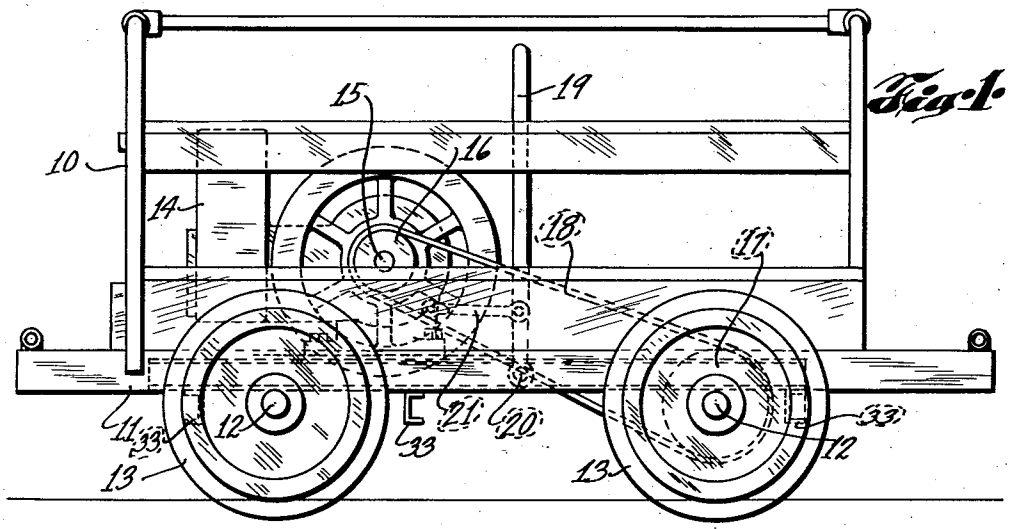


Fig. 1.

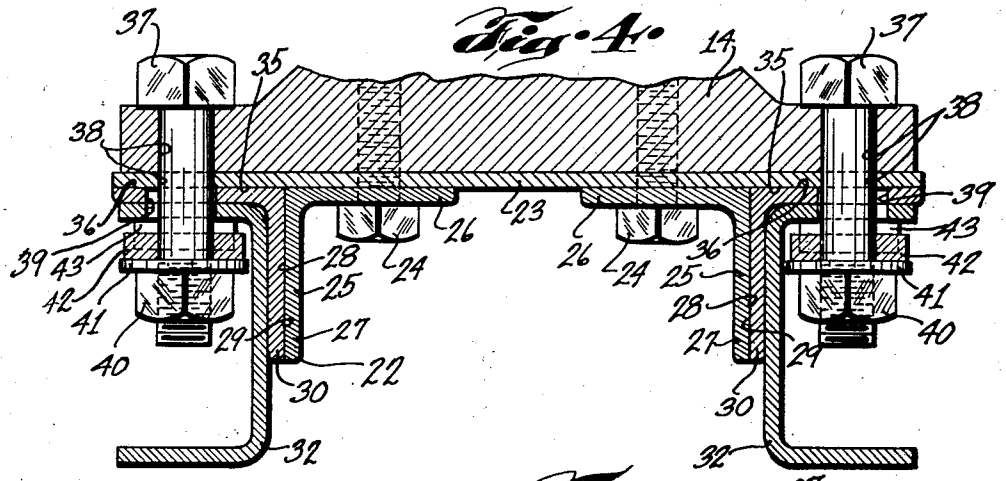


Fig. 4.

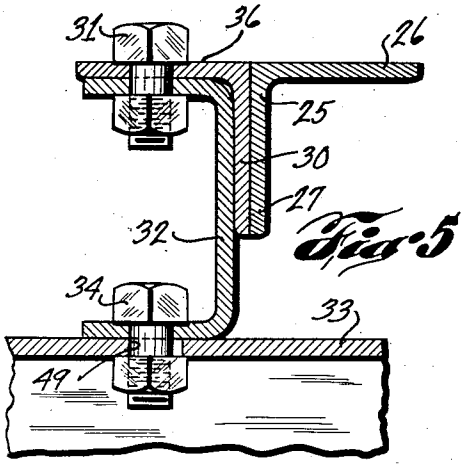


Fig. 5.

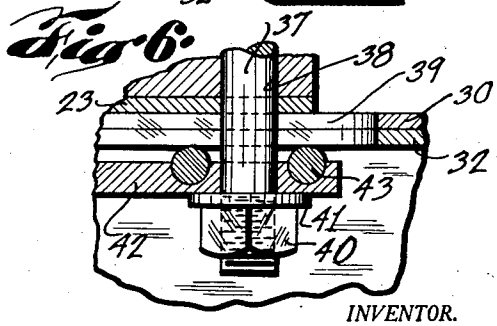


Fig. 6.

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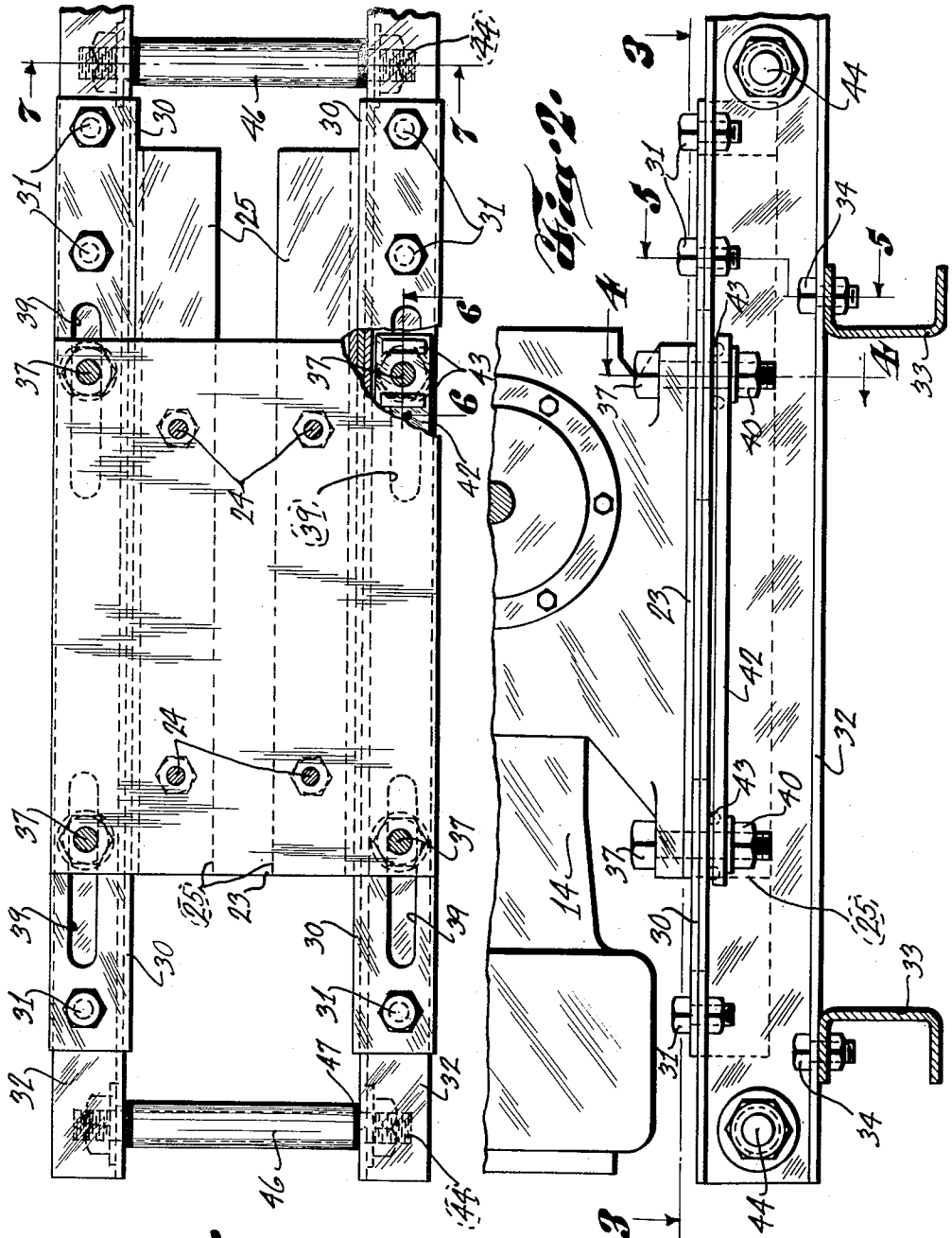


Fig. 3.

Fig. 2.

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Fig. 7.

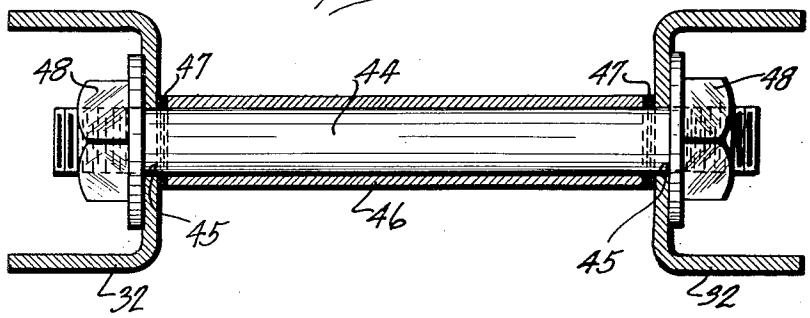
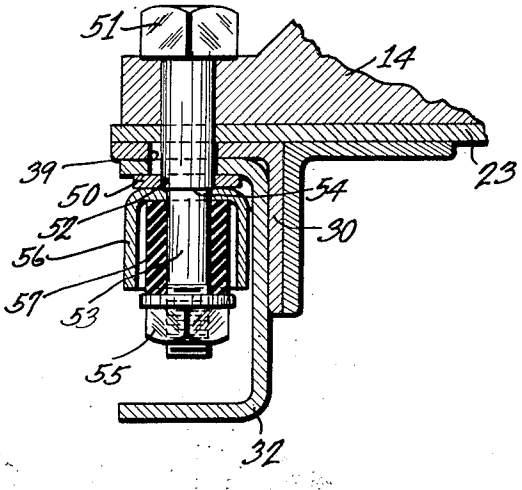


Fig. 8.



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UNITED STATES PATENT OFFICE

1,964,542

ENGINE MOUNTING

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Application October 28, 1932, Serial No. 639,990

13 Claims. (Cl. 105—107)

This invention relates to improvements in engine mountings, and more particularly to a sliding base or mounting for internal combustion engines, for example, those of a type used for the propulsion of railway motor cars.

An object of the present invention is to provide an improved engine mounting for belt driven motor cars, in which the engine is arranged to slide between and along a pair of spaced guide members, so mounted with respect to the frame structure of the car, as to form a part thereof, and thereby to increase its strength and rigidity, as well as to provide a rigid substructure for the engine.

A further object is to provide an improved sliding engine base for use in connection with railway motor cars, in which the base is constructed entirely of structural steel members, which are relatively light in weight, and practically unbreakable, and are extremely simple and inexpensive to form and assemble.

A still further object is to provide an improved sliding engine base assembly, which includes spaced depending members which are arranged to slide between and along guideways, the sliding members of the base having relatively large wearing surfaces for providing and maintaining accurate alignment of the base parts, and means for readily and easily adjusting the spaced relation between the wearing surfaces of the sliding members and guideways, to permit of easy adjustment to compensate for wear during service.

An additional object is to provide an improved sliding base assembly, which includes engine slide members and guideways, which are constructed and arranged so that a portion of their wearing surfaces are disposed in a vertical plane to prevent any appreciable quantity of moisture or water collecting between the wearing surfaces, and thus to cause rust and corrosion; the parts heretofore thus adversely affected necessitating a greater manipulative force in order to move the engine along the guideways.

Further objects and advantages will appear from the following detailed description of parts, and from the accompanying drawings, in which:

Fig. 1 is a longitudinal elevation of a preferred form of railway motor car, to which the present improvements are applied; Fig. 2 is an enlarged fragmentary longitudinal elevation, partially in section, of a preferred form of engine mounting means; Fig. 3 is a plan view, partially in section, of the engine mounting as viewed from line 3—3 in Fig. 2; Fig. 4 is an enlarged fragmentary section taken along line 4—4 in Fig. 2; Fig. 5 is an enlarged fragmentary section taken along line 5—5 in Fig. 2; Fig. 6 is an enlarged fragmentary section taken along line 6—6 in Fig. 3; Fig. 7 is an enlarged section taken along line 7—7 in Fig. 3; and Fig. 8 is an enlarged fragmentary sectional elevation of a modified form of engine hold-down means.

Referring by reference characters to the drawings, the numeral 10 designates, generally, a preferred form of railway motor car which includes a suitable frame structure 11, carried upon car axles 12 which are provided with usual car wheels 13. An internal combustion engine 14, of the type commonly employed on railway motor cars, is, by preference, provided with a crank shaft 15 for driving a pulley 16, which transmits power to a pulley 17 over a belt 18, the pulley 17 being secured to one of the car axles 12. For controlling the effective driving tension of the belt 18, the engine 14 is arranged to be moved longitudinally of the car frame, in such manner and direction that the distance between centers of the pulleys 16 and 17 is reduced or increased. A manual control lever 19 is pivotally secured by means of a pin 20 to the frame structure 11 of the motor car, the lever being connected, intermediate its ends, to the engine, by means of a link 21, so that the engine may be moved toward or away from the pulley 17, depending upon the direction of pivotal movement of the lever 19. The lever may be held in any predetermined adjusted position by any suitable notching or latching means (not shown).

The engine 14 is, by preference, supported upon an improved mounting, generally indicated at 22, and which includes a steel plate or base member 23, to which is removably secured, such as by bolts 24, a pair of spaced angle members 25, each having a horizontal flange portion 26 directed inwardly of the car and engine, and a vertically depending portion 27. The depending portions are, by preference, each provided with a smooth wearing face 28, which slidably engages corresponding mating faces 29 provided, respectively, on angle guide members 30 which are removably secured, as by bolts 31, to channel or sill members 32. These channel members are, by preference, disposed longitudinally of the car, but transversely of, and adjustably secured to cross sill members 33, as by bolts 34, these cross members forming part of the frame structure of the car.

As shown in Fig. 4, the vertically depending portion 27 of each angle member is, by preference, spaced inwardly of the lateral edges of the

plate member 23, so as to provide smooth horizontal wearing faces 35 which slidably engage corresponding faces 36 formed on the guide members 30.

The engine 14 and its associated base plate 23 are adjustably secured to the guideways 30, by means of engine hold-down bolts 37 which extend through suitable bolt apertures 38, provided in the engine base and base plate. Each bolt 37 extends through its associated elongated or slotted opening 39 provided in the horizontal wearing surface of each of the guide members 30, there being a corresponding, registering slot in the flange portion of each channel member 32. The bolts 37, which are each provided with a nut 40 and a washer 41, are arranged in groups on each side of the engine base, each group thereof being connected, across their projecting ends, by a bar member 42, which is, by preference, supported on the nuts and washers of the associated bolts. Each bar is, by preference, vertically spaced from the under side of the flange portion of the associated channel member, so as to permit friction-reducing members 43 to be carried therebetween, the members 43, by preference, being suitably mounted in seats therefor on the bar members. It will be readily understood that, if it is so desired, a spring or other suitable resilient means (not shown) may be disposed between the washer 41 and the bar member 42 for yieldingly positioning these parts. When the nuts 40 are taken up, the weight of the engine and the pressure applied to the bolts, is carried, at least in substantial part, by the members 43.

The above provision, therefore, enables the engine to be moved, by means of the manual control lever, lengthwise of the car, for adjusting the tension in the belt 17, such movement causing the engine 14 and base plate 23 with its associated angle members 25, to move, guided by the wearing surfaces provided on the guideways, in engaging similar wearing surfaces 28 and 36 on the angle members. During such movement the hold-down bolts 37 travel along, and in slotted openings 38, the sliding movement thereof being aided by the reduced area of contact provided by members 43.

It has been found in practice that after considerable service, the slide faces may be subjected to appreciable wear, resulting in certain irregularities in alignment of the guide members with respect to the guideways. Provision is made for adjusting the guideways, so as to take up this wear, by studs 44 which extend transversely through and between openings 45 provided in the channel members 32. Suitable tubular spacer members 46 are, by preference, mounted on each through stud 44, between the channel members. The length of each spacer member or sleeve is, by preference, less than the initial distance between the channel members, the annular space between the ends of the spacer member and the channel members, being taken up by circular shims 47, which are, by preference, spilt on one side to facilitate removal and/or replacement. It will be readily seen that by taking up on nuts 48, threadedly associated with the studs 44, the channel members may be drawn toward each other, and that by adding or removing shims the effective distance between the channel members may be adjusted to compensate for any wear of the slide members, and also to enable the channels, guides and guideways to be kept in accurate parallelism at all times.

In order to permit such adjustment of the channel members, apertures 49 in the cross sills 33, are each made somewhat larger in diameter than the associated bolt 34, or these openings may be elongate in form, so that the bolt, and channel member 32 held thereby, may be moved lengthwise of the sill member, and transversely of the car, and likewise, the slotted openings 39 are of an area and shape to permit the entire base guideway assembly to be moved with respect to the frame structure. After the necessary adjustment has been effected, the bolt and nut structure 34 may be taken up, and the guideway structure again secured to the frame 11 of the car.

In Fig. 8 there is shown a modified form of engine hold-down arrangement in which the above described assembly is replaced by an improved cushioning device including a wearing strip 50, which is placed in rubbing contact with the under side of the flange portion of the channel members. An engine hold-down bolt 51, extending through the engine base and plate 23, slotted openings 39 in the angle member 30, channel member 32, and through an opening 52 in the strip 50, is provided with a reduced portion 53, forming a shoulder 54, the end of the reduced portion being threaded to receive a securing nut 55. An inverted cup-shaped retaining member 56, positioned concentrically of the reduced portion of the bolt 51, is arranged to be biased against the shoulder 54 by a resilient, cushioning member 57, which preferably consists of a material such as a rubber composition, disposed about the reduced portion 53 of the hold-down bolt and between the inner surface of the retaining member and the washer associated with the nut 55.

It will be readily seen that the herein described improved engine mounting has several decided advantages over the older prevailing types of bases. The entire base structure may be of structural steel shapes which are readily available, and thus eliminate expensive and heavier cast iron members to effect a considerable saving in construction cost, the use of structural steel members resulting in a simpler and more rugged construction. Further, it will be seen that the guide-shoes 30 which receive the major portion of the wear, due to sliding movement of the engine, are readily removable and replaceable. It will, also, be seen that the guide surfaces are so positioned as to negative any possibility of a trough being formed, to permit the collection of moisture on the sliding surfaces to cause rusting, as is prevalent in cast iron base structures. The improved provision for adjusting the channel members for wear, and the fact that the wearing surfaces of the slide members are relatively larger than the sliding surface areas usually provided in older prevailing types of engine bases, insure a better alignment and a greater ease in moving the engine upon the base.

It will, of course, be understood that the present detailed description of parts, and the accompanying drawings, relate to only a single, preferred executional embodiment of this invention, and that substantial changes may be made in the described arrangement and construction of parts without departing from the spirit and full intended scope of the invention.

I claim:

1. A slidable engine support for a vehicle including vehicle cross sills, a pair of parallel guide angles detachably carried by the engine, spaced longitudinal sill structures including parallel angle bars arranged for slidably receiving therebe-

tween, the guide angles associated with the engine, means for adjustably anchoring the longitudinal sill structures to the vehicle cross sills, and adjustable spacing means bridging said longitudinal sill structures.

2. In combination in a railway motor car, a frame including longitudinal sill members constituting an engine support, guide members removably secured to said sill members, means for connecting said guide members in spaced relation, and means for adjusting the position of said sill members with respect to each other, and to the frame of the car.

3. An engine mounting for railway cars, comprising a framework fabricated of structural steel shapes, including a pair of longitudinal guideways each having a horizontal face on which the engine is slidably mounted, and a vertical face, guide followers detachably secured to an engine, in depending relation thereto, and in sliding engagement with the vertical faces of the guideways, spacer members disposed transversely of said guideways, and means for adjusting the effective length of said spacer members, to compensate for wear of the guideways and followers.

4. A supporting structure for permitting shifting movement of an engine, including spaced pairs of angle members, the members of each pair being arranged in opposed slidable relation, one member of each pair being detachably carried by the engine and the other of each pair disposed to serve as a guide therefor, a pair of longitudinally disposed channel bars by which the guiding angle members are carried, means for laterally adjusting the guiding angles with respect to the channel bars, and means for adjusting the space relation between said channel bars.

5. A supporting structure for permitting shifting movement of an engine, including spaced pairs of angle members, the members of each pair being arranged in opposed slidable relation, one member of each pair being carried by the engine and the other of each pair mounted to serve as a guide therefor, and supports for the guiding angle members, formed to permit adjustment of said members in a direction transversely of the line of engine-shifting movement.

6. A supporting structure for permitting shifting movement of a vehicle engine, including spaced pairs of angle members, one member of each pair being stationary and providing a horizontal surface for slidable engagement by the engine, the other member of each pair having a vertical leg projecting between the stationary members and guidingly engaged thereby, means separately detachably securing the stationary members to the vehicle, and means for adjusting the space relation between the coacting angle members.

7. In combination in a railway motor car, a frame including longitudinal sill members, guide members secured to said sill members, on and between which the engine is slidably mounted, spacer members disposed transversely of said guide members, tie members passing through said spacer members and arranged to hold the sill members in assembled relation, and means carried by the tie members for effecting adjustment of the spacer members.

8. An engine mounting for use in railway motor cars, including guide members, guide followers, means detachably securing said followers to an engine, in position along said guide members, friction-reducing elements associated with said guide members, and means for adjusting the space relation of said guide members and followers.

9. In combination in a shiftable engine mounting, spaced supports over which the engine is adapted for shifting movements, friction-reducing inserts of cylindrical form operable along said supports, and means carried by the engine constituting a carrier or holder for said inserts.

10. In combination in a railway motor car, a frame including longitudinal sill members, guide members removably secured to said sill members, said guide members having substantially vertical guide faces, guide followers engaging said guide faces, bolts for holding the engine in sliding relation on said guide members, and friction-reducing elements of circular section movable with the engine and movable along portions of said sill members.

11. A supporting structure for permitting shifting movement of an engine, including spaced pairs of angle members, the members of each pair being arranged in opposed slidable relation, one member of each pair being carried by the engine and the other of each pair mounted to serve as a guide therefor, holding members projecting from the engine through the guides, a structure bridging certain of said holding members, and cylindrical elements disposed between the bridging structure and the guides.

12. In a shiftable engine mounting for railway motor cars, a stationary guide structure below the engine, said structure including channel bars extending longitudinally of the engine, holddown bolts extending from the engine through portions of said guide structure, a hollow open-ended element carried by each of said bolts and within the channels of said bars, a block of resilient material apertured to extend over said bolt and disposed within the hollow element, and a nut carried by said bolt in compressing engagement with said block of resilient material.

13. In combination in a railway motor car, a frame including cross sill members, spaced longitudinal sills, means for adjustably anchoring the longitudinal sills to the cross sills, spaced pairs of angle members, the members of each pair being arranged in opposed slidable relation, one member of each pair being stationary and providing a horizontal surface for slidable engagement by the motor, the other member of each pair having a vertical leg projecting between the stationary members and guidingly engaged thereby, holding members projecting from the motor through the guides, a structure bridging certain of said holding members, spacer members disposed transversely of said guide members, tie members passing through said spacer members and arranged to hold the guide members in assembled relation, and means for adjusting the effective length of said spacer members.

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