I. F. AVERY.

REMOVABLE TRUCK BODY.

APPLICATION FILED DEC. 22, 1917.

1,293,664.

Patented Feb. 11, 1919.

6 SHEETS—SHEET 1.

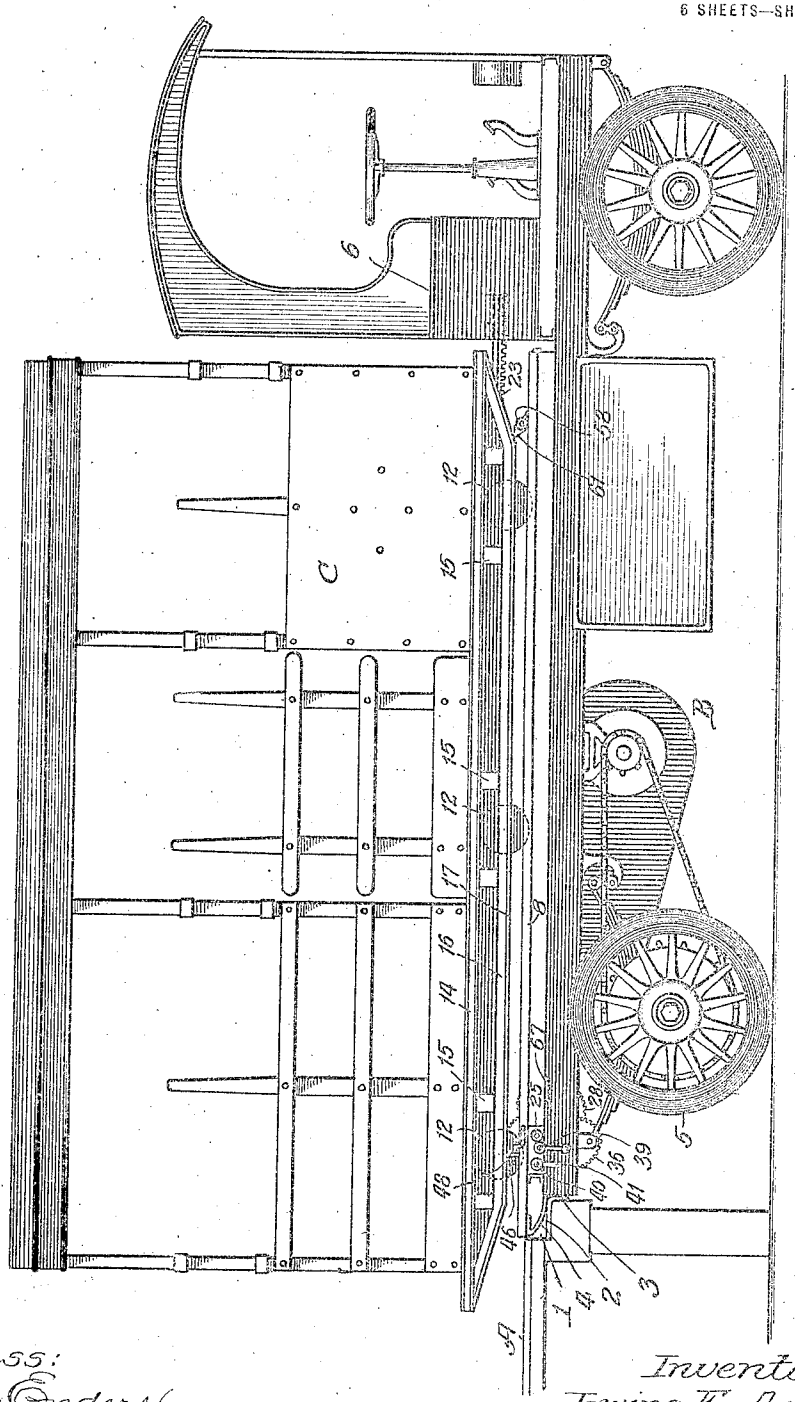


Fig. 1.

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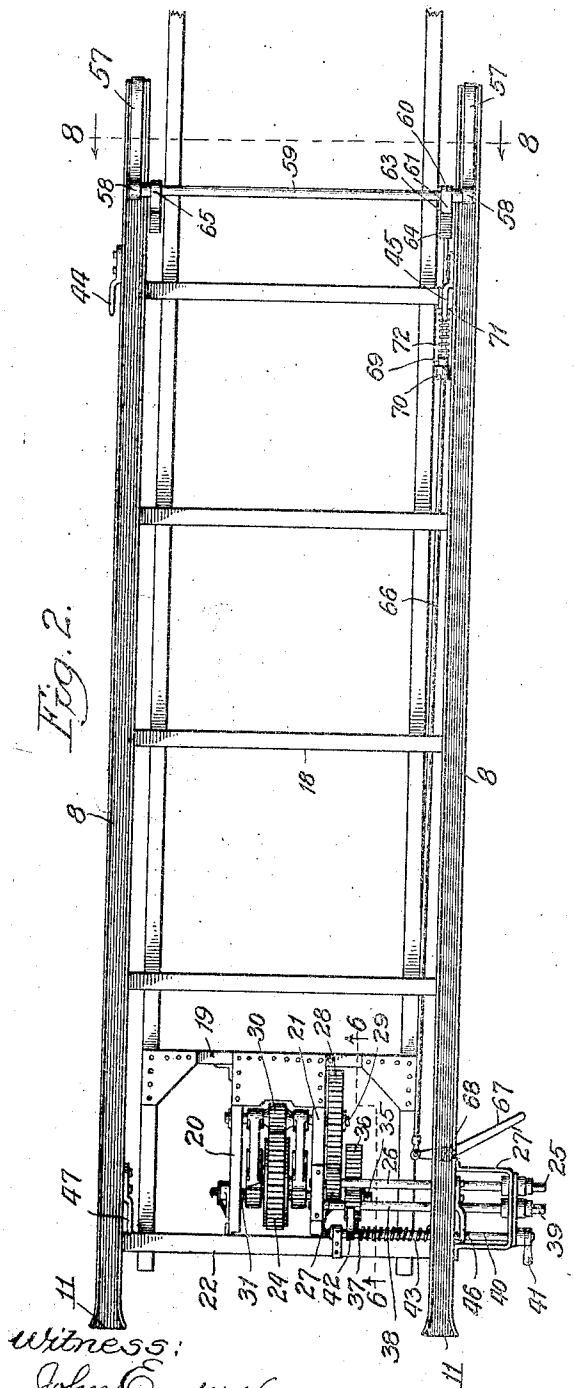


Fig. 2.

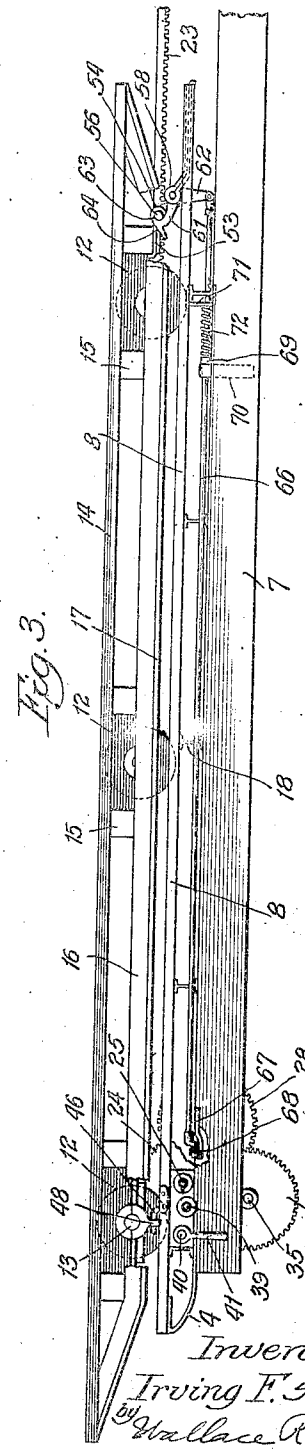


Fig. 3.

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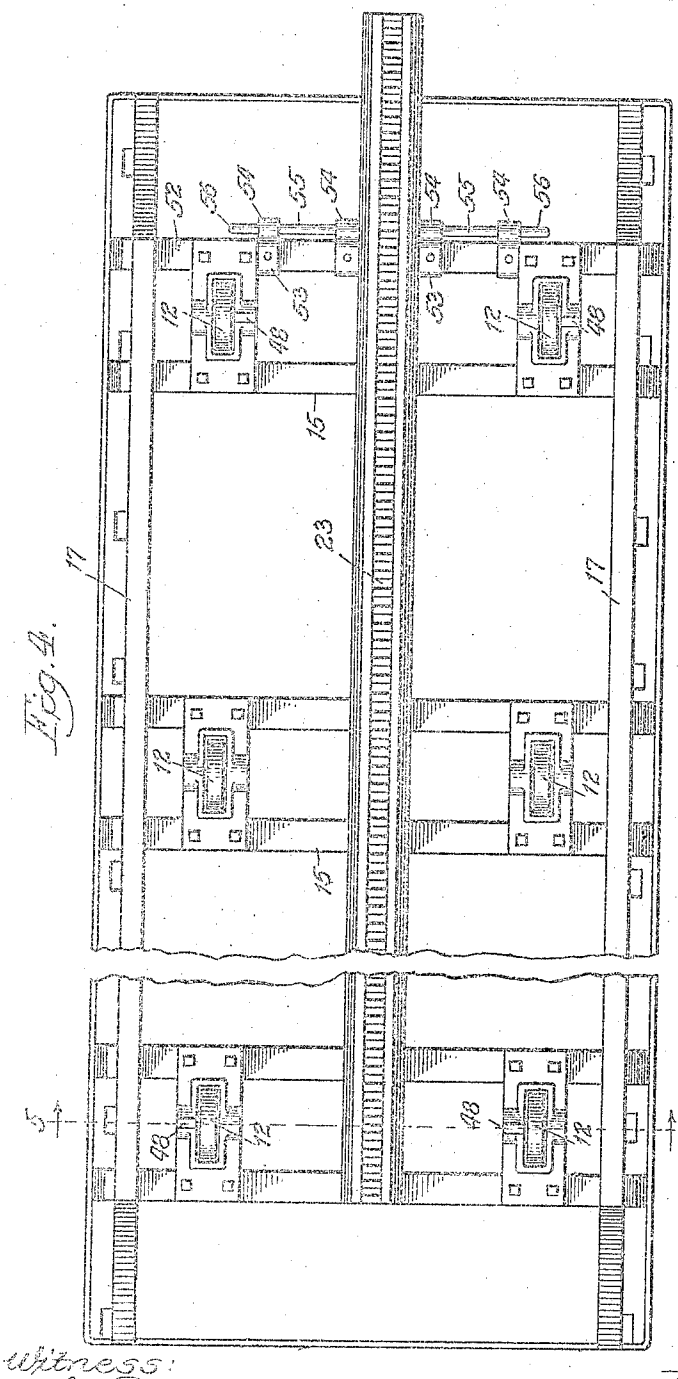


Fig. 4.

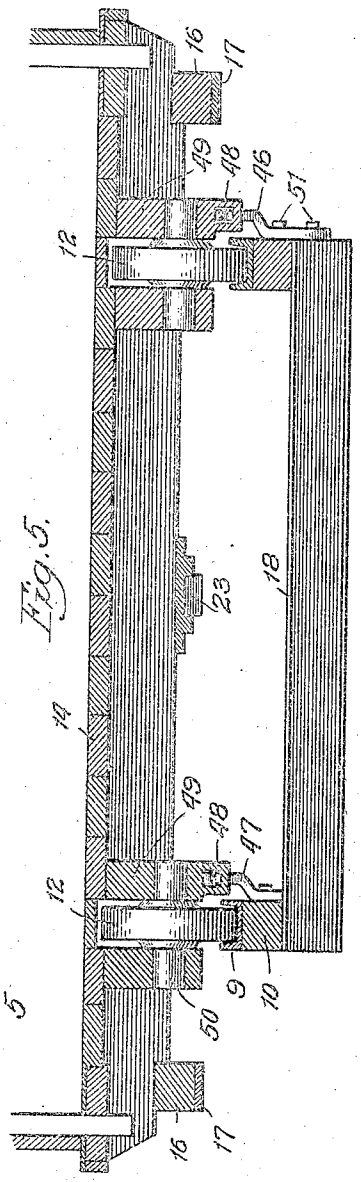


Fig. 5.

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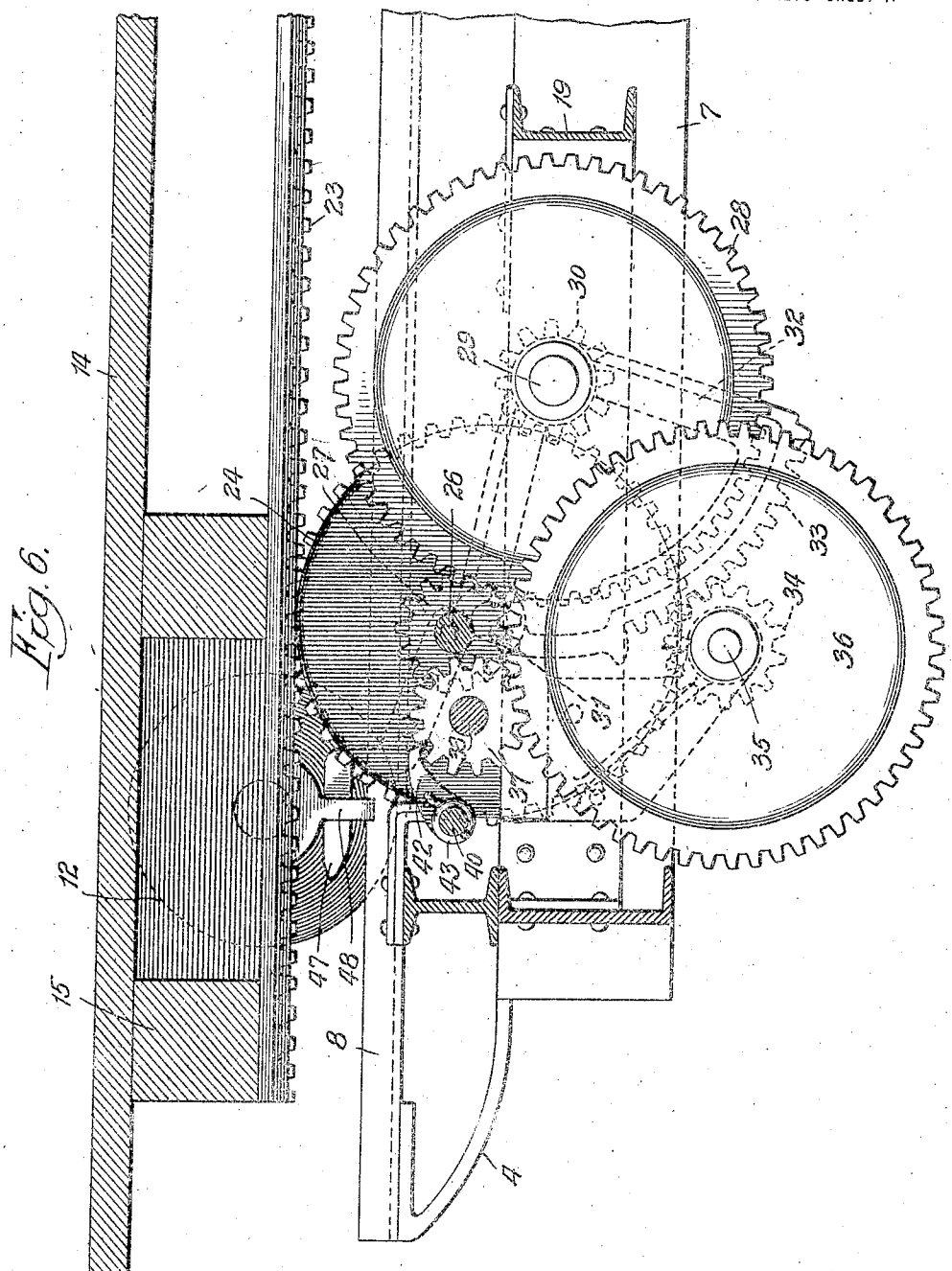


Fig. 6.

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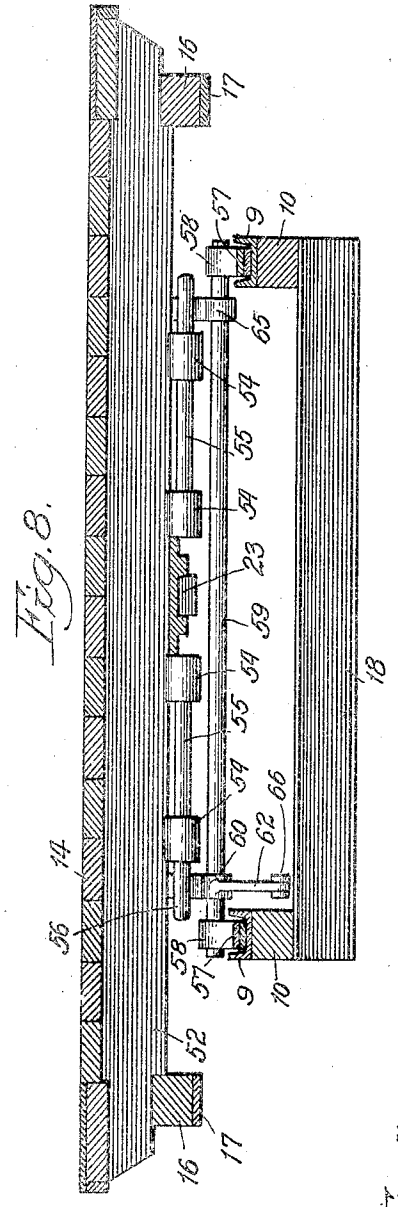


Fig. 8.

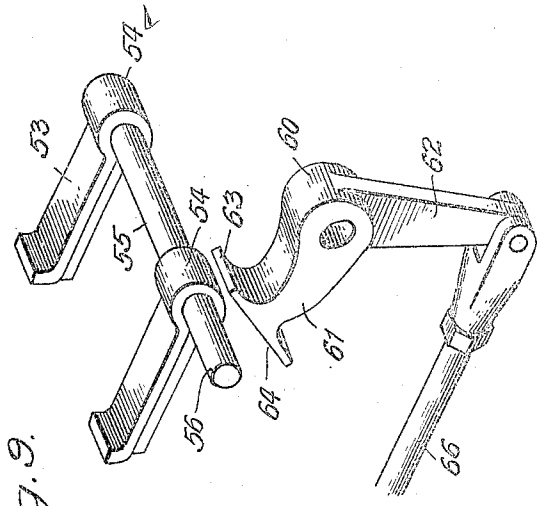


Fig. 9.

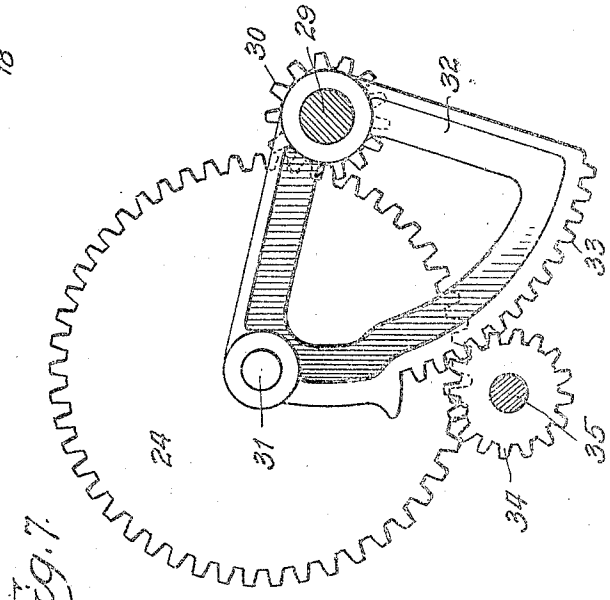


Fig. 7.

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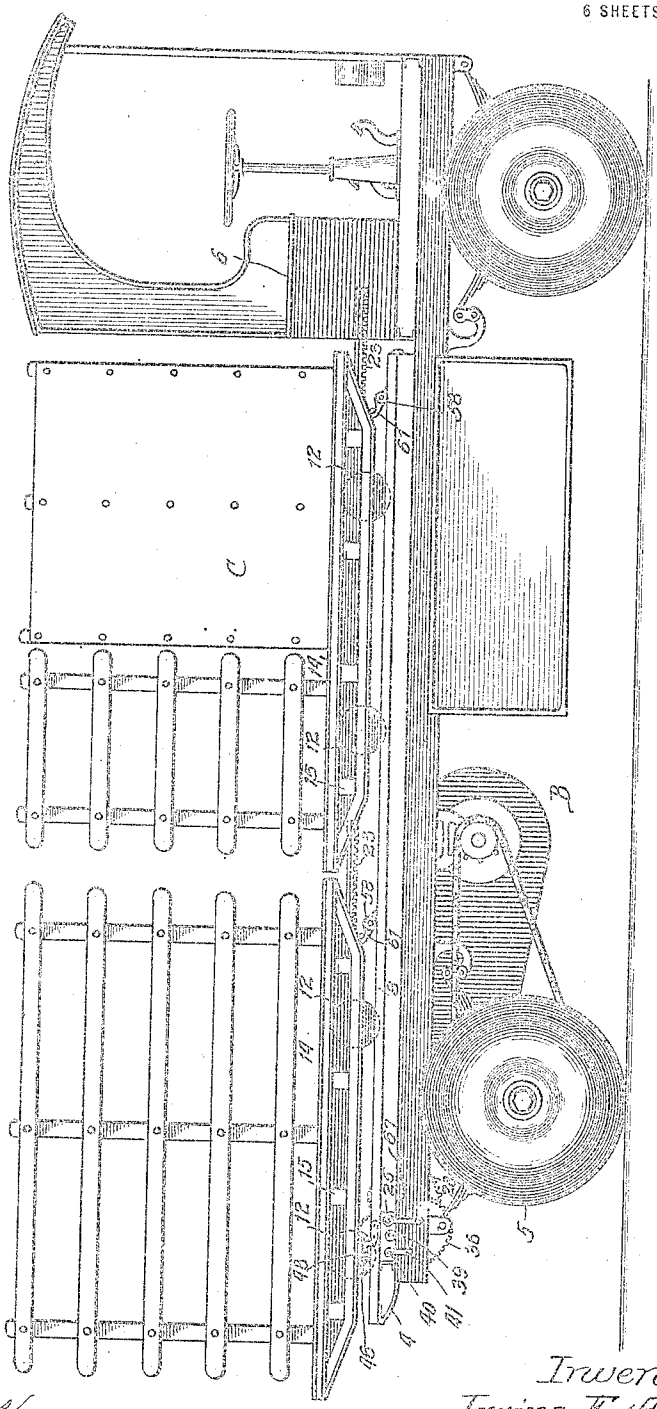


Fig. 10.

Witness:
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Inventor:
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Atty.

UNITED STATES PATENT OFFICE.

IRVING F. AVERY, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO IDEAL REMOVABLE BODY CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

REMOVABLE TRUCK-BODY.

1,293,664. Specification of Letters Patent. Patented Feb. 11, 1919.

Application filed December 22, 1917. Serial No. 208,350.

To all whom it may concern:

Be it known that I, IRVING F. AVERY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Removable Truck-Bodies, of which the following is a specification.

This invention relates to removable truck bodies and more particularly to that class of bodies which are interchangeable and where one may be loaded while the truck is away on a trip with a previously loaded body.

In the delivering of materials by truck from one place to another, the question of time is a factor of exceeding importance. In the use of trucks having a body permanently fixed in position, it is obvious that much time is lost as a result of the enforced idleness of the truck while being loaded and unloaded. Where the volume of material to be hauled is great the loss of time, with its corresponding monetary loss, will be enormous with the use of such fixed bodies. By my invention, this loss of time and money is entirely eliminated and I have rendered possible the keeping of the trucks substantially continuously on the move, thus increasing their effectiveness to the maximum.

Among the objects of my invention is to provide a plurality of interchangeable removable bodies for trucks to permit the loading of one body while the truck is away on a trip with a previously loaded body whereby the truck upon its return may have the empty body instantly removed and a loaded body immediately substituted therefor; further to render possible the easy and quick substitution of one body for the other; further to reduce to the minimum the loss of time occasioned by the idleness of the truck at each end of its trips; further to provide a novel form of mechanism for substituting one body for another; further to provide means whereby the mechanism for changing the bodies can be adjusted and secured to operate at various heights with relation to the chassis frame; further to produce a novel form of locking means for positively preventing the body from slipping backwardly and off of the truck while in transit and yet permit its removal at the proper time; further to provide a novel arrangement for holding the body against any vertical movement with relation to the chassis frame; further to so arrange the locking means and the mechanism for moving the body along the chassis frame, that they may both be operated from substantially the same position of the operator; further to provide an arrangement for bringing the track for the body wheels in proper alinement with the loading platform; further to make use of a plurality of smaller removable bodies to be simultaneously carried by the truck whereby a fractional part of a full load may be loaded on each thereof to be left without loss of time at various destinations on a single trip; and such further objects, advantages and capabilities as will later appear.

My invention further resides in the combination, construction and arrangement of parts illustrated in the accompanying drawings, and while I have shown therein a preferred embodiment of my apparatus, I wish it to be understood that the same is susceptible of change and modification without departing from the spirit of my invention.

In the drawings:

Figure 1 is a side elevation of a truck embodying my invention and in position to have the body removed therefrom onto the loading platform.

Fig. 2 is a plan view of the chassis frame with the body removed.

Fig. 3 is an elevation showing the upper part of the chassis frame with the bottom portion of the removable body in position thereon, parts being broken away for the sake of clearness.

Fig. 4 is a plan view of the under side of a removable body, a portion being removed for convenience.

Fig. 5 is a vertical transverse sectional view taken through the upper portion of the chassis frame and the lower portion of the removable body, this section being taken on the line 5—5 of Fig. 4.

Fig. 6 is a fragmentary longitudinal vertical section taken on the line 6—6 of Fig. 2 and showing the mechanism for removing the body from the chassis frame. In this view a portion of the body is also shown.

Fig. 7 is a detail elevation showing the

main driving gear for removing the body, and the sector arm for raising and lowering this gear.

Fig. 8 is a vertical transverse section taken on the line 8—8 of Fig. 2.

Fig. 9 is a perspective detail view showing the locking means for holding the body against rearward movement on the chassis frame.

Fig. 10 is an elevation showing my invention applied to a truck having a plurality of removable bodies thereon.

Referring to Fig. 1, A represents the loading platform against which the truck, represented generally by B, may be backed in order that the removable body C may be rolled from off the truck onto the platform. The platform at its forward edge is provided with the recess 1, upon the bottom of which is placed the metal plate 2, to prevent undue wear upon the material at the bottom of the recess. It will be noted that this plate 2 is formed at its forward portion with the downwardly extending flange 3, thus providing a structure that will readily guide the beveled end 4 at the rear of the chassis frame into position so that the track upon which the body wheels roll will be in proper alinement with the upper surface of the platform A. The truck is of the usual type comprising the customary wheels 5 and driver's seat 6.

Referring to Figs. 2 and 3, the upper portion of the chassis frame 7 has secured thereon a track comprising the rails 8, which rails, as will be noted, are provided upon each side of each thereof with the upstanding flange 9, and the flat web portion 10. These rails are also outwardly flared at their rear ends as indicated at 11 (see Fig. 2) for the purpose of more readily guiding the body wheels into proper position when loading the body onto the frame. As seen in Fig. 3, the removable body is provided on its under surface with a plurality of wheels 12, which wheels are suitably journaled in the boxes 49 (best seen in Fig. 5) which will be more fully described later. The floor of the body is designated at 14, and is braced by suitable cross braces 15 and the longitudinal beams 16, against the under faces of the latter of which extends from end to end of the body flat metal plates 17, the function of which is to greatly increase the rigidity of the body. As seen in Fig. 3, the rails 8 are secured upon the I beams 18, which are in turn mounted upon the upper surface of the chassis frame 7. As pointed out above, the rear end of the chassis frame at each side and directly under the rails, is provided with the bevel 4 to aline the rails 8 with the upper surface of the platform.

Referring to Fig. 2, it will be seen that adjacent the rear end of the chassis frame is located a structural frame work, comprising the cross beam 19, and the longitudinally extending beams 20 and 21 extending from the cross beam 19 to the end beam 22. Within this structural frame work is suitably mounted the mechanism for moving the body longitudinally of the chassis frame, and which mechanism will now be described. It will first, however, be pointed out that extending longitudinally and centrally of the underneath side of the body and projecting a substantial distance from the front end thereof is the straight rack 23 (see Fig. 4) which rack is driven by the main driving gear 24 (see Fig. 6). Power for driving the gear 24 is supplied by a crank applied to the end 25 of the shaft 26 (see Fig. 2) which shaft extends a suitable distance through the side of the chassis frame, and is mounted at its outer end in the bracket 27'. Upon the inner end of the shaft 26 is fixed the pinion 27, which pinion in turn meshes with the gear wheel 28 suitably keyed to the shaft 29, which shaft is journaled adjacent its ends in the beams 20 and 21. Also keyed to rotate with the shaft 29 and approximately midway between the beams 20 and 21 is the pinion 30, which pinion meshes with the main drive gear 24 to impart rotation thereto. It will thus be seen that by rotation of a crank upon the outer end 25 of the shaft 26, rotation will be imparted through the train of gears just described to the drive gear 24, which will in turn drive the rack 23 and cause the body C to move longitudinally in the desired direction along the track 8. The rack 23 and gear 24 are each provided with a shroud to prevent crowding of the teeth.

In loading and unloading these bodies onto or from the truck frame, it may often occur that there will be uneven places in the pavement upon which the truck wheels rest, or that one platform may be slightly higher than another, both of which features, together with others not mentioned, may cause the drive gear 24 to assume various heights with relation to the rack 23, thus making it possible that if such differences in height were very great, the drive gear 24 might be thrown entirely out of engagement with the rack 23. In order to enable the drive gear 24 to be made to mesh with the rack 23 at all times, and in all vertical positions of the rack 23, I have provided a novel adjusting means which I will now describe.

Referring to Fig. 6, the drive gear 24 is mounted upon the shaft 31 shown in dotted line in this figure, and which shaft 31 is in turn mounted at each of its ends in the upper outer corner of the sector arms 32 (see Fig. 7,) there being one of these sector arms on each side of the drive gear 24. These sector arms are in turn rotatably mounted upon the shaft 29 and at each side of the pinion 30. Formed upon the outer face of

the sector arms 32 and for the greater length of their lower portion are the teeth 33, which teeth in turn mesh with the pinions 34, which pinions are suitably keyed to the shaft 35. Also keyed to the shaft 35 is the gear wheel 36, which in turn meshes with the pinion 37 mounted upon the shaft 38, which shaft as shown in Fig. 2 extends through the side of the chassis frame, and is supported at its outer end in the bracket 27'. The outer end of the shaft 38 is formed with a squared or otherwise suitably designed end 39, upon which may be placed in driving engagement a crank handle similar to that used for driving the shaft 26. In fact, the same crank may be interchangeably used upon each of the ends 25 and 39. It will thus be seen that as the shaft 38 is rotated by this crank arm, motion will be imparted through the pinion 37 and gear 36 to the pinions 34, the rotation of which will cause the sector arm 32 to be elevated or lowered according to the direction of rotation of the crank handle. Since the gear 24 as stated above has its shaft, as seen in Fig. 7, mounted in the upper outer corner of the sector arm 32, any elevation or depression of the sector arm, will effect a corresponding elevation or depression of the drive gear 24, since, as shown in the drawings, these parts will move together as far as any up and down motion is concerned.

For the purpose of locking these parts in their adjusted position so that the drive gear 24 after once being vertically adjusted will remain in adjusted position, I have provided the shaft 40 which is placed a slight distance to the rear of the shaft 38, and which also extends through the side of the chassis frame and through the bracket 27, and has secured at its outer end the handle 41. Fixed upon the inner end of the shaft 40 and in position to engage the pinion 37 is the pawl 42, which as shown in Fig. 6, is suitably formed at its end to come into locking engagement with the teeth of the gear 37. This pawl is held in locking engagement with the pinion teeth by the coil spring 43, which encircles and is suitably secured upon the shaft 40, and to remove the pawl 42 from engagement with the pinion 37, it will be necessary to overcome the tension in the spring by appropriate movement of the handle 41. This pawl will be held out of engagement with the pinion 37 during the time which is required for the vertical adjustment of the drive gear 24, after which the handle 41 will be released and the pawl 42 will assume its locking engagement with the pinion 37, thus in turn insuring that the gear 24 will be held at the proper elevation to effectively mesh with the rack 23 on the underside of the body. In order to relieve any twisting strains in the elevation or depression of the drive gear 24, there are provided two of the sector arms 32 located one on each side of the drive gear 24.

In order to hold securely the body from any vertical movement with relation to the frame after being placed in its final position, there are provided the tapered rearwardly extending hooks 44, 45, 46 and 47 (see Fig. 2) the former two of which are located adjacent the front end of the chassis frame, and the latter two of which are located adjacent the rear end of the same. Referring to Figs. 3 and 5, it will be seen that these hooks are formed to engage with the perforated ears 48 upon the forward longitudinal movement of the body. The ears 48 are preferably formed integral with the lower portion of one of the journal boxes 49, in which journal boxes rotate the axles 50 of the wheels 12. It will thus be seen that as the body moves through the last few inches of its travel toward its final position, the hooks 44, 45, 46 and 47 will enter the perforated ears 48, and thus hold the body securely against any vertical movement with relation to the chassis frame. It is to be especially noted in connection with the hooks 44 and 45, that they are located one on the outside of one of the rails and the other on the inside of the other of the rails, and that the rear hooks 46 and 47 are located on the opposite side of the respective rails, the purpose for which is to permit the ears 48, which are to engage with the hooks 44 and 45, to pass the hooks 46 and 47 while the ears are traversing this particular part of the track, thus eliminating the danger of the ears for the front hooks coming into engagement with the rear hooks while they are passing the same. The hooks as shown are secured in position by suitable fastening means, such as bolts or the like, indicated at 51.

I will now describe the locking means provided for preventing any rearward movement of the body after being placed in proper position upon the truck. Secured to the under side of the cross beam 52 are the straps 53 (see Figs. 4 and 9) which straps are bent to provide the suitable eyelets 54, in which eyelets are fixedly held the short rods 55; there being one of these rods fixed upon each side of the rack 23, as shown in Fig. 4, and as also seen in this figure the rods 55 are so positioned in the ears 54 that they will present the extending portions 56 beyond the outer ear 54. Secured upon the upper side of each of the track rails 8, and as best seen in Figs. 2 and 8, are the straps 57, which straps are bent back upon themselves to form the eyelets 58, in which eyelets are journaled at its respective ends the shaft 59, which as shown extends across from one rail to the other

at their forward ends. Keyed to rotate with the shaft 59 and adjacent one end thereof is the bell crank 60 best seen in Fig. 9, and which bell crank comprises the two arms 61 and 62. The arm 61 is formed at its upper outer corner into the hook 63, and at its extreme outer end into the beveled plain surface 64, which plain surface, as shown in Fig. 9, is formed with an upward inclination toward the front end of the truck.

As the projection 56 of the stub shaft 55 moves forwardly with the body, it will ride over the beveled surface 64, and thus depress the arm 61 of the bell crank, which after the end 56 has passed thereby will fly upwardly under the action of the spring to be later described, and thus cause the hook 63 to come into engagement with the extension 56, and lock the body against any rearward movement with relation to the chassis frame. Upon the end of the shaft 59 opposite from the bell crank 60 is provided a locking device 65 similar to that just described, with the exception that the arm 62 of the bell crank has been omitted, the structure otherwise being the same as that described in connection with the arm 61. The provision of one of these locking devices upon each side insures a more perfect and positive lock than if only one were used.

Connected to the lower end of the arm 62 of the bell crank 60 by a pin joint is the rod 66, which as seen in Figs. 2 and 3, extends rearwardly through suitable apertures in the I beams 18 to a point closely adjacent the operating shafts 26 and 38. At its rear end the rod 66 is pivoted to the inner end of the handle 67, which handle is pivoted at 68 in a suitable manner to the chassis frame 7. The rod 66 towards its front end has fixed thereon the collar 69, which collar in turn abuts against the bracket 70, through the upper end of which bracket the rod 66 slidably passes. Encircling the rod 66 and located between the collar 69 and the plate 71 is the coil spring 72, the function of which is to impel the rod 66 in the rearward direction, and thus hold the collar 69 against the bracket 70.

By this arrangement it will be seen that upon moving the outer end of the lever 67 rearwardly, the rod 66 will be moved forwardly against the tension of the spring 72, and the hook 63 will in turn be lowered in an obvious manner to free the projection 56, and thus permit the body to be moved longitudinally of the chassis frame. Immediately upon the release of the handle 67, the rod 66 under the action of the spring 72, will be moved rearwardly and return the hook 63 into its locking position, so that when a body is again moved forwardly on the chassis frame, it will be locked in position immediately upon the passing of the extension 56 over the bevel face 64, and into engagement with the hook 63, this hook under the action of the spring 72, immediately flying upwardly as soon as passed by the extension 56. An important feature in connection with this locking arrangement is that the handle 67 for operating the same is positioned closely adjacent the ends 25 and 39 of the operating shafts 26 and 38 respectively, whereby the operator may stand in position to turn the cranks upon the ends of the shafts 26 and 39 and without moving his position may grasp the handle 67 to free the locking device at the front; thus eliminating any necessity of the operator leaving the position from where he operates the mechanism to move the body on the frame, and have to walk around the front end of the truck in order to release the locking mechanism.

It often occurs that different portions of a single load may have to be delivered at different destinations, which if only a single body were used would necessitate the standing idle of the truck while this fractional part of the load were being removed. In order to eliminate this loss of time, I have provided an arrangement which, as seen in Fig. 10, comprises the use of a plurality of individual complete bodies simultaneously upon the truck. Each of these bodies is completed in the manner described above, the only changes necessary being the provision of an additional locking means for the rear body and the further provision of the necessary number of additional hooks and perforated ears to prevent the bodies from moving in a vertical direction with relation to the chassis frame. Another valuable feature of this use of a plurality of smaller bodies on a single trip is that oftentimes the available space in a warehouse or the like through which one of the bodies will have to be rolled is so small and necessitates such short turns as would be embarrassing were a long body being manipulated in such confined quarters. By providing a plurality of shorter bodies, they may each be very readily manipulated in a very small space. As shown in Figs. 1 and 10, an opening is provided in the rear of the seat 6 into which the projecting end of the rack 23 may pass when the body is in its forward position.

Having now described my invention, I claim:—

1. In a freight truck, a truck frame having a surface adapted to support a movable body frame, a body frame movably supported thereon, a rack on one frame, and a pinion on the other frame and movable with relation to said surface, whereby said pinion may be made to engage or disengage said rack.

2. In a freight truck, a truck frame hav-

ing a surface adapted to support a movable body frame, a body frame movably supported on said surface, a rack mounted on one frame, a pinion mounted on the other frame and movable vertically with relation to said surface to engage and disengage the rack, and means for moving the pinion toward and from the rack.

3. In a freight truck, a truck frame having a surface adapted to support a movable body frame, a body frame movably supported on said surface, a rack on the body frame, a pinion on the truck frame and movable vertically with relation to said surface to engage and disengage the rack, and means for operating said pinion.

4. In apparatus of the class described, a chassis frame, a removable body on said frame, and means for holding said body against movement vertically from said frame, said means comprising a plurality of pairs of hooks and eyes in staggered relation whereby the forward ones will clear the rearward ones in moving said bodies onto or off of said frame.

5. In apparatus of the class described, a chassis frame, a removable body on said frame, a rack on said body, a gear adapted to drive said rack, means for operating said gear, and means for raising and lowering said gear toward and away from said rack, said last mentioned means comprising an oscillating arm upon which said gear is journaled.

6. In apparatus of the class described, a chassis frame, a removable body on said frame, a rack on said body, a gear for driving said rack, an oscillating arm upon which said gear is journaled, means for swinging said oscillating arm whereby to raise or lower said gear with relation to said rack, means for locking said arm in its raised or lowered position, and means for driving said gear whereby to move said body longitudinally of said frame.

7. In apparatus of the class described, a chassis frame, a removable body on said frame, a rack on said body, a shaft journaled in said frame, a pinion fixed on said shaft, a gear driven by said pinion and adapted to mesh with said rack, means for rotating said shaft, an arm member rotatably mounted on said shaft and having a shaft in its outer portion on which said gear is mounted, and means for swinging said arm on said first mentioned shaft whereby to raise and lower said gear into and out of mesh with said rack.

8. In apparatus of the class described, a chassis frame, a removable body on said frame, a rack on said body, a shaft journaled in said frame, a pinion fixed on said shaft, a gear driven by said pinion and adapted to mesh with said rack, means for rotating said shaft, an arm member rotatably mounted on said shaft and having a shaft in its outer portion on which said gear is mounted, means for swinging said arm on said first mentioned shaft whereby to raise and lower said gear into and out of mesh with said rack, and means for locking said arm in its raised or lowered position.

9. In apparatus of the class described, a chassis frame having a track thereon, a removable body longitudinally movable on said track, and means spaced along said track in staggered relation for holding said body against vertical displacement from said frame.

10. In apparatus of the class described, a chassis frame having a track thereon, a removable body longitudinally movable on said track, and means for holding said body against vertical displacement from said frame, said means comprising a hook and eye adjacent the front end of said frame and a second hook and eye longitudinally spaced rearwardly from said first hook and eye, said second hook and eye being in transversely staggered relation to said first hook and eye, whereby to permit the first mentioned eye to pass the rearward hook when said body is moved forward on said track.

11. In apparatus of the class described, a chassis frame, a removable body movable longitudinally on said frame, and automatic locking means for locking said body against rearward movement on said frame, said means comprising a pin on said body and a bell crank on said frame, said crank having on one arm a hook with its outer face beveled to cause depression thereof when it contacts with said pin, and a spring pressed rearwardly extending rod connected to the other arm of said crank, whereby said locking means may be released from the rear of the frame.

12. In apparatus of the class described, a chassis frame, a removable body movable longitudinally on said frame, means on said frame for moving said body longitudinally thereof, and automatic locking means for releasably locking said body against rearward movement on said frame, said first mentioned means and the releasing of said locking means being operable from substantially the same position of the operator.

13. In apparatus of the class described, a chassis frame, a removable body longitudinally movable thereon, journal boxes depending in pairs from said body, a wheel journaled between each pair of said boxes, a perforated ear extending from one box of each pair, and hooks on said frame with which said ears will interlock upon longitudinal movement of said body to hold the same against vertical movement.

14. In apparatus of the class described, a chassis frame, a removable body longitudinally movable thereon, journal boxes de-

pending in pairs from said body, a wheel journaled between each pair of said boxes, a perforated ear extending from one box of each pair, and hooks on said frame with which said ears will interlock upon longitudinal movement of said body to hold the same against vertical movement, the hooks of the rear pairs being staggered with relation to those of the front pairs, whereby the ears of the front pairs will pass the rear hooks when said body is moved longitudinally onto said frame.

15. In a freight-truck, a truck-frame, a wheeled body movably mounted thereon, a rack mounted below the body, a yoke pivoted on the truck-frame, a pinion carried by the yoke to drive the rack, a second pinon mounted coaxially with the yoke pivot and intermeshed with said first pinion, means for actuating said second pinion, and means for raising and lowering the yoke to engage and disengage said first pinion with and from the rack.

16. In a freight-truck, a truck frame, a wheeled body movably mounted thereon, a rack mounted below the body, a horizontal drive shaft, journaled on the truck-frame, a yoke having one end pivoted on said shaft, a drive pinion on the shaft, a second pinion carried by the yoke, driven by said first pinion, and engageable with the rack, and means for raising and lowering the free end of the yoke.

17. In a freight truck, a truck frame, a body frame movably supported thereon, a rack mounted on one frame, a pinion mounted on the other frame, movable toward and from the rack to engage and disengage with and from the rack, and means for locking the pinion against movement, said means including a second pinion; and a pawl adapted to releasably engage the teeth of said second pinion to lock said first mentioned pinion against movement.

In witness whereof I hereunto subscribe my name to this specification.

IRVING F. AVERY.