March 22, 1927. 1,621,844

A. F. KLASING

CAR BRAKE

Filed March 1, 1923 3 Sheets-Sheet 1

Fig. 1.

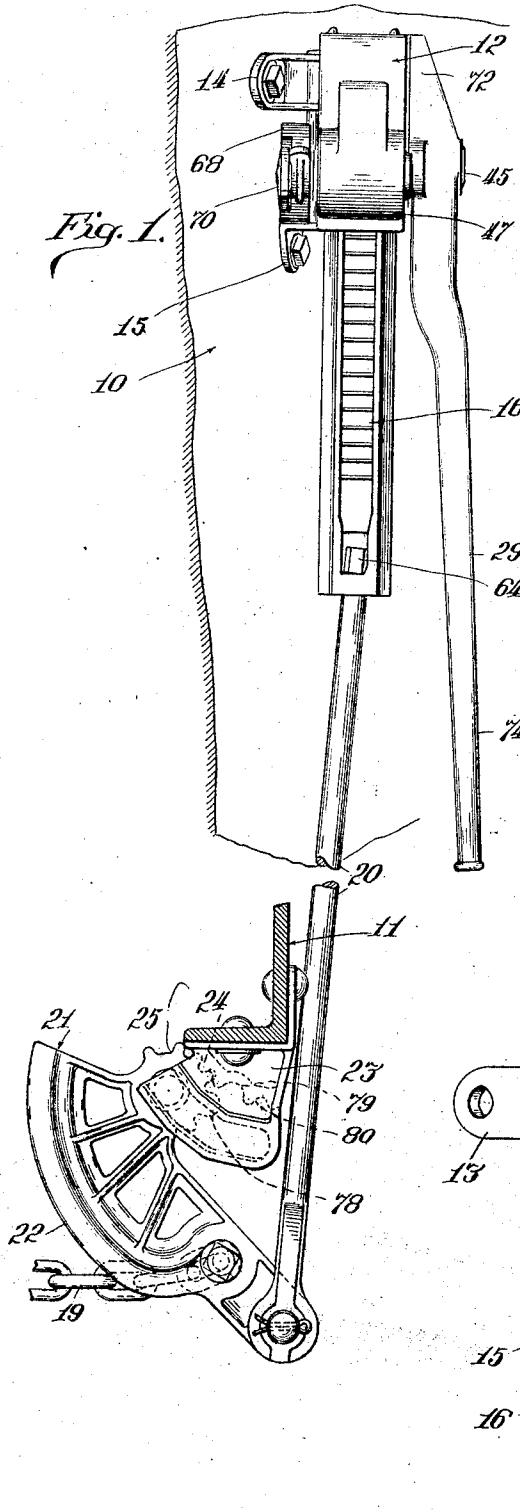


Fig. 2.

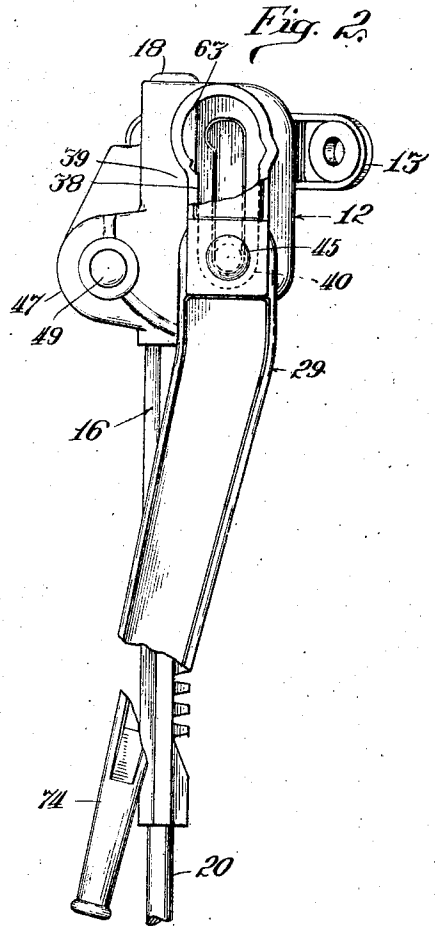
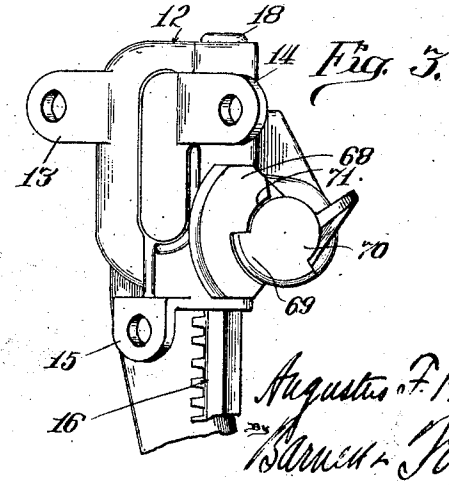


Fig. 3.



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Fig. 4.

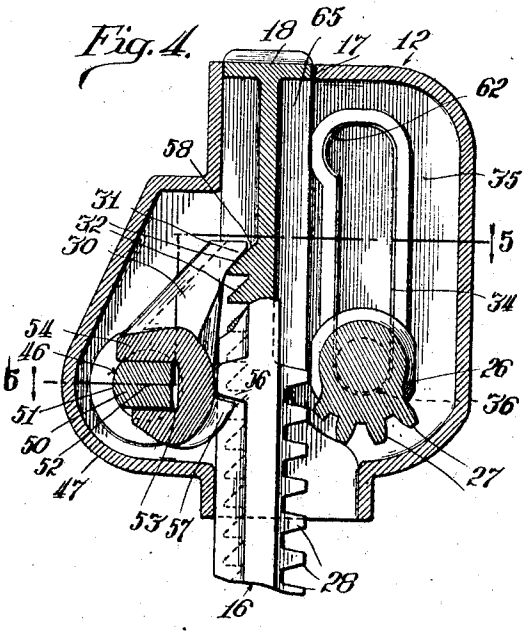


Fig. 6.

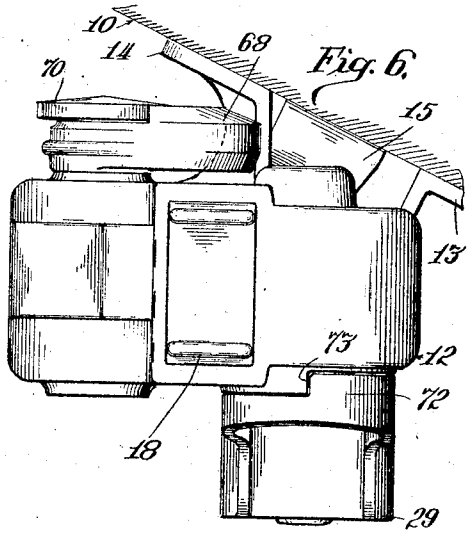


Fig. 5.

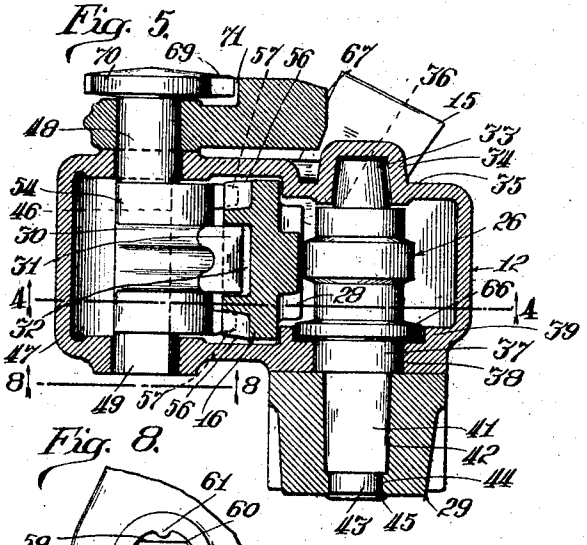


Fig. 8.

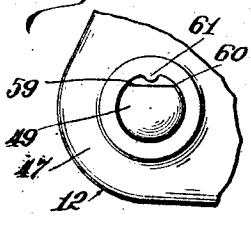
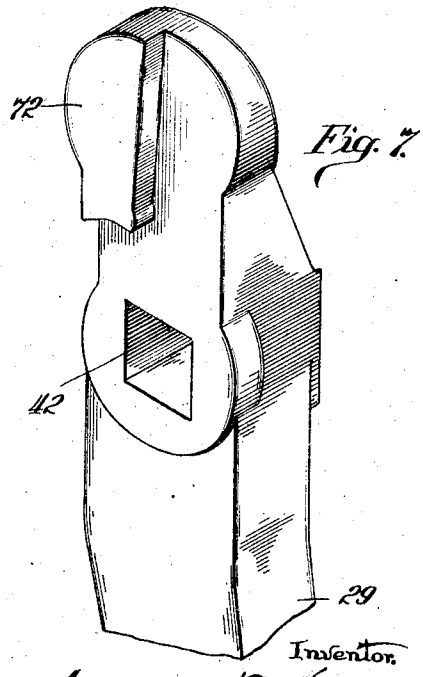


Fig. 7.



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Fig. 10.

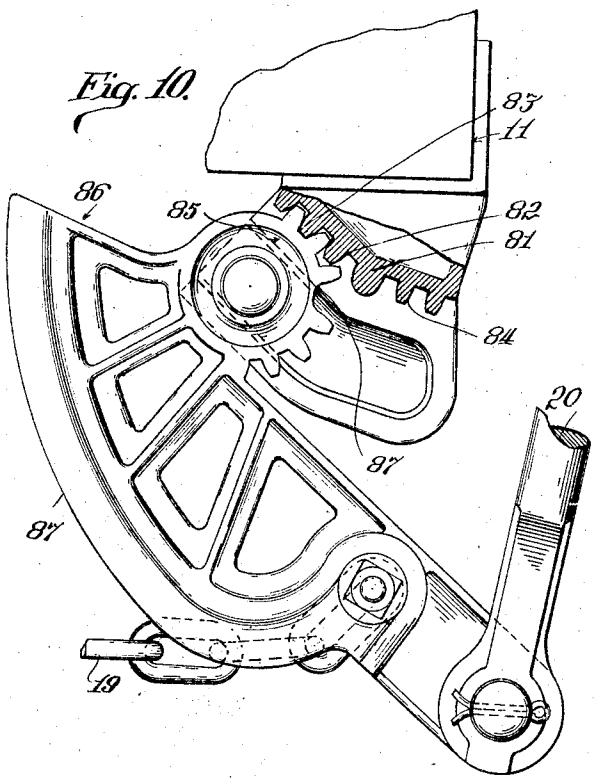


Fig. 9.

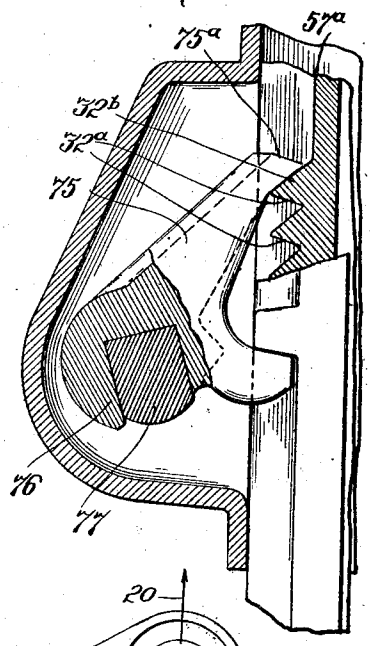
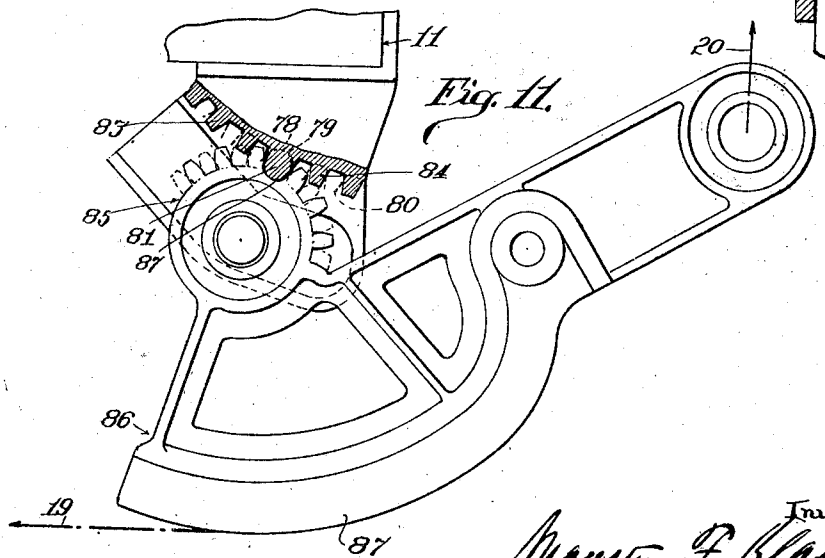


Fig. 11.



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Patented Mar. 22, 1927. 1,621,844

UNITED STATES PATENT OFFICE.

AUGUSTUS F. KLASING, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE KLASING CAR BRAKE COMPANY, A CORPORATION OF COLORADO.

CAR BRAKE.

Application filed March 1, 1923. Serial No. 622,009.

My invention relates to mechanism for manipulating the brakes of a railway car of the type involving a hand lever which is operated by repeated oscillatory movements to set the brakes by raising step by step a substantially vertically arranged rack bar, or equivalent element to which the brake beams are connected by suitable transmission mechanism. Car brake apparatus of this general type is shown in Patent No. 1,420,554, granted to me on June 20, 1922 in my own co-pending application Serial No. 533,269 filed February 1, 1922.

The general purpose of the present invention is to provide further changes in the construction and arrangement of the parts of the apparatus with a view to making certain improvements in the apparatus. These improvements comprise an arrangement of the operating lever of the apparatus diagonally across the rack which it raises so that if the lever is bent the brakes can still be operated and so that the weight of the lever by holding it against a suitably arranged stop, prevents the lever from swinging with the weaving movements of the car, as is the case when the lever hangs freely in a vertical position; the construction of the housing and rack and an arrangement of the rack and its operating pinion in the housing which while allowing the ready assembly of these parts prevents the pinion from being removed without detachment first of the brake connections from the rack and the removal of the rack from the housing; an improved and simplified construction of the mechanism for holding the rack in elevated positions which eliminates lost motion when the detent engages the rack, which reduces friction to insure freedom and certainty of action of the parts and lessens wear, and which makes it impossible for a careless workman to assemble these parts in any but their proper operative relationship; a novel construction of the pinion for raising the rack whereby this element is made stronger and more durable and the manufacturing cost of the same reduced; and an improvement in the device for changing the upward vertical pull of the rack to a horizontal pull on the brake rigging under the car, whereby the leverage of the apparatus is increased at the time that the brake shoes are in contact with the car wheels.

The invention is illustrated in the accompanying drawings wherein

Fig. 1 is a fragmentary sectional elevation of the brake mechanism of my invention shown as applied to the end of a railway box car, the upper part of the figure being in a plane oblique to the end of the car, to better illustrate this part of the mechanism which is obliquely arranged on the car wall, while the lower portion of the figure is on a plane at right angles to the end wall of the car.

Fig. 2 is a fragmentary end elevation of the upper part of the brake mechanism, in a plane at right angles to the plane of the upper portion of Fig. 1, this figure showing what may be termed a front side of the apparatus.

Fig. 3 is a fragmentary view, in perspective, of the rear or inner side of the apparatus shown as though removed from the car wall.

Fig. 4 is a fragmentary longitudinal, sectional view of the brake setting mechanism and its housing, taken on line 4—4 of Fig. 5.

Fig. 5 is a sectional plan on line 5—5 of Fig. 4.

Fig. 6 is a plan view of the housing and the operating lever.

Fig. 7 is a view, in perspective, of the upper end of the lever with its rack operating pinion removed.

Fig. 8 is a fragmentary view, in elevation, taken on line 8—8 of Fig. 5.

Fig. 9 is a fragmentary vertical sectional view illustrating a modified and preferred construction of the rack holding detent and the shaft on which it is mounted.

Fig. 10 is a fragmentary vertical sectional view of a modified and preferred form of mechanism for translating the upward pull of the rack bar to a substantially horizontal pull on the chain forming part of the brake rigging under the car body, and

Fig. 11 is a diagram to illustrate the advantages of the mechanism shown in Fig. 10.

Referring to the drawings, 10 designates the end wall of a railway box car, and 11 the end sill of the car. It will be understood

that the apparatus is not limited to application to a box car but may be used on railway cars of any type. 12 designates a housing which is formed with lugs 13, 14, and 15 for securing it to the car wall 10. 16 is a rack bar which extends upwardly through the housing 12, is adapted to project through an opening 17 in the top of the housing, and is formed, preferably, with a head 18 which closes this opening when the rack bar is in its normal or lowermost position. The car may be provided with any suitable form of brake rigging under its deck consisting of the usual brake beam and equalizers for moving the brake shoes against and away from the wheels of the car. This rigging, which will ordinarily be provided with a compressed air actuated mechanism for operating it, is also operable by a chain 19 and this chain, which in the common type of railway car hand brake mechanism is attached to and winds upon the end of a revoluble brake staff on the end of the car, in the brake manipulating apparatus of my invention is connected, by suitable transmission mechanism, with the rack bar 16. My present invention is not concerned with this transmission mechanism which is shown, however, for the purpose of illustrating my present improvements in an operative brake setting apparatus and consists of a rod 20 loosely connected with the lower end of rack bar 16, a rocking element 21 to which chain 19 is attached and upon the curved surface 22 of which the chain bears when rack bar 16 is raised to rock element 21, and a channeled bracket 23, the under surface of which is in the form of a rack 24 engaged by a pinion 25 on the rocking element so that as angular movement is imparted to element 21 it also moves forwardly and downwardly, that is to say, rolls on the rack 24, to increase the take-up of the brake connections.

The rack bar 16 is raised by means of a mutilated pinion 26, the teeth 27 of which engage with teeth 28 on one edge of the rack bar, pinion 26 being fixed to the upper end of an operating lever 29 by means of which the pinion is rotated. The pinion is mounted in a housing so that it is movable vertically as well as capable of rotation. When the outer end of the lever 29 is raised the pinion is rotated to engage the teeth 28 of the rack and raise the rack. The upward swinging movement of the lever can be stopped at any point and a detent 30 having a tooth 31 will engage one or other of the holding teeth 32 on the back of the rack to hold the rack in its elevated position. The operator then drops the lever, which of its weight swings back to hanging position. The pinion, and with it the lever, are raised as the pinion rotates in the backward direction, the pinion climbing up the rack until the pinion teeth are freed from the rack teeth. Pinion and lever then fall to their normal positions.

The pinion 26 consists preferably of a drop forging and is formed at one end with a tapered gudgeon or journal 33 adapted to slide in a closed slot in the form of a tapered channel 34 formed in the back wall 35 of housing 12, the journal finding a bearing in the curved bottom surface 36 of the channel. The pinion is also formed with a preferably cylindrical bearing 37 which has vertical movement in a slot 38 in the front wall 39 of housing 12, the lower surface of this slot being curved, as indicated at 40, to provide a bearing for the journal 37 when the pinion is rotated in engagement with the rack bar 16. Outwardly of journal 37 is a portion 41 square in cross section and slightly tapered to fit into a corresponding opening 42 in the upper end of the operating lever 29, and a stud 43 on the squared portion 41 extends through a corresponding opening 44 in the lever and is riveted over on the outer face of the lever, as indicated at 45. In manufacturing the pinion the teeth 27 are cut. The pinion is then treated to harden it, trunnions as well as the teeth being hardened, and the stud 43 is annealed so that it may be riveted over on the lever.

The detent 30 is non-rotatably mounted on a rock shaft 46 which extends through an enlargement 47 of the housing and is formed with journals 48, 49 turning in bearings in the front and rear walls of the housing, and with a center portion 50, the upper, lower and inner surfaces of which are flat while the outer side 51 is formed with a curved projection extending to a point further from the axis of rotation 52 of the rock shaft (Fig. 4) than the front surface 53 of this part of the shaft. The detent is formed with a jaw 54 having a configuration corresponding to the middle portion 50 of the rock shaft so that the detent may be non-rotatably engaged with the rock shaft without the use of any fastening devices. The detent is held on the shaft by the rack bar 16, the inner edge of which stands immediately in front of the detent. The rack bar is formed on this face with two lugs 56 on opposite sides of the series of teeth 32 adapted to bear against lugs 57 on the detent when the rack is in its lowermost position, the engagement of these lugs throwing the nose 31 of the detent against the inclined surface 58 of the uppermost holding tooth 32. The middle portion 50 of the rock shaft is greater in width than in vertical dimension so that in assembly of the parts there is only one possible position of the detent on the rock shaft. A careless workman cannot make any mistake in assembling the parts. To prevent the rock shaft from being inserted through the casing from the wrong side the journal 49 thereof is formed with its up-

per surface flat, as indicated at 59 (Fig. 8) and the corresponding bearing 60 in the casing is formed with a depending lug 61 which projects toward the flattened surface 59. This allows the shaft to rock as far as is necessary.

The channel 34 in which the journal 33 of the pinion 26 moves is formed at its upper end with an offset or enlargement 62 on the side adjacent to the rack bar and the slot 38 in the front wall of the housing is formed at its upper end and on the same side with an enlargement 63. By this arrangement the pinion may be put in place in the housing before the rack bar is assembled. The latter is put into the housing through the opening 17 in the top thereof after the detent has been placed on the rock shaft. The rod 20 is then attached to the lower end of the rack bar, rod 20 having a T head 64 allowing this connection to be made when the rod is turned at right angles from its normal position. The rod, however, cannot be disconnected from the rack bar when in its normal position, that is, when pivoted to the rocking transmission element 21 with the latter mounted on the car body. The rack bar is formed above its teeth 28 with a rib 65 which prevents the pinion from being withdrawn through the enlargement 63 so long as the rack bar is in place in the housing. Pinion 26 is formed just inside of the journal 37 with a boss 66 adapted to bear against the front wall of the housing along the sides of slot 38.

The design and arrangement of the housing, pinion, rack bar, detent and rock shaft are such that the pinion, rack bar, detent and rock shaft may be assembled in the housing without bolts, rivets or other fastening devices but when once assembled they cannot be removed therefrom without detaching rod 20 from the rack bar and this involves taking the entire apparatus off the car. This feature is a matter of very considerable importance since, besides simplifying the construction of the parts, minimizing their number and allowing all of the parts to be made heavy and strong, the apparatus is protected against being tampered with by unskilled or malicious persons. Apparatus designed to be placed upon a freight car should always be guarded against being tampered with maliciously and against attempts to make repairs or adjustments by persons who have not the skill to make such repairs or adjustments.

The rock shaft is held at one limit or the other of its rotation so as to maintain the detent in engagement with or out of engagement with the holding teeth 32 of the rack bar by means of a weighted trip 67 which is revolubly mounted directly upon the journal 48 of the rock shaft. This direct mounting of the weight minimizes friction so as to insure proper operation of the trip particularly when the detent is automatically reset in the manner to be hereinafter described.

The weight is formed with an arcuate lug 68 which is adapted to bear against one end or the other of an arcuate lug 69 on the head 70 of the rock shaft, the weight being recessed, as indicated at 71, for the head.

The lever 29 is formed at its upper end with a stop lug 72 adapted to bear against a shoulder 73 on the housing 12. The handle portion 74 of the lever is arranged obliquely to the upper portion of the lever so that with stop lug 72 bearing against shoulder 73 the handle portion of the lever extends diagonally across and in front of the rack bar 16. This arrangement has two purposes. In the first place, if the handle is bent, as may happen considering that the apparatus is located, ordinarily, on the end of a railway car, the handle can still be swung to set the brakes which would not be possible if it hung down on the side of the rack bar to which it is pivoted and were bent far enough so as to strike against the rack bar when a swinging movement was attempted. In the second place, the weight of the oblique portion of the lever tends to keep the lug 72 against the shoulder 73 to prevent vibratory movements of the lever when the car weaves.

Operation (Figs. 1 to 8).—The brakeman stands on a platform, or the like, (not shown) arranged at a convenient distance from the handle 74 of the lever 29 and to set the brakes pulls up on the lever repeatedly until the slack in the brake connections has been taken up and the brake shoes pressed against the wheels with sufficient force to bring about the required braking action. Ordinarily it will be necessary to pull up on the lever two or more times. At the end of each stroke the operator releases the lever. The detent holds the rack bar in the position to which it has been elevated while the lever in swinging back toward its original position rises with the pinion as the latter climbs the rack bar until its teeth are released from the rack bar, whereupon lever and pinion drop to their normal position. To release the brakes the tripping weight is turned to a position to throw the detent out of engagement with the holding teeth of the rack bar. This disengagement of the rack bar, however, does not take place until the lever 29 has been turned enough to engage the first tooth of the pinion with one of the rack bar teeth and raise the rack bar enough to release the pressure of the holding teeth on the detent. The weight 67 then rocks the detent sufficiently to disengage the tooth thereof from the holding teeth 32 and the rack drops. When the rack approaches the end of its downward movement

the lugs 56 strike against lugs 57 on the detent and this automatically re-sets the detent to a position on surface 58 in readiness to engage the rack when it is again raised.

In Fig. 9, I have shown a holding mechanism for the rack bar 57ª which is of superior construction to the corresponding mechanism shown in the preceding figures in that it minimizes lost motion as between the detent and the rack bar holding teeth when the rack bar is released by the lifting mechanism. In the arrangement shown in Fig. 9 the detent 75 is formed with a jaw 76 which, in the operative position of the detent, is disposed obliquely to the vertical, the shaft on which said detent is mounted, corresponding to shaft 54 of the preceding figures, being formed with a portion 77 of corresponding configuration. By employing this expedient for mounting the detent the detent does not have the tendency to rock forwardly under the downward thrust of the rack bar which is present, to a certain extent, in the holding mechanism previously described. It is a matter of some importance to minimize lost motion in engagement between the detent and the rack bar in order that approximately full power of the brake mechanism may be exerted against the brakes while the shoes are held in locked engagement with the wheels of the car.

With the same end in view, and also to make it easier to release the rack from the detent by diminishing the amount of upward movement of the rack necessary to effect such release, the upper edge of the detent, instead of being made horizontal, for the normal position of the detent, as shown in Fig. 4, is given a downward inclination as indicated at 75ª in Fig. 9, and the under surfaces 32ª of the teeth 32ᵇ on the rack bar 57ª are inclined downwardly in the direction away from the detent. By this configuration of the detent and holding teeth the engagement of the detent with the teeth and its disengagement therefrom, do not involve raising the rack so high as is necessary with the construction shown in Fig. 4. The difference is slight, but is a matter of importance since it is desirable to hold the brakes as firmly as possible against the wheels when the brakes are set. Also in releasing the brakes very considerable power is required to raise the rack in any case, and the shorter the distance it has to move the less force will be required.

The lower part of Fig. 1 shows a device, which has been described in a cursory manner, for translating the vertical movement of rod 20 and rack bar 16 into a substantially horizontal pull on the chain 19 connected with the brake rigging under the car, and Figs. 10 and 11 illustrate a modification of and improvement upon the power transmitting mechanism shown in Fig. 1.

Referring first to Fig. 1, it will be seen that the effective length of the member 21, considered as a lever of the second class, is diminished as the lever is drawn down rack 24. If the point of attachment of the load to the lever (bearing point of chain 19 thereon) remained fixed the power exerted on the brake rigging under the car for a given force applied to member 21 by rod 20 would gradually increase with the rolling movement of member 21 toward its brake setting position. This would be objectionable since the amount of slack in the brake connections of different cars varies considerably so that the amount of force available for actually pressing the brake shoes against the wheels of the car would widely vary, depending upon the position of the member 21 at the time that the shoes come into contact with the wheels. Consequently the surface 22 over which chain 19 is flexed when the brake mechanism is operated to set the brakes, is calculated so as to compensate for the shortening of the length of the lever thereby maintaining a substantially constant ratio between the arms of the lever. Sufficient power is always available, therefore, to set the brakes effectively. In the arrangement shown in Fig. 1 the pinion 25 on member 21 is provided with a large tooth 78 which engages an enlarged recess 79 in the rack 23 when the rack approaches the limit of its normal working movement. As a factor of safety the rack is provided below the large recess 79 with a pair of small teeth 80, but the intention is that the rack shall finish its movement while the large tooth 78 is in engagement with the recess 79 and the pitch line of the small teeth 80 is inclined at a less angle to the horizontal than the pitch line of the teeth 24 so that the pinion will have a pivotal movement of some amplitude on tooth 78. The tooth 78 and recess 79 are located on the pinion and rack so that, for most cars at least, the brake shoes will be brought against the wheels while the member 21 is pivoting on the tooth 78. The amplitude of pivotal movement is enough to take care of any ordinary variations in the slack of the brake connections. In setting the brakes, therefore, the rolling movement of the pinion takes up the slack but when the shoes are forced against the wheels the movement of member 21 is a pivotal movement on tooth 78 in which friction is minimized. The contour of surface 22 over which chain 19 winds, is such as to maintain a constant lever ratio so that in all positions of member 21 there is always sufficient power available to set the brakes effectively. This is true, approximately, but not exactly so far as the arrangement of Fig. 1 is concerned. When recess 79 provides the ful-

crum for member 21 the effective length of the lever is greater than it would be were tooth 78 and recess 79 the same size as the smaller teeth and recesses. This results in an effective lengthening of the lever with consequent diminution of power on the brake shoes.

A better arrangement is shown in Fig. 10. Here the large tooth, designated 81, is on the rack, which is designated 82, the tooth being arranged between the upper and lower sets of smaller teeth 83, 84, the pitch lines of which are at an angle to each other. The pinion 85 on the power transmitting member 86 is formed with a recess 87 to receive the large tooth 81 on the rack. By this construction of the rack and pinion the change in lever ratio resulting from the large tooth is such as to increase, to a certain extent, the power applied to the brakes, for a given force on the other end of the transmitting member instead of decreasing such power as in the arrangement of Fig. 1. The winding surface 87 on element 86 has the same contour as surface 22 of member 21. The difference in lever ratios at the time the brakes are being forced against the wheels of the car involved in this reversal of the large tooth and its corresponding recess is apparent from Fig. 11 in which the full lines show the rack and pinion construction of Fig. 10 while the construction of Fig. 1 is illustrated by dotted lines.

I claim:

1. In a mechanism for manipulating brakes of a railway car, the combination of a housing having a side wall provided with an opening for the passage of a pinion, a rack bar slidably mounted within the housing upon one side of said opening and being provided at one end of its teeth with a longitudinally extending obstructing portion, a mutilated pinion adapted to be passed into the housing through said opening and to engage with the teeth of the rack bar, the longitudinal obstructing element being adapted to prevent the movement of the pinion in a direction to permit of its withdrawal through said opening, means for turning said pinion and brake mechanism actuated by the movement of said rack bar.

2. A car brake comprising a housing having a longitudinal slot and an enlarged opening at one end of the slot for the passage of a pinion, a rack bar slidably mounted within the housing upon one side of the slot and opening, said rack bar having a longitudinal rib, arranged at the end of the set of teeth of the rack bar, a mutilated pinion having a shaft operating within said slot, said mutilated pinion being adapted to be passed into the housing through the enlarged opening, the rib being adapted to prevent the movement of the pinion in a direction which would permit of its removal through said enlarged opening, means to turn the mutilated pinion, and brake mechanism actuated by the movement of the rack bar.

3. A car brake, comprising a housing, a pinion revolubly mounted in said housing and movable into and out of position through an opening in the wall of the housing, a rack bar movable into position to be operated by said pinion after the pinion is in position in the housing, said rack bar having a part adapted to be arranged in the path of travel of the pinion to prevent the movement of the pinion which will permit of its removal through said opening, means for rotating said pinion for giving said rack bar a longitudinal movement, a brake rigging underneath the car, and means actuated by the movement of said rack bar for operating the brake rigging.

4. A car brake, comprising a housing, a pinion revolubly mounted in said housing and movable into and out of position through an opening in the wall of the housing, a rack bar slidable from above into position to be operated by said pinion after the pinion is in position in the housing, said rack bar having a part adapted to be arranged in the path of travel of the pinion to prevent the movement thereof which would permit of the withdrawal of said pinion through said opening, means for rotating said pinion for giving said rack bar a longitudinal movement, a brake rigging underneath the car, and operative connections between said brake rigging and the lower end portion of said rack bar below said housing serving upon upward movement of the rack bar to set the brakes.

5. In mechanism for manipulating the brakes of a railway car, the combination of a housing, a rack bar extending substantially vertically through said housing, and a pinion adapted to mesh with said rack bar and formed with journals, said housing being formed with slots to receive said journals having enlargements at their upper ends in the direction toward said rack bar to allow the pinion to be placed in the housing, and a rack bar having a part arranged in the path of travel of the pinion to prevent the movement of the pinion in a direction which would permit of the removal of the pinion from the casing through said enlargements.

6. In mechanism for manipulating the brakes of a railway car, the combination of a housing, a rack bar extending, substantially vertically, through said housing, a pinion adapted to mesh with said rack bar and formed with journals, said housing being formed with slots to receive said journals having enlargements at their upper ends in the direction toward said rack bar to allow the pinion to be placed in the hous-

ing, a rack bar having a longitudinal part arranged in the path of travel of the pinion to prevent the movement of the pinion in a direction which would permit of the removal of the pinion from the casing through said enlargements, holding teeth on the rack bar, a detent to engage said holding teeth the back of which is formed with a jaw, and a rock shaft journaled in said housing having a portion extending through and non-rotatably engaged with the jaw of said detent.

7. In mechanism for manipulating the brakes of a railway car, the combination of a housing, a rack bar extending substantially vertically through said housing, a pinion to mesh with said rack bar formed at opposite ends with journals, the inner wall of said housing being formed with a channel to receive one of said journals and the outer wall of the housing with a slot to receive the other of said journals, said recess and slot being formed at their upper ends with enlargements in the direction toward the rack bar and the rack bar having a longitudinal rib disposed in the path of travel of the pinion to prevent the movement of the pinion in a direction which would permit of the removal of the pinion from the housing through said enlargements.

8. In mechanism for manipulating the brakes of a railway car, the combination of a housing, a rack bar extending substantially vertically through said housing, an operating lever, and a pinion to mesh with said rack bar consisting of an integral forging comprising a middle toothed portion, journals, and a shank polygonal in cross section extending from one of said journals and adapted to fit a correspondingly shaped recess in said lever, and formed with a stud adapted to extend through and be riveted to said lever.

9. A car brake, comprising a housing, a shaft extending through said housing, a detent provided with a socket slidable into position on said shaft from one side of the shaft, and a bar movable into position in said housing and having holding teeth in position for operative engagement by said detent, said bar when in operative position serving to prevent the withdrawal of the detent from the shaft.

10. A car brake, comprising a housing, a rock shaft extending through said housing, a detent provided with a socket slidable into position on said shaft from one side of the shaft, said shaft and socket being fitted together so as to cause the detent to swing upon rocking motion of the shaft, and a bar movable into position in said housing and having holding teeth in position for operative engagement by said detent, said bar when in operative position serving to prevent the withdrawal of the detent from the shaft.

11. A car brake, comprising a housing, a pinion revolubly mounted in said housing and movable into and out of position through an opening in the wall of the housing, a shaft extending through said housing opposite the normal position of said pinion, a detent provided with a socket slidable into position on said shaft from one side of the shaft, a rack bar movable into position between said pinion and said detent after they are in position in the housing so as to have operative engagement with the pinion and serving in such position to prevent the withdrawal of the pinion and the detent from the housing, holding teeth on said rack bar in position for operative engagement by said detent, means for rotating said pinion for giving said rack bar a longitudinal movement, a brake rigging underneath the car, and means actuated by movement of said rack bar for operating said brake rigging.

12. A car brake, comprising a housing, a bar extending through said housing, means for moving the bar longitudinaly, holding teeth on the bar, a rock shaft journalled in said housing adjacent to said bar, a detent mounted on said rock shaft within said housing so as to be swung by the rock shaft into and out of engagement with said holding teeth, a weighted trip rotatably mounted on the projecting end of said rock shaft, and lugs on said trip and said rock shaft adapted by engagement to cause said detent to be swung by said trip with lost motion therebetween.

13. In a brake mechanism, a housing provided in its side with a substantially vertical elongated slot and an enlarged opening extending laterally beyond the slot, a rack bar slidable within the housing upon the side of the slot beyond which the enlarged opening projects, said rack bar having a set of teeth and a rib extending longitudinally thereof above the teeth, a mutilated pinion adapted to be passed through the opening and including a hub carrying teeth upon a portion thereof, a shaft carrying the pinion and adapted to operate within the slot, said rib being adapted to engage with the hub of the pinion to prevent lateral movement thereof, so that the pinion can not be withdrawn through said enlarged opening, means to turn the pinion and brake mechanism actuated by the movement of the rack bar.

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