

May 31, 1938.

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2,118,960

ADJUSTABLE STOP FOR BRAKE HEADS

Original Filed Oct. 22, 1936

2 Sheets-Sheet 1

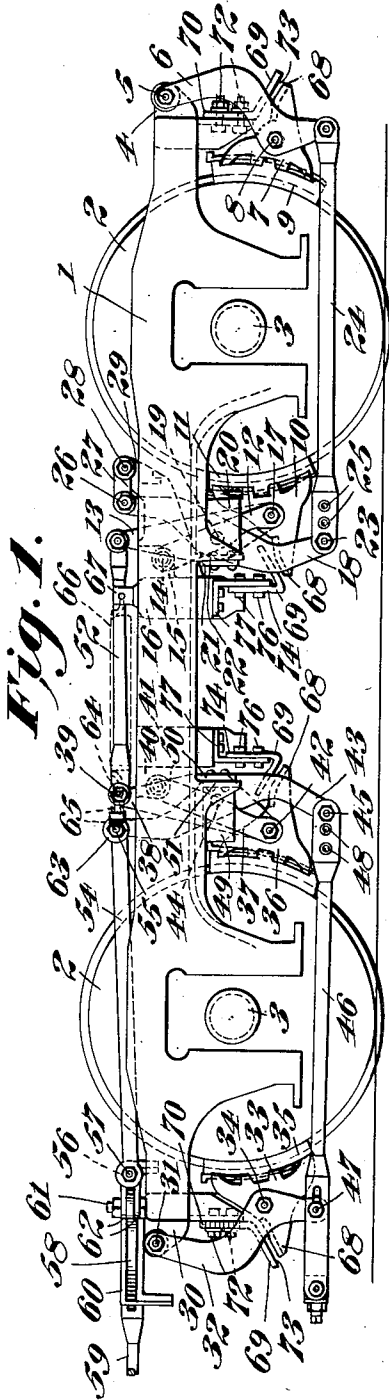


Fig. 1.

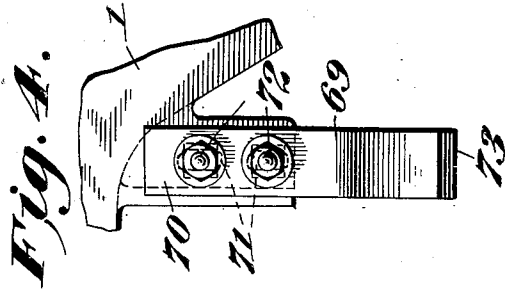


Fig. 4.

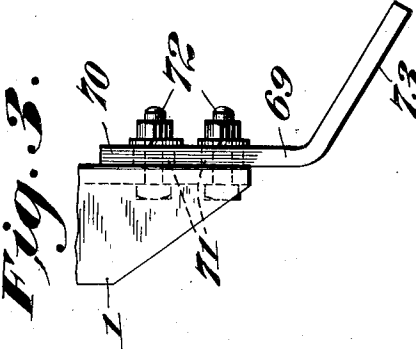


Fig. 3.

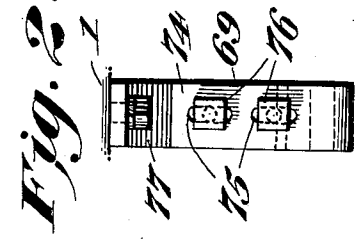


Fig. 2.

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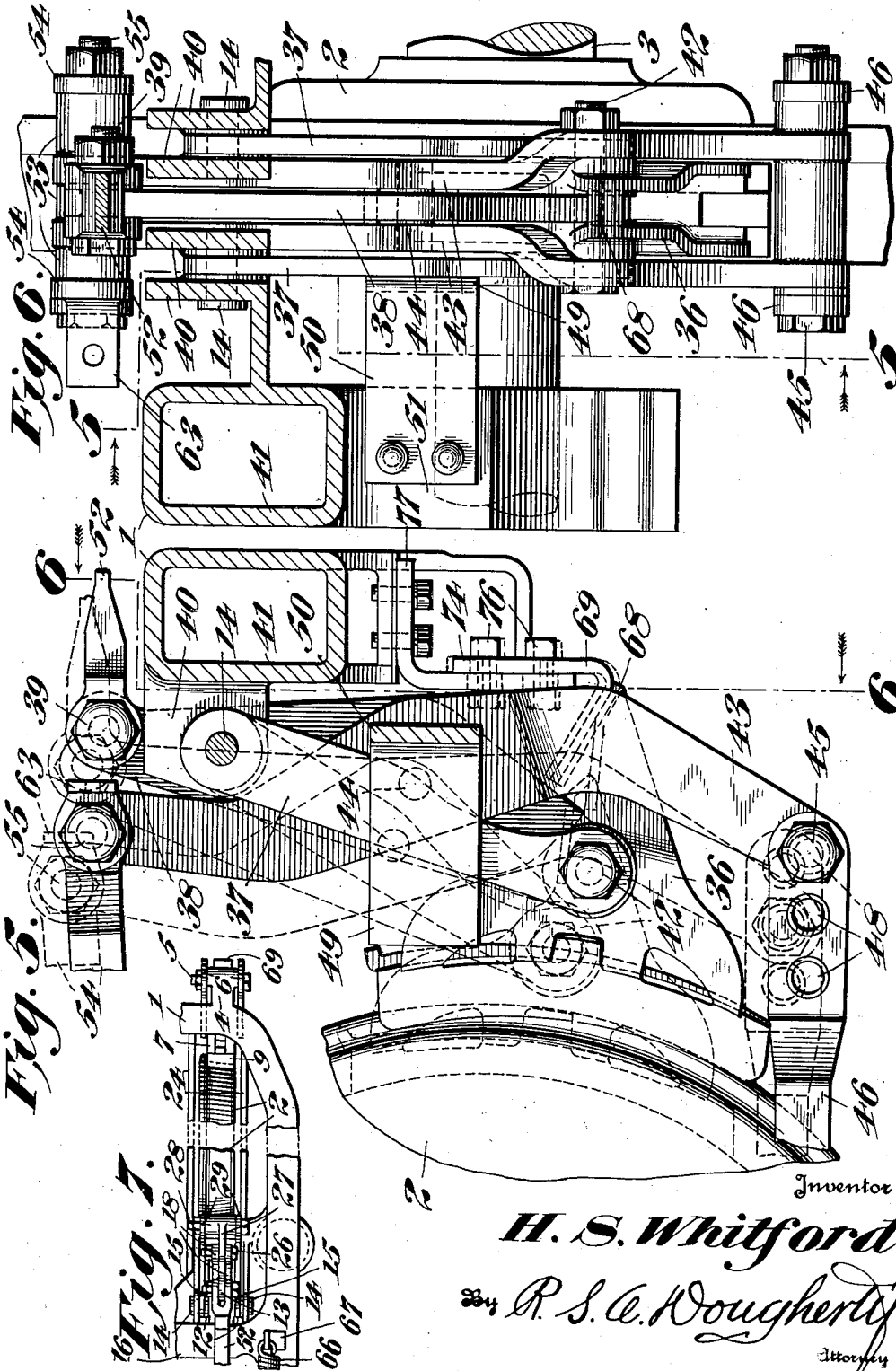
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ADJUSTABLE STOP FOR BRAKE HEADS

Original Filed Oct. 22, 1936 2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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ADJUSTABLE STOP FOR BRAKE HEADS

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Original application October 22, 1936, Serial No. 106,948. Divided and this application April 2, 1937, Serial No. 134,498

14 Claims. (Cl. 188—206)

My invention relates to brakes for railway cars and more particularly to the stops for engaging the brake heads when the brakes are released, and an object of this invention is to provide an improved means for insuring the frictional surface of the brake shoes carried by the brake heads to concentrically engage the wheel treads when the brakes are set and to insure an equalized engagement with the wheel treads at opposite sides of the truck, and is a division of my copending application entitled "Clasp brake" filed October 22, 1936, Serial No. 106,948.

Heretofore it has been the usual practice to support the brake heads by means of hanger links which have their upper ends pivoted to the truck frame without limiting stops or guiding means for the brake heads. In this manner of suspending the brake heads it is difficult to hold the frictional surfaces of all of the brake shoes when released at the same distance from the treads of the wheels so that when the brakes are set the frictional contact surfaces of the brake shoes will all engage the treads of the wheels with full braking force. It has also been found that if the brake shoes are not all adjusted properly and the frictional contact surfaces do not all engage the wheel treads concentrically that the shoes wear unevenly.

With my invention I obviate these defects by holding all of the brake heads at a predetermined distance from the wheels so that when the brakes are set the frictional contact surfaces of the brake shoes will all engage the wheel treads concentrically with full braking force.

One of the objects of my invention relates to the manner of forming the brake heads each with a contact projection, each adapted to engage an adjustable stop to maintain the brake head and shoe carried thereby in proper position relative to the wheel tread with which it comes in frictional contact, so that when the brakes are set the frictional contact surface of the brake shoe will concentrically engage the tread of the wheel.

Another object of my invention relates to the manner of attaching the stops to the truck frame so they can be easily and quickly adjusted.

My invention also has for its object a simple mechanism of this character which may be easily applied to a car truck frame of any ordinary or conventional type, the parts being strong and durable and not liable to get out of adjustment.

Having thus given a general description of the objections of my invention, I will now in order

to make the matter more clear, refer to the accompanying two sheets of drawings, forming a part of this specification and in which like characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of a car truck, showing the brakes in set position illustrating the application of my invention.

Fig. 2 is a detail rear elevation of one of the adjustable stops for one of the brake heads disposed at the inner side of the wheel.

Fig. 3 is a detail side elevation of one of the adjustable stops which are attached to the ends of the truck frame for engaging the contact projection of the brake heads to maintain the brake heads and shoes carried thereby in proper position relative to the wheel tread.

Fig. 4 is a front elevation of the adjusting stop shown in Fig. 3.

Fig. 5 is an enlarged side elevation of one of the inner sets of the brake head supporting and operating devices showing the brake shoe in the released position with parts in section taken on the line 5—5 of Fig. 6 and indicating in dotted lines the relative amount of wear allowed in standard practice for the brake shoes and treads of the wheels and the manner of adjusting the stops for engaging the projections on the brake heads.

Fig. 6 is a vertical section taken on the line 6—6 of Fig. 5 and

Fig. 7 is a detail top plan view of a portion of the truck showing the manner of pivoting the truck and fulcrum levers thereto.

For illustration I have shown my invention as applied to a four wheeled truck frame for a high speed electric train having a brake rigging of the beamless clasp brake type mounted thereon, but my invention could be adapted for use with other types of brake rigging and truck frames equally as well if desired.

Referring now to the characters of references on the drawings, the numeral 1 indicates the truck frame, 2 the wheels and 3 the axles. It will be understood that the brake mechanism and associated parts on each side of the truck is constructed in a similar manner and a description of the mechanism at one side of the truck will apply to both.

A lug bracket 4, extends from the right hand end of the truck frame to which is pivoted by means of a bolt 5 a pair of spaced vertically disposed dead truck levers 6 between which a brake head 7 is pivoted at an intermediate point by means of a bolt 8, and a brake shoe 9 is se-

cured to the brake head by means of a tapered key in the usual manner, said brake shoe being adapted to frictionally engage the tread of the wheel.

5 The brake head 10 on the opposite side of the wheel carrying the brake shoe 11 is supported and connected by means of a pair of spaced hanger links 12 and a single centrally vertically disposed live truck lever 13. The upper ends of the hanger links 12 are pivoted as at 14 to spaced flanges 15 extending from the truck transom 16. The lower ends of the centrally disposed live truck lever 13 and the pair of spaced hanger links 12 are pivoted to the brake head 10 by means of a single bolt 17.

10 Between the centrally disposed live truck lever 13 and each hanger link 12 is a vertically disposed dead fulcrum lever 18. These two fulcrum levers 18 and the centrally disposed live truck lever 13 are pivoted together at an intermediate point as at 19. A guide plate 20 engages the face of the outer hanger link 12 and has a flanged end 21 attached to a flange 22 extending from the truck frame. By this guiding means for the links the brake shoe will be movable in a substantially straight line transversely of the axis of the wheels between the guide and the flange of the wheel.

15 The lower ends of the dead fulcrum levers 18 are splayed apart and pivoted as at 23 to one end of a pair of spaced connecting bars 24. These spaced connecting bars extend on each side of the car wheel with their opposite ends attached to the lower ends of the spaced dead truck levers 6, while the inner ends are provided with a plurality of perforations 25 to allow for adjustment. The upper ends of the dead fulcrum levers 18 are pivotally attached as at 26 to a link 27 which has its opposite end pivoted as at 28 to flanges 29 which extend upwardly from the truck frame.

20 The left hand end of the truck frame is constructed in a similar manner to that of the right-hand end having a lug bracket 30 extending therefrom to which is pivoted by means of a bolt 31 a pair of spaced vertically disposed dead truck levers 32, between which a brake head 33 is pivoted at an intermediate point by means of a bolt 34 and a brake shoe 35 is secured to the brake head adapted to frictionally engage the tread of the wheel 2.

25 A brake head 35 at the opposite side of the wheel is supported and connected by means of a pair of spaced hanger links 37 and a single centrally disposed live truck lever 38. The upper ends of the spaced hanger links 37 are pivoted as at 39 to spaced flanges 40 extending from the truck transom 41.

30 The lower ends of the centrally disposed live truck lever 38 and the pair of spaced hanger links 37 are pivoted to the brake head by means of a single bolt 42. Between the centrally disposed live truck lever 38 and each hanger link 37 is a live fulcrum lever 43. The two live fulcrum levers 43 and the centrally disposed live truck lever 38 are pivotally connected together at an intermediate point as at 44. The lower ends of the fulcrum levers 43 are splayed apart and pivoted as at 45 to one end of a pair of spaced connecting bars 46. These spaced connecting bars extend on each side of the car wheel with their opposite ends pivotally attached by means of a bolt 47 to the lower ends of the spaced dead truck levers 32 on the opposite sides of the wheel. The inner ends of the connecting bars 46 are provided with a plurality of perforations 48 to allow the lower pivoted ends of the live fulcrum levers

43 to be adjusted as the wheel tread and brake shoes become worn by frictional contact, while the opposite ends of the connecting bars 46 have a take-up device for adjusting the lower ends of the dead truck levers 32.

5 A guide plate 49 similar to the guide plate 20 engages the face of the outer hanger link 37 and has a flanged end 50 attached to a flange 51 extending from the truck frame.

10 The upper ends of the two live truck levers 13 and 38 are connected together by means of a connecting rod 52.

15 The upper ends of the live fulcrum levers 43 are perforated and provided with tubular spacing members 53 which are welded to the sides of the live fulcrum levers.

20 A pair of pull rods 54 have their inner ends pivotally attached by means of a bolt 55 to the tubular ends of the spacing members. These pull rods extend on opposite sides of the car wheel and the outer ends are spaced apart and connected together by means of a tubular spacing member 56 and bolt 57. An equalizing bar 58 having a pull rod connection 59 extending to a brake cylinder (not shown) is supported in keepers 60 mounted on the truck frame 1.

25 One end of the equalizing bar is pivotally attached by means of a bolt 61 to a bifurcated extension 62 of the tubular spacing member 56. The opposite end of the equalizing bar is connected in a similar manner to a duplicate set of brake rigging on the opposite side of the truck. An L-shaped bracket 63 is secured by means of the bolt 55 to the inner end of the pull rod 54 to which is secured an eye bolt 64 by means of nuts 65. A helical spring 66 has one end attached to the eye bolt 64 and the opposite end secured to the truck frame 1 as at 67, is adapted to release the brakes.

30 The brake shoes are all attached to the brake heads by means of a wedge key which is the usual standard practice.

35 The brake heads are each formed with a contact projection 68 each adapted to engage the inclined lower surface of an adjustable stop 69 which is adapted for vertical adjustment to limit the movement of the brake shoes and maintain them in proper position relative to the wheel tread which it comes in frictional contact, and to further provide a simple and efficient means of equalizing the wear of the brake shoes. The stops 69 attached to the ends of the truck frame each have a vertical portion 70 which is slotted as at 71 for the passage of bolts 72 for securing the stops to the truck frame and a downwardly and outwardly extending contact portion 73 shown inclined at an angle of substantially 30° from the horizontal although this angle may be varied if desired. The stops 69 at the intermediate portion of the truck frame are formed and attached to the truck frame in a slightly different manner than the stops at the ends of the truck, each have a vertical portion 74 slotted as at 75 for the passage of bolts 76 for securing the said stop to an angular bracket 77 which is attached to the truck frame, while the lower contact ends of these stops are inclined upwardly and outwardly also at an angle of substantially 30° from the horizontal.

40 After all of the stops have been adjusted in the required position to allow all the brake shoes to properly engage the wheel treads they will not normally be adjusted again during the life of the brake shoes although this may be necessary at times on account of unequal wear on the

moving parts and the brake shoes. By this manner of attaching the stops to the truck frame any required vertical adjustment for each stop 69 can be secured to allow the contact projection 68

5 of each brake head to engage the stop at the proper angle, so that when the brakes are set the frictional contact surfaces of all of the brake shoes will engage the wheel treads concentrically at all times.

10 In standard practice the tread of the wheel is allowed to wear down one and one-half inches before the wheel is discarded, while the brake shoe is allowed to wear one and one-eighth of an inch before being replaced by a new brake shoe, as indicated in dotted lines in Fig. 5.

15 To allow for this wear the pivotal points between the ends of the connecting bars 24 and 46 and the lower ends of the truck and fulcrum levers and the vertical position of the stops 69 can be adjusted if required.

The operation of my braking mechanism is as follows: Assuming that the brake shoes are in the released position as indicated in Fig. 5, the contact projection 68 of each brake head will then engage the inclined lower surfaces of the adjustable stops and the brake shoes will then be held a short distance from the treads of the wheels. When it is desired to set the brakes fluid pressure is admitted to a brake cylinder as is the usual practice thereby moving the pull rod 59 and equalizing bar 58 connected thereto inwardly towards the center of the car so as to transmit braking power through the pull rod and equalizing bar to the fulcrum levers and truck levers and swinging the brake heads until the brake shoes carried thereby are brought into contact with the treads of the wheels. The brake mechanism will then be set in the position indicated in Fig. 1. When it is desired to release the brakes the fluid pressure to the brake cylinder is turned off and the pressure in the cylinder exhausted in the usual manner. The spring 66 will then release the brake.

In the drawings for illustration I have shown my brake rigging and stops as applied to a four wheeled truck, but it could be adapted for use with six or eight wheeled trucks equally as well or it could be arranged for use on one or a plurality of trucks operated simultaneously if desired.

Although I have shown and described my invention in considerable detail, I do not wish to be limited to the exact and specific details shown and described, but may use such substitutions, modifications or equivalents thereof as are embraced within the scope of my invention, or as pointed out in the claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a railway brake, a truck frame for supporting the brake, wheels for supporting the truck frame, a truck lever pivoted to the truck frame, a brake head pivotally connected to the truck lever, a contact projection having an inclined top surface extending from the intermediate portion of the brake head, a stop attached to the truck frame adjacent to the brake head adapted to engage the inclined top surface of the contact projection and limit the movement of the brake head when the brake is released, and means for setting and releasing the brake.

2. In a railway brake, a truck frame, wheels for supporting said truck frame, brake heads carrying a brake shoe disposed at opposite sides of

a wheel, means for setting and releasing the brake, a contact projection extending from each brake head, and a stop attached to the truck frame on opposite sides of the wheel adjacent to each brake head each adapted to engage a contact projection of a brake head.

3. In a railway brake, a truck frame, wheels for supporting said truck frame, brake heads carrying brake shoes disposed at opposite sides of each wheel, means for setting and releasing the brake, a contact projection extending from each head, a stop attached to the truck frame adjacent to each brake head adapted to engage the contact projection extending from each brake head, and means for adjusting the stops in relation to the contact projections.

4. In a railway brake, a truck frame, wheels for supporting said truck frame, brake heads carrying brake shoes disposed at opposite sides of each wheel, means for setting and releasing the brake, a contact projection extending from each brake head, a stop attached to the truck frame adjacent to each brake head each having an inclined surface adapted to engage the contact projection of each brake head, and means for vertically adjusting the stops.

5. In a railway brake, a truck frame for supporting the brake, wheels for supporting the truck frame, a truck lever pivotally connected to the truck frame on opposite sides of each wheel, a brake head pivotally connected to the truck lever at one side of each wheel, a contact projection extending from each brake head, and a stop attached to the truck frame adjacent to each brake head adapted to engage the contact projection and limit the movement of the brake heads when the brake is released.

6. In a railway brake, a truck frame for supporting the brake, wheels for supporting the truck frame, a truck lever pivoted to the truck frame, a brake head pivotally connected to the truck lever at one side of each wheel, a contact projection extending from each brake head, a stop having a vertical portion and an inclined portion adapted to engage the contact projections and limit the movement of the brake heads when the brake is released, slots formed in the vertical portion of each stop, and a bolt extending through each slot for securing the stops to the truck frame.

7. In a railway brake, a truck frame, wheels for supporting said truck frame, a brake head carrying a brake shoe disposed at one side of each wheel, means for setting and releasing the brake, a contact projection extending from each brake head, a stop having an upwardly inclined lower surface adapted to engage each contact projection extending from each brake head, and a bracket secured to the truck frame for supporting each stop.

8. In a railway brake, a truck frame, wheels for supporting said truck frame, a brake head carrying a brake shoe disposed at one side of each wheel, means for setting and releasing the brake, a contact projection extending from each brake head, brackets secured to the truck frame, a stop having a vertical portion and an upwardly inclined lower surface adapted to engage each contact projection extending from each brake head, slots formed in the vertical portion of each stop, and a bolt extending through each slot in the vertical portion of the stop adapted to secure each stop to a bracket.

9. In a railway brake, a truck frame, wheels for supporting said truck frame, a brake head carrying a brake shoe disposed at one side of

each wheel, means for setting and releasing the brake, truck levers pivoted to the truck frame for supporting the brake heads, a contact projection extending from each brake head, a stop having a vertical portion and a downwardly inclined lower surface adapted to engage each contact projection extending from each brake head, slots formed in the vertical portion of each stop, and a bolt extending through each slot in the vertical portion of the stop adapted to secure each stop to the truck frame.

10. In a railway brake, a truck frame, wheels for supporting said truck frame, a brake head carrying a brake shoe disposed on each side of each wheel, means for setting and releasing the brake, a contact projection extending from each brake head, a stop at one side of each wheel secured to the truck frame each having a downwardly inclined lower face adapted to engage each contact projection extending from each brake head on one side of each wheel, and a stop at the opposite side of each of said wheels supported by the truck frame, each having an upwardly inclined lower face adapted to engage each contact projection extending from each brake head on the opposite side of each wheel.

11. In a railway brake, a truck frame, wheels for supporting said truck frame, a brake head carrying a brake shoe disposed on each side of each wheel, means for setting and releasing the brake, a contact projection extending from each brake head, and an oppositely inclined stop at each side of each wheel secured to the truck frame adapted to engage each contact projection extending from each brake head and limit the movement of said brake heads when the brake is released.

12. In a railway brake, a truck frame, wheels for supporting said truck frame, a brake head carrying a brake shoe disposed on each side of each wheel, means for setting and releasing the brake, a contact projection extending from each

brake head, a stop at each side of each wheel secured to the truck frame adapted to engage the contact projections extending from the brake heads, the inclined contact surface of the stop on one side of each wheel extending in the opposite direction to that on the opposite side of said wheel, and means for vertically adjusting the stops.

13. In a railway brake, a truck frame, wheels for supporting said truck frame, a brake head carrying a brake shoe disposed on each side of each wheel, a contact projection extending from each brake head, truck levers pivotally connected to the truck frame for supporting the brake heads, a stop on one side of each wheel having a downwardly inclined lower face for engaging the contact projection on one side of each wheel, a stop on the other side of each wheel having an upwardly inclined lower face for engaging the contact projection of the brake head on the other side of each wheel, and means for setting and releasing the brake.

14. In a railway brake, a truck frame, wheels for supporting said truck frame, a brake head carrying a brake shoe disposed on each side of each wheel, a contact projection extending from each brake head, truck levers pivotally connected to the truck frame for supporting the brake heads, a stop on one side of each wheel having a downwardly inclined lower face for engaging the contact projection on one side of each wheel, a stop on the other side of each wheel having an upwardly inclined lower face for engaging the contact projection of the brake head on the other side of each wheel, slots formed in the stops, a bolt extending through each slot adapted to attach the stops to the truck frame and to allow vertical adjustment of the stops, and means for setting and releasing the brake.

HARRY S. WHITFORD.