March 16, 1937. S. W. HAYES 2,073,694

BUMPER POST

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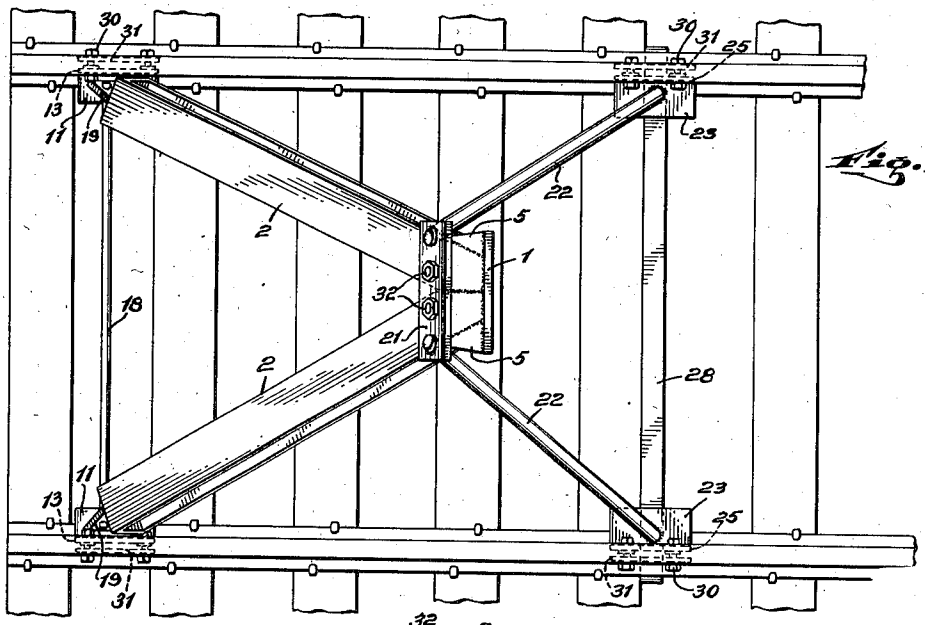


Fig. 1.

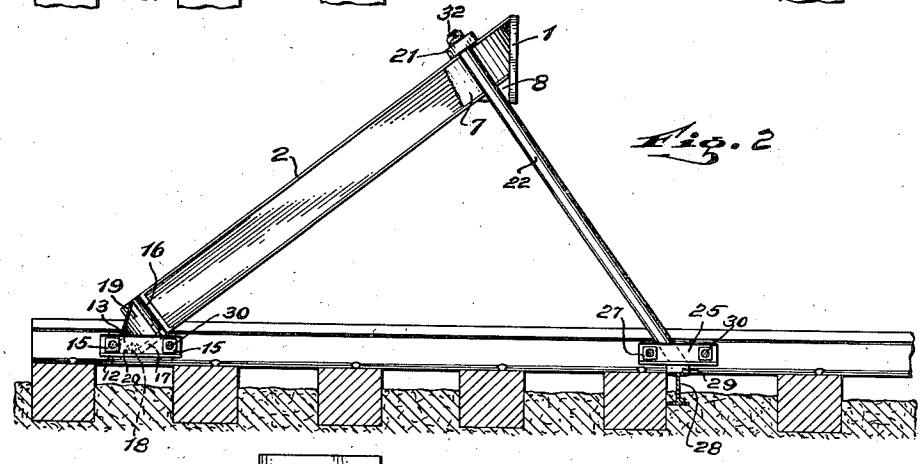


Fig. 2

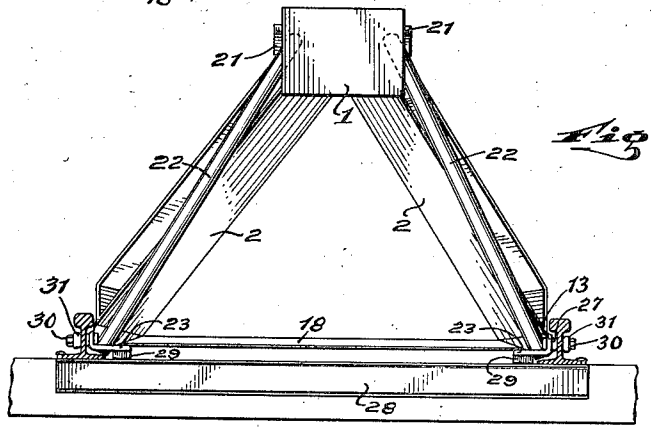


Fig. 3.

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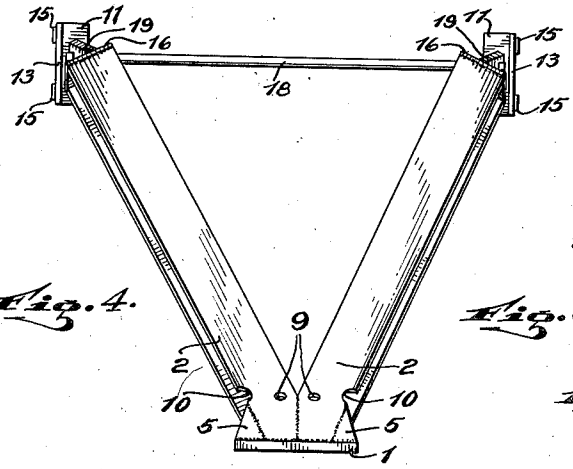


Fig. 4.

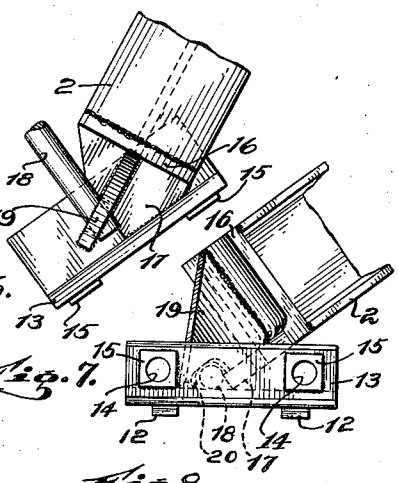


Fig. 6.

Fig. 7.

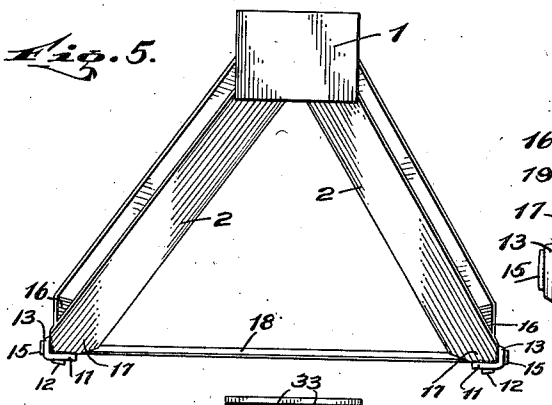


Fig. 5.

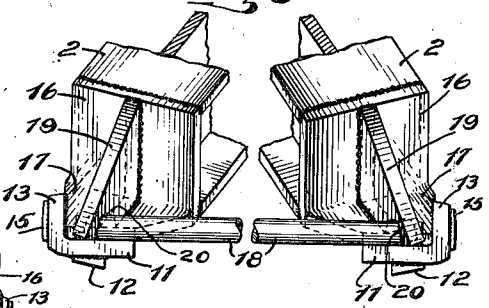


Fig. 8.

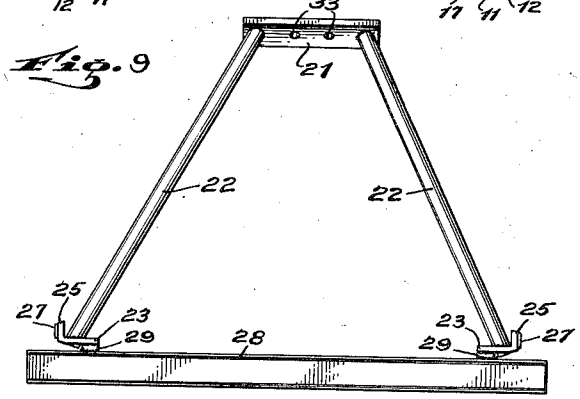


Fig. 9

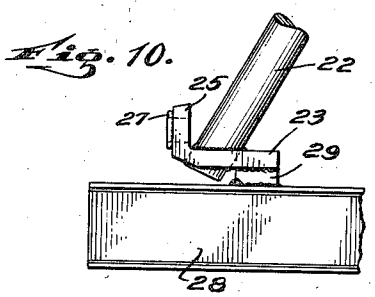


Fig. 10.

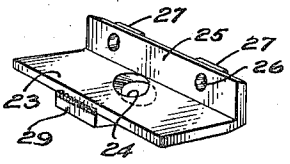


Fig. 11.

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Fig. 12.

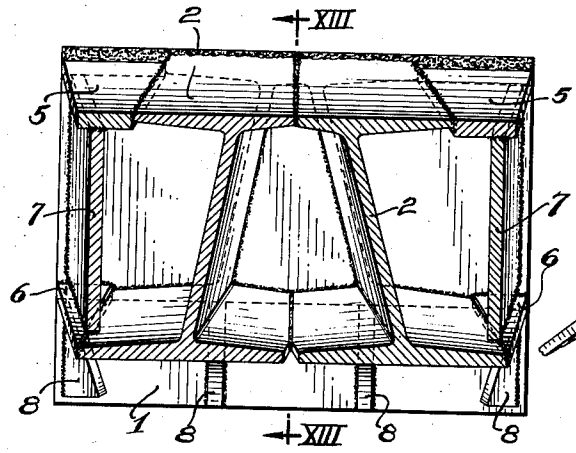
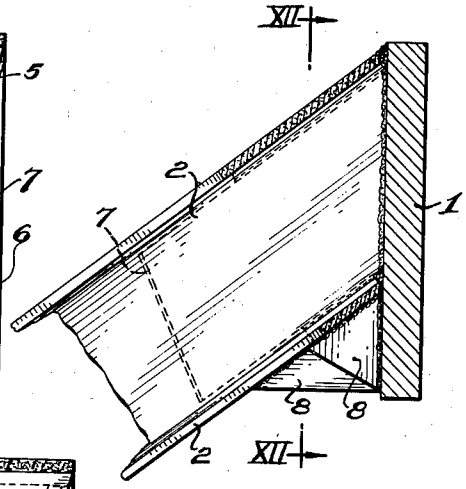


Fig. 13.



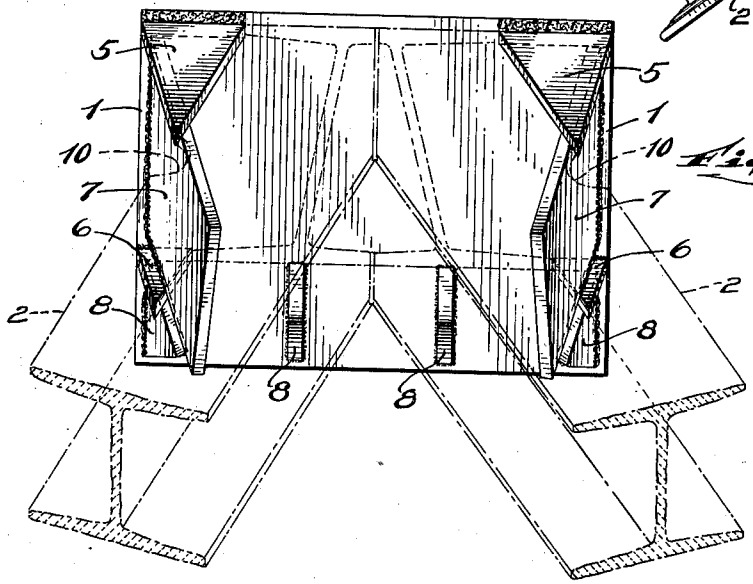


Fig. 14.

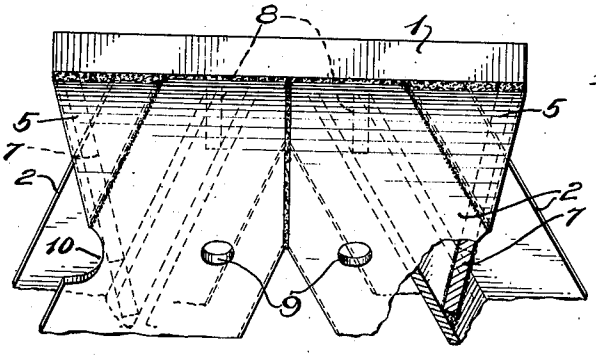


Fig. 15.

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Fig. 16.

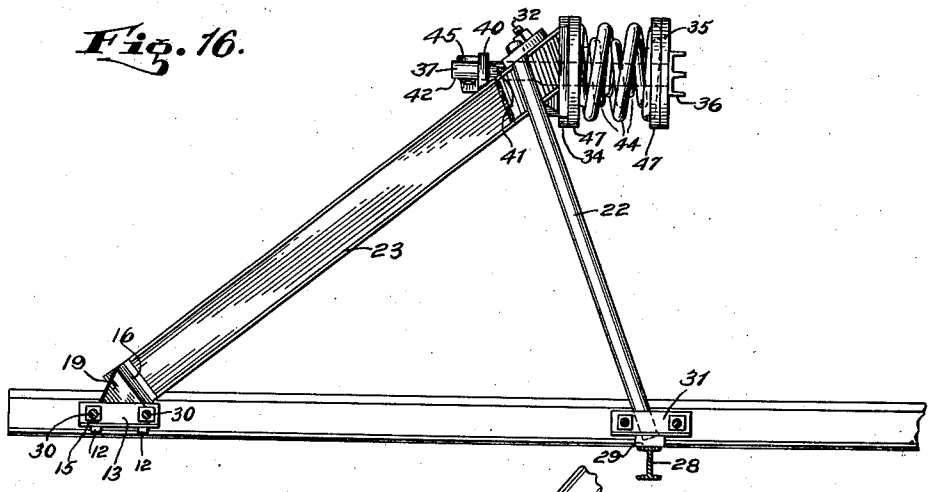


Fig. 17.

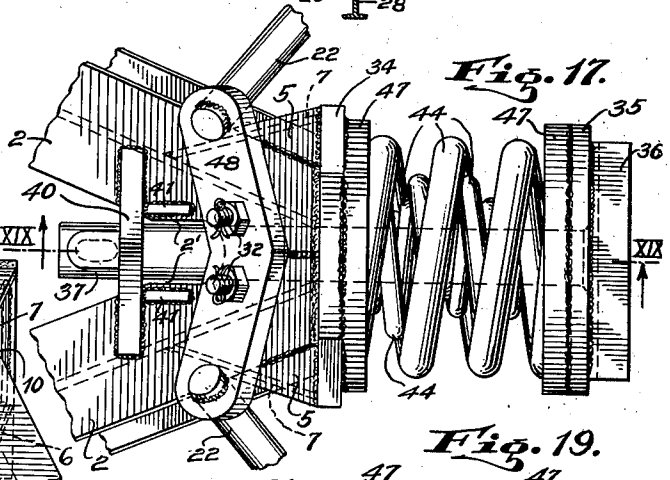


Fig. 18.

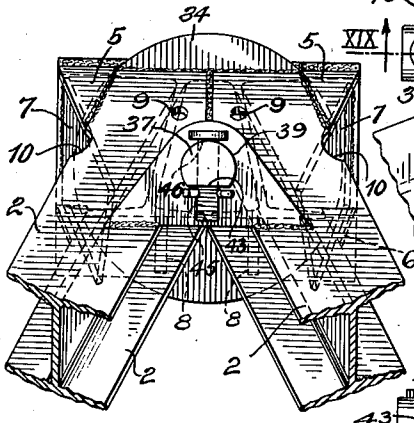
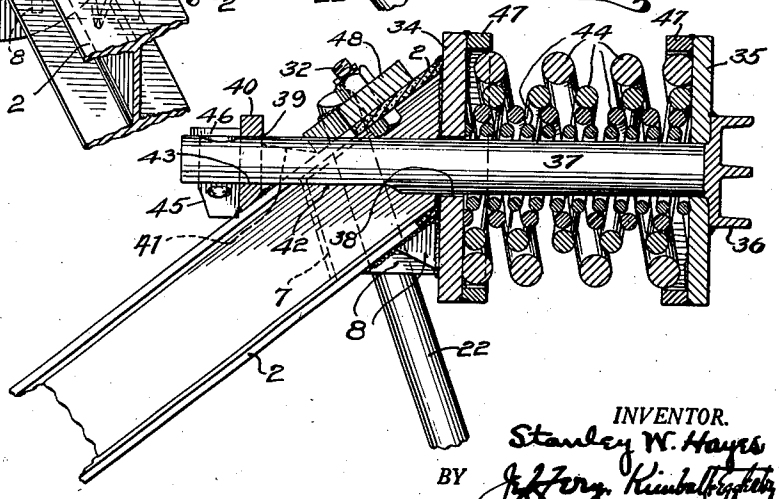


Fig. 19.



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Patented Mar. 16, 1937

2,073,694

UNITED STATES PATENT OFFICE

2,073,694

BUMPER POST

Stanley W. Hayes, Richmond, Ind., assignor to Hayes Track Appliance Company, Richmond, Ind., a corporation of Indiana

Application December 20, 1932, Serial No. 648,069

13 Claims. (Cl. 104—254)

The invention relates to improvements in bumper posts of the type in which a bumper head is located between the rails and supported from the road bed by compression and tension means, and is primarily an improvement on the bumper post of the application of this applicant, Serial No. 558,283, filed August 20, 1931. In both these posts stress of bumper impact is transmitted to the road bed by divergent compression members and by divergent tension members, the term "road bed" being used broadly to indicate the ballast, ties, rails, or any one or more of them. Various features of the invention are however applicable to posts of other descriptions, in which either the compression or the tension structure does not have a divergent character.

The application of this applicant Serial No. 648,068, filed December 20, 1932 (now Patent 2,022,767) in which the illustrative embodiment of the invention is an integral tetrahedron, shows, describes and claims novel subject matter common thereto and to this application. The object of the present invention is to simplify and strengthen the construction, lessen the number of parts as compared with the post of my said application, Ser. No. 558,283, and thereby promote ease of shipment and installation in track. The invention thus consists in improvements in the construction and arrangement both of the compression structure and of the tension structure, as explained in the specification, and more particularly pointed out in the claims.

Referring to the drawings:

Fig. 1 is a plan of the preferred embodiment of the post installed in track;

Fig. 2 is a longitudinal sectional elevation corresponding to Fig. 1, the near or lefthand rail being removed showing the post in side elevation;

Fig. 3 is a transverse sectional elevation taken from in front of the post shown in Fig. 1;

Fig. 4 is a plan of the compression unit;

Fig. 5 is a front elevation corresponding to Fig. 4;

Fig. 6 is a detail perspective of the lefthand compression base structure;

Fig. 7 is a side elevation corresponding to Fig. 6 from the outside;

Fig. 8 is a detail rear elevation showing the compression base structure;

Fig. 9 is a front elevation of the tension unit;

Fig. 10 is a detail front elevation of the lefthand tension base connection;

Fig. 11 is a perspective of the righthand tension base plate;

Fig. 12 is a vertical section on the line XII—XII, Fig. 13, showing in detail and on a larger scale the construction of the bumper head;

Fig. 13 is a longitudinal section on the line XIII—XIII, Fig. 12;

Fig. 14 is a rear elevation of the bumper head structure, the compression members being shown in dot and dash lines;

Fig. 15 is a plan of the bumper head structure, part of the lefthand compression member being broken away to show details of construction.

Fig. 16 is a side elevation of a platform contact post embodying the invention and including spring bumper head structure, the near rail being removed;

Fig. 17 is an enlarged detail plan showing the bumper head and associated structure of the post of Fig. 16;

Fig. 18 is a detail rear elevation of the head and related structure of the post of Fig. 16, and Fig. 19 is a longitudinal vertical section on the line XIX—XIX, Fig. 17.

Referring more particularly to the embodiment of the invention illustrated in Figs. 1 to 15, and especially to Figs. 4, 5, and 9, the first two of which show the compression structure and the last the tension structure, each of these structures is separately fabricated being constructed as a complete integral unit adapted for handling, shipment and installation in track as such, each unit being located substantially in a single plane and when assembled in track both being located in planes transverse of the track and diverging lengthwise thereof.

Referring to Figs. 12 to 15, illustrating the details of bumper head construction: 1 is the bumper plate, against the back of which abut both of the compression members 2, which are flanged beams, preferably H beams, located flange side up and side by side, having the inner front corners of their adjacent top and bottom flanges removed on a line lengthwise of the track to permit the flanges to abut, the compression members in this relation being welded to each other and to the back of the bumper post. The H-beams 2 are thus located in the same transverse plane. The upper and lower outside flanges of both compression members 2 are respectively extended and the structure braced by angular brace plate pieces 5 and 6 fitting the angles between the respective flanges and the back of the bumper plate 1, cornering on the latter and welded thereto, and also welded to the adjacent flange. Side plate members 7 close the space between the back of the bumper plate and the web and adjacent outer

flanges in the case of each H-beam. These side plate members corner on the back of the bumper post and on the web of the adjacent H-beam and are welded thereto and to the adjacent flanges and brace pieces 5, 6. Further brace plate pieces 8 are located in the angle between the underside of the H-beams, or the extended H-beam lower flanges as the case may be and the back of the bumper plate, two of these plates being in planes longitudinal to the track and the outer two being in the plane of the adjacent side plate 7. This welded bumper head structure embodies certain features in a broad sense characteristic of one or both of the aforesaid applications and claimed therein, and has also distinctive and novel features not found in either. Strength, lightness and compactness characterize this welded plate structure, particularly as against the usual heavy and clumsy head castings, and it is therefore preferred. The H-beam flanges are provided with bolt holes 9 for use in securing the compression and tension units together and with edge recesses 10 to permit tension members to pass.

The compression members 2 diverge downward, outward and rearward to compression base structure with which they are integral and which is similar to that of application Serial No. 558,283, above identified, although in some respects an improvement thereon.

Referring particularly to Figs. 6, 7, and 8, which after the manner of the said application Serial No. 558,283 show base structure built up out of plates or plate-like elements, the base structure for each compression member comprises a base member and an abutment member for the compression member, these being preferably, as in the preferred and illustrated construction, a rear attachment angle plate having both a base portion 11 provided with pads 12 to seat on the rail base and an upstanding rail attachment flange 13 having bolt holes 14 and surrounding pads 15 for coaction with the web of the adjacent rail, and an angle having a leg 16 constituting an end abutment for the adjacent compression member, which seats thereon and is welded thereto, and a leg 17 extending downward, rearward and outward from the leg 16 in the plane of the lower flange of the compression member or H-beam to the base plate member, to both the angularly related parts of which it is welded. The leg 17 preferably corners on the base portion 11, as shown in Fig. 7, on a line transverse to the axis of the base plate, i. e. crosswise of the track, and the cross bar 18 connecting the base members having its ends extending along the end of the adjacent leg 17 and seating on the base portion 11 is welded thereto. Brace plate members 19 seating in the angle between the legs 16, 17 of the angle are provided, as in the structure of application Ser. No. 558,283, above referred to, but each, instead of being in a plane lengthwise of the track, is located in the longitudinal axial plane of the adjacent compression member, in the construction shown the plane of the web of the H-beam directly in the line of the transmitted force. Each of these brace plates is notched on its underside at 20 to receive, and enable it to be set over, the adjacent end of the cross bar 18, to which and to the base portion 11 of the base structure it is welded, cornering on the latter portion as will be seen from Fig. 8. It will be understood that although this mode of connecting the respective base structures is preferred, it is not exclusive of others and it will be understood further that modification of the compression base structure within the invention as stated in the claims may be made.

The tension unit, see particularly Figs. 9, 10, and 11 is provided with a cross bar 21 having adjacent its ends holes through which pass the diverging tension bars 22 which are welded to the cross bar and extend downward, outward and forward therefrom to tension base structure which, as illustrated and preferred, includes at each side a base plate 23 having therein a hole 24, through which the inclined adjacent tension member 22 passes at an angle as in the corresponding structure of the other said applications, and to which plate said member is welded. The base plate in the illustrated structure is a track fixture plate having an upstanding flange 25 provided with bolt holes 26 with surrounding pads 27. The respective base structures are connected by a metal beam 28, preferably an I-beam, the respective plates being integral with the beam, spaced apart the distance between the rails, and vertically spaced from the rail top by pads 29 welded to the beam and to the base plate to provide recesses to receive the respective rail bases.

The compression structure and the tension structure being separate integral units may be compactly disposed one on the other for shipment, both being substantially flat and may also be installed in track easily their weight being such that this can readily be done by two men. In this operation after locating and drilling all bolt holes, one of the rails is moved out, the compression unit set in place against the other rail and bolted (bolts 30 and washers 31), the tension unit set in place over the compression unit and against the remaining rail, connecting bolts 32 passed through holes 33 in plate 21 and 9 in the flanges of the compression members, and track bolts 30 inserted through the bolt holes and washers 31, the other rail replaced, the rest of bolts inserted and all bolts tightened.

Referring to Figs. 16 to 19, which show the invention embodied in a post of greater height and designed to act as a platform contact post, the parts of the post, so far as they are substantially similar to those of the post already described, have been designated by the same reference numerals. The features requiring special description are those in and adjacent the bumper head, which is of the yielding spring type already familiar in the art broadly speaking. In this bumper, the head 34 is in effect a disc having for purposes of support integral lateral extensions, or it may be regarded as an oblong plate with disc-completing extensions at top and bottom. It is supported from the flanged compression members or H-beams 2 which abut and, in the illustrated head, corner thereon and are welded thereto. This plate is opposed to a co-axial face plate 35, a disc, which has welded thereto a usual transverse anti-climbing bar 36, and is provided with a stem 37 extending rearward through face plate 35 and through a hole 38 in the rear plate 34 and through a passage in the rest of the structure in its rear. This passage is formed by complementary notches 2' in the inner edges of the upper flanges of the H-beams aligned with said holes and by a stem-receiving hole 39 in a cross bar 40 welded to the top H-beam and braced therefrom, as by brace plate pieces 41 welded thereto and to the adjacent flanges. The hole 39 is shaped to correspond with the rear end portion of the stem which has a slabbed portion 42 coacting with the plane surface 43 in the guide, both stem end and hole be-

ing of modified cylindrical section. Coaxial coil cushioning springs 44 surrounding stem 37 and successively of greater strength from the innermost spring to the outermost in the known fashion, seat in shallow cups formed by the plates 34, 35 to which are welded ring or rim members 47. Return of the plate 35 etc. is limited by the headed retaining stop pin 45, 46 which coacts with the rear face of the guide bar 40. The tension cross bar 48 has a forwardly pointing angle to leave room in the V space thus provided for the stem and brace structure. The operation of this post will be evident without detailed description.

I claim:

1. In a bumper post, a substantially triangular integral compression unit, having at its apex a bumper plate, struts abutting on the back of said bumper plate welded thereto and diverging therefrom downward, outward and rearward in a plane transverse to the track to base structures welded respectively to the lower end of the respective struts, and a cross connecting member spacing said structures and welded thereto.

2. In a bumper post, bumper head structure including a bumper plate, H-beams arranged flange side up abutting on the back of the bumper plate located side by side, welded to each other and to the back of the bumper plate and extending downward, outward and rearward therefrom to the road bed, side plates closing the space between the back of the bumper plate and the web and flanges of the adjacent H-beam and welded to the parts named, and brace plate pieces fitting and welded in the angle between the underside of the respective H-beams and the bumper plate and welded thereto in the plane of the adjacent side plate.

3. In a bumper post, bumper head structure including a bumper plate, flanged beams arranged flange side up side by side and abutting on and welded to the back of the bumper plate, having end corner pieces removed from the adjacent pair of upper flanges, which then abut on a line lengthwise of the track, and are welded together, said beams diverging outward, downward and rearward from the bumper plate and being located in a plane transverse of the track and extending lengthwise thereof, flange extension brace plate pieces welded in the angles between the bumper plate and the outside upper flanges, and additional brace plate means welded into the bumper head structure.

4. In a bumper post, bumper head structure including a bumper plate, flanged beams arranged flange side up side by side and abutting on and welded to the back of the bumper plate, having corner pieces removed from the adjacent pair of upper flanges, which then abut on a line lengthwise of the track, and are welded together, said beams diverging outward, downward and rearward from the bumper plate and being located in a plane transverse of the track and extending lengthwise thereof, and means for bracing said head structure incorporated therein by welding.

5. In a bumper post, bumper head structure including a bumper plate, H-beams arranged flange side up abutting on and welded to the back of the bumper plate, having end corner pieces removed from the adjacent pairs of upper and lower flanges, said H-beams having said flange edges welded to each other in a plane lengthwise of the track and diverging outward, downward and rearward from the bumper plate, flange extension brace plate pieces welded in the angles between the bumper plate and the respective outside flanges, and additional brace plate means beneath the H-beams fitting in the angle between the same and the bumper plate and welded to both.

6. In a bumper post, bumper head structure including a bumper plate, H-beams arranged flange side up abutting on the back of the bumper plate, having end corner pieces removed from the adjacent pairs of upper and lower flanges, said H-beams having said flange edges welded to each other in a plane lengthwise of the track and being welded to the bumper plate, and diverging outward, downward and rearward therefrom, flange extension brace plate pieces welded in the angles between the bumper plate and the respective outside flanges, side plate members occupying the space between the back of the base plate and the web and outside flanges of the adjacent H-beam and welded thereto and to the said brace plate pieces, and additional brace plate means beneath the H-beams fitting in the angle between the same and the bumper plate and welded to both, a pair of the last mentioned brace plate means being located respectively in the planes of the respective side plate members.

7. In a bumper post having flanged compression members converging upwardly, inwardly and forwardly from the road bed and provided at their upper ends with stem receiving notches in their adjacent edges, a rear bumper head plate supported by said compression members in abutting relation with and welded to said compression members, said bumper head plate having a hole therein, a front or face bumper head plate having a rearwardly extending stem passing through said stem receiving notches and said hole and being slidable therein, spring means interposed between said bumper head plates, a guide plate carried by said compression members and having an aperture for slidably receiving said stem, and stop means for controlling the forward movement of the stem.

8. A bumper post having H-beams arranged flange side up extending upwardly, inwardly and forwardly from the road bed to deliver stress of impact thereto, part of the front inner corners of the flanges of said H-beams being removed on a line lengthwise of the track to permit side contact of said flanges, said upper flanges being correspondingly notched at their upper ends, a rear bumper plate in abutting relation with and welded to the upper ends of said H-beams, said plate having a hole therethrough coacting with said notched flanges to provide a fore and aft passage, a transversely extending guide plate behind the bumper plate seating on and welded to the flanges of said H-beams and braced therefrom, said guide plate having a guide hole aligned with the aforesaid passage, a striker plate having a rearwardly projecting stem passing through said fore and aft passage and said guide hole, coil springs located between the rear and striker plates and surrounding said stem, and means for limiting the forward movement of the striker plate.

9. In a bumper post, a bumper head comprising a pair of axially aligned plates having annular rim portions welded to their adjacent faces forming shallow cup structures, a set of coaxial coil springs having their ends in said cup structures, the rear plate having a hole coaxial with the plate and springs, the front plate being a striker plate having anti-climbing means asso-

ciated therewith and having a rearwardly extending stem surrounded by said springs and passing through said hole in said rear plate, said stem having its rear end slabbed, and stop means for limiting the forward movement of the striker plate.

10. A bumper post comprising a substantially triangular integral compression unit having a bumper head forming an apex thereof, and a substantially trapezoidal integral tension unit having an upper member forming a parallel side thereof, the non-parallel sides thereof being adapted to receive said bumper head therebetween, whereby said upper member engages said compression unit rearwardly of said bumper head, and securing means for removably securing said upper member to said compression unit rearwardly of said bumper head, whereby to secure said integral compression and tension units in assembled relationship.

11. A bumper post consisting of two separately fabricated truss units, each built up by welding their component parts into an integral truss structure for handling as such, a said truss unit including a bumper head, a pair of compression members extending downward, outward and rearward from the bumper head and each having its end abutting on and welded to the leg of an angle, the other leg of which extends downward and rearward therefrom and is welded to base structure, and an angular brace member located in the longitudinal axial plane of the compression member, fitting and welded in an angle and welded to the base structure, and the other said truss unit including tension structure for transmitting stress of impact from the bumper head to the roadbed.

12. A bumper post consisting of two separately fabricated integral sections, each built up by welding together separate component parts and designed for separate handling, each said section having means for connection to opposite points in the respective track rails, one said section including the bumper head and serving as the compression unit, the other said section constituting a tension unit interlockably engageable with the compression unit, and means for removably securing the two sections together in interlocking relationship.

13. A bumper post consisting of two separately fabricated truss units, each built up by welding from separate component parts into an independent integral truss structure for handling as such, a said unit constituting a compression truss unit including a bumper head, the other said unit constituting a tension truss unit interlockably engageable with the compression truss unit, and means for securing said truss units together as a complete post.

STANLEY W. HAYES.