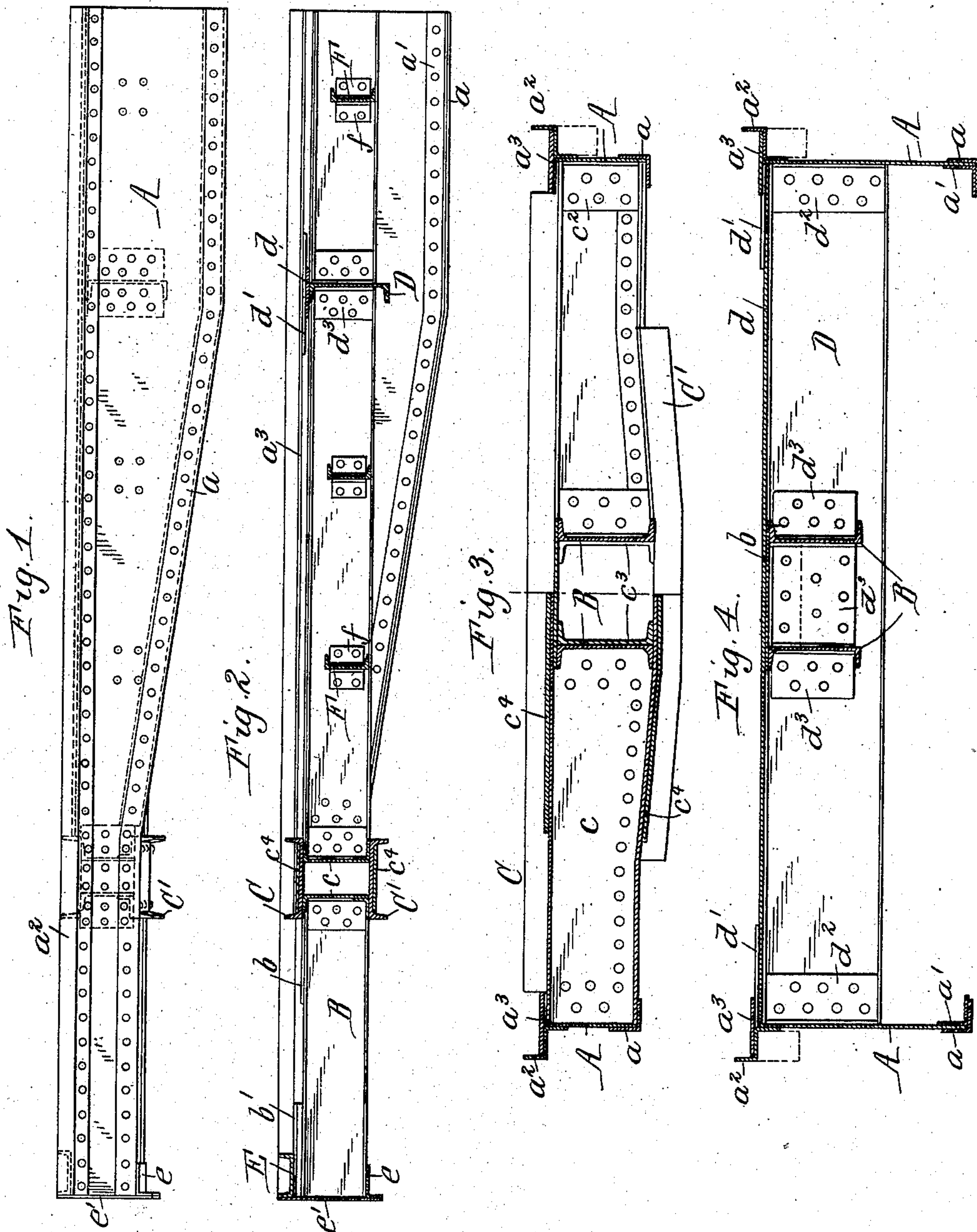


H. R. KEITHLEY.
UNDERFRAME FOR RAILWAY CARS.

APPLICATION FILED JAN. 21, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:
E. A. Volk.
M. S. S. S.

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UNITED STATES PATENT OFFICE.

JONAS KAUFMAN, OF NEWCASTLE, PENNSYLVANIA.

WIRE FENCE.

SPECIFICATION forming part of Letters Patent No. 741,798, dated October 20, 1903.

Application filed December 30, 1902. Serial No. 137,141. (No model.)

To all whom it may concern:

Be it known that I, JONAS KAUFMAN, residing at Newcastle, in the county of Lawrence and State of Pennsylvania, have invented a new and Improved Wire Fence, of which the following is a specification.

My invention relates to improvements in that class of picket fences in which metallic picket members are employed having clips or notched portions for engaging the wire strands; and primarily my invention seeks to provide a fence of the character stated in which the parts are relatively arranged to permit of a rapid setting up of the fence at a very low cost for material and labor and in which the parts are especially designed to be easily manipulated and assembled and when joined to form a strong, durable, and neat fence.

My invention in its more complete nature comprehends a peculiar construction of metal picket having a special design of integral clips or wire-strand-holding members; and in its still more subordinate features my invention consists in certain details of construction and peculiar combination of parts, all of which will hereinafter be fully explained, and specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a portion of a fence embodying my invention. Fig. 2 is a front view of a picket with the strand joined therewith. Fig. 3 is a vertical section thereof on the line 3 3 of Fig. 2. Fig. 4 is a horizontal section of the same on the line 4 4 of Fig. 3. Fig. 5 is a perspective view of one of the pickets disconnected from the strands. Fig. 6 is a view of a slightly-modified form of my invention. Fig. 7 is a detail section, on a slightly-enlarged scale, of the upper end of Fig. 3, the tongue 3 being shown bent back through the slit 2^c.

In carrying out my invention the wire strands *a a* are made fast to the posts *b b*, which may be of wood or metal, of any approved form and to which the said strands *a* are secured by staples 1, as shown, or in any other well-known manner.

The essential feature of my invention lies in the peculiar construction of the pickets *d*, all of which are of light construction, and a

detail description of one will therefore suffice for all.

Each picket *d* consists of a flat metal plate 55 having a series of apertures 1^a for the passage therethrough of wire strands that may be run at right angles to the front face of the plate, and at suitable intervals the plate 1 has longitudinal depressions on the rear face, 60 which form convexed ribs or corrugations on the front face, as indicated by 2^a, which add strength and rigidity to the body of the plate and overcome the portion of the plate weakened by the openings *W* made therein, presently again referred to. At the upper end of the depressed portions 2 the plate *d* is formed with inverted -U-shaped slits 2^c, whereby to provide at the upper end of the portions 2 tongues or clip members 3. The 70 tongues or clip members 3 have longitudinal depressions in their front face, as at 3^a, whereby to present convexed longitudinal corrugations or ribs 3^d on the rear face thereof, which extend their length for reasons presently explained. The convexed ribs on the 75 body of the plate and the concaved depressions in the face *d*³ merge at the point indicated by *x*, and the said ribs or depressions in practice are simultaneously made by passing the plate *d* through suitably-constructed rolls having die-faces to properly form the said convexed and concaved depressions shown and described, and while the U-shaped slits may be cut under a separate operation 85 the said slits and the longitudinal corrugations may be simultaneously made by suitable machinery, it being also understood that the several depressions and slits may be formed in the plate consecutively as it passes 90 through the machine lengthwise, or all of the depressions and the slits may be made by one stamping operation.

In the manufacture of the pickets *d* the tongues are pressed out sufficiently from the 95 face of the plate to permit slipping the wire strands *a* between the said tongues and the body of the plate, and the tongues or clips are bent at the points where the two longitudinal ribs meet, which is at the lower end of 100 the U-shaped openings, as indicated by *X*. By bending the tongues at the point stated and by reason of the merging of the convexed and concaved portions, as stated, the said bent

UNITED STATES PATENT OFFICE.

HERBERT R. KEITHLEY, OF BUFFALO, NEW YORK.

UNDERFRAME FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 741,799, dated October 20, 1903.

Application filed January 21, 1903. Serial No. 140,003. (No model.)

To all whom it may concern:

Be it known that I, HERBERT R. KEITHLEY, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Underframes for Railway-Cars, of which the following is a specification.

This invention relates to a metal supporting structure or underframe for railway-cars which is of that type built up entirely of ordinary commercial rolled shapes and plates. The underframe is especially desirable for wooden box-cars or composite wood and metal box-cars, but is also well adapted for wooden-bottom flat-cars and wooden gondola cars.

The object of the invention is to produce an underframe which is composed of the minimum number of parts and weight of metal and has the maximum carrying strength, stiffness, and rigidity to withstand the shocks and strains to which it is subjected in use.

In the accompanying drawings, consisting of two sheets, Figure 1 is a side elevation of one-half of an underframe embodying the invention. Fig. 2 is a longitudinal section thereof in line 2 2, Fig. 5. Fig. 3 is an enlarged transverse section thereof in line 3 3, Fig. 5. Fig. 4 is an enlarged transverse section thereof in line 4 4, Fig. 5. Fig. 5 is a plan view thereof, broken away to show the manner of connecting the bolster and transoms with center sills.

Like letters of reference refer to like parts in the several figures.

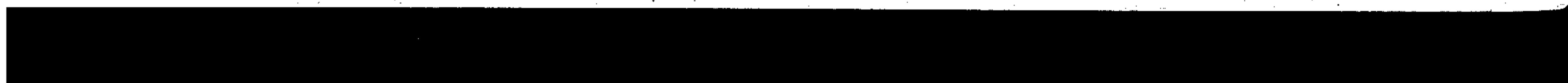
The underframe is composed of two longitudinal side sills or members which are in the form of built-up plate-girders and carry the main part of the load of the car between the bolsters, two longitudinal center sills which while they supplement the side girders and carry a portion of the load on each side of the two bolsters are comparatively light beams and are chiefly intended to resist and transmit the draft strains and buffing shocks, end sills, and transverse bolsters and intermediate transoms which rigidly connect the side girders and center sills and serve to properly distribute the load and stresses from the center sills to the side girders.

Each plate-girder side sill is composed of a vertical web-plate A and upper and lower or compression or tension flanges formed by

flanged bars riveted to the web-plate. As shown, the lower flange is composed of an outer angle-bar a , which extends from end to end of the sill, and an inner angle-bar a' , which extends from one bolster to the other. The vertical flanges of the angle-bars are riveted to the lower edge of the web-plate, and their horizontal flanges project inwardly. The upper flange of the side sill consists of a Z-bar a^2 , arranged outside of the web-plate with its web horizontal, inner flange projecting downwardly and riveted to the web-plate, and outer flange projecting upwardly. The Z-bar is reinforced between the bolsters by a horizontal plate a^3 , riveted to the web of the Z-bar and projecting to both sides of the web of the side sill. The plate-girder side sills are preferably deeper at their central portions or between the bolsters than at their ends to afford the necessary strength without unduly increasing their weight. The second angle-bar of the lower flange and plate of the upper flange also increase the strength and rigidity of the side sills between the bolsters.

B B represent the longitudinal center or draft and buffing sills, which are arranged in their usual relation. The center sills are preferably formed of channel-beams, which extend from end to end of the underframe and are arranged with their webs vertical and their flanges projecting horizontally outward. The center sills are connected by a top cover or tie plate b , which extends from one bolster to the other, and short top tie or cover plates b' at the ends of the center sills.

The bolsters are arranged in their usual relation near the ends of the underframe. Each bolster is preferably constructed, similar to the bolster shown in Letters Patent No. 707,702, granted to me August 26, 1902, of upper and lower channel-beams C C', which extend continuously or unbroken from one side girder to the other, respectively, above and below the center sills, and vertical members c , which connect the channel-beams between the side girders and center sills. The channel-beams are preferably arranged with their webs horizontal, the flanges of the upper channel extending upwardly and those of the lower channel downwardly. The ends of the bolster, which are of less depth than the central portion, extend in between the in-



sills and the tops of which are in substantially the same horizontal plane as the tops of said side sills, bolsters connecting said side sills and center sills, and transoms connecting said side sills and center sills between the bolsters, each of said transoms having a continuous compression member which extends from one side to the other above said center sills and is connected at its ends to the upper flanges of said side sills, substantially as set forth.

4. In an underframe, the combination of side sills in the form of plate-girders, and which constitute the main load-supporting members of the underframe, center sills which are of uniform depth throughout and of less depth than the central portions of said side sills and the tops of which are in substantially the same horizontal plane at the tops of said side sills, bolsters connecting said side sills and center sills, and transoms connecting said side sills and center sills between the bolsters, each of said transoms having continuous upper and lower compression and tension members which extend from one side to the other respectively above and below said center sills, the ends of said compression member being connected to the upper flanges of said side sills, substantially as set forth.

5. In an underframe, the combination of plate-girder side sills, center sills of less depth than the central portions of said side sills and the tops of which are in substantially the same horizontal plane as the tops of said side sills, and continuous transoms connecting said side sills and center sills, each of said transoms consisting of a vertical web through which said center sills pass, a continuous lower flange which extends from one side to the other below said center sills, and a continuous upper compression-flange which extends from one side to the other above said center sills, substantially as set forth.

6. In an underframe, the combination of plate-girder side sills, center sills which are of uniform depth throughout and of less depth than the central portions of said side sills, and continuous transoms connecting said side sills and center sills, each transom consisting of a channel-beam having openings for the passage of the center sills and a continuous

lower flange which extends from one side to the other below said center sills, and a plate extending from one side to the other over said center sills and riveted to the upper flange of said channel-beam, substantially as set forth.

7. In an underframe, the combination of plate-girder side sills having inwardly-projecting upper flanges, center sills which are of uniform depth throughout and of less depth than the central portions of said side sills, bolsters connecting said side sills and center sills, and transoms connecting said side sills and center sills between the bolsters, the transoms and bolsters having continuous upper flanges, the bolsters and transoms being secured to said inwardly-extending upper flanges of the side sills, substantially as set forth.

8. In an underframe, the combination of built-up plate-girder side sills which constitute the main load-supporting members of the underframe, center sills of less depth than the central portions of said side sills, and the tops of which are in substantially the same horizontal plane as the tops of said side sills, and bolsters and transverse transoms connecting said side sills and center sills and each having continuous upper and lower members which extend from one side sill to the other respectively above and below said center sills, substantially as set forth.

9. In an underframe, a side sill comprising a vertical web-plate, a flanged bar secured to the lower edge of said web-plate, and a Z-bar arranged with its web horizontal and one flange secured to the upper edge of said web-plate, substantially as set forth.

10. In an underframe, a side sill comprising a vertical web-plate, an angle-bar secured to the lower edge of said web-plate, a Z-bar arranged with its web horizontal and one flange secured to the upper edge of said web-plate, and a plate secured to the web of said Z-bar, substantially as set forth.

Witness my hand this 17th day of January, 1903.

HERBERT R. KEITHLEY.

Witnesses:

CHAS. W. PARKER,
JOHN J. BONNER.