

(No Model.)

2 Sheets—Sheet 1.

E. B. SMITH.
FIFTH WHEEL.

No. 552,150.

Patented Dec. 31, 1895.



Fig. 6.

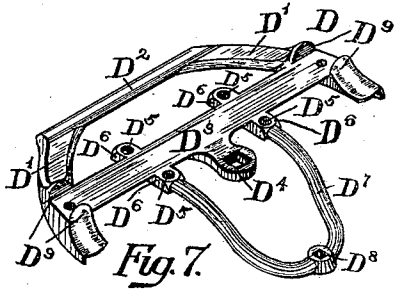


Fig. 7.

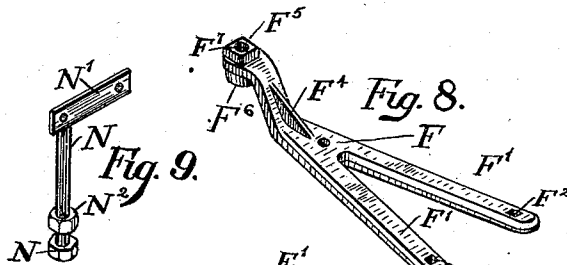


Fig. 8.

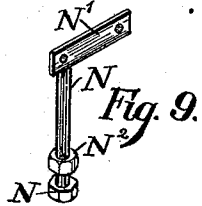


Fig. 9.

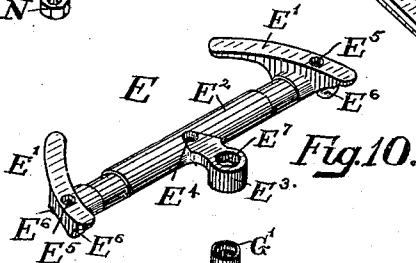


Fig. 10.



Fig. 11.

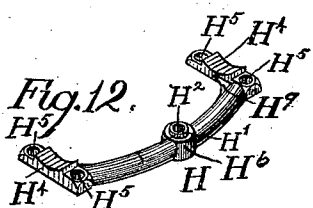


Fig. 12.

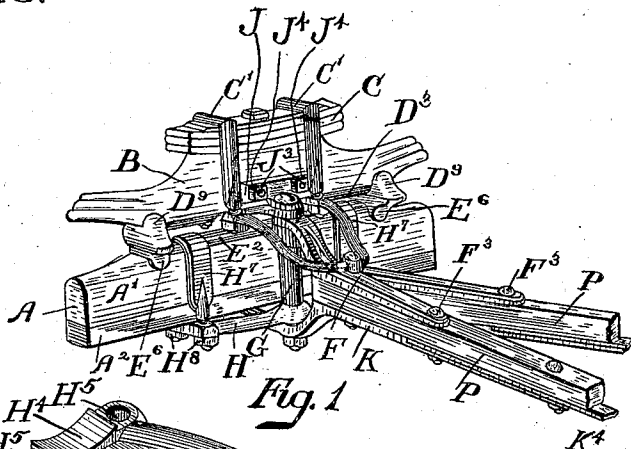


Fig. 1.

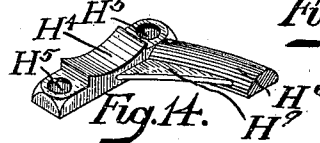


Fig. 14.

Attest:
W. C. Jones
A. S. Ludlow

Inventor:
Ezra B. Smith
per
Wm. Hubbell Fisher,
Attorney.

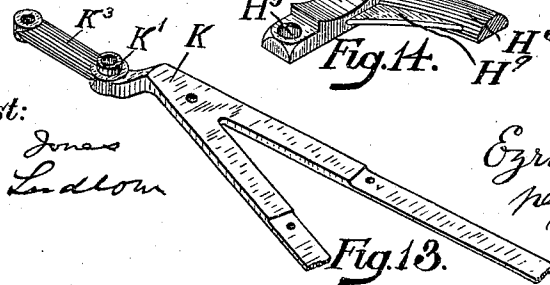


Fig. 13.

(No Model.)

2 Sheets—Sheet 2.

E. B. SMITH.
FIFTH WHEEL.

No. 552,150.

Patented Dec. 31, 1895.

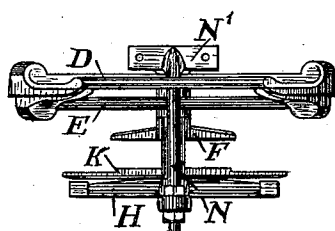
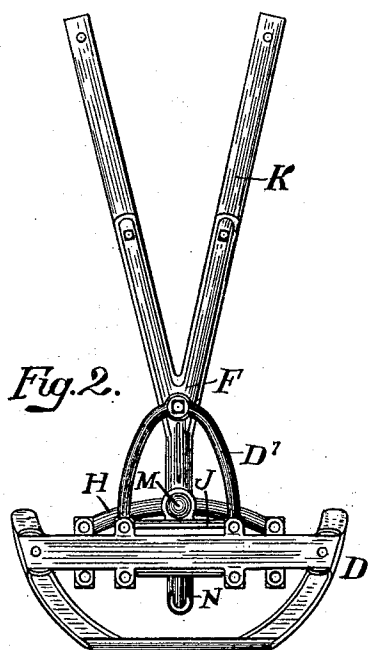


Fig. 3.

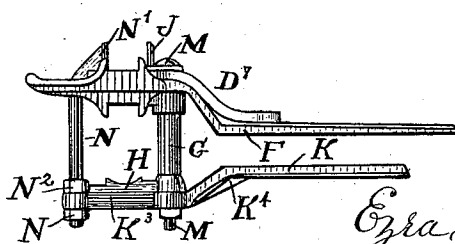


Fig. 4.

Attest:
Wm. E. Jones
A. S. Laddman

Inventor:
Ezra B. Smith
per
Wm. Hubbell Fisher,
Attorney.

UNITED STATES PATENT OFFICE.

EZRA B. SMITH, OF CINCINNATI, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
THE EBERHARD MANUFACTURING COMPANY, OF CLEVELAND, OHIO.

FIFTH-WHEEL.

SPECIFICATION forming part of Letters Patent No. 552,150, dated December 31, 1895.

Application filed November 28, 1892. Serial No. 453,367. (No model.)

To all whom it may concern:

Be it known that I, EZRA B. SMITH, a citizen of the United States of America, and a resident of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Fifth-Wheels, of which the following is a specification.

The several features of my invention and the various advantages resulting from their use, conjointly or otherwise, will be apparent from the following description and claims.

In the accompanying drawings, making a part of this specification, and to which reference is hereby made, Figure 1, Sheet 1, shows in perspective central portions of the front axle and head-block and front portions of the perch and a fifth-wheel embodying my invention and combined with the said axle, head-block, and perch. Fig. 2, Sheet 2, is a top view of the said fifth-wheel by itself. Fig. 3 is a front elevation of the said fifth-wheel. Fig. 4 is a side elevation of the same, that side of the wheel being shown which is at the right hand in Fig. 2. Fig. 5, Sheet 1, represents a vertical central section of those parts in proximity to and assembled around the king-bolt, said section being taken in a plane parallel to the axial length of the vehicle, this figure showing in elevation the king-bolt and its securing-nut and a part of the brace of the fifth-wheel and of axle-plate. Figs. 6, 7, 8, 9, 10, 11, 12, 13, and 14 are perspective views respectively indicating in detail the various portions which enter into the construction of the fifth-wheel.

A indicates the usual front axle, suitably constructed and in the present illustrative instance consisting of a wooden portion A' and an iron or steel portion A².

B indicates the head-block.

C indicates a front transverse spring consisting of one or more leaves and secured to the head-block by clips, as C' C'.

D indicates the upper half or portion of the fifth-wheel. It consists of the wings D' D', preferably united by the front connecting portion D³. These two wings D' D' of the fifth-wheel D are united at or near their mid-length by the bar D³, and the latter is pro-

vided at the center of its length with the rearwardly-projecting eye D⁴, having an angular aperture, as shown. To this bar D³ are secured the lower ends of the clips C' C', the said ends of the said clips respectively passing through the bolt-holes D⁵ of the bar in case the latter is made wide; otherwise the said holes D⁵ will pass through the lugs or projections D⁶ of the bar D³. Rearwardly projecting from the said bar is the perch-brace D⁷, provided at its rear portion with the bolt-hole D⁸. The preferred places where the brace D⁷ is connected to the bar D³ are where the rear lugs D⁶ are located, substantially as shown, the lugs and brace thus forming one piece. The bar D³, wings D', forward connecting portion D³, lugs D⁶, and brace D⁷ are preferably cast or otherwise formed of one piece of metal. These wings D' D' are respectively provided at each side of the bar D³ with the upwardly-projecting lips D⁹ D⁹ D⁹ D⁹, and the head-block B rests upon the bar D³ and between each pair of opposing lips.

E represents the lower half or portion of the fifth-wheel and consists of the wings E' E' and the uniting-bar E², the latter provided with the rearwardly-extending eye E³, the bar being further provided with the perforation E⁴ and each wing having a perforation E⁵. Each wing has a pair of downwardly-projecting lips E⁶, located at opposite sides of the bar, if the latter were extended across the wings. Between the opposing lips of each pair is received the upper portion of the axle A, the central top portion of the axle bearing against the under side of the bar E². Openings E³ E³ and E⁴ respectively receive a screw, the latter passing into the axle-cap and firmly securing the lower half of the fifth-wheel thereto.

The wings D' D' of the upper half of the fifth-wheel respectively rest upon the wings E' E' of the lower half.

The perch may be single or double, and is provided with the usual perch-iron F. If the perch be double, the perch-iron is preferably bifurcated, being provided with the two diverging pieces F' F', each of which is respectively connected by suitable bolts F³, passing

through holes F^2 F^3 in said diverging pieces and into or preferably through the perches P P, substantially as shown in Fig. 1.

The perch-iron F (shown by itself in Fig. 8) is preferably provided with the fin F^4 , for strengthening it, and its upper end is provided above with the square boss or lug F^5 and below with the round boss or lug F^6 , concentric with each other. Through these lugs and the front end of the perch-iron is a bolt-hole F^7 , of sufficient diameter to allow the king-bolt to pass.

In practice, the upper lug F^5 fits into the square hole of the eye D^4 of the upper half of the fifth-wheel, the upper end of the lug being preferably flush with the upper surface of the eye D^4 for furnishing bearing-surface additional to that of said eye D^4 , against which the piece J^2 of plate J can bear, and for increasing the stability of the structure.

The lower boss or annular lug F^6 fits down into the opening E^7 in the eye E^3 of the lower half of the fifth-wheel. This opening E^3 immediately below the lower end of the lug F^6 , as shown in Fig. 5, is contracted to a diameter a trifle in excess of the diameter of the king-bolt, thereby forming a shoulder or seat E^8 against which the upper end of the sleeve G bears, to keep the axle-plate H from shifting its position.

In the under side of the eye E^3 is a recess E^9 , concentric with the bolt-hole opening of said eye, and of a diameter to closely admit the upper end of the sleeve-brace G. The lower end of this sleeve G fits over and around the annular lug or boss H^1 located on the upper central portion H^6 of the cross-brace or axle-plate H. Through this annular lug H^1 and said brace H is the opening H^2 , through which the king-bolt passes. The inner edge of each end of the tubular or sleeve brace G is beveled away, forming a beveled edge G^1 , substantially as shown. The object of thus beveling or counterboring the end of the sleeve is to enable it to easily fit and to be easily fitted over the annular lug H^1 of the axle-plate. It is impossible to cast the said flange exactly vertical, and at the junction of the said flange and plate more or less sand or metal will be present. By counterboring the end of the sleeve the latter will fit over the flange and over said sand or extra metal and rest directly upon the plate. The object of counterboring both ends of the sleeve is to save the time of the operator when putting the fifth-wheel together. Both ends being counterbored, he does not need to take the time to select a given end of the sleeve.

In the under side of the axle-plate H and below the annular lug H^1 and concentric therewith is the recess H^3 , which receives an annular lug or boss K^1 of the lower perch-iron K. The vertical opening K^2 through said shoulder K^1 and perch-iron is for the passage of the king-bolt. The perch-iron K is to be adapted, as the case may be, to be applied to a single or a double perch and is connected

thereto in any desired manner. In the present illustrative instance the perch-iron is bifurcated, and the divided portions are respectively connected to their respective adjacent perches P by means of bolts F^3 . The rear bolts F^3 , in the present instance, unite not only the lower perch-iron K to the perch, but also the upper perch-iron F and the iron perch-plate K^4 to their respective perches. The axle-plate consists of the brace H^6 and the end wings H^4 , and these wings extend under the axle A. Where the bottom of the axle is rounded, the wings are preferably concave in their upper side, as shown, to receive the rounded portion of the said bottom of the axle. Holes H^5 in the wings respectively receive the adjacent ends of clips H^7 , which pass over the uniting-bar E^2 and extend down on each side of the axle and are bolted in the usual manner by nuts H^8 , securely holding together the axle-plate H, the lower fifth-wheel and the axle, making them as one.

The axle-plate H—that is, the portion H^6 thereof—is curved outward and rearward, substantially as shown. The junction of the end of the brace with its adjacent wing H^4 is strengthened by a light web H^9 . The curve in the brace is thus important. I am enabled to dispense with a straight metal extension from beneath the center of the axle rearward to the bolt M, as would not be the fact were the brace straight, as is usually the case. By this curve metal is also economized. The web confers upon the junction of the wing H^4 and cross-piece H^6 additional strength fully sufficient to resist the torsional and angular strains—viz., the breaking strains to which said wing and cross-piece are at their said junction subjected.

The cross-brace is subjected to a great pressure and strain at its center—viz., at the king-bolt in a direction from rear to front. The convex form of the cross-brace H^6 curved backward, as it is, enables it with a minimum of metal in its construction to successfully meet this pressure.

Above the eye D^4 of the upper fifth-wheel, heretofore specified, is a plate J, having a vertical portion J^2 and a horizontal eye J^1 , extending rearwardly. The vertical portion J^2 is secured to the rear face of the head-block in the vicinity of where the fifth-wheel uniting bar or brace D^3 is present by means of bolts passing through the head-block and respectively through the holes J^3 J^3 of the plate, the bolts receiving nuts J^4 , substantially as shown in Fig. 1. It should be here stated that the opening through the eye J^1 is square or otherwise formed, so as to engage the king-bolt and prevent the latter from rotating when located therein. The lower perch-iron preferably has a strengthening-fin K^4 , substantially as shown in Fig. 4.

The king-bolt M having an enlarged upper portion or head M^1 extends through the eye J^1 and the opening F^7 in the perch-iron, eye

E³, sleeve G, eye G' and opening K² of the perch-iron K, it being understood that the eye D⁴ in the upper fifth-wheel is present in connection with the angular shoulder F⁵ of the perch-iron F, substantially as hereinbefore specified. Below the perch-iron K, the king-bolt is provided with the screw-thread M³, on which is a nut M⁴. The latter being duly turned, secures between it and the head M' of the bolt the eye J', the perch-iron F interlocking with the upper and lower portions of the fifth-wheel, the sleeve G interlocking with the lower half of the fifth-wheel, and the lower axle-plate H interlocking with the lower perch-iron and the brace H⁶ of the axle-plate H. The upper portion of the king-bolt where it comes in contact with the eye J' of the vertical plate J is made square to fit the square hole of said eye, or if the said eye J' be otherwise shaped, this portion of the king-bolt is formed to correspondingly fit into and engage with the same. It will thus be seen that all of these parts are securely interlocked with the king-bolt located at the rear of the axle and all the parts are firmly placed in position.

When it is desired to increase the strength of the structure herein mentioned, a front brace N should be present, united at its lower end by bolting (or otherwise) to the forward end of the extension K³ of the lower perch-plate, and at its upper end provided with the vertical plate N', bolted to the head-block.

It will be observed that the entire arrangement of the king-bolt and of the parts through which it passes is such as to exclude water from the bolt and the various portions thereof, thereby preventing the parts from rusting. In this way the friction of one part on another is reduced to a minimum and the interlocking parts are rendered more durable. Thus it will be observed that the upper surface of the king-bolt is rounded and that the under surface of the king-bolt makes a tight joint with the eye J'.

It will also be observed that the rear edge of the eye J' is beveled and combines with the rear upper surface of the head of the king-bolt to make an inclined roof or shed down which the water will readily run away.

It will also be observed that the rear edge of the eye J' extends to the rear edge of the eye D⁴, and the edge of the eye J' at all points, except in front, extends out as far as the edge of the eye D⁴, and moisture running down the edge of eye J' will run down the edge of eye D⁴ and be to a great extent prevented from entering between eye J' and eye D⁴.

It will also be observed that the lug F⁵ extends upward within the eye D⁴, and thereby prevents to a great extent any water which perchance may enter between the eye F⁷ of the perch plate or brace and the eye D⁴ from entering any farther between the adjacent portions of these bearings. The downwardly-projecting lug F⁶ of eye F⁷, as before stated, extends down into eye E³ and at rear is entirely covered and protected from the water

by the perch-plate F⁴. Any water which might fall upon the upper surface of the eye E³ in front of the eye F⁷ is unlikely to enter between the two for the reason that the strain and tendency are such as to keep the front under surface of the eye F⁷ always hard-pressed against the upper surface of the front portion of the eye E³—namely, at the point W. The upper end of the sleeve G extends up into the lower portion of the annular flange of the eye E³, and hence no water can enter there between them. The upper portion—namely, H'—of the eye H³ of the brace H extends upwardly into the sleeve, and thereby prevents water from entering between the said sleeve and eye. The annular flange K' of the lower perch-plate extends upward into the eye H³ of the brace and thus prevents water from entering between said eye and plate. There is but little opportunity for water to enter between the nut M⁴ and the lower surface of the eye of the lower perch-plate, for the reason that the nut M⁴ is entirely beneath and out of the way of the water falling from the sides of the perch-plate, the sides of the latter extending beyond and outside of the nut.

It should be noted that the upper perch-plate is located between the upper and lower halves of the fifth-wheel—namely, between the eyes D⁴ and E³—so as to allow the sleeve G to rest between the lower half of the fifth-wheel and the axle-plate H. Among the advantages resulting from this arrangement may be stated that the wear on the ends of the sleeve G is thereby prevented, because the sleeve and the lower half of the fifth-wheel and the axle-plate H will together with the axle turn as one, and the sleeve will not turn against said lower fifth-wheel or against the said axle-plate. Another advantage is that such arrangement makes it impossible for the sleeve G to rattle after the vehicle has been used sufficiently long to otherwise wear the ends of said sleeve enough to cause a rattle.

What I claim as new and of my invention, and desire to secure by Letters Patent, is—

1. In combination with the headblock and axle, the king bolt located at their rear, and headblock plate J secured to the rear side of the headblock, the upper fifth wheel connected to headblock having cross piece D³ and central eye D⁴, the latter located at rear of the headblock, rearwardly projecting perch brace D⁷, adapted to fit the upper perch plate and secured to the fifth wheel, the perch plate F having eye F⁷, lower fifth wheel having cross piece E² secured to the axle and having eye E³, located behind the axle, sleeve G, plate H, the sleeve G interlocking between the eye E³ and axle plate, and the lower perch plate having eye K², the king bolt passing through the several parts, substantially as and for the purposes specified.

2. In combination with a headblock and axle, a fifth wheel, the king bolt located at rear of the axle, and upper and lower perch plates, eyes of the upper and lower halves of the

fifth wheel, eye J' connected to the headblock, the axle plate H connected to the axle, the king bolt passing therethrough, and through the perch plates and other eyes, substantially as and for the purposes specified.

3. In combination with a headblock and axle, a fifth wheel, the king bolt located at rear of the axle, and upper and lower perch plates, and eyes from the upper and lower halves of the fifth wheel, and eye J' connected to the headblock, the axle plate H connected partly to the under side of the axle, the sleeve G located between fifth wheel plate E and axle plate H and fins H⁹, located at and adjacent to the respective junctions of the wing and part H⁶, the king bolt passing through the said eyes and perch plates, substantially as and for the purposes specified.

4. In combination with the headblock and axle and fifth wheel, the king bolt located at rear of the axle, and upper and lower perch plates and eyes of the upper and lower halves of the fifth wheel, and eye J' connected to the headblock, and the rearwardly convex axle plate H having the wings H⁴ connected to the under side of the axle, and lower perch iron lug K' fitting into recess H³ of axle plate, the king bolt passing through said eyes and plates, substantially as and for the purposes specified.

5. In combination with the headblock and axle and fifth wheel, king bolt located at rear of the axle, upper perch plate, eyes of the upper and lower halves of the fifth wheel, eye J' connected to the headblock, sleeve G, axle plate H having the wings H⁴ connected to the under side of the axle, said plate curved toward the rear, the lower perch plate having upwardly projecting annular lug K', the king bolt passing through said eyes and plates, substantially as and for the purposes specified.

6. In combination with the headblock and axle and fifth wheel, the king bolt located at rear of the axle, and upper and lower perch plates and eyes of the upper and lower halves of the fifth wheel, eye J' connected to the headblock, the axle plate H having the wings H⁴ connected to the under side of the axle, said brace convexly curved toward the rear, and having central aperture for king bolt, the king bolt passing through said eyes and plates, and lug H² received into the lower end of sleeve G, substantially as and for the purposes specified.

7. The combination of the headblock and axle and the upper half of the fifth wheel, provided with eye D⁴ located at the rear of the headblock, and lower half of the fifth wheel provided with eye E³ located at the rear of the axle and concentric with eye D⁴, the eye E³ in its upper portion having recess E⁷ and in its lower portion the recess E⁹, the upper perch plate F being provided with the upwardly extending angular lug F⁵, received into the eye D⁴, and further provided with

the lower annular lug F⁶ received into the upper recess E⁷ of the eye E³, the axle plate H provided with wings H⁴, said plate with convexly rearwardly curved brace H⁶ provided with eye H² having the upwardly extending annular lug H⁷, and sleeve G at its lower end fitting over the said lug H⁷ and at its upper end received into the recess E⁹ of the eye E³, and lower perch plate K having eye K² and upper annular lug K' received into recess H³ in the lower portion of the said eye H² of the brace H⁶, and king bolt M passing through said eyes and sleeve and securing together the said parts, substantially as and for the purposes specified.

8. The combination of the headblock and axle and the upper half of the fifth wheel, provided with eye D⁴ located at the rear of the headblock, and having superincumbent eye J', and lower half of the fifth wheel provided with eye E³ located at the rear of the axle and concentric with eye D⁴, the eye E³ in its upper portion having recess E⁷ and in its lower portion the recess E⁹, the upper perch plate F being provided with the upwardly extending angular lug F⁵, received into the eye D⁴, and further provided with the lower annular lug F⁶ received into the upper recess E⁷ of the eye E³, the axle plate H provided with wings H⁴ and convexly rearwardly curved brace H⁶ provided with eye H² having the upwardly extending annular lug H⁷ and sleeve G, its lower end fitting over the said lug H⁷ and its upper end received into the recess E⁹ of the eye E³, and lower perch plate K having eye K² and upper annular flange K' received into recess E³ in the lower portion of the said eye H² of the brace H⁶ and king bolt M passing through said eyes and sleeve and securing together said parts, the lower perch plate being provided with a forward extension K³ connected by nuts N², N², to the front vertical brace N, secured to the headblock, substantially as and for the purposes specified.

9. The combination of the king bolt, headblock, eye J', upper and lower eyes of fifth wheel, and upper perch iron interlocking between them, axle plate H, and sleeve G resting against the eye of fifth wheel plate E, and above the axle plate H, substantially as and for the purposes specified.

10. The combination of the headblock, and plate J fastened thereto, king bolt M, located back of the axle, fifth wheel plates D and E, perch iron F entering between the said fifth wheel plates and engaging the king bolt, in rear of the axle, and axle plate H forming brace for lower end of the king bolt, substantially as and for the purposes specified.

11. The combination of the headblock, king bolt located at rear of the axle, plate J supported by the headblock, fifth wheel plate D below said plate J, lower fifth wheel plate E and perch iron F located between said fifth wheel plates, lower perch iron K extending beyond center of axle and the king bolt pass-

ing through and engaging said parts, and the axle plate bracing the lower end of the king bolt and pivotally connected thereto, substantially as and for the purposes specified.

5 12. In the combination of a vehicle fifth wheel, a perch iron F between fifth wheel plates projecting rearward and downward from said plates and the rear portion of the iron F resting on the top of the perch and engaging the king bolt in the rear of the axle, 10 plate D having eye for king bolt, and brace D' resting directly on upper perch iron and fastened thereto, substantially as and for the purposes specified.

15 13. In the combination of a vehicle fifth wheel, the curved axle plate H extending beneath sleeve G and holding said sleeve against king bolt projection of fifth wheel plate E, and perch iron F located wholly back of the

axle and between the projections of the fifth 20 wheel plates D and E, substantially as and for the purposes specified.

14. In the combination of a vehicle fifth wheel having king bolt in the rear of the axle, and passing through fifth wheel plates D and 25 E, sleeve G, upper perch iron F, located between plates D and E, axle plate H, and lower perch iron K, sleeve resting against lower side of fifth wheel plate E and upper side of axle 30 plate H and perch iron K located below axle plate H and fastened together by the king bolt, substantially as and for the purposes specified.

EZRA B. SMITH.

Attest:

A. S. LUDLOW,
K. SMITH.