

(No Model.)

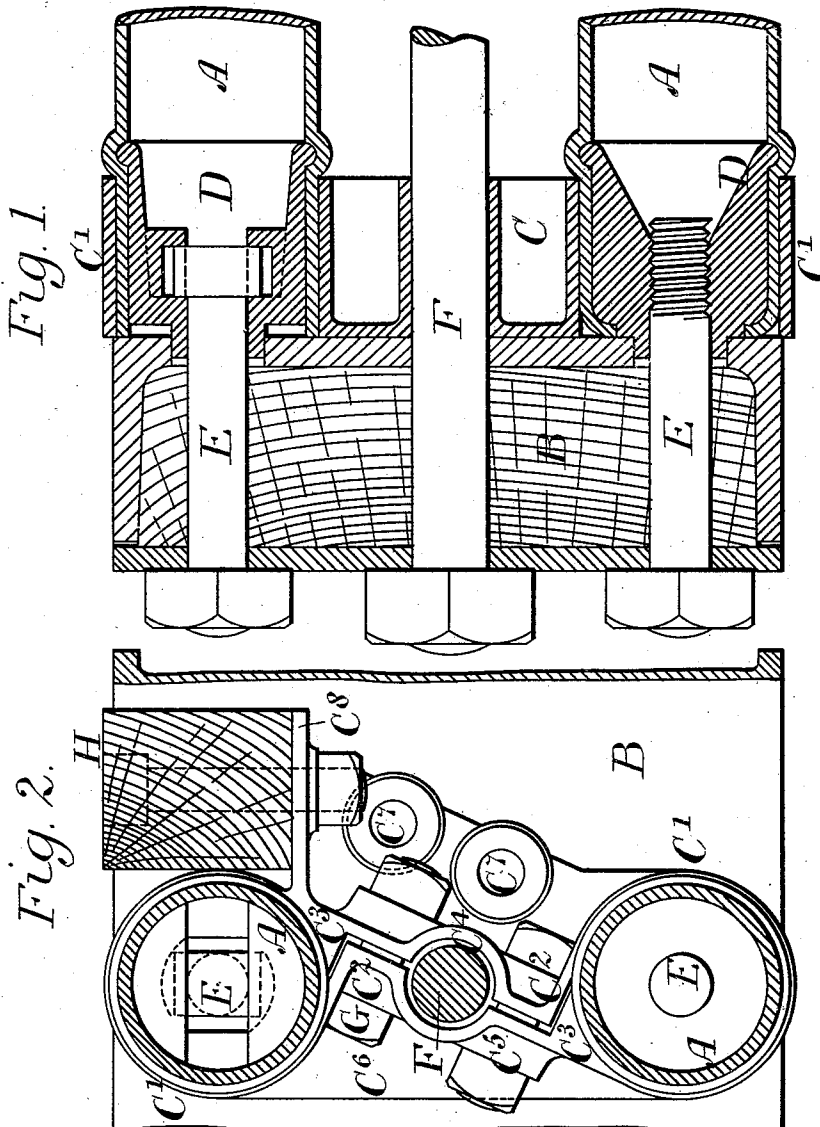
5 Sheets—Sheet 1.

G. W. ETTINGER.

METALLIC UNDER FRAME FOR RAILWAY CARRIAGES.

No. 506,652.

Patented Oct. 10, 1893.



Witnesses
J. A. Saul
G. W. Rea

Inventor
George Watson Ettinger
by *James L. Norris*
Att'y.

(No Model.)

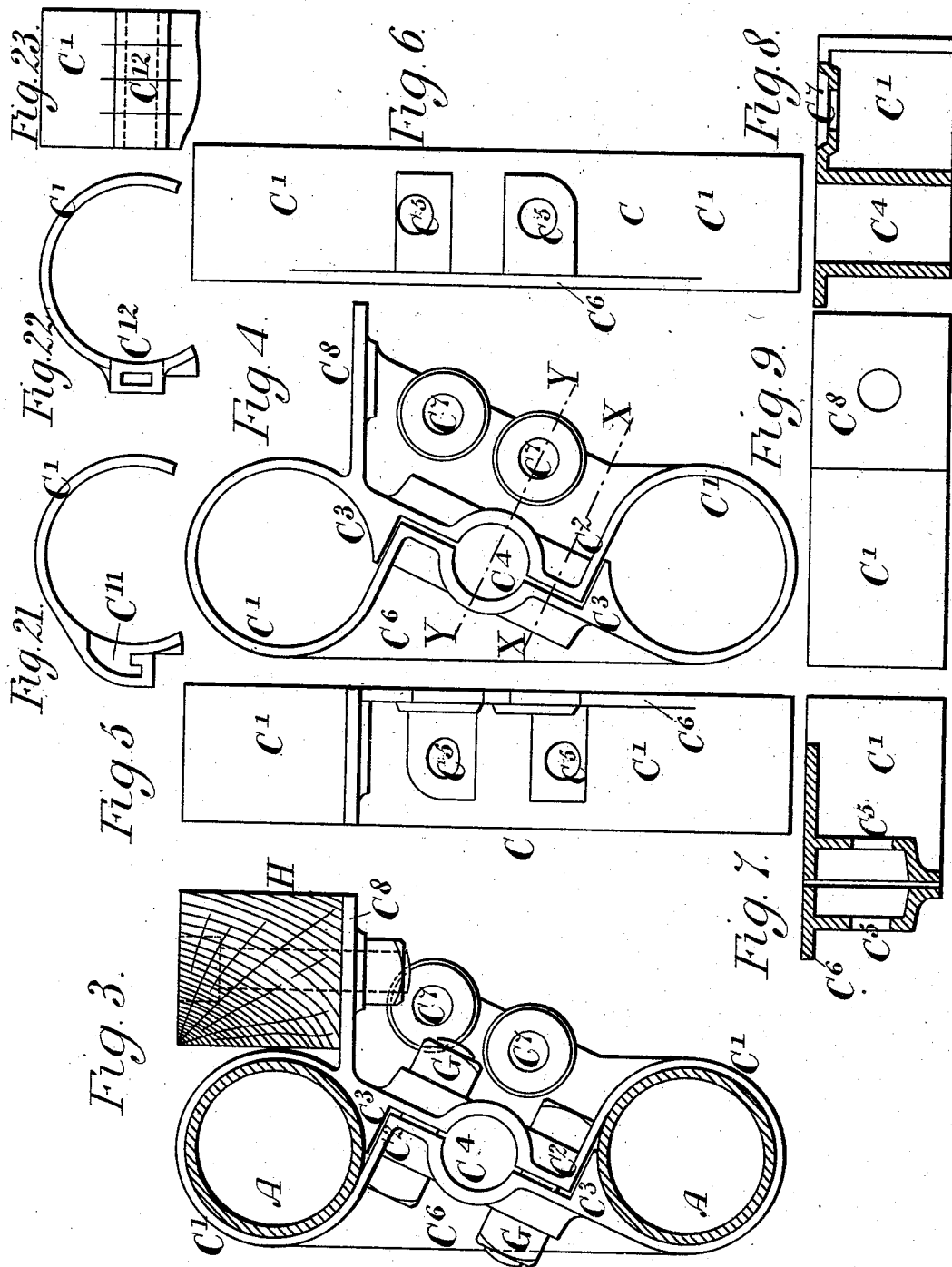
5 Sheets—Sheet 2.

G. W. ETTINGER.

METALLIC UNDER FRAME FOR RAILWAY CARRIAGES.

No. 506,652.

Patented Oct. 10, 1893.



Witnesses
J. A. Saul
G. W. Rea.

Inventor
George Watson Ettenger
by James L. Norris
Atty.

(No Model.)

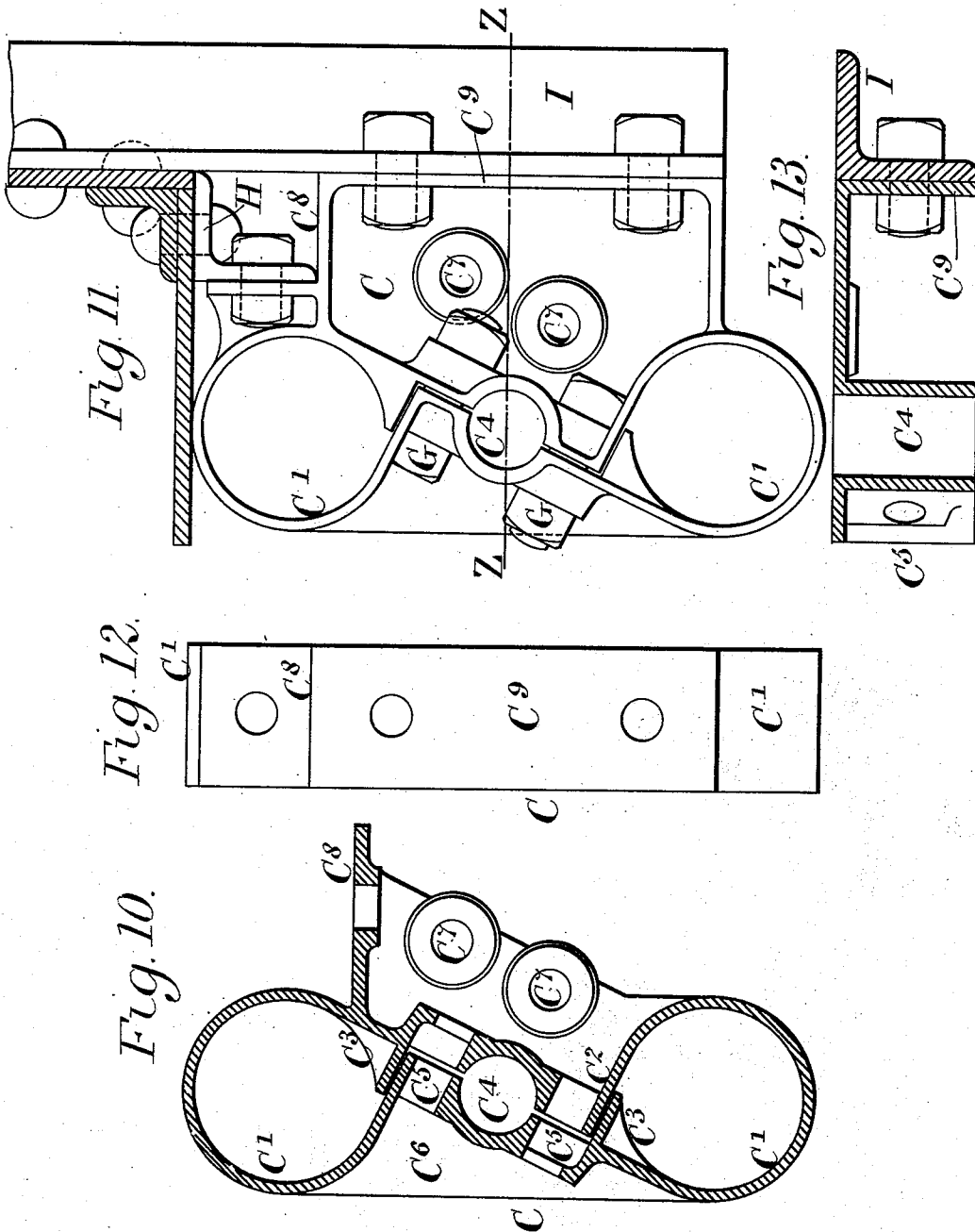
5 Sheets—Sheet 3.

G. W. ETTINGER.

METALLIC UNDER FRAME FOR RAILWAY CARRIAGES.

No. 506,652.

Patented Oct. 10, 1893.



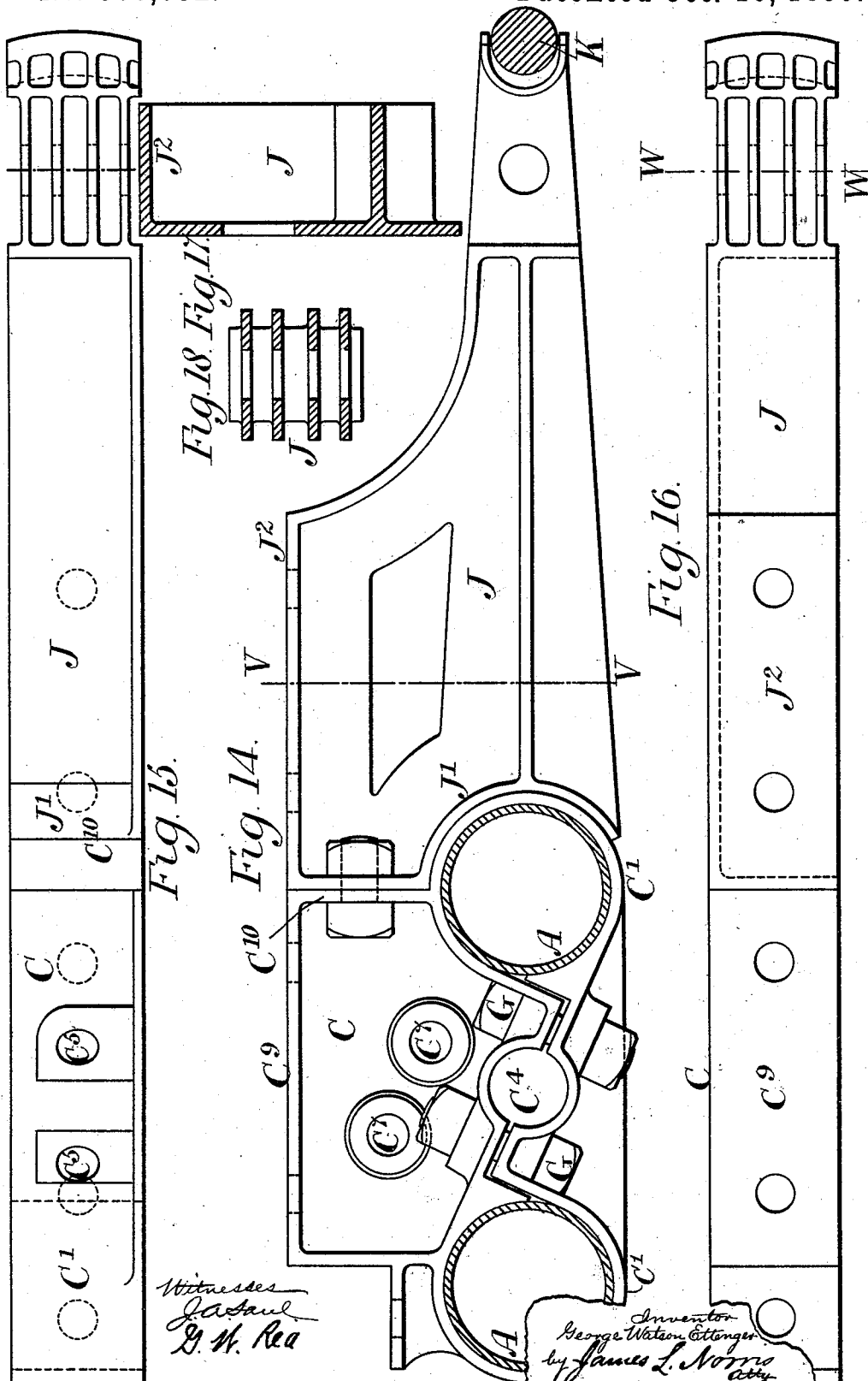
Witnesses
J. A. Paul
G. W. Rea,

Inventor
George Watson Ettinger
by *James L. Norris*
Atty.

5 Sheets—Sheet 4.

METALLIC UNDER FRAME FOR RAILWAY CARRIAGES.

Patented Oct. 10, 1893.



(No Model.)

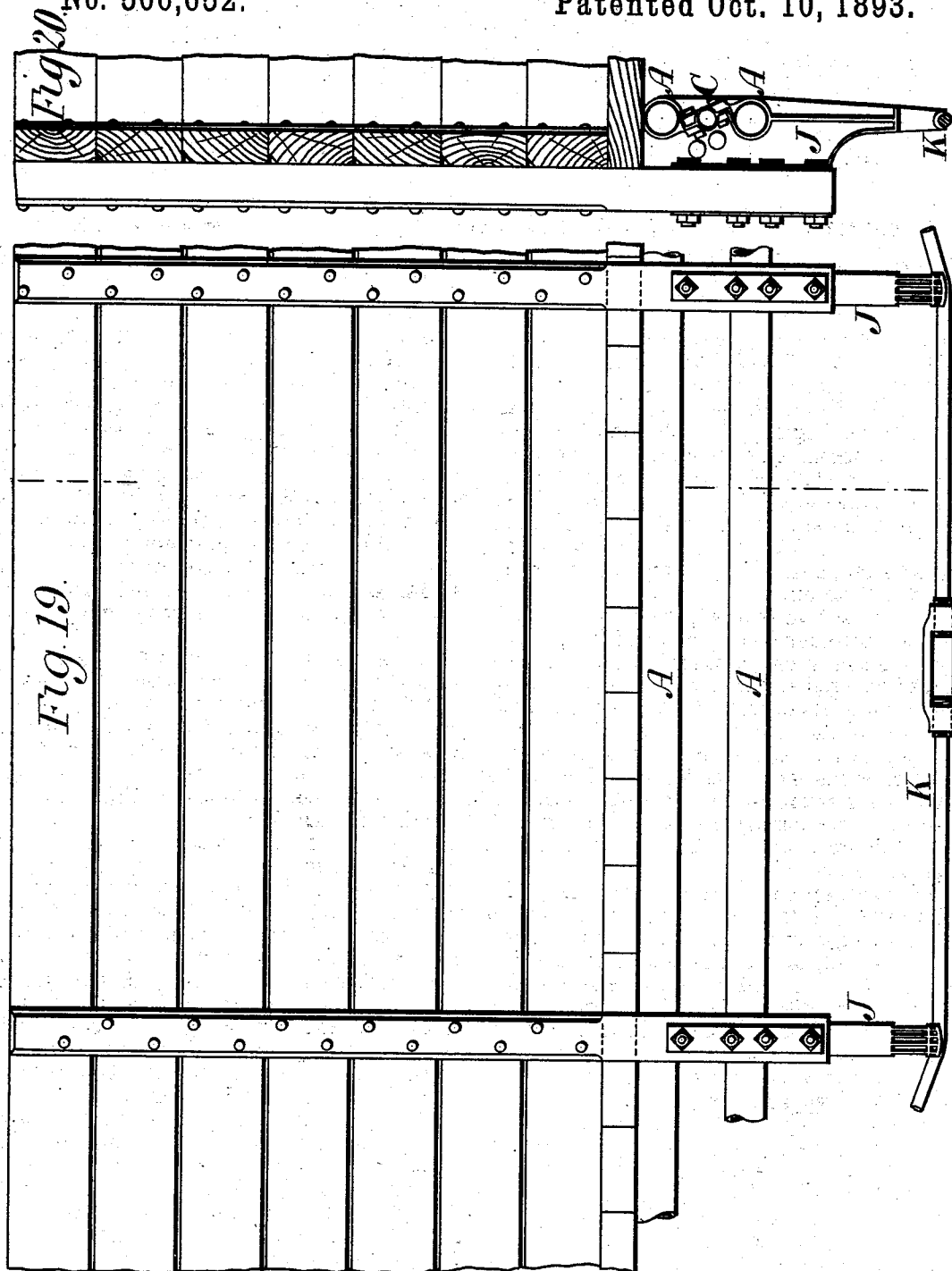
5 Sheets—Sheet 5.

G. W. ETTINGER.

METALLIC UNDER FRAME FOR RAILWAY CARRIAGES.

No. 506,652.

Patented Oct. 10, 1893.



Witnesses
J. A. Paul.
E. H. Rea.

Inventor
George Watson Ettenger
by *James L. Morris*
Atty.

UNITED STATES PATENT OFFICE.

GEORGE WATSON ETTINGER, OF BARROW-IN-FURNESS, ASSIGNOR OF ONE-HALF TO GEORGE EARL CHURCH, OF LONDON, ENGLAND.

METALLIC UNDER FRAME FOR RAILWAY-CARRIAGES.

SPECIFICATION forming part of Letters Patent No. 506,652, dated October 10, 1893.

Application filed June 15, 1893. Serial No. 477,747. (No model.) Patented in Belgium May 24, 1893, No. 104,792, and in Italy June 9, 1893, LXVII, 35.

To all whom it may concern:

Be it known that I, GEORGE WATSON ETTINGER, a citizen of the United States, residing at 12 Church Street, Barrow-in-Furness, Lancashire, England, have invented certain new and useful Improvements in the Construction of Metallic Under Frames of Railway Carriages and Vehicles, (for which I have obtained Letters Patent in Italy, dated June 9, 1893, LXVII, 35, and in Belgium, dated May 24, 1893, No. 104,792,) of which the following is a specification.

This invention relates to that construction of metallic under frames of railway carriages and wagons wherein metal tubes are employed as longitudinal sole bars, there being two or more such tubes the one placed vertically above the others.

The present improvements relate to the connection of the said tubes to each other and to other parts of the under frame by means of metal binders, constructed as I will describe with reference to the accompanying drawings in which—

Figure 1 shows a longitudinal section of the joint of the tubes with the headstock of the framing, together with a binder. Fig. 2 shows a cross section of the tubes showing the inner side view of the binder. Fig. 3 shows a side view of a binder at the other parts of the tubes. Fig. 4 shows the binder detached. Fig. 5 shows an outer end view of the same; Fig. 6 an inner end view; Figs. 7 and 8 sections taken respectively on lines X X and Y Y of Fig. 4; Fig. 9 an under side plan and Fig. 10 a vertical section. Fig. 11 shows a side view; Fig. 12 a front view, and Fig. 13 a section on line Z Z of Fig. 11, of a modified form of the binder for adapting it as a support for the upright pillars of the truck body. Fig. 14 shows a side view of another modification adapting the binder for the attachment of the struts for the trussing of the tubes. Fig. 15 shows the outer end view; Fig. 16 the inner end view, and Figs. 17 and 18 sections of the strut on lines V V and W W Figs. 14 and 16. Figs. 19 and 20 show part elevation and section of the truck body with the binder and strut formed of one piece.

Figs. 21, 22 and 23 show modified forms of the binder constructed of two separate parts.

At Figs. 1 and 2 the tubes A are fixed to the headstock B by first enlarging their ends and after introducing therein beaded plugs D, reducing the ends again by forging or pressing so as to grip the plugs, which are then secured to the headstock by screw bolts E in either of the ways shown, the binder C Figs. 1 to 10 having previously been fitted onto the ends of the tubes so as to lie with its flange close against the inner face of the headstock, to which it is secured by screw bolts.

The binder C consists first of a metal band of loop shape C' that fits almost completely round each tube, passing diagonally across the intervening space between the tubes so as to pass off at a tangent at the one tube and to be bent at right angles at C² at the other tube where it also joins tangentially onto the circular part as shown.

In order to cause the band to more or less completely encircle each tube, it is formed with an internal projection at C³ fitting round the tube. In the middle of the part between the tubes the band is formed with two semi-circular hollows C⁴ which encircle a tie bolt F running parallel with the tubes A and secured with its ends to the head stocks and transom as shown at Fig. 1. On each side of these hollows the band is formed with embossed holes C⁵ for the reception of screw bolts G, by means of which, when the binder is fitted on the tubes, the loops can be drawn tight round the latter so as to hold them securely, and it will be seen that as the part at C² passes tangentially from the loop and in line with the bolt G, the pull of the latter will effectively draw the loop tight round the tube, while at the same time the opposite part of the loop will be supported against the cross strain exercised by the bolt, by the abutment afforded by the projection C³. On the outer sides of the band are formed flanges C⁶ for strengthening it, and in the inner flange are formed bolt holes C⁷ for bolting the binder against the headstocks B and thus further securing the connection of the tubes to the

binders. A horizontally projecting flange or bracket C⁸ is also provided for attachment by bolts to a false sole bar or floor sill H for securing the floor of the vehicle to the under-frame.

The above described form of the binders is that adopted for the end binders next the head stocks B, and such intermediate binders that do not at the same time serve for the attachment of struts for the trussing or for attachment of the vertical supports of the body. The modified constructions of the binders for these purposes are shown at Figs. 11, 12 and 13. In the construction shown in side view at Fig. 11, front view at Fig. 12, and section on line Z Z at Fig. 13, the flange on one side of the binder C is extended sufficiently to form a square outer face C⁹, in line with the side plates of the body so as to serve for the attachment of the vertical supports I of the body, these supports as also the body being in this case assumed to be of metal; the sill H being also of angle iron, the flange C⁸ is modified in form to receive it. This same construction of the binder is also adapted for the attachment of the struts J for the truss rods K, as shown at Figs. 14 to 18.

The flange of the binder is formed with a square lower face C¹⁰, to which is secured by a bolt the upper end of the strut J, this being also made to fit with a circular curved part J' round the circular lower end of the binder C which thus affords the strut the necessary support. The outer face J² of the strut is made in line with the face C⁹ of the binder, so as also to serve for attachment of the extended vertical support as shown at Figs. 19 and 20 which show a part side elevation and part cross section of a truck with wood body. As shown in these figures, the strut J may also be formed in one piece with the binder, instead of being of a separate piece.

Instead of forming the loop of the binder C of a single piece, as described, it may be divided and the parts joined together either by a hooked joint as at C¹¹ Fig. 21, or loops C¹² engaging with each other and secured by a key as shown in end and front views at Figs. 22 and 23.

When the binders are constructed with their loops of a single piece they are made with their loop sufficiently sprung open to allow them to be slipped longitudinally over the tubes A into the position which they have

to occupy, when they are secured by the screw bolts G a small space being still left between the meeting parts of the loop as shown, after the tightening up of the bolts, so as to insure that the circular parts of the loop shall grip the tubes A tightly.

Having thus described the nature of my invention and the best means I know for carrying the same into practical effect, I claim—

1. A metal binder for securing together and to other parts of the under frame tubular bearers A, said binder consisting of a loop shaped band C' passing round the tubes and tangentially and diagonally across from the one tube to the other, and bent at right angles at C², said band having flanges for attachment to other parts of the under frame and being provided with embossed holes for the reception of bolts for nipping the band on the tubes A, substantially as described.

2. A metal binder for securing together and to other parts of the under frame tubular bearers A said binder consisting of a loop shaped band C' passing round the tubes and tangentially thence to a right angle bend C² on the one side while on the other side it is provided with an internal projection C³ bearing against the tube A and affording support against the pull of the screw bolt, substantially as described.

3. A metal binder for securing together and to other parts of the under frame, tubular bearers A said binder consisting of a loop shaped band C' passing round the tubes and tangentially and diagonally from the one tube to the other, said tangential and diagonal parts being secured by bolts so as to nip the band round the tubes, and a strut J supporting the truss rod, projecting downward from the under side of the binder, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 9th day of May, A. D. 1893.

GEORGE WATSON ETTINGER.

Witnesses:

CHAS. D. ABEL,
Chartered Patent Agent, 28 Southampton Buildings, London, W. C.

JNO. P. M. MILLARD,
Clerk to Messrs. Abel & Imray, Consulting Engineers and Patent Agents, 28 Southampton Buildings, London, W. C.