(No Model.) 2 Sheets—Sheet 1.

W. H. MARSHALL.

TRUCK BOLSTER.

No. 565,481. Patented Aug. 11, 1896.

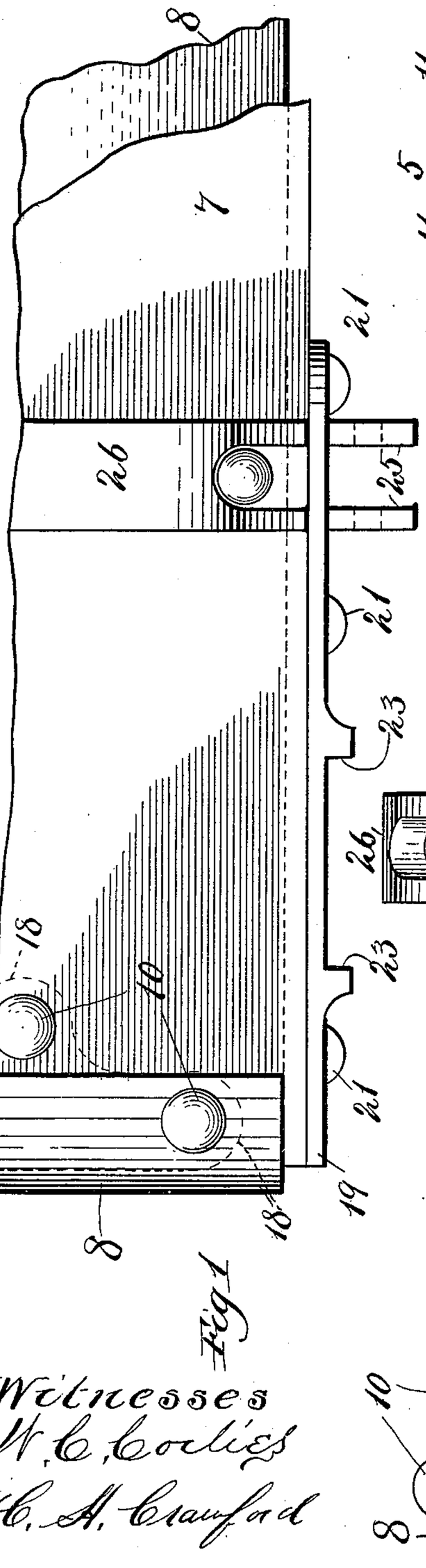

Fig 1

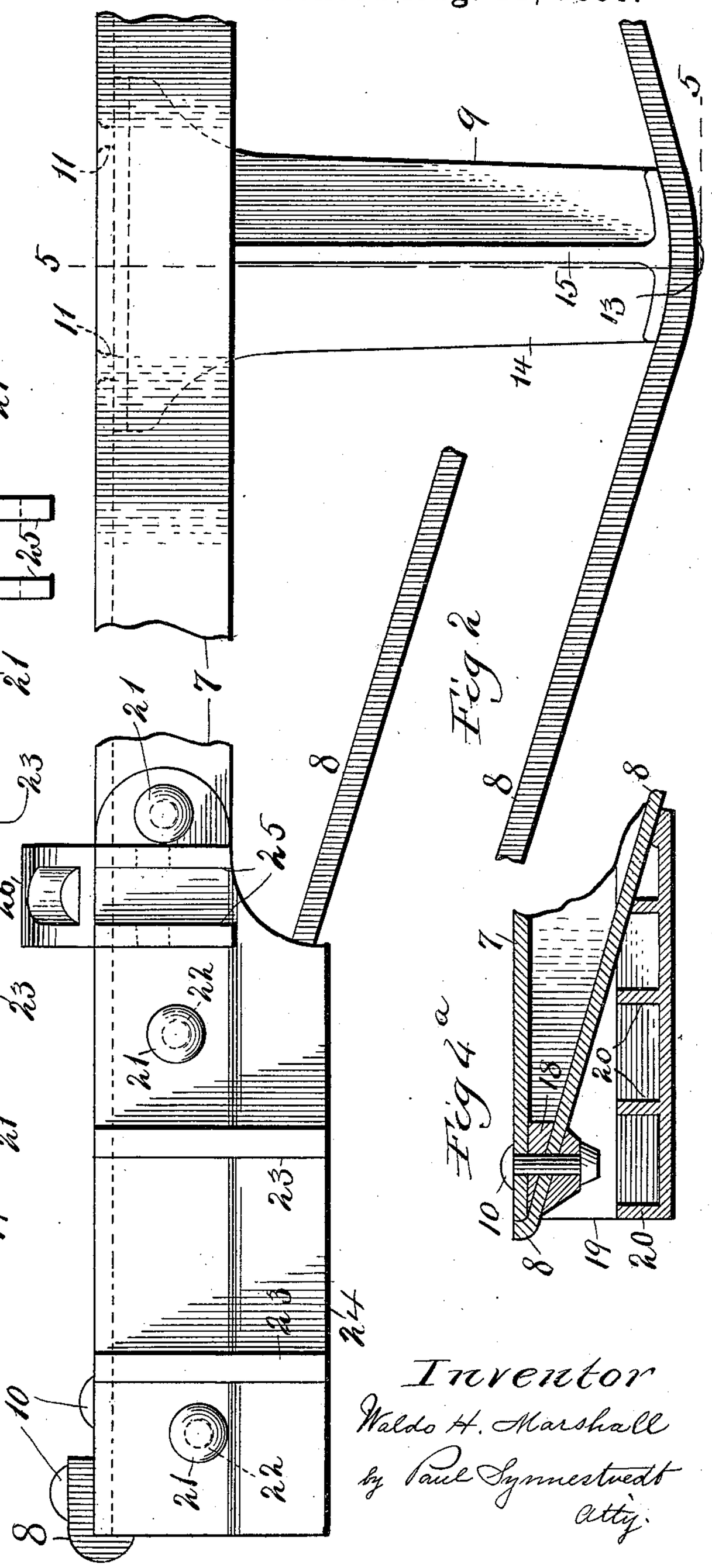

Fig 2

Fig 4a

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(No Model.) 2 Sheets—Sheet 2.

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TRUCK BOLSTER.

No. 565,481. Patented Aug. 11, 1896.

Fig. 3.

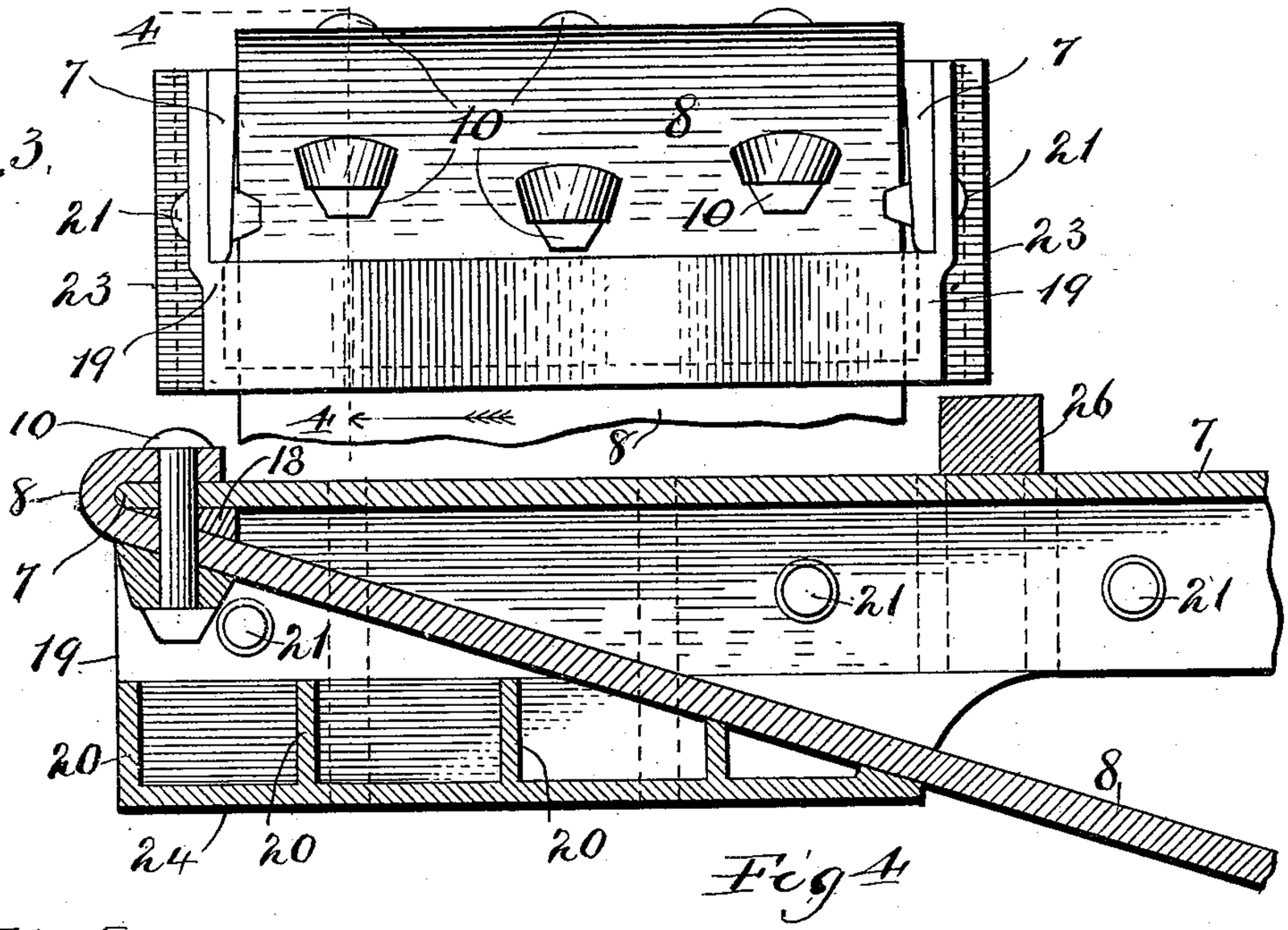


Fig. 4

Fig. 5.

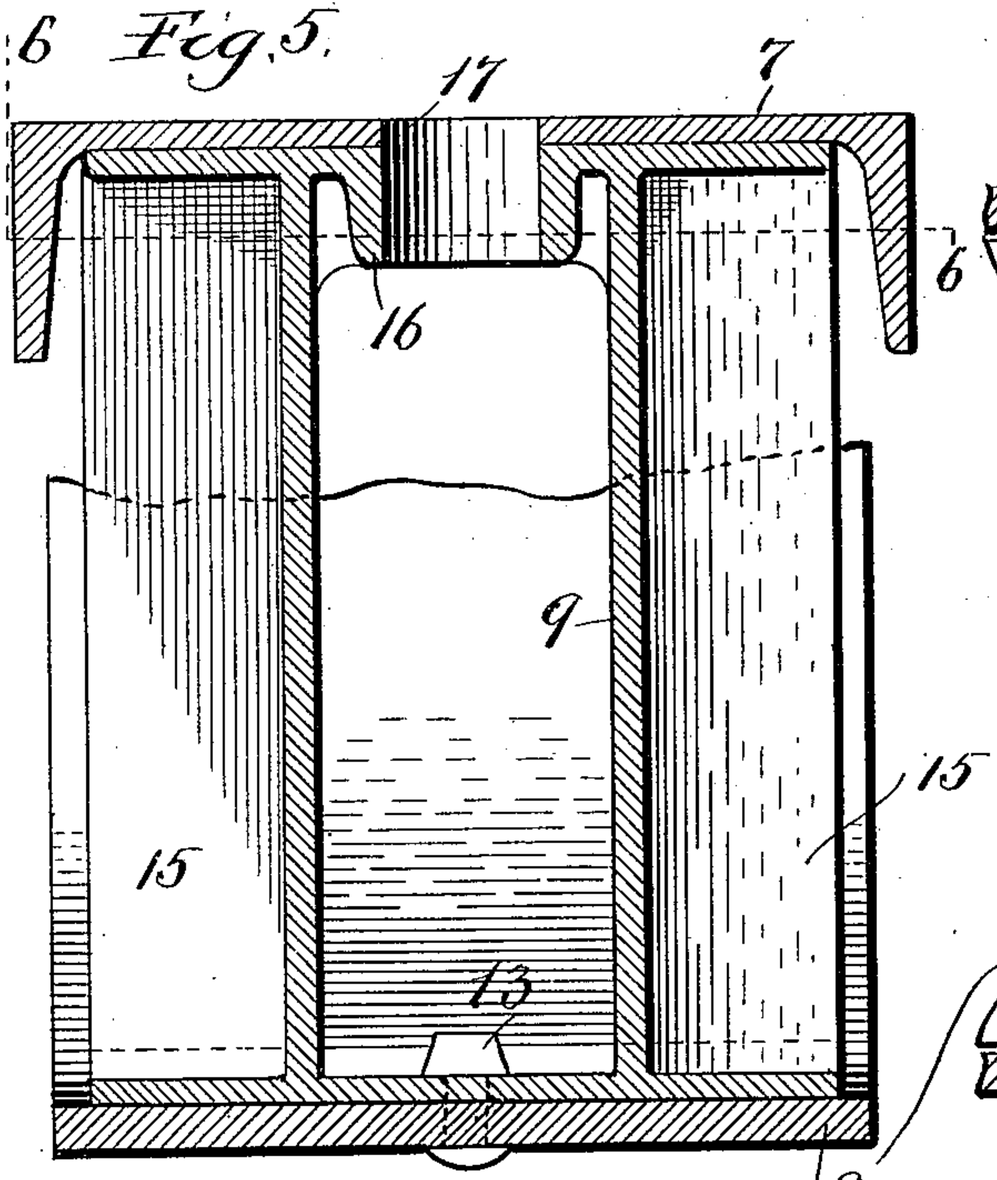
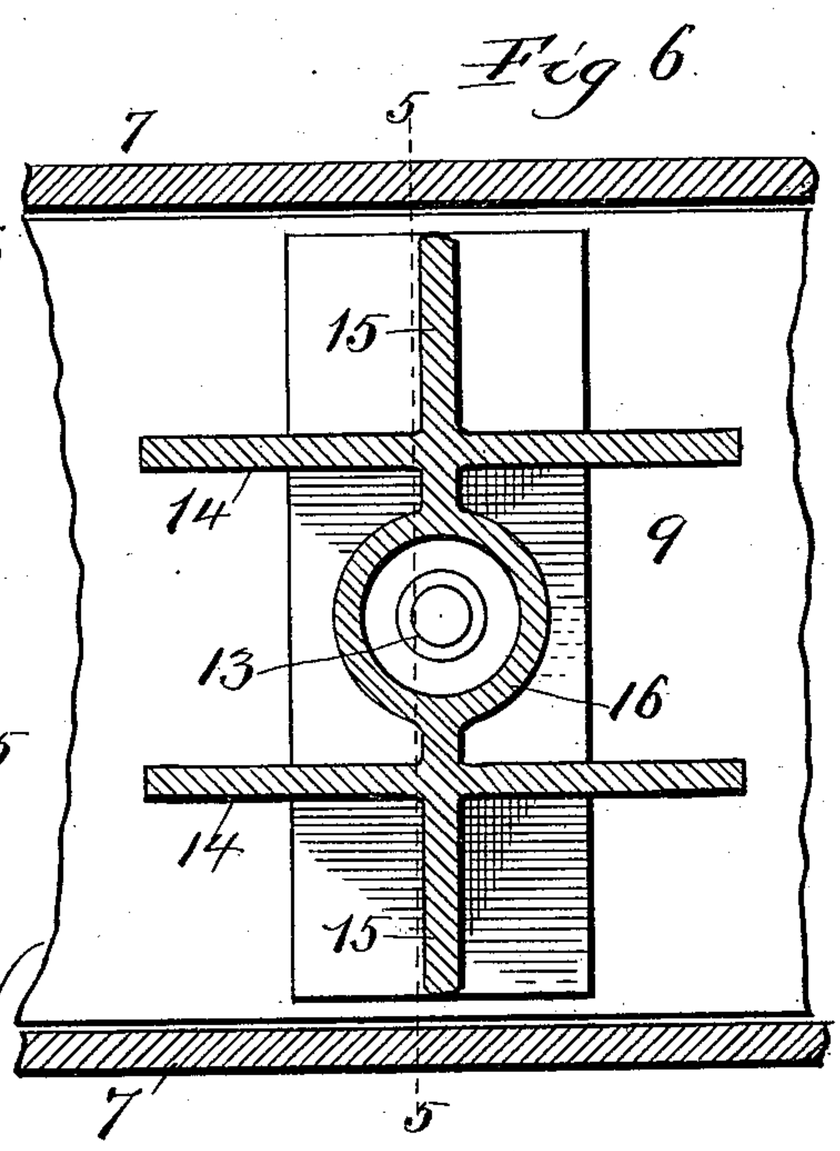


Fig. 6.



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UNITED STATES PATENT OFFICE.

WALDO H. MARSHALL, OF CHICAGO, ILLINOIS, ASSIGNOR TO WILLIAM V. KELLEY, OF SAME PLACE.

TRUCK-BOLSTER.

SPECIFICATION forming part of Letters Patent No. 565,481, dated August 11, 1896.

Application filed January 13, 1896. Serial No. 575,277. (No model.)

To all whom it may concern:

Be it known that I, WALDO H. MARSHALL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Truck-Bolsters, of which the following, taken in connection with the accompanying drawings, is a specification.

From commercial rolled forms which require no special machinery or expensive process to construct, combined in a secure and at the same time simple manner, I aim to provide a truck-bolster which will be practically a permanent and unyielding structure, while at the same time it is lighter in weight and less expensive for a given strength than any other heretofore made.

A further object of my invention is to provide, in combination with a channel-iron compression member, a tension member in the form of a single plate so united with the compression member at the ends as to form a perfect and unyielding joint not dependent on the shearing strength of either bolts or rivets, and to evenly distribute the strains over the entire sectional area of the tension member.

Still another object of my invention is to combine in one casting of strong and simple construction the spring-seat, the column-guides, and the brake-hanger brackets, as will be hereinafter more particularly described.

To better understand the nature of my improvements, reference may be had to the accompanying drawings, in which—

Figure 1 represents a plan view of one end of a bolster embodying my improvements. Fig. 2 is a side elevation of the same. Fig. 3 is an end view. Fig. 4 is a vertical section at one of the ends, taken on the lines 4 4 of Figs. 1 and 3. Fig. 4ª represents a modified form of the construction shown in Fig. 4. Fig. 5 is a vertical transverse section of the bolster, taken on lines 5 5 of Figs. 1 and 2. Fig. 6 is a plan section of the king-post, taken on the line 6 6 of Fig. 5.

In the practice of my invention I use for the compression member of the bolster a channel-iron 7, preferably having its flanges projecting downward, and for the tension member a plate 8. For the king-post I provide a casting of special shape, (marked 9,) and at the ends of the bolster I bend the end of the plate 8 around the end of the channel-iron 7, and secure the two firmly together by rivets 10, the two rivets which are nearest each end, respectively, preferably passing through the plate on both sides of the channel-iron, as clearly shown in the various views, particularly Fig. 4.

The king-post 9, which is more clearly shown in Figs. 2, 5, and 6, I make with a broad bearing-surface at its upper end to afford a good local support for the center plate, this bearing-surface being further strengthened by the provision of a specific arrangement of webs underneath. Two of these webs, I arrange parallel with the center line of the bolster, and extending out from them are transverse webs 15, and at the center of this casting I provide a circular socket 16, for the center pin of the truck, which socket or opening coincides with a hole made through the channel-iron, as indicated at 17. Projecting out from the king-post are formed two lugs 11, adapted to project through holes 12 12 in the channel-iron to be riveted down as a convenient mode of fastening the casting firmly in place. Ordinary rivets can be used in place of lugs, if desired. At the other end of this casting I insert a rivet 13 for uniting the casting to the plate which forms the tension member.

Where the end of the plate 8 is bent around the end of the channel-iron 7, I use washers with inclined faces to afford a firm bearing for the rivets 10. The piece which is set between the channel-iron and plate is in the form of a triple washer 18, made of the shape shown by dotted lines in Fig. 1. The plate 8 is made of a width approximately equal to the inside distance between the flanges of the channel-iron, and thus passing between the flanges at the ends aids in keeping the parts in place.

After the channel-iron 7, plate 8, and king-post 9 are fastened together, as described, I rivet to each end of the bolster a casting 19 of special construction, which I will next proceed to describe. In general this is shaped like a box, open at its top, having one end removed to allow it to be slipped onto the bolster and the other end extending up the sides

about half-way, so as to allow room for the rivets and tapering washers. Inside of this box I construct a series of transverse ribs 20 for strengthening it, as shown in Fig. 4. To secure this fastening firmly to the rest of the bolster, I use rivets 21, passing through the flanges of the channel-iron at points marked 22 on Fig. 2. On the outside of each of the sides of this end casting or box I form the column-guides 23. The bottom of the casting 24, being made flat, forms a bearing for the springs, commonly called the "spring-seat." While this is shown on the drawings as a flat surface it can of course be provided with lips, bosses, or any other construction adapted to afford a socket for the springs, if desired. At the inner end of each of the sides of this box I make, where such construction is desired, two pairs of lugs or brackets 25 for supporting the brake-hangers. Ordinarily these three parts, *i. e.*, the spring-seat, column-guides, and brake-hanger lugs, are made as separate castings. By forming them all in one piece in the manner described I do away with these several separate parts and at the same time obviate all necessity of the use of a large number of bolts and nuts to hold these pieces in place. The whole structure being an integral form is much stronger and more rigid than is possible under the usual practice. Where the brackets are not designed to be suspended from the bolster, the brake-hanger brackets 25 would of course be omitted.

A common form of side bearing is shown at 26, and any usual construction of center plate can be employed.

To those familiar with the various strains to which truck-bolsters are subject it will be seen on reflection that the use of a channel-iron, combined with a plate in the manner which I have shown, has the following important advantages: As a compression member of the truss a channel-iron is one of the best sections available to take a heavy strain without buckling, as it needs no lateral or vertical support to keep it in shape. Truck-bolsters and their upper members in particular are subject to other strains in service besides those necessary to carry the load, and the most serious of these is the lateral strain due to rough handling of cars in switching. If a car is coupled to another with violence or stopped or started suddenly, the forces are transmitted through the car-bodies to the trucks by means of the center plates, and all the forces necessary to move the trucks suddenly are thus first taken by the top member of the truck-bolster on which the center plate is secured.

A bolster formed of a channel-iron placed as I propose and having the ends of the plate passing between its flanges and bent up around its web in the manner shown is particularly well adapted to receive these strains without distress or failure.

The use of the single plate for a tension member makes possible the formation of a most rigid joint at the end. It also reduces the number of parts over what would be necessary if the tension member was composed of several plates, bars, or rods, and furthermore insures a uniform strain over the entire sectional area of the tension member which cannot be assured where the tension of several plates, bars, or rods has to be separately adjusted, as no amount of care can make each take its proportionate share of the strains.

The method of fastening the ends of the tension member is also of great importance. Unless the joint is perfectly secure and unyielding the bolster is sure to be a failure. By the construction I employ this result is accomplished in a more simple, yet perfect manner, than has been heretofore known in the art. In bending the end of the plate over the end of the channel I have made a joint that is not dependent on rivets for its strength and cannot yield in the least. The rivets shown might be omitted altogether where the workmanship is perfect, as they are for the purpose of clamping down the end of the plate where that end has not been bent down as closely as it should have been. In Fig 4ª I have shown a modified form of the joint between the channel-iron and plate, in which construction the plate is also turned up against the end of the channel-iron but is not bent over on the top, as shown in Fig. 4. The rivets in this case serve to clamp the members together, so as to prevent the upturned lip from being separated from the channel, but they do not in any way sustain any of the main strain on the tension member. This construction involves a little less forgework in manufacture, but I prefer the form of Fig. 4 as the more secure.

If a joint is dependent upon the shearing strength of bolts or rivets, so many of them must be employed that the strength of the tension member is seriously reduced. Where an intermediate piece or filling-block is placed between the ends of the tension and compression members it is very likely to distort under heavy strains, and even though it yields but slightly the bolster will deflect considerably in consequence. Furthermore it is to be noted that I have obtained a truss that is very shallow at the ends, a form of construction which is peculiarly well adapted for use in car-trucks where the room available above the springs is limited, as is the case in most forms used at the present day.

The king-post which I use really performs two functions. Besides doing duty as a king-post its upper end is spread out so as to give a better local support to the channel-iron immediately under the center plate, so that the constant battering on the latter as the car passes over rail-joints or rough track will not distort the channel-iron at that point. This secondary duty of the king-post has been borne in mind in the choice of it in preference to queen-posts and in the arrangement

of the various vertical webs of which the post consists, but I do not desire to be understood as limiting myself to the use of a single strut or cross-piece in this position, as it is obvious that two and even more might be used without in any manner departing from the spirit of my invention.

By constructing the spring-seat, column-guides, and brake-hanger brackets all in one casting I reduce the weight and also the number of parts to a minimum.

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

1. In a truss for car-truck bolsters, the combination with a commercial rolled channel-iron compression member, and a flat-plate tension member bent up at each end of said compression member and passing between the flanges of the same, of a support for separating said compression and tension members at a point between their ends, arranged and combined substantially as shown and described.

2. In a bolster for car-trucks, the combination with a commercial rolled channel-iron compression member, of a flat-plate tension member and a king-post, said tension member being bent up at each end of said compression member, after passing between the flanges of the same; in a manner substantially as shown and described.

WALDO H. MARSHALL.

Witnesses:
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C. A. BLAKE.