

No. 775,217.

PATENTED NOV. 15, 1904.

J. H. GRAHAM.
CAR CONSTRUCTION.
APPLICATION FILED JAN. 2, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

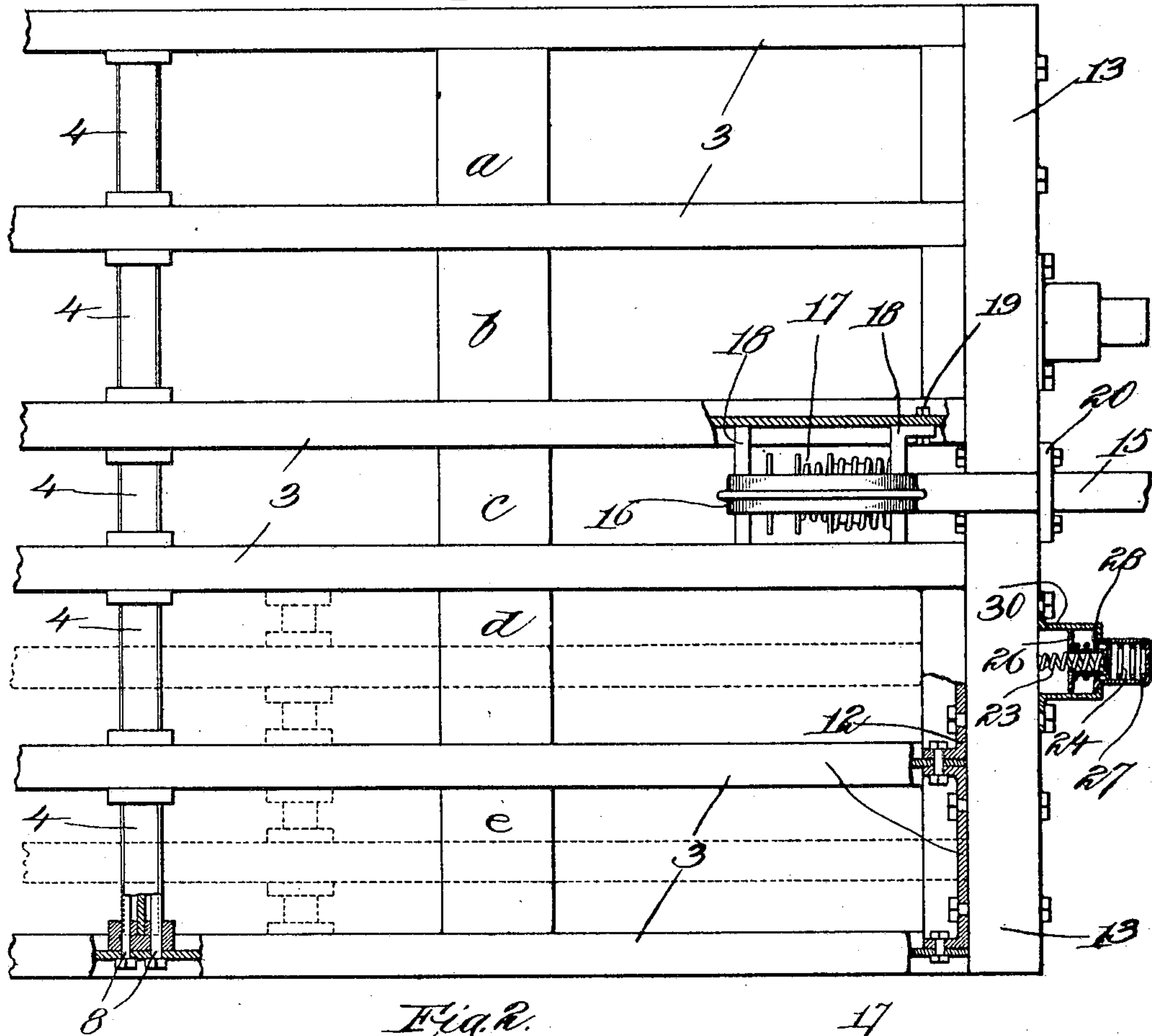


Fig. 2.

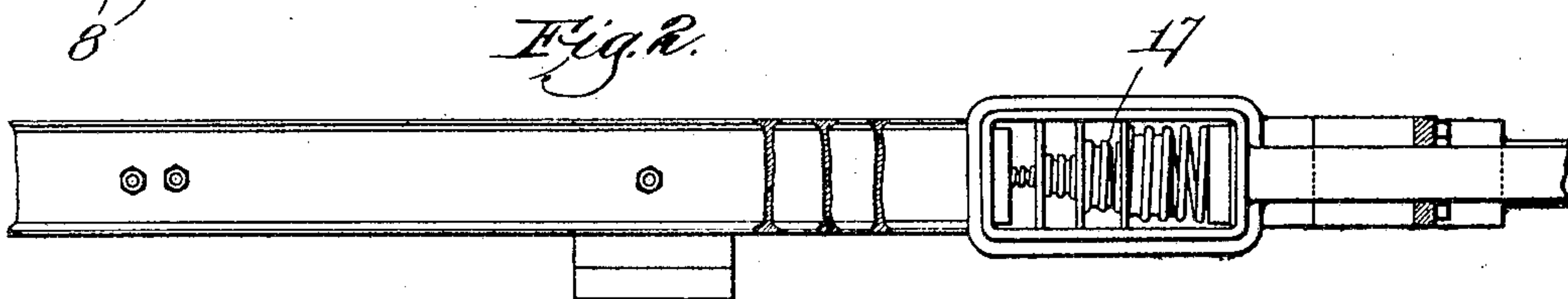
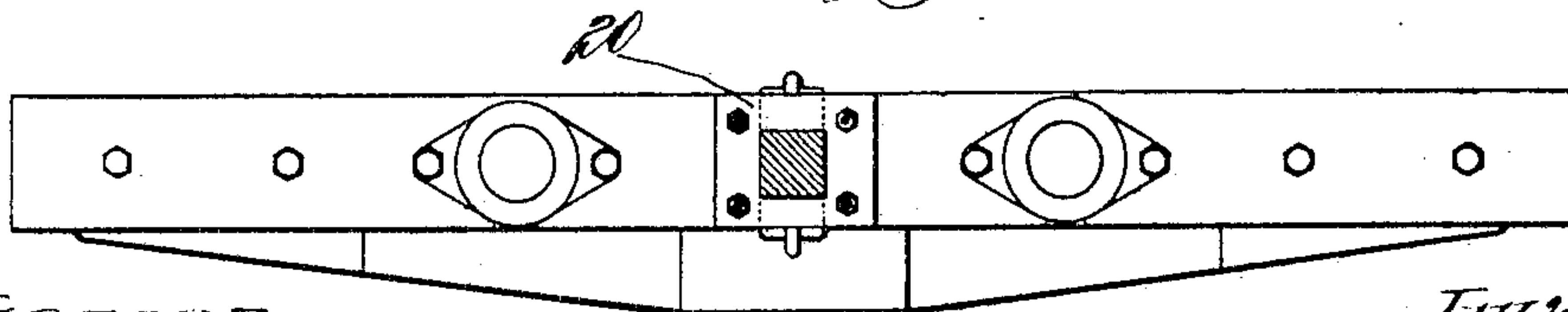


Fig. 3.



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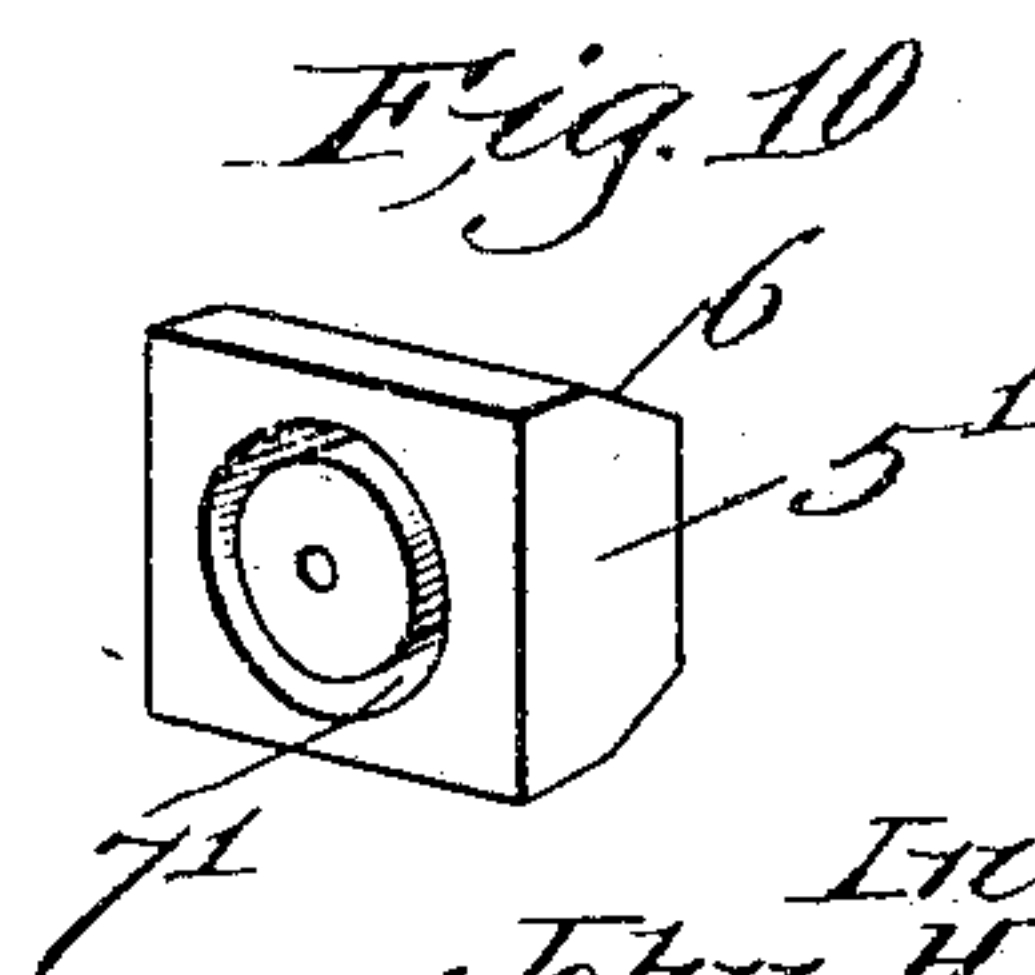
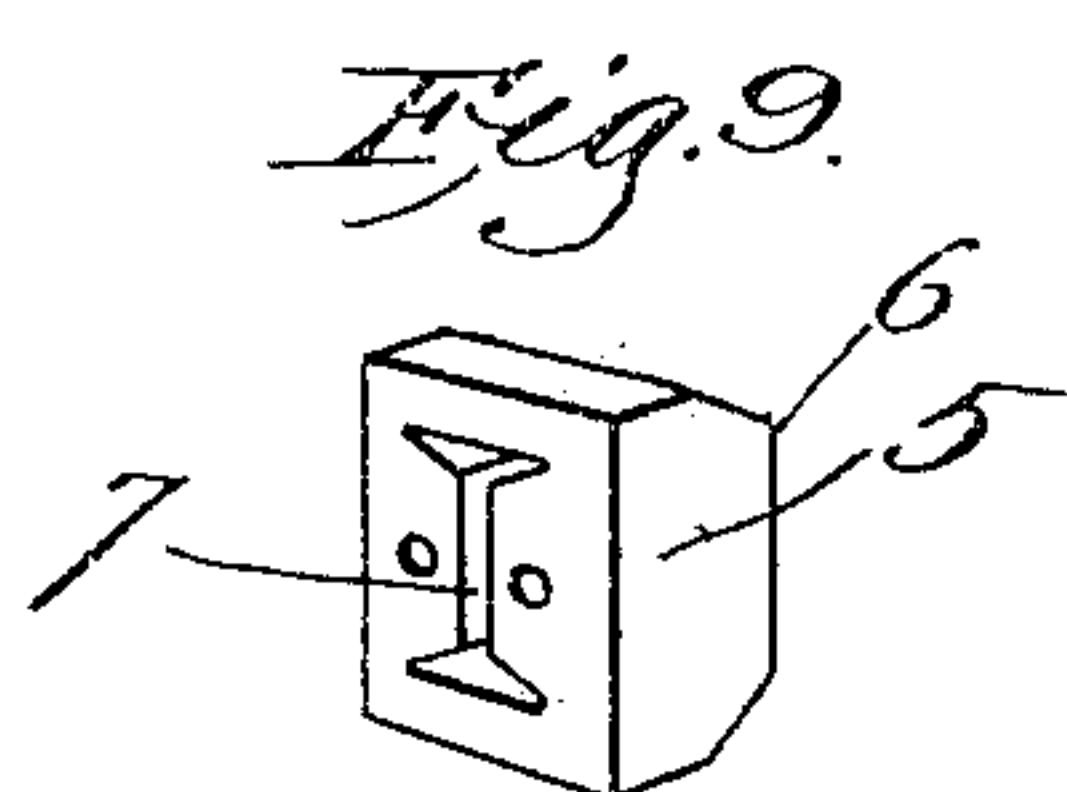
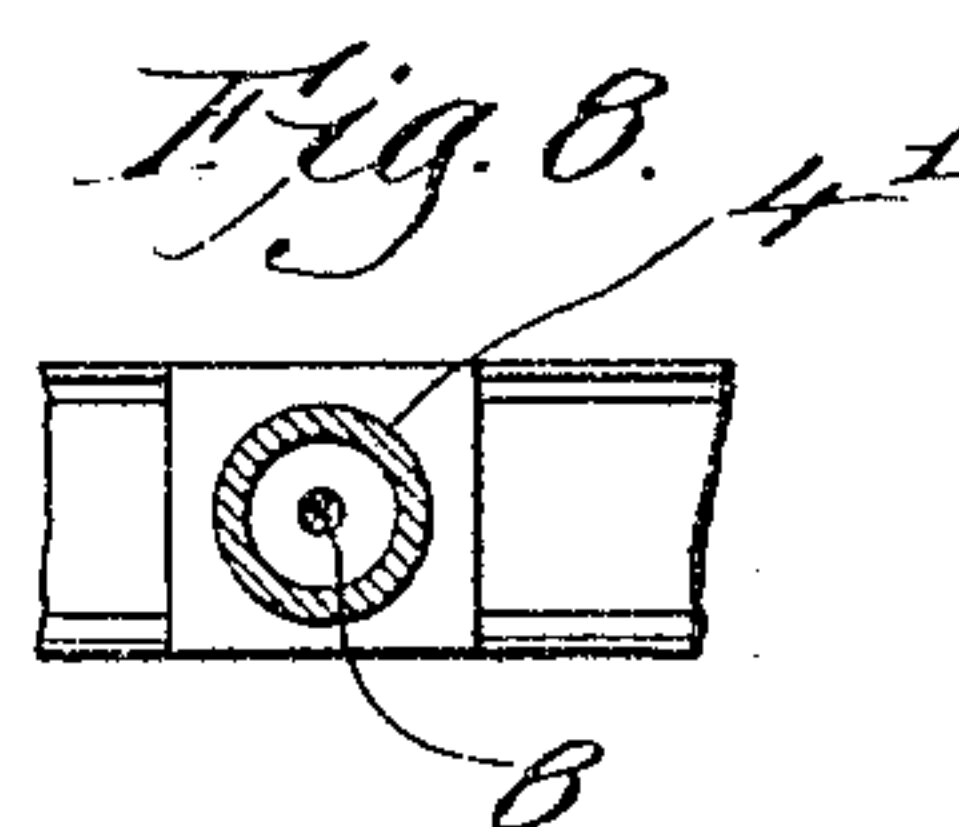
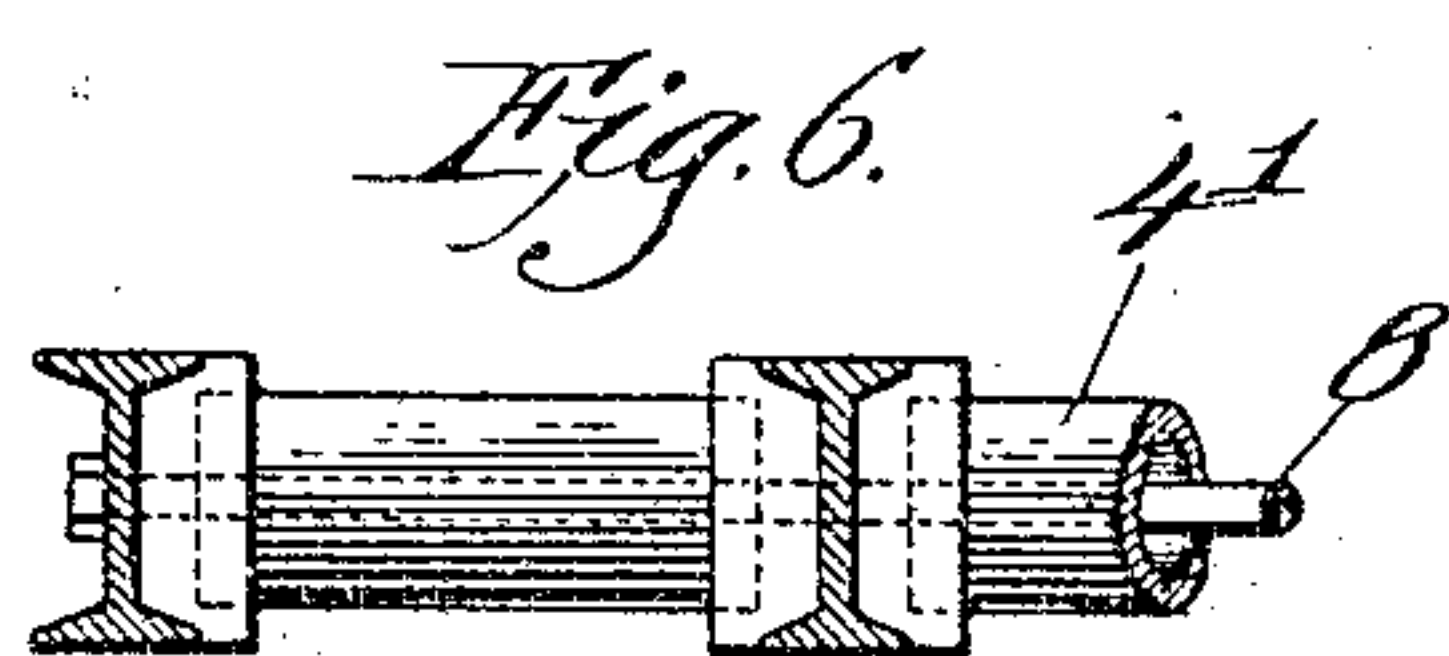
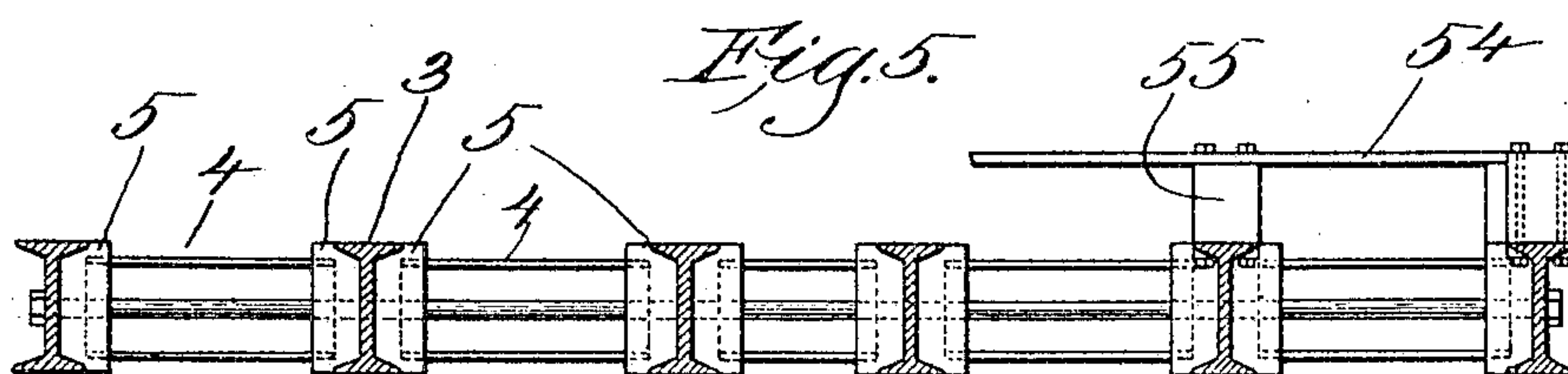
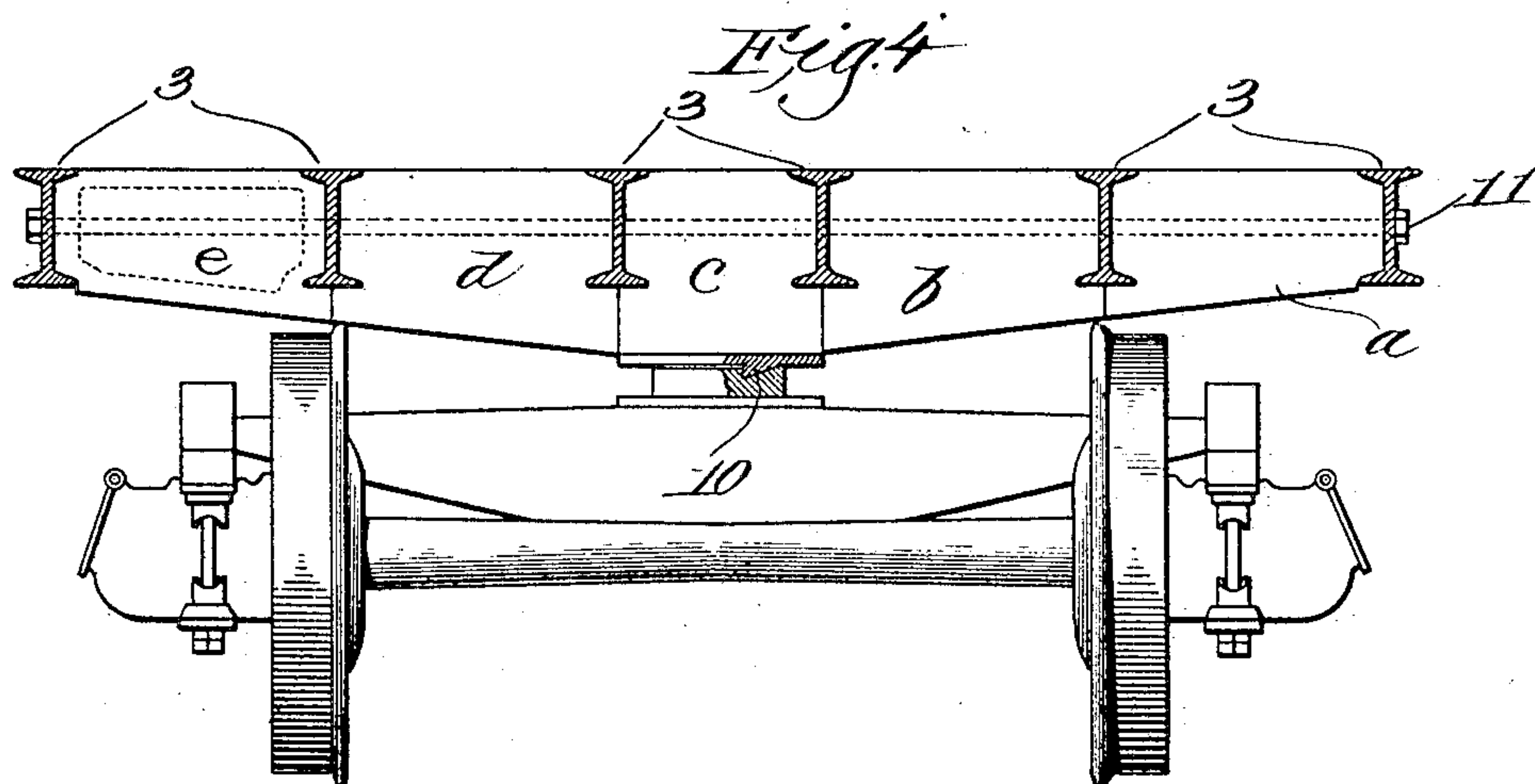
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JOHN HECTOR GRAHAM, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO
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CAR CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 775,217, dated November 15, 1904.

Application filed January 2, 1903. Serial No. 137,431. (No model.)

To all whom it may concern:

Be it known that I, JOHN HECTOR GRAHAM, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Car Construction, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

10 This invention relates to steel or other metallic car-bodies, and aims to provide a novel construction of car-body which may be readily constructed or taken apart and which is interchangeable—that is, which can be changed
15 from a car of lighter weight to one of heavier weight, or vice versa, with a minimum expenditure of labor.

Steel car-bodies are at present commonly made by riveting together the various elements composing the frame or body—that is, the longitudinal sills, end sills, bolsters, &c. With this manner of constructing the car-body, however, it is very difficult to remove any one element for the purpose of replacing
25 it with a new element in case such action is necessary, and, furthermore, after being in use a certain length of time the joints become rusted to such an extent as to cause them to loosen somewhat. When this occurs, it is
30 necessary to remove the rivets and partially dismantle the car-body in order to cleanse the rusted surfaces and paint the same, a very tedious and expensive operation.

In order to provide a steel or metallic car-body which is especially adapted for freight-cars and which can be quickly erected or dismantled and the carrying capacity of which can also be changed in the minimum of time, I have departed materially from the existing
35 modes of construction and have developed a type of car-body which is put together on what I call the “key” system.

According to my system the car-body is composed as nearly as possible of standard
45 elements which are keyed together to form the complete car-body without the use of rivets. With this construction the carrying capacity of the car may be changed by merely adding or subtracting certain elements.

50 In constructing my improved car I will pref-

erably make all the longitudinal sills of the same character, some suitable standard commercial form of beam to be employed for this purpose. The cross-sills are in the nature of sectional sills and comprise spacing members
55 between adjacent longitudinal sills and tie members extending transversely across the body and operating to tie the longitudinal sills together. Each spacing member has its ends shaped to fit the contour of the side face of the
60 longitudinal sills, and as all of the longitudinal sills are similar the spacing members of course are interchangeable. By means of this construction the use of rivets is avoided, and the heads of all bolts or tie-rods employed may
65 be situated on the outside of the car-body, where they are readily accessible.

Referring now to the drawings, Figure 1 is a plan view of a portion of the frame of one of my improved cars. Fig. 2 is a side elevation of Fig. 1, parts thereof being broken
70 out to better show the construction. Fig. 3 is a front view of the car-frame. Fig. 4 is a section on the line *xx*, Fig. 1. Fig. 5 is a section on the line *yy*, Fig. 1. Fig. 6 is a detail showing a slightly-modified construction. Figs. 7, 8, 9,
75 and 10 are details hereinafter referred to.

The longitudinal sills of the car-body are designated by 3, and these may be of any suitable construction, but I will preferably
80 employ some standard commercial iron—such, for instance, as I-beams or channel-iron. In the drawings I have illustrated the sills as in the form of I-beams. All of the sills are of the same size, whether they be side sills, draft-
85 sills, or intermediate sills, and they are therefore interchangeable. The cross-sills, by means of which the longitudinal sills are tied together, each comprises spacing members situated between adjacent longitudinal sills
90 and tie members extending clear across the car-body and tying the sills together. The spacing members serve to properly position the longitudinal sills, and the tie members hold the whole structure rigidly together. 95
The spacing members may be of any suitable commercial shape, such as I-beams, channel-iron, or tubular. In Figs. 1, 5, and 7 I have illustrated the spacing members as being in the form of I-beams and in Figs. 6 and 8 as 100

in the form of tubular members. In Fig. 1 I have designated the spacing members by 4, each of said members of course being of the proper length to properly position the longitudinal sills. In Fig. 1 I have illustrated a car-body comprising the side sills, the center draft-sills, and two intermediate sills. I will preferably give each end of each spacing member a contour corresponding to the contour of the side face of the longitudinal sills, so that when the spacing member is in place its end accurately fits the longitudinal sill. This may either be done by giving the end of the spacing member itself such a contour or by providing supporting-blocks or socket-pieces which have the proper contour to fit the longitudinal sills and which also receive the ends of the spacing members. Where the longitudinal sills and spacing members are in the form of I-beams, such socket-pieces, which I have designated by 5, will have the shape shown in Fig. 9—that is, the face 6 thereof will be shaped to fit the side face of the longitudinal sill and the opposite face will be provided with a socket 7, shaped to receive the end of the spacing member 4. Instead, however, of providing the block with a socket to receive the end of the spacing member it may have any other means, such as projections, to engage said spacing member and hold it properly positioned. After inserting the spacing members constructed as above described between adjacent sills the whole are tied together by means of tie-rods 8, which may, if desired, extend through the blocks 5. In Fig. 1 I have shown two tie-rods 8, situated at each cross-sill; but it is not essential to my invention that these tie-rods be situated directly at the cross-sills, as they may be positioned anywhere in the length of the car-body without changing the principle involved in this invention. Where the spacing members 4 are tubular in shape, as shown in Fig. 4 and in Figs. 6 and 8, the socket-piece 5' will of course have a correspondingly-shaped socket 7' to receive the end of the spacing member, and, if desired, the tie-rod 8 may pass through the spacing member. Any number of cross-sills may be employed, according to the size and carrying capacity of the car.

I preferably employ a special form of bolster in connection with the car, the bolster herein illustrated being a sectional one. As shown in Fig. 4, it comprises the sections *a*, *b*, *c*, *d*, and *e*, each section being received between adjacent longitudinal sills and having its end face shaped to fit the side face of the sill. These sections of the bolster may be made in any suitable way; but I will preferably cast them in the shape desired. The center section *c* is deeper than the end section and is provided with any suitable bearing 10, by which the car-body is supported upon the truck. I will preferably employ a tie-rod 11 in connection with the bolster, as illustrated.

The end sills are also preferably sectional sills, and may be of any suitable shape. As herein shown, they comprise pieces 12, which are received between adjacent sills and which are secured thereto in any suitable way. Secured to the end sills are wooden buffing members or headers 13, which are especially designed to receive the shock of buffing, and thus relieve the metallic end sills therefrom.

Any suitable draft-rigging may be employed, and for convenience I have herein shown the spring mechanism illustrated in my copending application, Serial No. 117,685, filed July 30, 1902. The draw-bar is designated by 15 and has the usual yoke 16 inclosing a suitable spring mechanism 17, which is confined between the follower-plates 18. The forward plate 18 coöperates with stops or check-castings 19, carried by the draft-sills, as usual in draft-rigging. It will be noted from Fig. 4 that all of the longitudinal sills are on the same level, and the draw-bar therefore comes in the same horizontal plane as the end sills. Accordingly I omit the section 12 of the end sills from between the draft-sills and provide two buffing members 13, one each side of the draw-bar 15, said draw-bar being received between the buffing members. I may, if desired, employ a guide-plate 20, which is secured to the inner ends of the two buffing members 13 and through which the draw-bar extends.

In order to relieve the spring mechanism of the draft-rigging from any shocks incident to buffing, I will preferably employ buffers, which are carried by the buffing members 13. While it would be within my invention to employ any suitable buffer, I prefer one having a graduated spring mechanism, as shown in Fig. 1. This special buffer comprises a spring 23 of lesser tension, which acts against a spring 24 of greater tension. One end of spring 23 abuts against the buffing-piece 13 and the other end is received in a flanged cup-shaped member 26, the flange of which abuts against one end of the spring 24. The other end of the spring 23 is received in a casing 27, the flange 28 of which is engaged by the flange 29 of a retainer 30, carried by the member 13. With this construction when two cars come together the shock will be absorbed by the buffers on the two cars which are brought into engagement. By employing two springs 23 and 24 having different tension a buffer is provided, which is adapted to absorb any buffing shock of whatever magnitude, for the smaller spring 23 will absorb the lighter shocks, but will be compressed by the heavier shock until the flange 20 strikes the member 13, when the spring 24 will come into play.

It will be seen from the above that my improved car-body may be very easily and readily constructed and that comparatively few special parts or pieces are required. The form of longitudinal sills and spacing mem-

bers is such as may be purchased in the open market, and all that is necessary is to cut them into the proper lengths. Another advantage lies in the fact that all of the nuts on the tie rods and bolts employed are on the outside of the car-body, where they are readily accessible, and if, therefore, the car needs any repairing the work of dismantling it or tightening up the structure is reduced to a minimum. If the joints become rusted in any way, it is a very simple matter to loosen the tie-bolts and remove any individual spacing member, sandblast the surfaces of the iron which are in engagement, and repaint the same. Another important advantage I secure is the ease with which cars of different carrying capacity may be constructed without the necessity of special pieces for any special size of cars. Assuming that the type of car illustrated in Fig. 1 is suitable for one having a carrying capacity of forty thousand pounds, if it is desired to construct one having a carrying capacity of eighty thousand pounds it is only necessary to add extra longitudinal sills, as shown in dotted lines, Fig. 1. In such cases of course the length of the spacing members would have to be changed; but it is a comparatively simple and inexpensive matter to provide different lengths of spacing members.

It is possible with my invention to convert a car from one having a certain carrying capacity to that having another carrying capacity by simply inserting or removing certain longitudinal sills. It will be obvious, of course, that in the heavier cars extra cross-sills will also be required. The only difference in construction, however, between cars having different carrying capacity is in the number of longitudinal or cross sills employed.

When the buffers are employed as above described, they relieve entirely the draft mechanism from the strain or shock incident to buffing. It is not necessary, therefore, to employ any check-castings to coöperate with the follower-plate at the rear of the loop 16, and in Fig. 1 I have omitted such check-castings.

The floor 54 of the car is shown as being supported on sills 55, which may either rest on the longitudinal sills or the cross-sills of the car-frame. In case the floor-sills 55 are supported on the longitudinal sills 3 I will preferably bolt the former to the latter, as seen in Fig. 5.

While I have herein illustrated one particular way in which my invention may be employed, I do not wish to be limited to the precise construction herein shown nor in any way except as specified in the claims.

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

1. In a car-body, a plurality of similar interchangeable longitudinal sills, spacing members between adjacent sills, each spacing member comprising a central strut and detachable socket-pieces at its ends, said socket-pieces being shaped to correspond to the contour of the sill, and tie-rods extending transversely across the body and tying the longitudinal sills together.

2. A car-body having a plurality of interchangeable longitudinal sills, a plurality of spacing members between each two adjacent sills, said spacing members having their ends keyed to the longitudinal members, and means to tie the latter together transversely.

3. In a car-body, a plurality of interchangeable longitudinal sills, and sectional end sills, each section of which is received between two adjacent longitudinal members.

4. In a car-body, a plurality of interchangeable longitudinal sills, sectional end sills, each section of which is received between two adjacent longitudinal members, and wooden buffing members carried by the end sills.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN HECTOR GRAHAM.

Witnesses:

LOUIS C. SMITH,
JOHN C. EDWARDS.