2 Sheets—Sheet 1.

B. F. BRITTON.

Bearing and Support for Elevated Railway, &c.

No. 207,245. **Patented Aug. 20, 1878.**

Fig. 2.

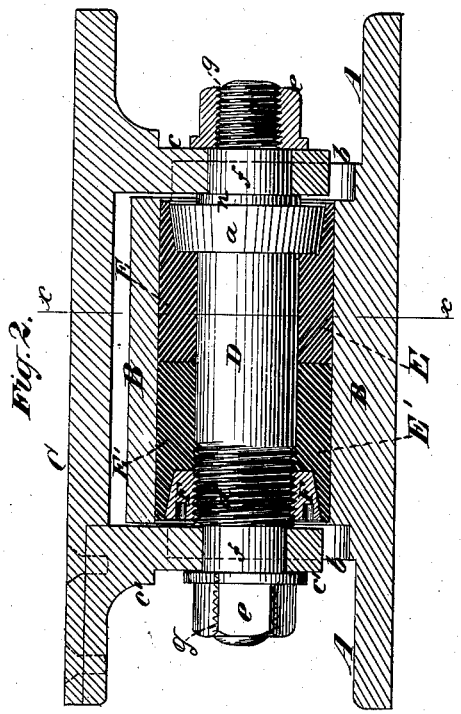


Fig. 4.

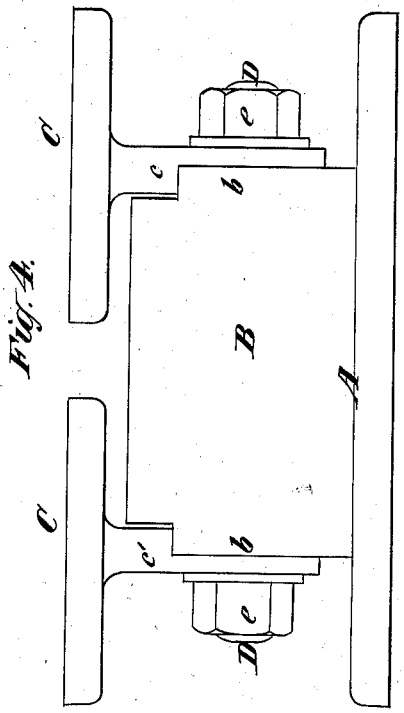


Fig. 1.

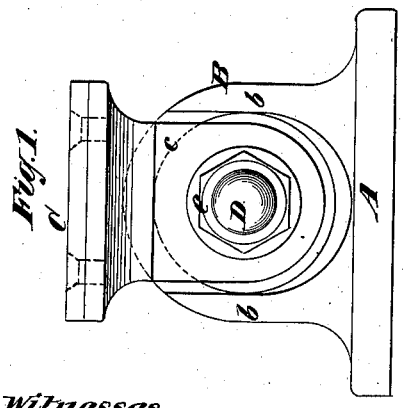
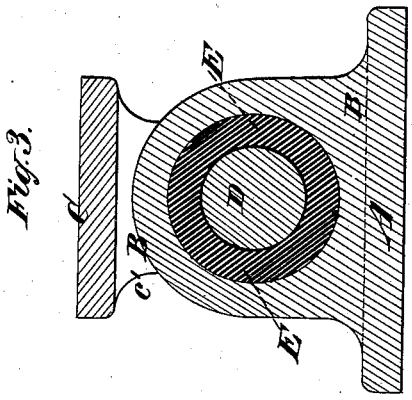


Fig. 3.



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2 Sheets—Sheet 2.

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Bearing and Support for Elevated Railway, &c.

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Fig. 6.

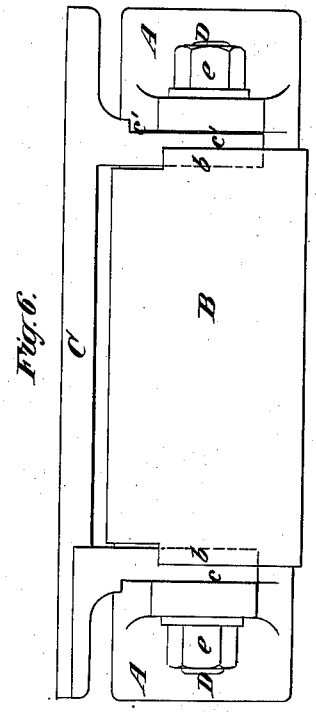


Fig. 5.

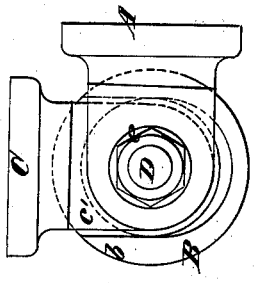


Fig. 7.

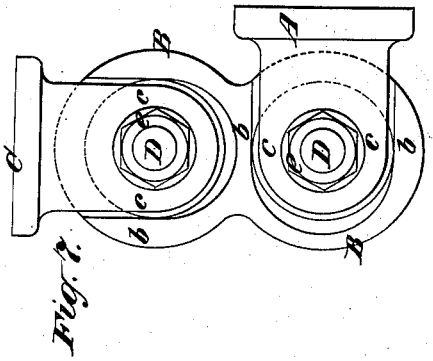
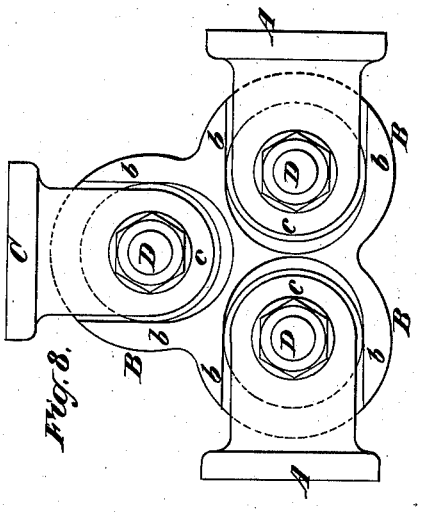


Fig. 8.



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UNITED STATES PATENT OFFICE.

BENJAMIN F. BRITTON, OF NEW YORK, N. Y.

IMPROVEMENT IN BEARINGS AND SUPPORTS FOR ELEVATED RAILWAYS, &c.

Specification forming part of Letters Patent No. **207,245**, dated August 20, 1878; application filed July 27, 1878.

To all whom it may concern:

Be it known that I, BENJAMIN F. BRITTON, of the city, county, and State of New York, have invented a new and useful improvement in bearings, supports, and connections to be employed in the permanent way of elevated or other railways and other fixed structures in machinery, and in railway-cars or other vehicles; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

The object of this invention is to provide effective means of sustaining weight in and of connecting the parts of such structures as are hereinabove mentioned and other structures and bodies in such manner as to reduce noise, and also to reduce and afford relief from other injurious or objectionable effects of concussion, jar, vibration, or other disturbances resulting from motion.

In carrying out my invention I employ a cushion or cushions of india-rubber or other elastic or yielding material surrounding a supporting, fastening, or connecting-bolt, which is employed or to be employed for holding the parts of a structure together.

My invention consists in novel construction of such bolt and of the connecting-pieces which are employed in connection with such bolt, and in the novel combination of such bolt, cushion or cushions, or connecting-piece, whereby friction or wear on the rubber or elastic material of the cushion or cushions is prevented or reduced, and its durability is preserved.

Figure 1 is an end view of a bearing, support, or connection applicable to various purposes, illustrating one of the simplest forms of my invention. Fig. 2 is a longitudinal central section of the same. Fig. 3 is a transverse section of the same. Figs. 4, 5, 6, 7, and 8 are views illustrating some modifications of my invention, which will be hereinafter described.

The connecting-pieces in the example of my invention shown in Figs. 1, 2, and 3 consist of a base-piece, A, and cap-piece C, made of metal or other material. The base-piece A consists of a plate having made in the same piece with or otherwise attached to it a box or shell, B, having a cylindrical interior. The cap-piece C consists of a plate, having near each end a lug, *c* or *c'*, which enters loosely, as shown in Fig. 1, between cheeks *b b*, formed upon the ends of the box or shell B, in such manner as to provide for a little lateral as well as vertical play between the said lugs and cheek-pieces. The said cheeks at each end have a space between them of a width not less than the diameter of the bore of the box or shell. A little room for play in a longitudinal direction is provided, as shown in Fig. 2, between the said lugs and the ends of the box B.

Instead of the said cheeks *b b* on the box, studs or projections of other form may be provided on the said box as the equivalents of the said cheeks to receive the lugs *c c'* of the cap-piece between them.

D is the supporting, fastening, or connecting bolt, and E E' are two cylindrical india-rubber cushions surrounding and fitting snugly to the said bolt, and fitting snugly within the whole length of the cylindrical bore of the box or shell B. Two cushions are represented, but a single cushion of the whole length of the box or shell may be employed. The said bolt D passes through and fits snugly within holes provided for it in the lugs *c c'* of the cap-piece C. It is furnished at a distance from one end with a fixed taper or conical collar, *a*, and at a distance from the other end with a screw-thread, *d*, which receives a nut, F, having a taper or conical exterior. The said collar and nut, which should be of corresponding volume, fit to cavities of corresponding form provided for them in the outer ends of the cushions E E'. Between the back of the conical collar *a* and the adjacent end of the bolt, and between the screw-thread *d* and the other end of the bolt, the latter is reduced in size, as shown at *f f* in Fig. 2, to fit the holes provided for it in the lugs *c c'* of the cap-piece C, and screw-threads *g* are provided on the ends of the bolt to receive nuts *e e* outside of the said lugs *c c'*. Between the collar *a* and the adjacent reduced portion *f* there is provided a shoulder, *n*, to form a space between the collar *a* and the adjacent lug *c* of the cap-piece for the expansion or flow of the india-rubber of the adjacent cushion lengthwise beyond the

said collar when the nut F is screwed up. In order to provide for the insertion of the bolt through the lugs *c c'*, one, *c'*, of the said lugs is made detachable from the cap-piece C, as shown in Fig. 2.

The cushions E E', which otherwise fill the whole of the annular space within the box B and around the bolt D and nut, may have their united length a little less than that of the box B, so as to leave a little space within the box outside of the outer faces of the collar *a* and nut F, as shown in Fig. 2, to provide for the expansion of the cushions longitudinally.

The bearing, support, or connection thus constructed of the base-piece A, box or shell B, cap-piece C, bolt D, and cushions E E' may be applied between the ties or sleepers and the rails, or between the ties or sleepers and the road-bed, or between other parts of the structure of elevated or other railways or bridges; or it may be applied between various superposed or connected parts of a railway-car or other vehicle, or under or between various superposed parts of machinery or other structure; and wherever it is applied it will have the effect of reducing or giving relief from the effects of jar, concussion, or vibration, and tend to prevent noise, the weight or impact being in all cases transmitted from the cap-piece to the base-piece through the bolt D and the elastic or yielding cushions E E', which, though tightly packed into the shell, are free to yield in all directions to any vibrations of the main parts A and C of the bearing or connection.

The collar *a* and nut F on the bolt D enable the cushions to be packed tightly within the box or shell B and around the bolt by screwing up the nut F by a suitable wrench, which may, preferably, be constructed to enter holes provided in the outer face of the nut, as shown in Fig. 2. The nut is screwed up until the entire annular space between the bolt and the interior of the box or shell B is closely filled, and until the rubber or other material begins to be squeezed out or "flow" from the open ends of the spaces surrounding the collar and nut.

The collar *a* and nut F might be of cylindrical or other parallel-sided form; but I prefer to make them taper, as by that means I am enabled to compress the rubber tightly between the exteriors of the nuts and the surrounding portions of the interior of the box or shell B, as well as in all other parts of the box, which is very desirable to insure the prevention of friction on the india-rubber, and thereby insure its durability.

In case of the cushions and bolts being of great length an additional screw-thread, *d*, and nut F may be provided on the bolt in place of the fixed collar *a*, so that the india-rubber may be screwed up from either end or both ends of the box, the nut at either end in such case serving as the equivalent of the collar *a* while the nut at the other end is being screwed up.

My invention is capable of various modifications, to wit: The form of the two connecting-pieces A and C, which, for the want of a better term, and as expressing the nature and position of the said pieces in the example shown in Figs. 1, 2, and 3, I have termed the "base-piece" and "cap-piece," may be varied according to the positions in which they are to be applied in any structure, or to the nature of such structure—as, for instance they may be reversed—the piece A, to which the cushion-box is attached, being uppermost, and the piece C underneath, or they may be arranged side by side instead of one above the other. The said pieces and the interposed bolt cushion or cushions and shell or box may be so applied in a structure that instead of supporting a superposed body they may have a body suspended from them. Some other modifications are illustrated in the drawing, and may be briefly described, as follows:

Fig. 4 is an outside longitudinal view of a bearing, support, or connection in all respects like that shown in Figs. 1, 2, and 3, except that, instead of the lugs *c c'* being connected in one cap-piece, they are each attached to a separate cap-piece, C, which may be desirable in some cases to facilitate the application of the invention.

Fig. 5 is an end view, and Fig. 6 a side or longitudinal view, of a bearing, support, or connection, which differs from that shown in Figs. 1, 2, and 3 in having provided, as an equivalent substitute for the base-piece A or lower support, a bracket-piece, A, to be bolted against the upright face of some suitable support, and in having the box B made separate from the said piece, but secured thereto by the bolt D, passing through lugs on the said bracket.

Fig. 7 is an end view of a bearing, support, or connection in which a bracket like that shown in Figs. 5 and 6 is employed as an equivalent substitute for the base-piece A, (shown in Figs. 1, 2, and 3,) but in which there are two cushion-boxes, B B, rigidly connected together, one receiving a bolt, D, which connects it with the bracket-piece A, and the other receiving a bolt, D, which connects it with the cap-piece C.

Fig. 8 is an end view of a bearing, support, or connection in which two brackets like that shown in Figs. 5 and 6 are employed, to be attached to the two upright faces of suitable parts of any structure, and in which there are three cushion-boxes, B B B, rigidly connected together, the two lower ones receiving bolts D D, which connect them with the two brackets A A, and the upper one receiving a bolt, D, which connects it with the cap-piece C.

In all of the above-described modifications the distinguishing characteristic is that one or more supporting or connecting bolts surrounded by elastic or yielding cushions inclosed and packed within a box or shell are employed to support or connect the parts of

a structure for the purpose of reducing and affording relief from the effects of concussion, jar, or vibration, and other disturbances resulting from motion.

I claim—

1. The combination, with a bolt and surrounding elastic cushion or cushions, of two connecting-pieces, A C, one of said pieces having attached lugs *c c'*, for the reception of the bolt, and the other having an attached box for the reception of the cushions, and being also provided with cheeks *b b*, at the end of said box, for the reception between them of the said lugs *c c'*, all substantially as herein described.

2. The combination, with the connecting-pieces A C and the elastic cushion or cushions fitted to a box in or on one of said connecting-pieces, of the connecting-bolt D, provided with a collar, *a*, at a distance from one end and a screw-thread and nut at a distance from the other end, and having reduced portions *f f* outside of the said collar and nut, and provided at its ends with screw-threads fitted with nuts *e e*, the said collar *a* and nut F being received within cavities in the said elastic cushion or cushions, all substantially as herein specified.

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