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C. STEFAN.

MEANS FOR OVERCOMING THE TRANSMISSION OF CONCUSSIONS TO VEHICLE  
FRAMES OR BODIES.

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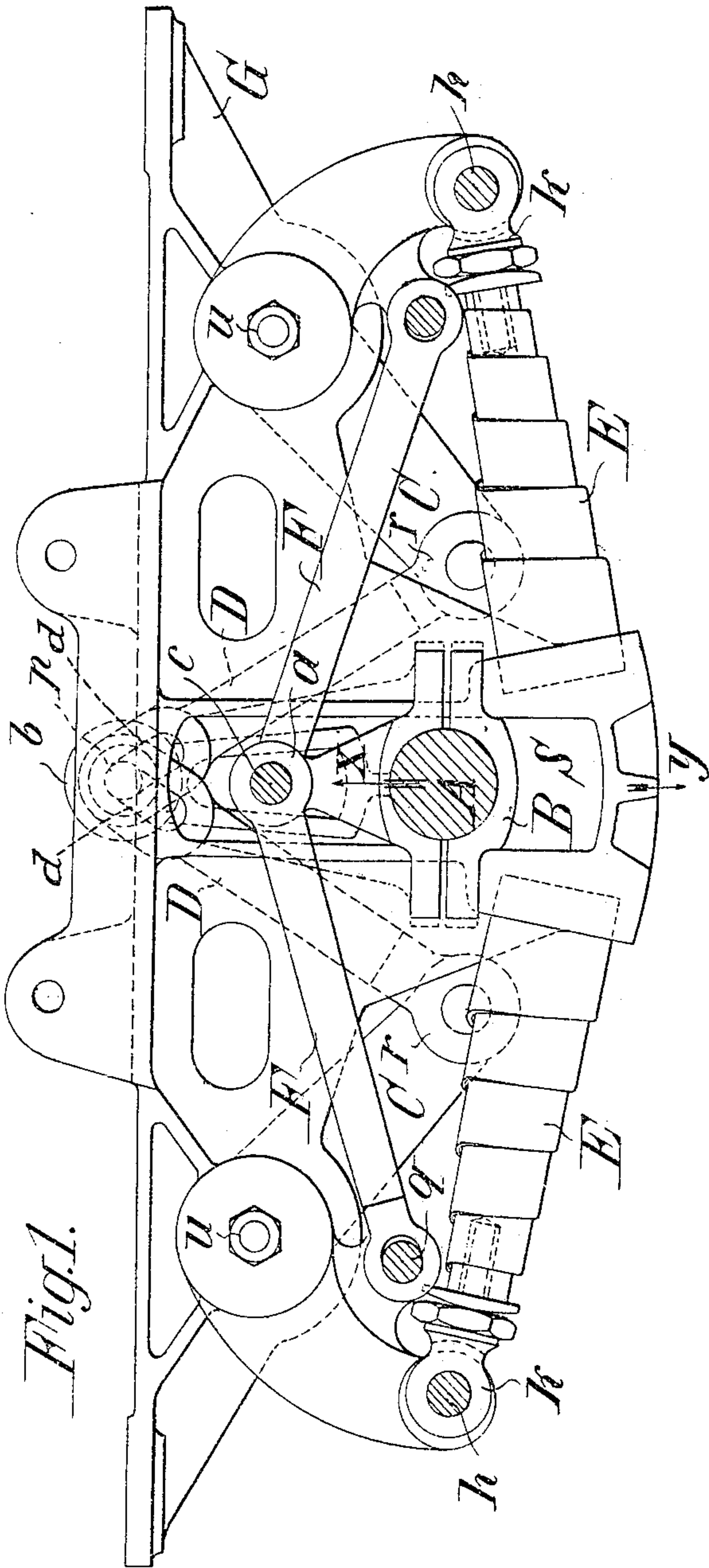


Fig. 1.

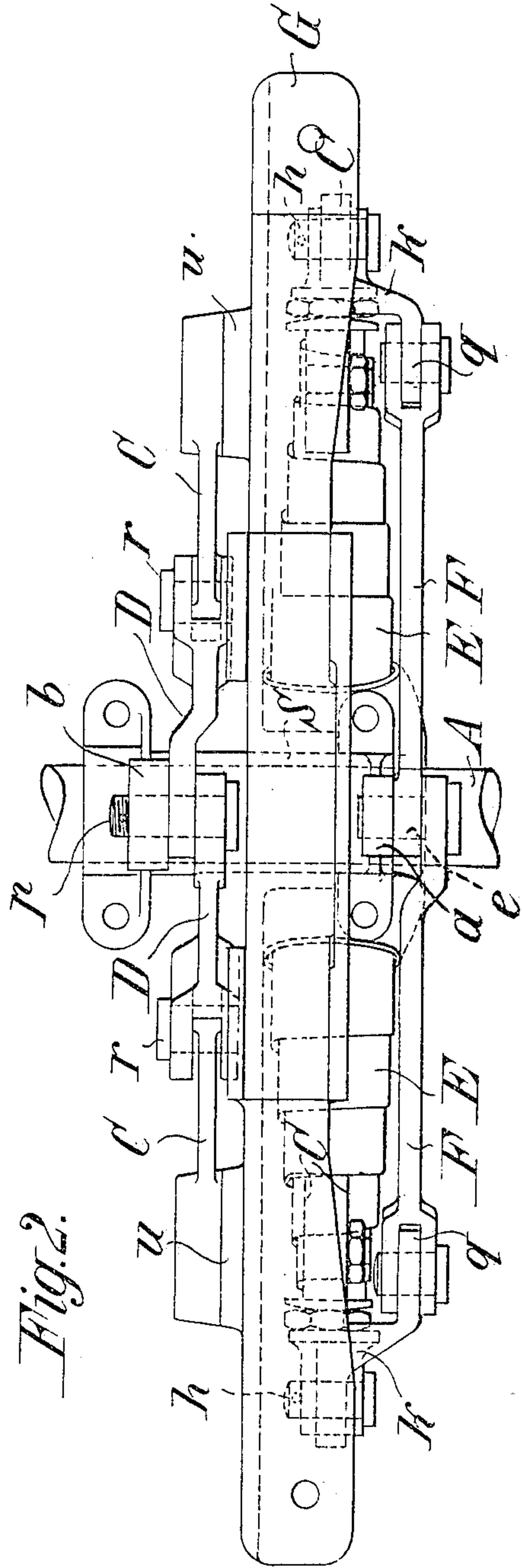


Fig. 2.

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# UNITED STATES PATENT OFFICE.

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MEANS FOR OVERCOMING THE TRANSMISSION OF CONCUSSIONS TO VEHICLE FRAMES OR BODIES.

SPECIFICATION forming part of Letters Patent No. 793,165, dated June 27, 1905.

Application filed January 28, 1905. Serial No. 243,133.

*To all whom it may concern:*

Be it known that I, COLOMAN STEFAN, a subject of the Emperor of Austria-Hungary, residing at Vienna, Empire of Austria-Hungary, have invented certain new and useful Improvements in Means for Overcoming the Transmission of Concussions to Vehicle Frames or Bodies, of which the following is a specification.

This invention relates to an apparatus that can be applied to all vehicles running on wheels, by means of which the vertically upward directed concussive movements due to unevenness of the roadway are compensated by means of a force originated simultaneously and acting in a vertical downward direction in such a manner that the said concussions can have no effect on the framing or on the body of the vehicle.

In the accompanying drawings, Figure 1 shows a front view of the arrangement, the parts being shown at rest and the axle being shown in section. Fig. 2 shows a plan of the same.

As can be seen from the drawings, to the axle A is rigidly fixed a sliding piece B, which serves as guide for the axle in working in the slot S of the plate G. This sliding piece is provided with two bosses *a* and *b*, in which are mounted the pivot-bolts *p* and *c* of the tension-rods D and F. These rods are connected by pivot-bolts *r* and *q* with the elbow-levers C, that are pivotally mounted at *u* on the fixed plate G. The levers C act upon the volute springs E by means of guide-bolts *h*, pivotally mounted at *h*. The levers C, rods D and F, and springs E are arranged symmetrically on each side of the axle A, and the springs are inclined downward toward each other, preferably at an angle of twenty-five to thirty degrees to the horizontal plane.

When a concussive force acts upon the axle A, this moves up in the direction of the arrow *x* in the guide-slot S of the plate G and transmits the force of the concussion, by means of the rods D and F, directly to the bolts *r* and *q* of the elbow-levers C, the motion being transmitted first through both rods D and F simultaneously and in the further

course of the movement, in consequence of the difference in length of the arms of the elbow-lever, through the rods F only. During this part of the movement the longitudinal slots *z* of the rods D are shifted with regard to the bolt *p*. By this means the levers C are turned and the volute springs E are compressed. When the concussive action has terminated, all the parts are brought back to their original position, and consequently also the axle A, by the expansion of the springs E. This construction of the apparatus has the effect that on the one hand the concussive force is compensated by means of a force which is originated simultaneously and which acts in a vertical downward direction, as indicated by the arrow *y*, and on the other hand that the springs are only strained with a part of the force resulting from the axial pressure of the vehicle, so that they can be comparatively weak, and therefore sensitive.

As above stated, the two pairs of rods D and F act in the commencement simultaneously, whereas during the latter part of the way which the levers C make during their oscillation the latter is acted upon by the pair of rods F only. By this arrangement the effect is obtained that the concussive force is at first transmitted to the springs E by means of the long arm of the lever C, and therefore with great sensitivity; but when the concussive force increases beyond a certain limit it will act through the rods F upon a smaller lever-arm, so that in this manner most vigorous concussions can also be transferred to the said springs without overstraining the latter.

I claim—

1. An apparatus for overcoming the transmission of concussions to vehicle-bodies or the like comprising a plate, an axle-support, means for vertically guiding the axle-support in said plate, a bell-crank lever on each side of the axle-support and pivotally connected to the plate, one set of oppositely-disposed links connecting the bell-crank levers with an upper point of the axle-support, another set of oppositely-disposed links connecting the bell-crank levers with a lower point of the axle-support, and springs connected with the bell-



crank levers which normally tend to react against the upward movement of the axle-support.

2. An apparatus for overcoming the transmission of concussions to vehicle-bodies or the like comprising a plate, an axle-support, means for guiding the axle-support in said plate, a pivoted lever supported in the plate on each side of the means for guiding the axle-support, one set of links connecting one of the ends of each of the pivoted levers with the axle-supporting means, a second set of links connecting the other end of each of the pivoted levers with the axle-supporting means, and resilient means cooperating with the pivoted levers which normally tend to react against the upward movement of the axle-support.

3. An apparatus for overcoming the transmission of concussions to vehicle-bodies or the like comprising a plate, a movable axle, means for guiding the movable axle, a pivoted lever on each side of the means for guiding the movable axle, oppositely-disposed links connecting one arm of the pivoted levers with the movable axle, another set of links connecting the other arm of the pivoted levers with the movable axle, and means cooperating with said pivoted levers for reacting against the upward movement of the axle.

4. An apparatus for overcoming the transmission of concussions to vehicle-bodies or the like comprising a plate, a movable axle, a sliding piece for the axle, means for guiding the sliding piece, levers supported in bearings, one of said levers being on each side of the means for guiding the sliding piece, oppositely-disposed links having at one end a pin-and-slot connection with the sliding piece and at the other end a pivoted connection with one arm of the levers, a second set of oppositely-disposed links having one of their ends pivotally connected to the sliding piece below the pin-and-slot connection and their other ends to the other arm of the levers, and means cooperating with said levers for reacting against the upward movement of the axle.

5. An apparatus for overcoming the transmission of concussions to vehicle-bodies or the like comprising a plate, a movable axle, a slid-

ing piece for the axle, means for guiding the sliding piece in said plate, levers supported in bearings in the plate, one of said levers being on each side of the means for guiding the sliding piece, oppositely-disposed links connecting one arm of each of the levers with the sliding piece, a second set of oppositely-disposed links having one of their ends pivotally connected to the sliding piece below the connection of the other links and their other ends connected to the other arms of the levers, and a spring reacting against the levers to retard the upward movement of the sliding piece in its guiding means.

6. An apparatus for overcoming the transmission of concussions to vehicle-bodies or the like comprising a plate, a movable axle, a sliding piece fixed to the axle, means for guiding the sliding piece, levers supported in bearings, one of said levers being on each side of the means for guiding the sliding piece, oppositely-disposed links one of their ends having a pin-and-slot connection with the sliding piece and their other ends connected to one of the arms of the levers, a second set of links having one of their ends connected to the sliding piece below the pin-and-slot connection of the other set of links and their other ends connected to the other arms of the levers, and springs reacting against the plate and levers.

7. An apparatus for overcoming the transmission of concussions to vehicle-bodies or the like, comprising a movable axle, means for supporting the movable axle, a pivoted lever on each side of the means for supporting the movable axle, oppositely-disposed links connecting one arm of the pivoted levers with the means for supporting the movable axle, another set of links connecting the other arm of the pivoted levers with the means for supporting the movable axle, and means cooperating with said pivoted levers for reacting against the upward movement of the axle.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

COLOMAN STEFAN.

Witnesses:

JOSEF RUBASCHE,  
ALVESTO S. HOGUE.