No. 742,793. PATENTED OCT. 27, 1903.

W. S. JONES.

DRAW GEAR AND BUFFING APPARATUS.

APPLICATION FILED SEPT. 16, 1901. RENEWED OCT. 2, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 3.

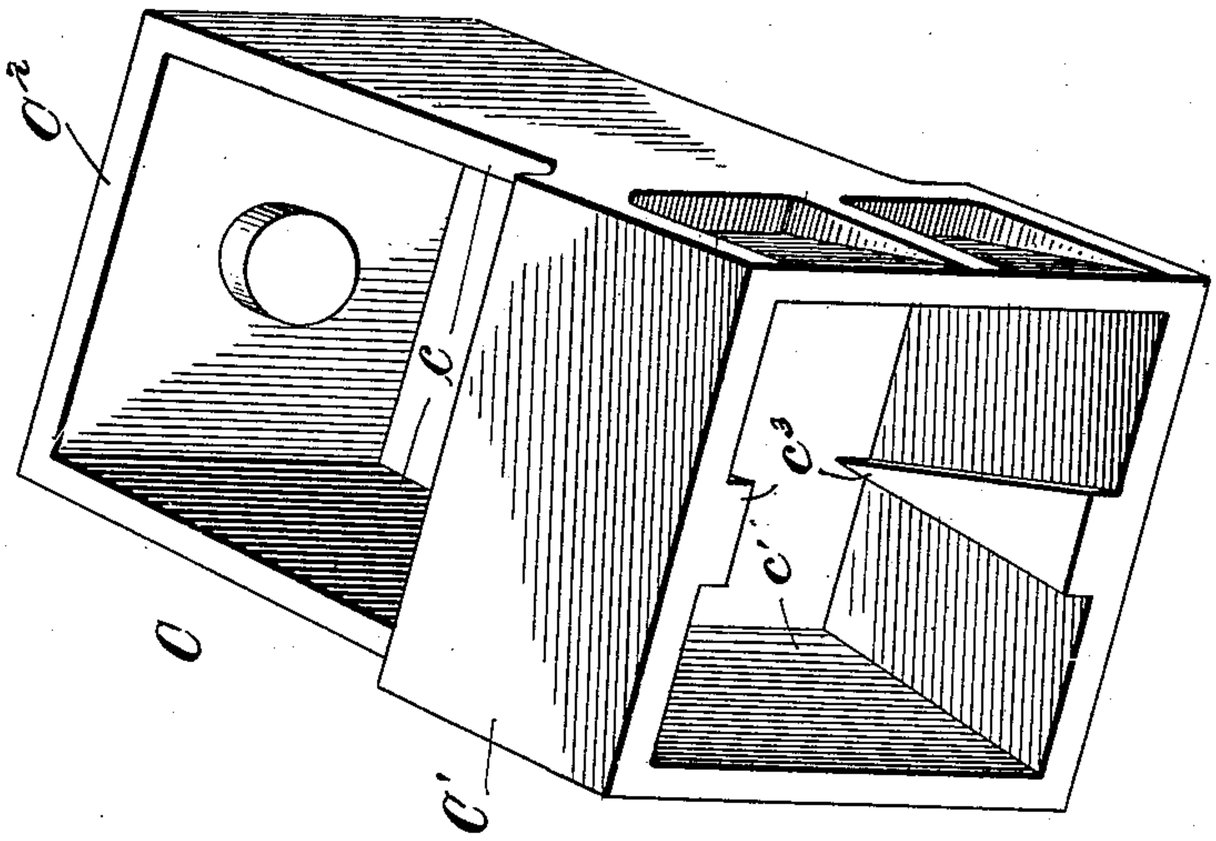


Fig. 1.

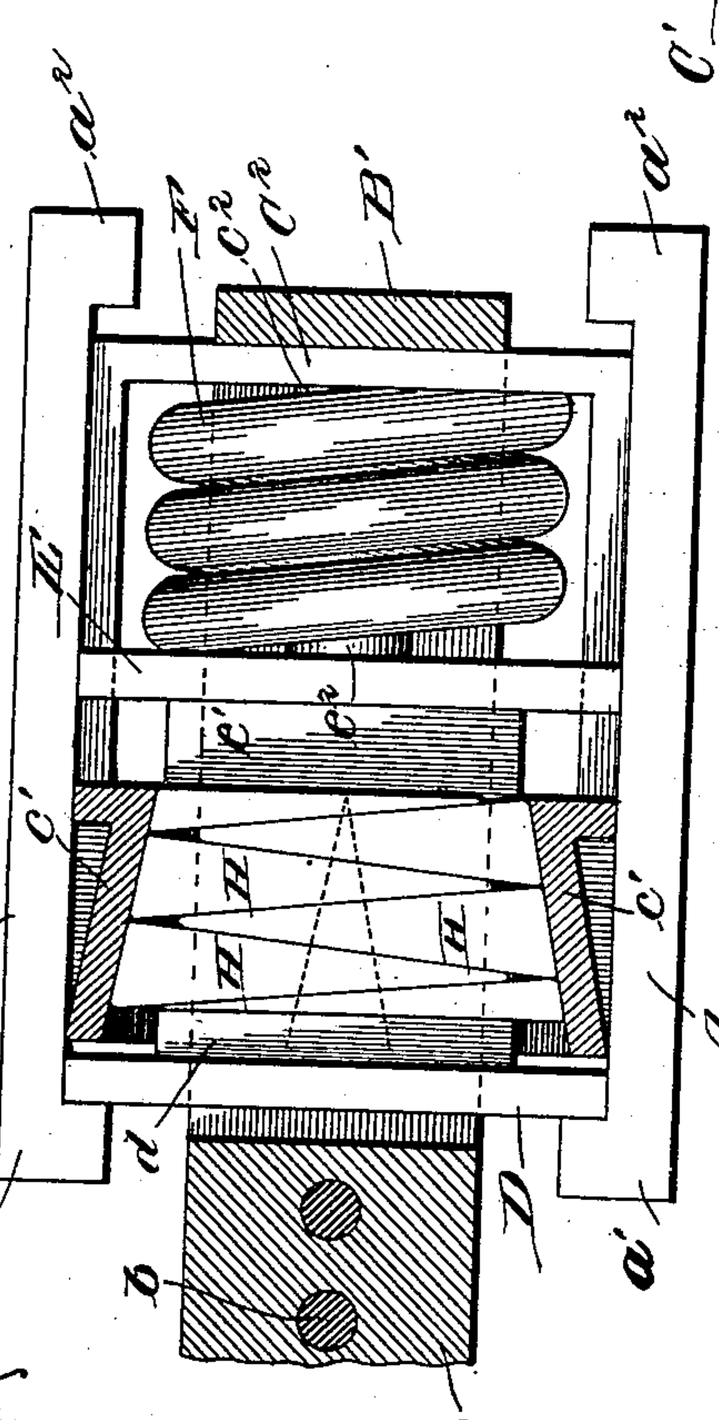
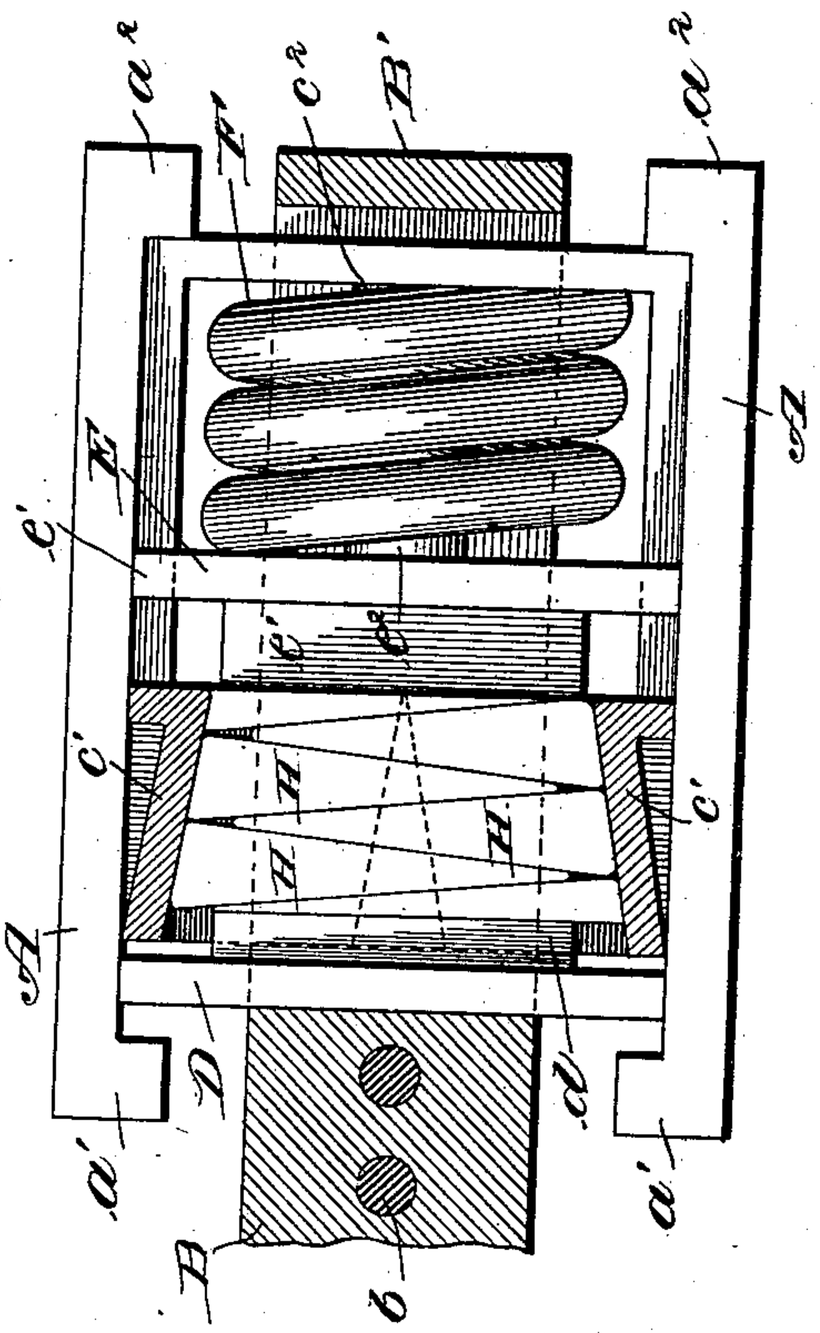


Fig. 2.



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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 4.

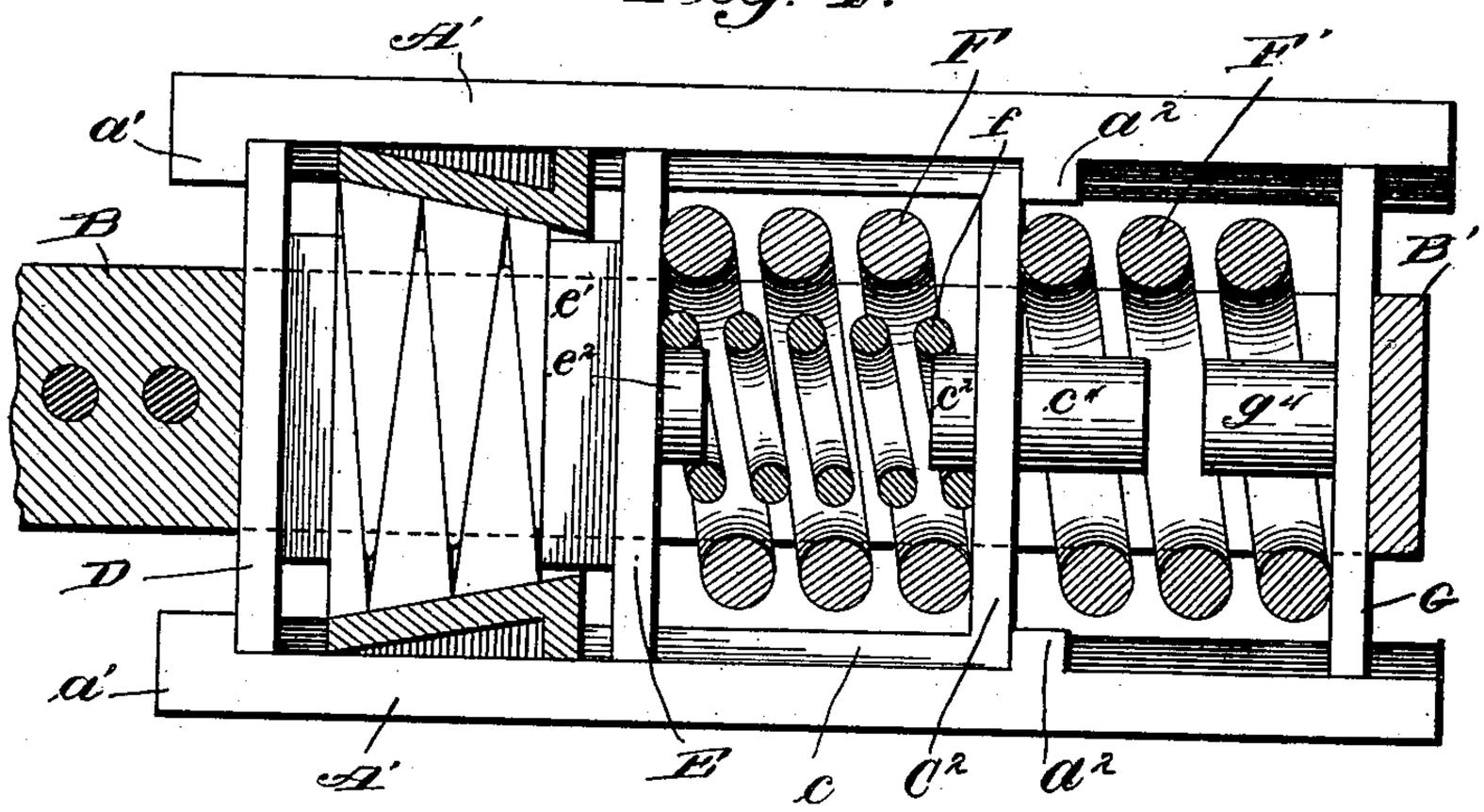
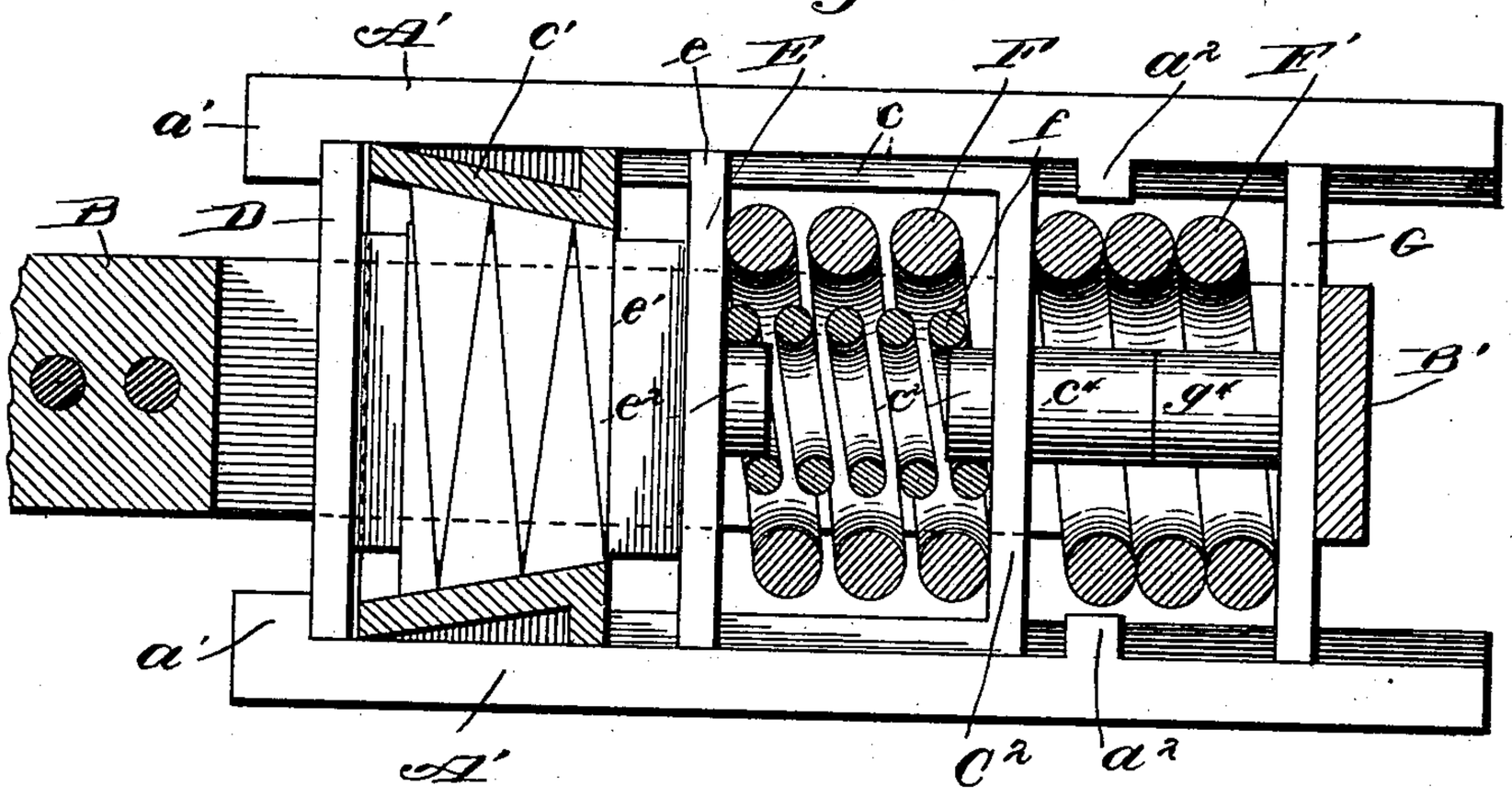


Fig. 5.



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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 6.

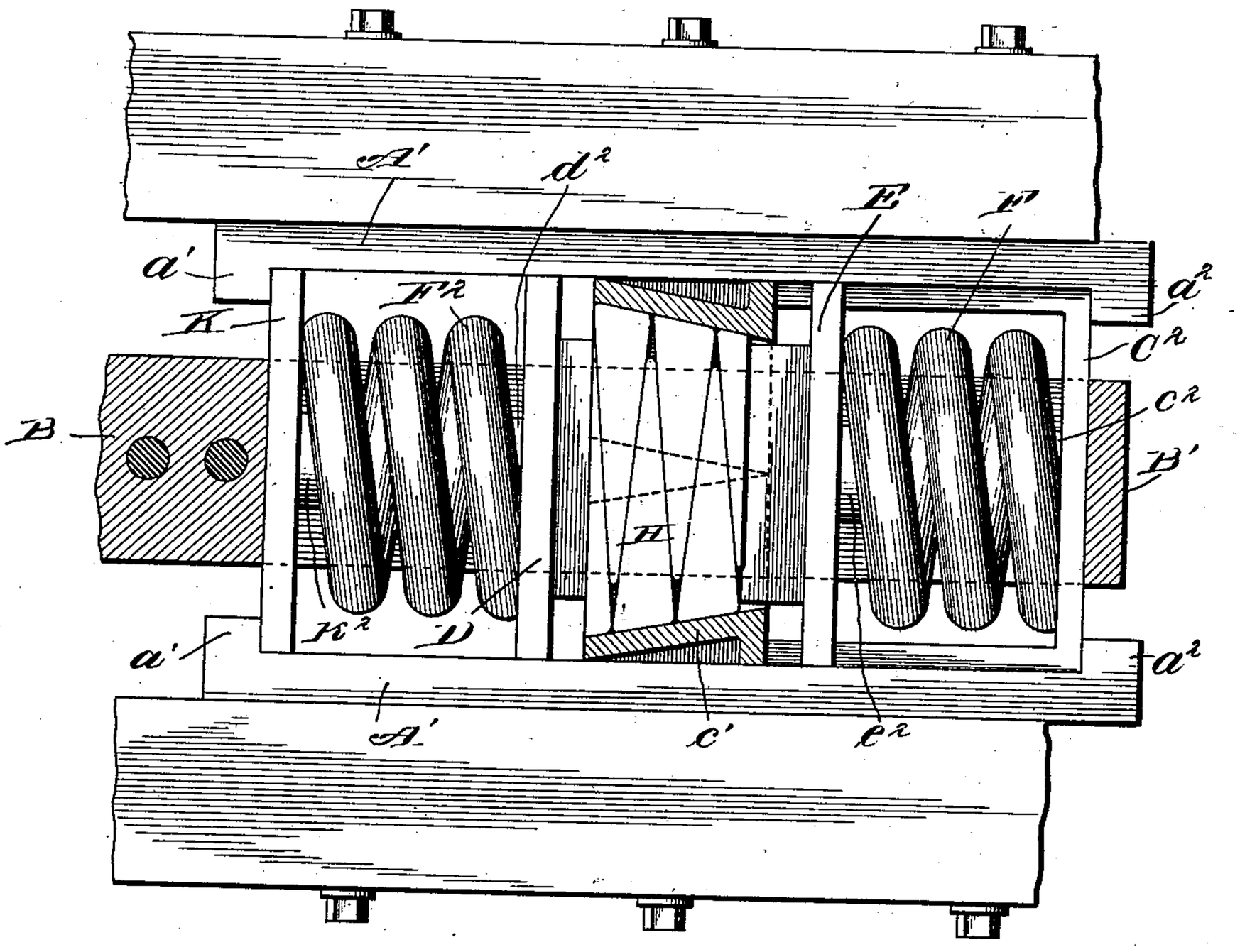


Fig. 7.

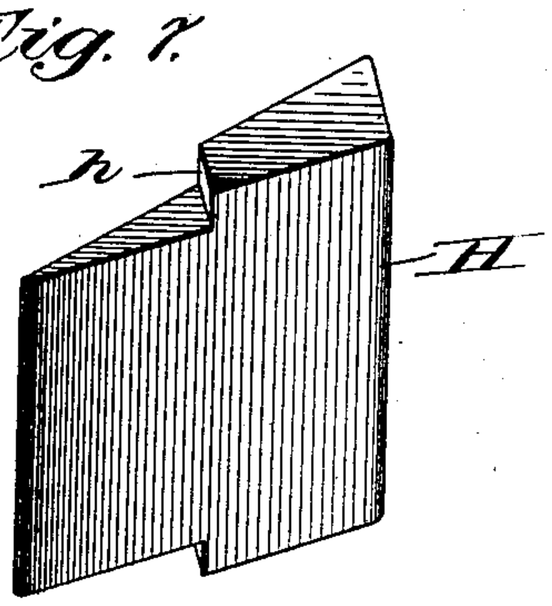
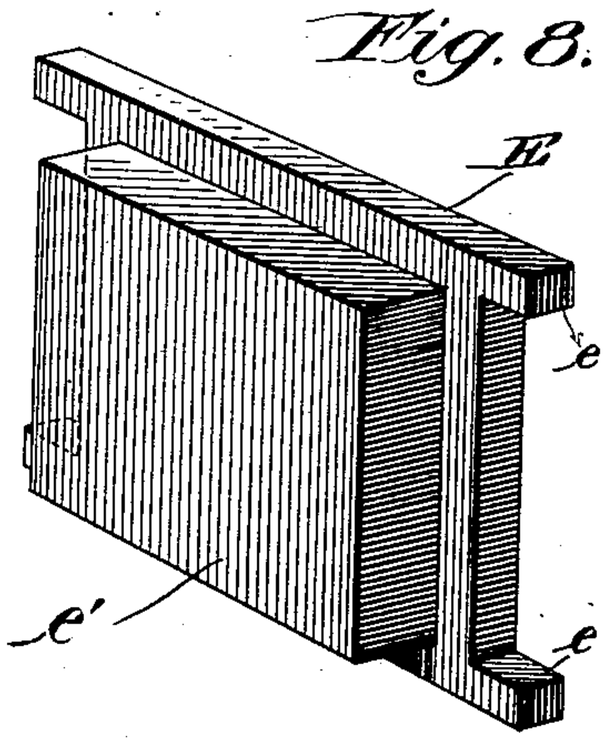


Fig. 8.



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No. 742,793. Patented October 27, 1903.

UNITED STATES PATENT OFFICE.

WILLIS S. JONES, OF CHICAGO, ILLINOIS, ASSIGNOR TO GEORGE WESTINGHOUSE, OF PITTSBURG, PENNSYLVANIA.

DRAW-GEAR AND BUFFING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 742,793, dated October 27, 1903.

Application filed September 16, 1901. Renewed October 2, 1903. Serial No. 175,528. (No model.)

To all whom it may concern:

Be it known that I, WILLIS S. JONES, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Draw-Gear and Buffing Apparatus; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates in general to draw-gear and buffing apparatus, and more particularly to that type of such apparatus in which a frictional resistance is produced and exerted to gradually transmit to the draft-timbers of a car any sudden or violent strain to which the draw-bar may be subjected in pulling or buffing.

The Master Car-Builders' regulations permit a comparatively limited relative movement between the draw-bar and draft-timbers of a car, and as it is desired to utilize a portion of such longitudinal relative movement during the usual strain incident to the running of a train only a comparatively slight relative longitudinal movement remains available for actuating the friction apparatus when it is brought into operation by a sudden or violent pulling or buffing shock occurring when the train is started or stopped. It is therefore necessary that the apparatus interposed between the draw-bar and draft-timbers of the car should be capable of exerting a great resistance when its members are relatively moved the comparatively slight longitudinal distance available.

An object of my invention is to provide a friction draw-gear and buffing apparatus in which the requisite retardation to the movement of the draw-bar relative to the draft-timbers of the car both in buffing and in pulling is produced by the same series of any desired number of overlapping wedge-shaped friction devices which are relatively moved transversely to the line of draft, thereby gradually applying the strain to which the draw-bar is subjected to the draft-timbers of the car.

A further object of my invention is to provide a friction draw-gear and buffing apparatus of the character described which will be inactive during the usual strain incident to the normal running of a train, but will be actuated by a sudden or violent shock occurring when the train is started or stopped to create the desired resistance to the movement of the draw-bar relatively to the draft-timbers of the car.

My invention, generally stated, consists in a series of overlapping wedge-shaped friction devices which are forced into frictional contact by a longitudinal movement and are then relatively moved transversely to the line of draft, thereby gradually transmitting the strain exerted upon the draw-bar in pulling or in buffing to the draft-timbers of the car.

My invention further consists in a casing having a single hollow portion, the interior opposite surfaces of which are inclined, a series of overlapping friction devices located within the hollow portion of the casing and engaging the inclined opposite walls therein, and means for so connecting the casing and series of overlapping friction devices to the draw-bar and draft-timbers of the car that when a strain is exerted upon the draw-bar either in pulling or in buffing the friction devices are forced into frictional contact and are then moved relatively to the casing, whereby adjacent devices are relatively moved transversely to the line of draft through their engagement with the inclined interior walls of the hollow portion of the casing.

My invention will be more fully described hereinafter with reference to the accompanying drawings, in which the same is illustrated as embodied in several convenient and practical forms, and in which—

Figure 1 is a plan view of my invention, the draw-bar and yoke being shown in section and the top of the hollow portion of the casing being removed; Fig. 2, a view similar to Fig. 1 with the parts shown in the positions which they assume during a buffing action; Fig. 3, a perspective view of the casing or housing; Fig. 4, a plan view, with certain parts shown in section, of a modified arrangement of my invention; Fig. 5, a view similar to Fig. 4 with the parts shown in the positions which they assume during a pull-

ing strain; Fig. 6, a plan view, with parts shown in section, of still another modified embodiment of my invention, the parts being shown in their inactive positions; Fig. 7, a perspective view of one of the wedge-shaped friction devices, and Fig. 8 a perspective view of the interior follower.

Similar reference characters are used to designate similar parts in the several figures of the drawings.

Reference-letters A A indicate guides adapted to be secured to the draft-timbers of a car, such guides having stops a' and a^2 to limit the movement between the friction apparatus relative to the draft-timbers of the car. Any suitable form of guides and stops may be employed, the form shown serving merely to illustrate the operative connection of my invention therewith.

B indicates a portion of the draw-bar, to which are secured by suitable fastening devices b the ends of a strap or yoke B', which surround the friction apparatus in a manner usual in the art.

C indicates a casing or housing, which comprises a hollow portion C', preferably rectangular in shape, and side portions c, which connect the hollow end portion with a rear wall C^2, the various portions of the casing C being preferably formed integral. The opposite interior walls of the hollow portion C' are inclined, as indicated at c', while the interior surfaces of the intermediate walls are provided with wedge-shaped guides c^3, extending from the larger opening of the hollow portion of the casing toward the smaller opening thereof.

Within the hollow portion of the casing are located a series of overlapping friction devices H, preferably of wedge shape. These devices are provided with inclined ends engaging the inclined interior walls of the hollow portion of the casing. Shoulders h are provided at either side of each of the friction devices and are inclined parallel with the inclination of the larger end of the device, such inclined shoulders engaging the edges of the wedge-shaped guides c^3. The opposite edges of the wedge-shaped guides c^3 are parallel with the inclined inner walls of the casing and form guideways of a transverse width equal to the distance between the larger end and the inclined shoulders h of each of the friction devices.

A follower D is located between the larger opening of the hollow portion of the casing and the end of the draw-bar B, such follower having a reduced extension b, which projects within the larger end of the hollow portion of the casing and engages the adjacent member of the series of friction devices. An interior follower E is located at the opposite side of the hollow portion of the casing and is provided with a reduced extension e', which engages the adjacent member of the series of friction devices. The follower E is provided with projecting lugs e, which extend above the side portions c of the casing and serve as guides for the follower.

A compression-spring F is interposed between the rear wall C^2 of the casing and the opposite face of the follower E. The spring is prevented from displacement by means of lugs projecting toward each other within the ends of the spring, such lugs being secured to the follower E and to the interior surface of the rear wall C^2 of the casing. Such lugs may, if desired, perform the additional function of serving as stops to limit the compression of the spring when the friction apparatus is in operation.

The operation of the embodiment of my invention illustrated in Figs. 1 and 2 is as follows: When the draw-bar B is subjected to a pulling strain, the yoke B' pulls the casing C toward the follower D, the latter being held immovable with respect to the draft-timbers of the car through its engagement with the stops a' a'. The movement of the casing C toward the follower D causes the adjacent members of the friction devices H to frictionally engage each other, owing to the spring F transmitting the strain from the yoke B' to the follower E. The movement of the casing C toward the follower D causes the friction devices H to be moved transversely to the line of draft through the engagement of the inclined interior walls c' of the casing with the correspondingly-inclined larger ends of the several friction devices. When the pulling strain is relieved, the expansion of the spring F moves the casing C to its inactive position in engagement with the stops a^2 a^2 and also causes the several friction devices to be returned to their normal positions through the movement of the interior follower E, the friction devices being moved transversely through the engagement of the inclined shoulders h with the inclined edges of the guides c^3. When a buffing strain is exerted upon the draw-bar B, the several parts of the apparatus assume the positions indicated in Fig. 2—that is, the end member C^2 of the casing is held immovable with respect to the draft-timbers of the car through its contact with the stops a^2 a^2, while the follower D is moved toward the follower E through its contact with the draw-bar. Consequently the friction devices H are forced into frictional engagement through the resistance of the spring F, and as the friction devices are moved within the hollow portion of the casing they are moved transversely to the line of draft through their engagement with the inclined interior walls C' of the hollow portion of the casing. When the buffing strain is relieved, the expansion of the spring F forces the friction devices longitudinally to their normal positions through the interposed follower E and also returns the follower D to its inactive position in contact with the stops a' a'. The friction devices are moved horizontally through the engagement of their shoulders h with the guide-wedges c^3.

In Figs. 4 and 5 I have illustrated my improved apparatus as provided with an auxiliary spring F′, interposed between the exterior face of the wall C^2 of the casing, and an auxiliary follower G, engaged by the yoke B′. In this modified application of my invention the guides A′, which are adapted to be secured to the draft-timbers of the car, are extended beyond the stops a^2, so as to also guide the auxiliary follower G. The follower G is preferably provided with a projecting stop g^4, which is adapted to engage a stop c^4, projecting from the wall C^2 of the casing, such stops serving to limit the compression of the auxiliary spring F′, interposed between the wall C^2 of the casing C and the auxiliary follower G. An auxiliary spring *f* is also preferably located within the spring F to afford additional resistance to the relative movement of the follower E and wall C^2 of the casing C toward each other.

The operation of the modification of my invention, as illustrated in Figs. 4 and 5, is similar to the operation above described except that when the draw-bar B is subjected to a pulling strain the auxiliary spring F′, which offers less resistance than the combined springs F and *f*, is first compressed before the casing C is moved toward the follower D. If the pulling strain is insufficient to compress the combined springs F and *f*, as would be the case in the ordinary running of a train, the friction apparatus remains inactive. If, however, the pulling strain is greater than the tension of the spring F′, the latter is compressed, allowing the stops c^4 and g^4 to come into contact, whereupon the pulling force is transmitted to the casing C and the latter moved toward the follower D, thereby bringing into action the friction apparatus in the manner previously described. The parts are restored to their inactive positions upon the discontinuance of the pulling strain by the expansion of the several springs. The action of this embodiment of my invention in buffing is identically the same as described in connection with Figs. 1 and 2 of the drawings, inasmuch as the spring F′ remains inactive, owing to the casing C being immovably held through the engagement of the wall C^2 thereof with the stops a^2 a^2.

I have illustrated still another modified application of my invention in Fig. 6, in which an auxiliary spring F^2 is interposed between the exterior face of the follower D and an auxiliary follower K. The auxiliary follower K normally engages the stops a' a' and is engaged by the end of the draw-bar B. Lugs k^2 and d^2, similar to the lugs c^4 and g^4, (shown in Figs. 4 and 5,) may be secured to the opposing faces of the follower D and K to limit the compression of the auxiliary spring F^2 when a buffing-strain occurs. The operation of this modification of my invention is the same as the operation above described in connection with Figs. 1 and 2 except that the auxiliary spring F^2, which is preferably of less resistance than the spring F, the latter being, if desired, reinforced by a smaller spring *f*, will be compressed during the usual strain incident to the running of a train, and the friction apparatus will only be brought into action when the pulling or buffing strain is greater than the resistance of the auxiliary spring F^2. In starting or stopping a train the shock exerted upon the draw-bar is sufficient to compress the spring F^2 and bring the stops k^2 and d^2 into contact, whereupon the friction apparatus is brought into action and operates in the manner previously described—that is, in pulling the yoke B′ moves the casing C relatively to the friction devices H, the latter being held immovable through the engagement of the lugs d^2 and k^2 and the engagement of the auxiliary follower K with the stops a' a'. In buffing after the spring F^2 has been compressed the strain is transmitted through the lugs k^2 and d^2 to the follower D, which moves the friction devices H within the hollow portion of the casing, the latter being held immovable with respect to the draft-timbers of the car through its engagement with the stops a^2 a^2.

It is evident from the foregoing description of my invention that I have provided a friction draw-gear and buffing apparatus in which a series of wedge-shaped friction devices are relatively moved transversely to the line of draft, both in buffing and in pulling, thereby gradually transmitting the force exerted upon the draw-bar to the draft-timbers of the car. It is also evident that I have produced an apparatus such as described in which friction devices are inactive during the ordinary strain upon the draw-bar incident to the usual running of a train, but are rendered active whenever a violent strain or shock is exerted upon the draw-bar, as in starting or stopping the train, to gradually apply such strain to the draft-timbers of the car.

While I have described more or less precisely the details of construction, I do not wish to be understood as limiting myself thereto, as I contemplate changes in form, the proportion of parts, and the substitution of equivalents, as circumstances may suggest or render expedient, without departing from the spirit of my invention.

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

1. In a draw-gear and buffing apparatus, the combination with a bodily-movable casing, of a series of overlapping friction devices within said casing, a follower interposed between said series of friction devices and the draw-bar, means connecting said follower and said casing to the draw-bar and draft-timbers of a car whereby either said casing or said follower is held longitudinally immovable with respect to the draft-timbers of the car while the other is moved longitudinally, and

means for relatively moving adjacent friction devices transversely to the line of draft, substantially as described.

2. In a draw-gear and buffing apparatus, the combination with a bodily-movable casing comprising a hollow closed portion and an open portion, of a series of overlapping friction devices within said hollow portion of the casing, a spring located within said open portion and engaging at its opposite ends the end of said casing and the adjacent member of said series of said friction devices, a follower engaging the opposite member of said series of friction devices, a yoke secured to the draw-bar and surrounding said casing and friction devices, stops secured to the draft-timbers of a car adapted to limit the movement of said casing and said follower whereby either said casing or said follower is held immovable while the other is moved longitudinally, and means for relatively moving adjacent friction devices transversely to the line of draft, substantially as described.

3. In a draw-gear and buffing apparatus, the combination with a bodily-movable casing, of a series of wedge-shaped friction devices within said casing, a spring interposed between said series of friction devices and an end of said casing, means connecting the draw-bar with said casing and said friction devices whereby said casing and friction devices are relatively moved longitudinally, and means for relatively moving adjacent friction devices transversely to the line of draft, substantially as described.

4. In a draw-gear and buffing apparatus, the combination with a bodily-movable casing having a hollow portion the opposite interior walls of which are inclined, of a series of wedge-shaped friction devices within said hollow portion and engaging at their larger ends with said inclined interior walls, a spring interposed between said series of friction devices and the end of said casing opposite to the hollow portion thereof, means connecting said casing and said friction devices to the draw-bar and draft-timbers of a car whereby either said casing or said series of friction devices is held immovable while the other is moved longitudinally thereby forcing adjacent friction devices transversely to the line of draft through their engagement with the inclined interior walls of said casing, substantially as described.

5. In a draw-gear and buffing apparatus, the combination with a bodily-movable casing having a hollow portion, opposite interior walls of which are inclined and intermediate interior walls of which are provided with wedge-shaped guides, of a series of wedge-shaped friction devices within said hollow portion and engaging at their larger ends with said inclined walls and having shoulders engaging said wedge-shaped guides, a spring interposed between said series of friction devices and the end of the casing opposite the hollow portion thereof, means connecting said casing and said friction devices to the draw-bar and draft-timbers of a car whereby either said casing or said series of friction devices is held immovable while the other is moved longitudinally thereby forcing the adjacent friction devices transversely to the line of draft through their engagement with the inclined interior walls of said casing, said friction devices being returned to their normal positions through their engagement with the wedge-shaped guides, substantially as described.

6. In a device of the character described, the combination with the draft-timbers of a car, of a draw-bar, a bodily-moving casing, a series of overlapping friction devices within said casing interposed between the draw-bar and draft-timbers, means connecting the draw-bar with said casing and friction devices comprising a yielding element capable of resisting a predetermined strain but transmitting a strain in excess of said predetermined strain to the friction apparatus, substantially as described.

7. In a device of the character described, the combination with the draft-timbers of a car, of a draw-bar, a bodily-movable casing interposed between the draw-bar and draft-timbers, a series of overlapping friction devices within said casing, means connecting the draw-bar with said casing and friction devices, a spring of predetermined strength interposed between the draw-bar and said friction devices whereby a strain less than the strength of the spring is absorbed thereby while a strain greater than the strength of the spring is transmitted to the friction devices, substantially as described.

8. In a draw-gear and buffing apparatus, the combination with a series of overlapping friction devices interposed between the draw-bar and draft-timbers of a car, means for relatively moving said friction devices transversely to the line of draft when the draw-bar is subjected to an excessive strain, means located between said series of friction devices and the draw-bar for absorbing the usual strain on the draw-bar incident to the ordinary running of a train, substantially as described.

9. In a draw-gear and buffing apparatus, a wedge-shaped friction device comprising friction-surfaces and inclined shoulders projecting from its side edges, the larger end of the device being parallel with the plane of the inclined shoulders, substantially as described.

10. In a draw-gear and buffing apparatus, a casing comprising a hollow portion having inclined interior walls, open side walls extending from said hollow portion, and an end extending transversely to and uniting said sides, substantially as described.

11. In a draw-gear and buffing apparatus, the combination with a bodily-movable cas-

ing, of a series of friction devices within said casing, a follower interposed between said series of friction devices and the draw-bar, means connecting said follower and said casing to the draw-bar and draft-timbers of the car whereby either said casing or said follower is held longitudinally immovable with respect to the draft-timbers of the car while the other is moved longitudinally, and means for relatively moving adjacent friction devices transversely to the line of draft.

In testimony whereof I sign this specification in the presence of two witnesses.

WILLIS S. JONES.

Witnesses:
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CLARA C. CUNNINGHAM.