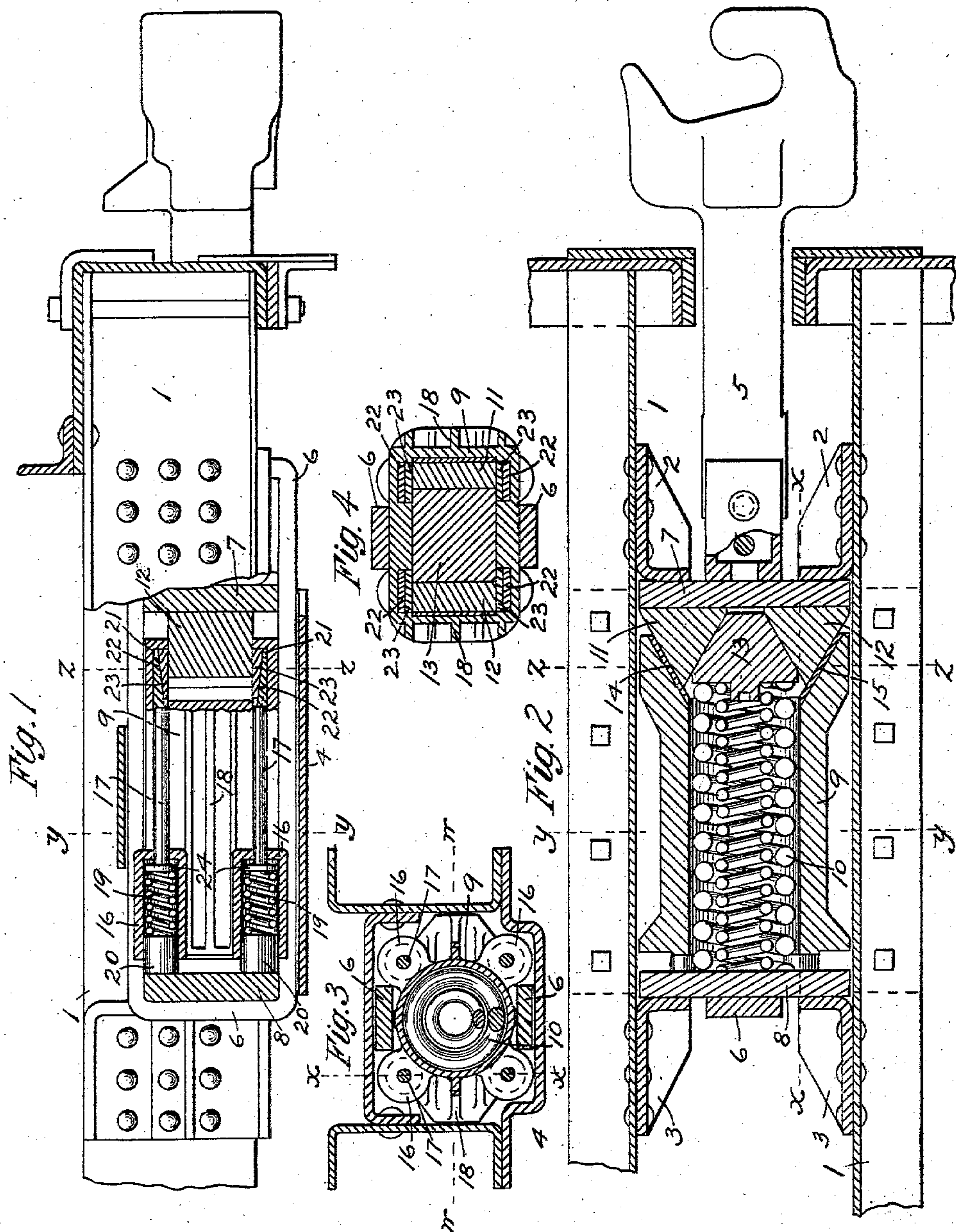


E. M. HERR.
DRAW GEAR AND BUFFING APPARATUS.

APPLICATION FILED FEB. 7, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:

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Fig. 7

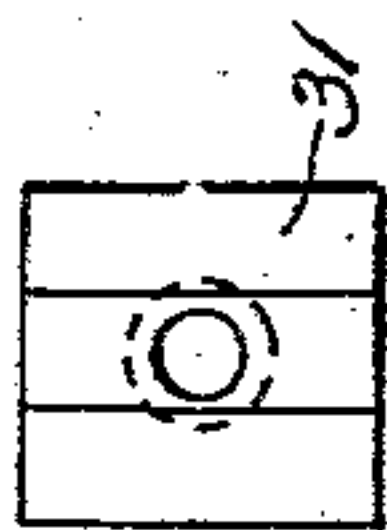


Fig. 5

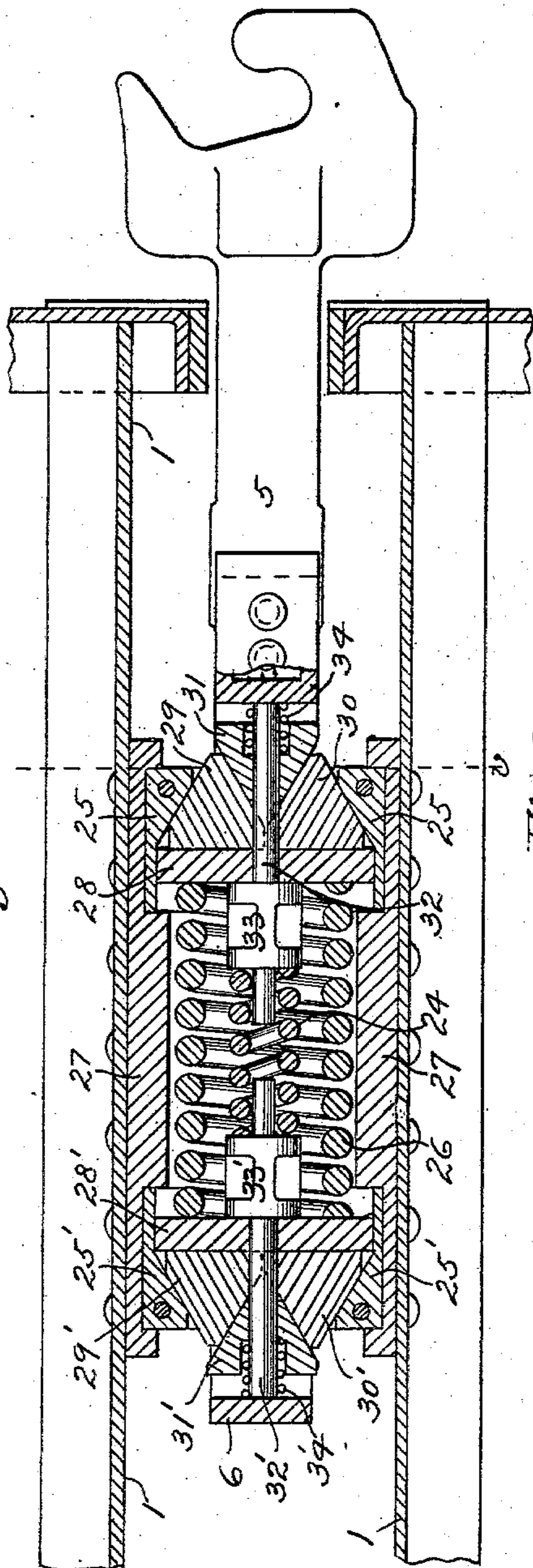
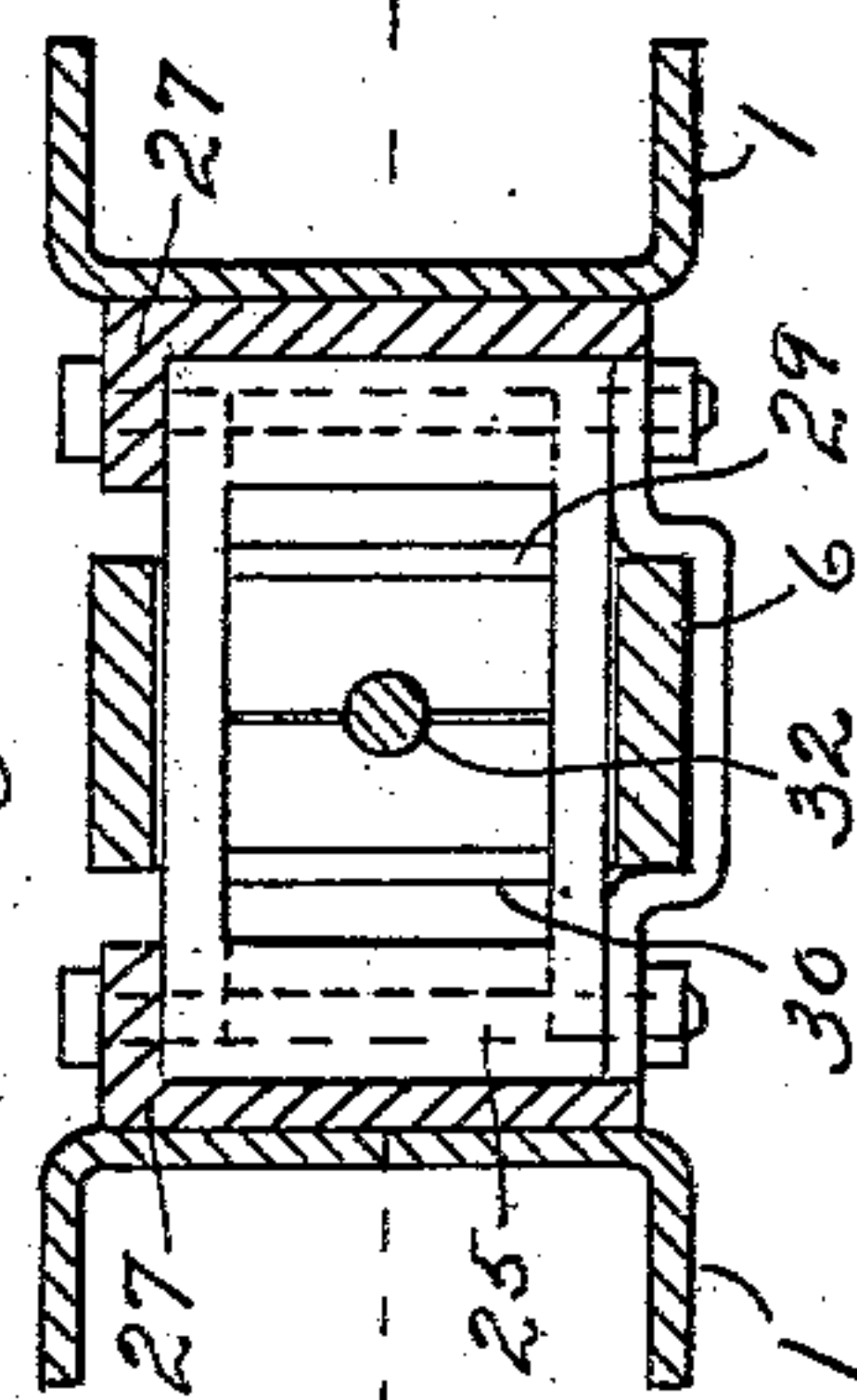


Fig. 6



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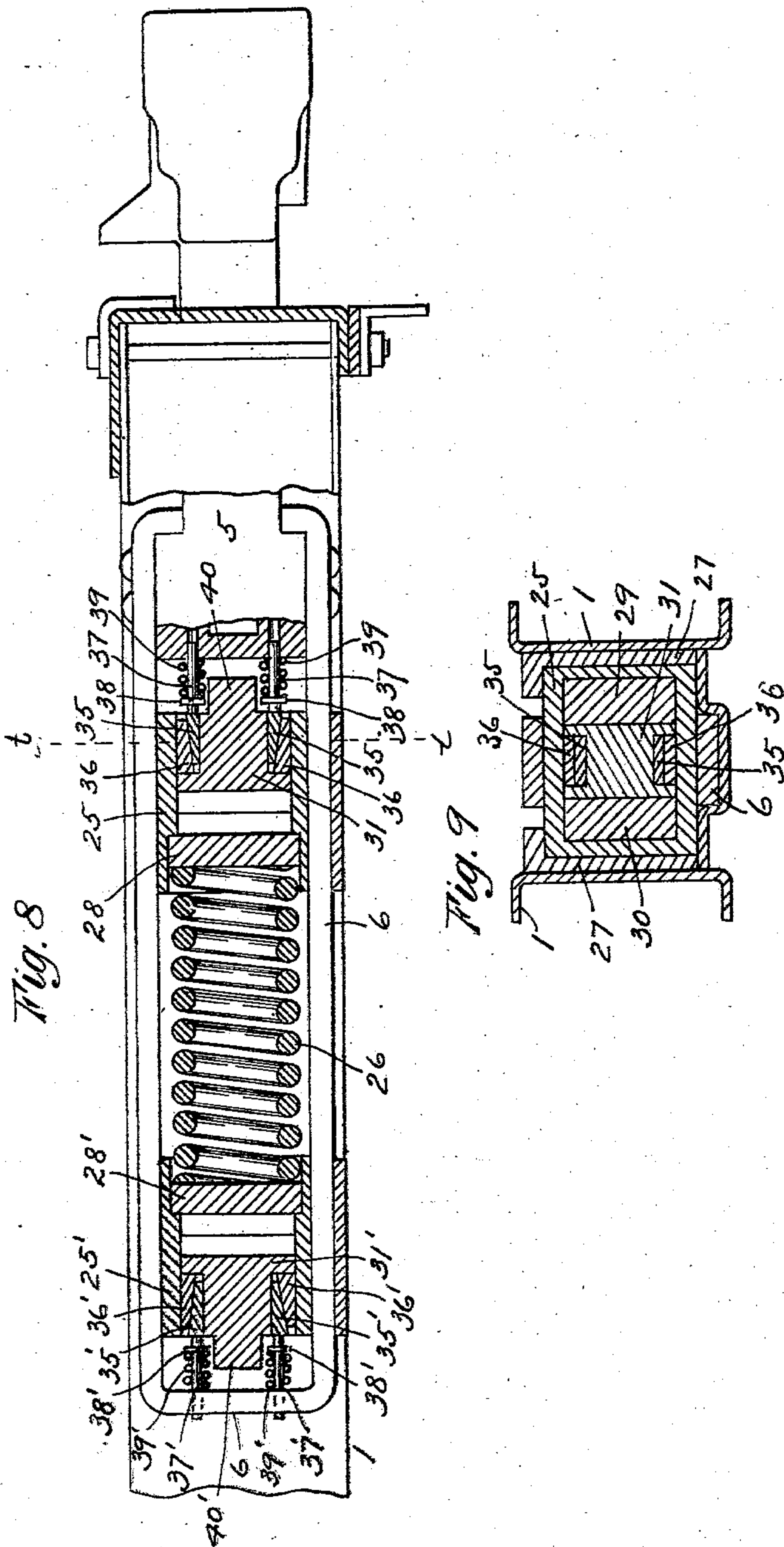
No. 740,429.

PATENTED OCT. 6, 1903.

E. M. HERR.
DRAW GEAR AND BUFFING APPARATUS.
APPLICATION FILED FEB. 7, 1902.

NO MODEL.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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DRAW-GEAR AND BUFFING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 740,429, dated October 6, 1903.

Application filed February 7, 1902. Serial No. 93,054. (No model.)

To all whom it may concern:

Be it known that I, EDWIN M. HERR, a citizen of the United States, residing in Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered certain new and useful Improvements in Draw-Gear and Buffing Apparatus, of which improvement the following is a specification.

This invention relates to railway draft appliances for resisting and taking up the shocks and strains of draft and buffing in the operation of cars, and more particularly to that class of such devices in which the moving member and spring resistance element are arranged in alinement with interposed friction members having oppositely-inclined faces whereby the transverse displacement of one of the friction members is converted into lineal pressure against the spring-resistance element.

One of the objects of the invention is to provide an apparatus of this class with a preliminary or initial spring resistance element which will check the first part of the draw-bar movement and be subjected to strain in advance of the main resistance element, to which the force of the greater strains is transmitted through the movement of the friction-blocks.

Another object of the invention is to provide such an apparatus with an additional frictional device operated by the preliminary movement of the draw-bar.

A further object of the invention is to provide means for clamping the housing and friction-blocks together during the preliminary movement of the draw-bar.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a vertical horizontal section of my improvement, taken on the line *xx* of Figs. 2 and 3. Fig. 2 is a horizontal section taken on the line *ww* of Fig. 3. Fig. 3 is a transverse section taken on the line *yy* of Figs. 1 and 2. Fig. 4 is a transverse section taken on the line *zz* of Figs. 1 and 2, the draft-sills being omitted. Fig. 5 is a horizontal section showing a modified form of my improvement. Fig. 6 is a transverse section taken on the line *vv*

of Fig. 5, the center wedge-block being removed. Fig. 7 is a detail view showing one of the center wedge-blocks. Fig. 8 is a vertical longitudinal section of the form of gear illustrated in Fig. 5, but shows a modified construction of the preliminary resistance-spring; and Fig. 9 is a transverse section taken on the line *tt* of Fig. 8.

The construction shown on Sheet 1 of the drawings will now be described.

The numeral 1 denotes the sills or draft-timbers of car-frame to which my improved draw-gear and buffing apparatus may be secured in any desirable manner. As shown in the drawings, the draft-lugs 2 and 3 are secured in pairs to the sills, and the connecting-plate 4 is provided to support the draw-gear. The draw-bar 5 has the usual strap 6 attached thereto and extending around the follower-plates 7 and 8. Between the follower-plates is located the improved friction draw-gear comprising a barrel casting or housing 9, carrying the main yielding resistance element or twin spring 10 and the friction-blocks 11, 12, and 13. The housing 9 is substantially cylindrical in shape, the exterior being provided with a series of longitudinal strengthening-ribs 18 and its forward end being flared outward on two opposite sides, providing two inclined faces 14 and 15, which cooperate with the corresponding faces of the triangular-shaped friction-blocks 11 and 12, respectively. Secured on the outside of the barrel casting or housing 9 and preferably cast integral therewith are the hollow cylindrical projections 16, preferably four in number, arranged at the four opposite corners, as shown, and containing the preliminary resistance-springs 19 and plungers 20, which extend out of the ends of said cylinders and engage the follower-plate 8. In the upper and lower inner faces of the flared end of the housing containing the friction-blocks are arranged the recesses 21, in which are located the wedge-blocks 22 and 23, and the rods 17, having heads 24 at one end thereof engaging the preliminary springs 19, extend into engagement with the wedge-blocks 22 at their opposite ends. These wedge-blocks 22 and 23 are located opposite the upper and

lower faces of the friction-blocks 11 and 12, so as to clamp the said friction-blocks and housing together during the preliminary movement of the draw-bar and to increase the friction between said blocks and housing during the subsequent movement of the draw-bar or pressure-transmitting member. When the parts are in their normal or release position, as shown in the drawings, there is an open space between the rear end of the housing 9 and the follower-plate 8 to allow for an initial movement of the draw-bar or pressure-transmitting member and a corresponding preliminary spring resistance before there is any material resistance exerted by the main resistance-spring 10 or any relative movement of the friction members. There is also a space between the flared end of the housing and the follower-plate 7 to allow for the subsequent movement of the draw-bar in the transmission of greater strains when the friction-blocks move into the end of the housing and the pressure is transmitted through them to the main resistance element or twin spring 10. The operation of this form of my improved construction during the act of pulling is as follows: The initial movement of the draw-bar and strap or pressure-transmitting member forces the follower-plate 8 against the plungers 20, compressing the preliminary springs 19 between said plungers and the heads 24 of the rods 17 and clamping the housing to the friction-blocks 11 and 12 by means of the wedge-blocks 22 and 23. The faces of these wedge-blocks are so inclined that the housing will always be clamped to the friction-blocks during the preliminary movement of the draw-bars and until the clearance-space is closed, thus preventing any relative movement of the friction-blocks during the preliminary movement. This initial or preliminary pressure is resisted by the preliminary springs 19, which have a resistance capacity sufficient to check and take up the minor strains and shocks to which the device may be subjected. Upon the application of greater strains and a further movement of the draw-bar the follower-plate 8 engages the end of the housing 9 and forces the same forward, causing the friction-blocks 11 and 12 to move transversely toward each other and into the housing and by their inclined faces forcing the center block 13 backward against the main resistance-spring 10, which thus exerts its action in alinement with the movement of the draw-bar. This subsequent movement is also resisted by the increased friction between the upper and lower faces of the friction-blocks 11 and 12 and the wedge-blocks 23, which are clamped against these faces by the preliminary movement of the draw-bar and the force of the spring 19. Although the main resistance-spring 10 is slightly compressed during the preliminary movement in which the clearance-space is closed, its resistance to this movement is very small, since in this position

it is extended to nearly its full length and nearly all the preliminary strain is taken up by the short preliminary resistance-springs 19.

During the operation of buffing the action of the apparatus is substantially the same as in pulling except that the pressure from the draw-bar is imparted to the follower-plate 7, which moves backward, together with the friction-blocks and the housing, there being no relative movement among these parts during the preliminary movement in which the clearance-space is closed. The preliminary movement in buffing clamps the wedge-blocks 23 against the opposite faces of the friction-blocks and is checked by the resistance of the springs 19, and the further or subsequent movement of the buffer, due to the greater strains, forces the friction-blocks into the housing, compressing the main resistance-spring 10, the action being the same as in the case of draft strains.

It is to be noted that the friction-blocks are interposed between the draw-bar or pressure-transmitting member and the main resistance-spring, so that the greater strain, due to the subsequent movement of the draw-bar in both draft and buffing, is transmitted to said main resistance-spring through the relative movement of the friction-blocks and housing.

According to the modified construction shown in Figs. 5, 6, and 7 two oppositely-arranged housings 25 and 25' are secured to the draft-sills in any desired manner—as, for instance, by means of the cheek-plates 27. The housing 25 contains the follower-plate 28 and wedge-shaped friction-blocks 29, 30, and 31, while the housing 25' carries the corresponding follower-plate 28' and friction-blocks 29', 30', and 31'. Between the follower-plates is located the main resistance-spring 26. The strap 6 of the draw-bar 5 extends around the housings and the end wedge-block 31' and is of the proper length to give a short preliminary movement of the draw-bar in either direction before engaging with and imparting movement to the friction wedge-blocks.

Push-rods 32 and 32' extend through central openings in follower-plates 25 and 25' and in the middle wedge-blocks 31 and 31', respectively, and are provided with collars 33 and 33', which bear against the inside faces of the respective follower-plates. Between the collars 33 and 33' is located the preliminary spring 24, while the outer ends of the push-rods engage the draw-bar 5 and the strap 6, respectively. Light springs 34 and 34' are located around the outer ends of the push-rods and in recesses in the respective wedge-blocks 31 and 31', for the purpose of keeping the inclined friction-surfaces of the wedge-blocks in contact with each other at times when the parts are in normal or release position, as shown in the drawings. The housings are provided with inwardly-flaring walls, which engage the inclined surfaces of the two side wedge-shaped friction-blocks as they are

forced against the same by the middle wedge-block, which is actuated by the draw-bar, strap, or other pressure-transmitting member. In buffing the initial movement of the draw-bar is transmitted directly through push-rod 32 and collar 33 to the preliminary resistance-spring 24. As the draw-bar moves inward the light spring 34 is compressed into the recess in the wedge-block 31, so that when the buffing strain is greater than can be resisted by the preliminary spring 24 the draw-bar then engages the wedge-block 31, forcing the same between the wedge-blocks 29 and 30, which move transversely against the inclined walls of the housing and transmits the pressure through the follower-plate 28 to the main resistance-spring 26. During draft strains a similar action takes place among the corresponding parts at the opposite end of the gear. The main resistance-spring is arranged in alinement with the draw-bar, and the wedge friction-blocks are interposed between them, so that the greater strains and shocks are transmitted to the main resistance-spring through the movement of the friction-blocks, while the preliminary or initial movement of the draw-bar is counteracted by the preliminary spring, thus securing a smooth and steady movement as the friction members enter into action.

In Figs. 8 and 9 I have shown a modified construction of the preliminary-spring device as applied to the form of spring-gear and friction-blocks illustrated in Fig. 5. The central push-rods and preliminary spring are dispensed with and in their place two preliminary springs 39 are located on rods 37, having collars 38 and adapted to actuate the wedge clamping-blocks 35 and 36, which are located in recesses in the middle friction-block 31, as shown.

The rods 37 are guided in openings in the draw-bar, and the middle friction-block 31 is provided with a boss or projection 40 to engage the draw-bar after the preliminary movement in buffing. During the initial or preliminary movement the wedges 35 and 36 are clamped, thus holding the friction-block 31 and the housing 25 rigidly together while the preliminary springs 39 are compressed. Then upon a further movement, due to greater buffing strains, the draw-bar engages the projection 40 of the middle wedge friction-block 31 and forces the side friction-blocks 29 and 30 transversely against the inclined sides of the housing 25 and lineally against the follower-plate 28 and main resistance-spring 26. The wedge-blocks 35 and 36 are actuated by the preliminary movement of the draw-bar and the compression of the springs 39 to give additional friction between the housing and the middle block 31 during the further or subsequent movement of the draw-bar. The parts are duplicated at the opposite end of the apparatus, as indicated by the primed reference-numerals, and a similar action takes place in

resisting draft strains. This construction, therefore, provides not only a preliminary spring-resistance, but also an additional frictional resistance, the same as is secured by the construction shown in the first sheet of drawings.

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

1. In a draw-gear or buffing apparatus, the combination of a draw-bar, a preliminary yielding resistance element, a main yielding resistance element arranged to exert its action in alinement with the movement of the draw-bar, and friction members interposed between said main resistance element and the draw-bar.

2. In a draw-gear or buffing apparatus, the combination of a draw-bar, a preliminary spring resistance element, a main spring resistance element, both of said resistance elements arranged to exert their action in alinement with the movement of the draw-bar, and friction members interposed between said main spring resistance element and the draw-bar.

3. In a draw-gear or buffing apparatus, the combination of a draw-bar, a yielding resistance element, friction members interposed between the draw-bar and the yielding resistance element, and means operated by the preliminary movement of the draw-bar for increasing the friction of said members.

4. In a draw-gear or buffing apparatus, the combination of a draw-bar, a spring resistance element, friction members interposed between the draw-bar and said spring resistance element, and a wedging device adapted to exert pressure against the said friction members by the preliminary movement of the draw-bar.

5. In a draw-gear or buffing apparatus, the combination with a draw-bar and a main resistance-spring, of friction members interposed between the draw-bar and said spring, a preliminary resistance-spring and means actuated by said preliminary spring for increasing the friction of said members.

6. In a draw-gear or buffing apparatus, the combination of a preliminary spring resistance element, a main spring resistance element arranged to exert its action in alinement with the movement of the draw-bar, friction members interposed between said main resistance element and the draw-bar, and a housing for said friction members.

7. In a draw-gear or buffing apparatus, the combination of a draw-bar, a spring resistance element, friction members interposed between the draw-bar and said resistance element, a housing for said friction members, and means actuated by the preliminary movement of the draw-bar for increasing the friction between the housing and said friction members.

8. In a draw-gear or buffing apparatus, the

combination of a draw-bar, a spring resistance element, friction members interposed between the draw-bar and said resistance element, a housing for said friction members and a wedging device inserted between said housing and said friction members and actuated by the preliminary movement of the draw-bar.

9. In a draw-gear or buffing apparatus, the combination of a draw-bar, a main resistance-spring, friction members interposed between the draw-bar and said spring, a housing for said friction members, a preliminary resistance-spring and means actuated by said preliminary spring for increasing the friction between the housing and the friction members.

10. In a draw-gear or buffing apparatus, the combination of a draw-bar, a main resistance-spring, friction - blocks interposed between the draw-bar and said spring, a housing for said friction-blocks, a preliminary resistance-spring, wedge-blocks adapted to be clamped between the housing and friction-blocks by the preliminary spring during the initial movement of the draw-bar.

11. In a draw-gear or buffing apparatus, the combination of a draw-bar, a spring resistance element, friction members interposed between the draw-bar and said resistance element, a housing for said friction members, and means actuated by the preliminary movement of the draw-bar for clamping said friction members to the housing.

12. In a draw-gear or buffing apparatus, the combination of a draw-bar, a main resistance-

spring, friction members interposed between the draw-bar and the said resistance-spring, a housing for said friction members, a preliminary resistance-spring, and a clamping device actuated by said preliminary spring for holding the friction members and the housing together during the preliminary movement of the draw-bar.

13. In a draw-gear or buffing apparatus, the combination of a draw-bar, a main resistance-spring, friction members interposed between the draw-bar and said spring, a housing for said friction members, preliminary resistance-springs, wedge-blocks bearing against opposite faces of said friction members, and means actuated by the preliminary springs for forcing said wedge-blocks against the friction members.

14. In a draw-gear or buffing apparatus, the combination of a draw-bar having a preliminary movement, a main resistance-spring arranged to exert its action in alinement with the movement of the draw-bar, friction members interposed between the draw-bar and said main resistance-spring, and a separate preliminary spring adapted to be strained by the preliminary movement of the draw-bar.

In testimony whereof I have hereunto set my hand.

EDWIN M. HERR.

Witnesses:

E. A. WRIGHT,
R. F. EMERY.