(No Model.) 3 Sheets—Sheet 1.

F. MOORE.

DRAW GEAR AND BUFFING APPARATUS.

No. 556,197. Patented Mar. 10, 1896.

FIG. 1.

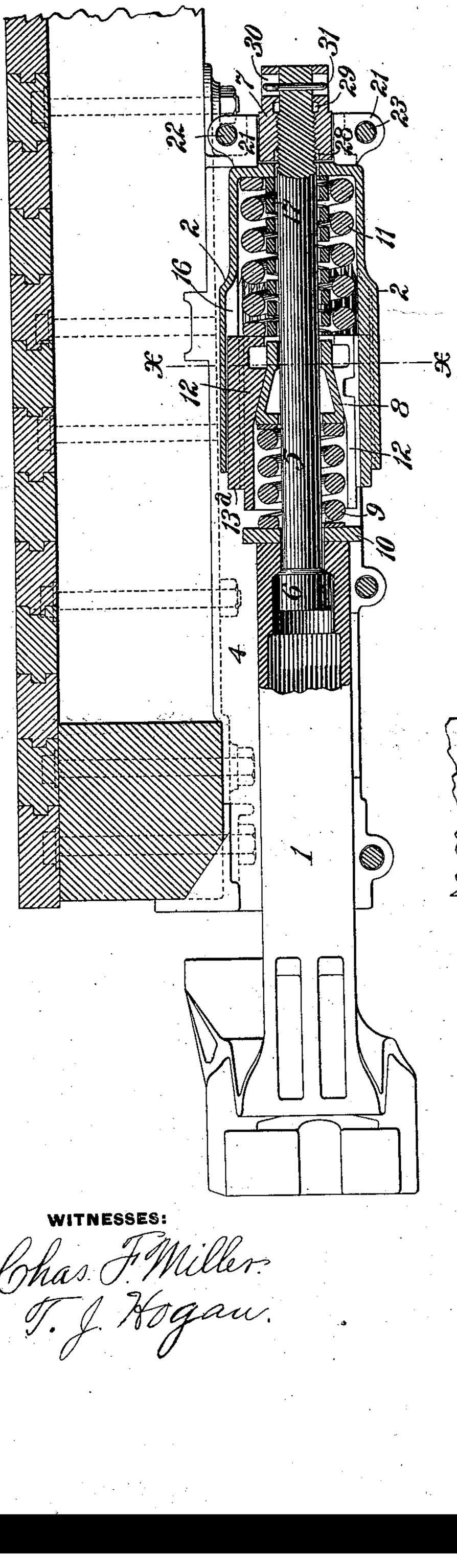
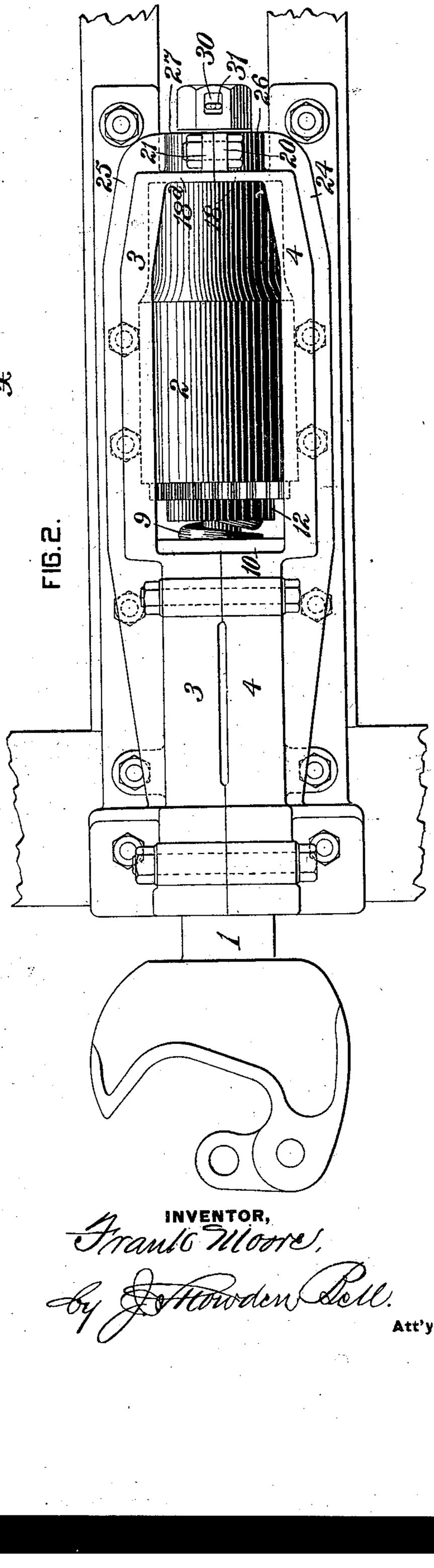


FIG. 2.



WITNESSES:

Chas. F. Miller.

T. J. Hogan.

INVENTOR,

Frank Moore,

by J. Howden Pell.

Att'y.

(No Model.) 3 Sheets—Sheet 2.

F. MOORE.

DRAW GEAR AND BUFFING APPARATUS.

No. 556,197. Patented Mar. 10, 1896.

FIG. 7.

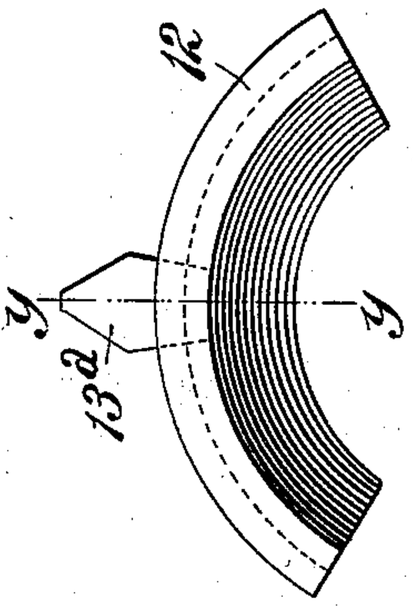


FIG. 11.

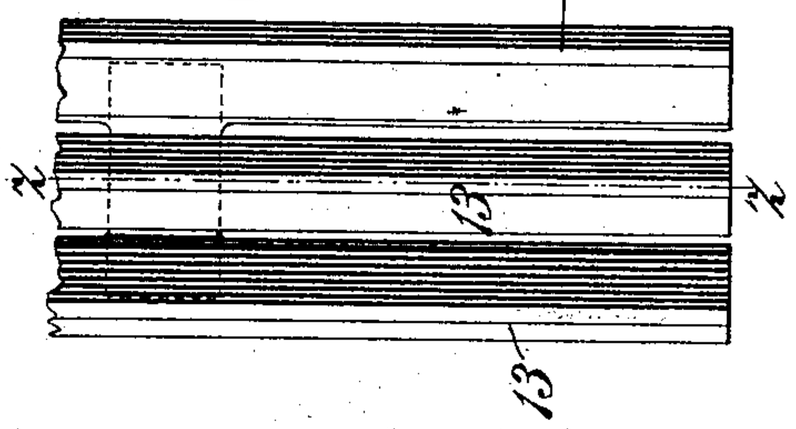


FIG. 10.

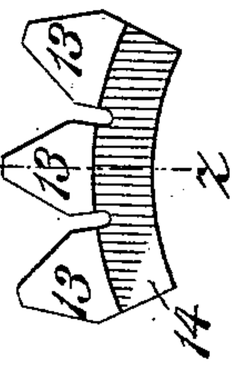


FIG. 6.

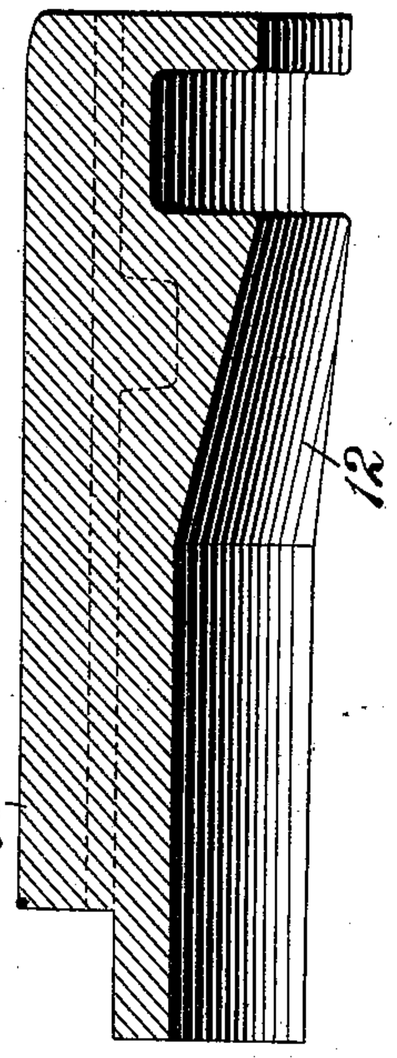


FIG. 8.

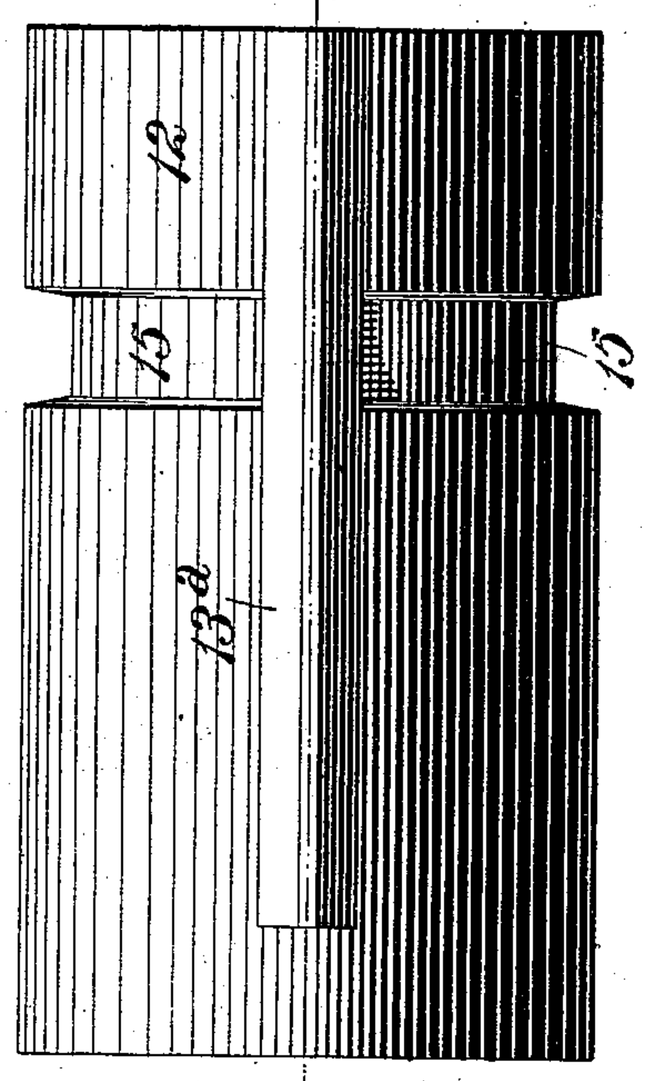


FIG. 9.

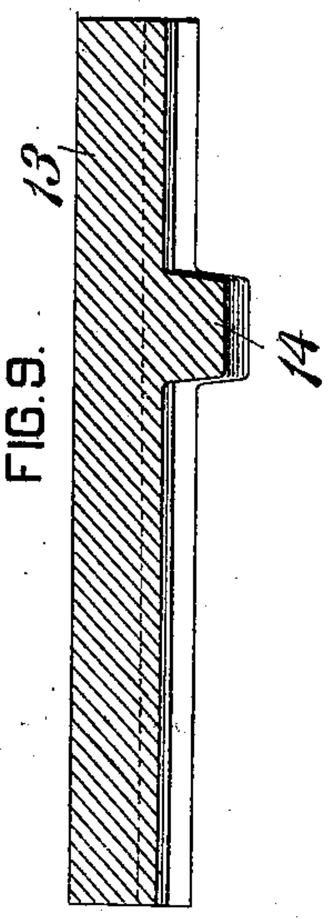
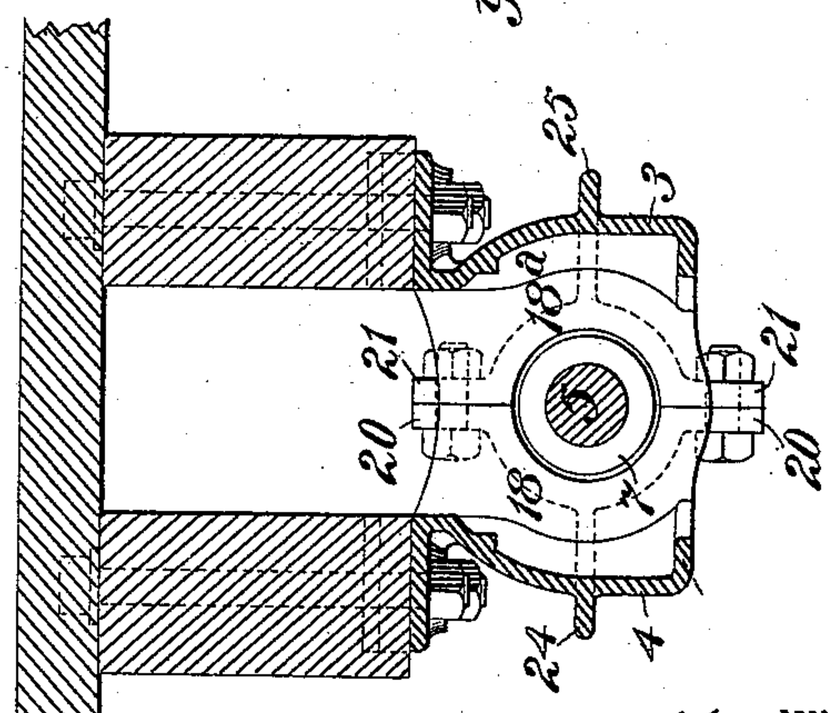


FIG. 3.



WITNESSES:

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(No Model.) 3 Sheets—Sheet 3.

F. MOORE.

DRAW GEAR AND BUFFING APPARATUS.

No. 556,197. Patented Mar. 10, 1896.

FIG. 4.

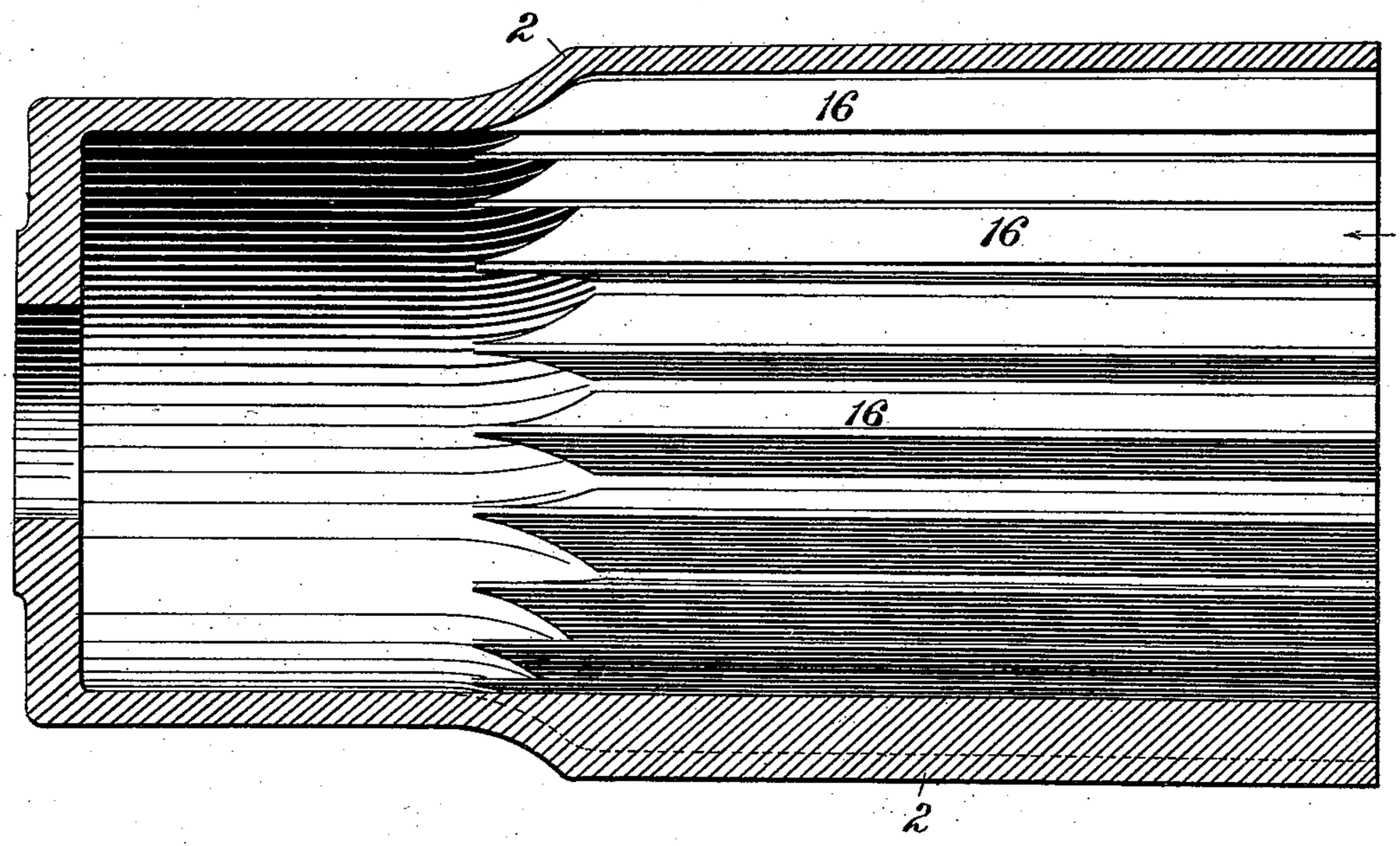
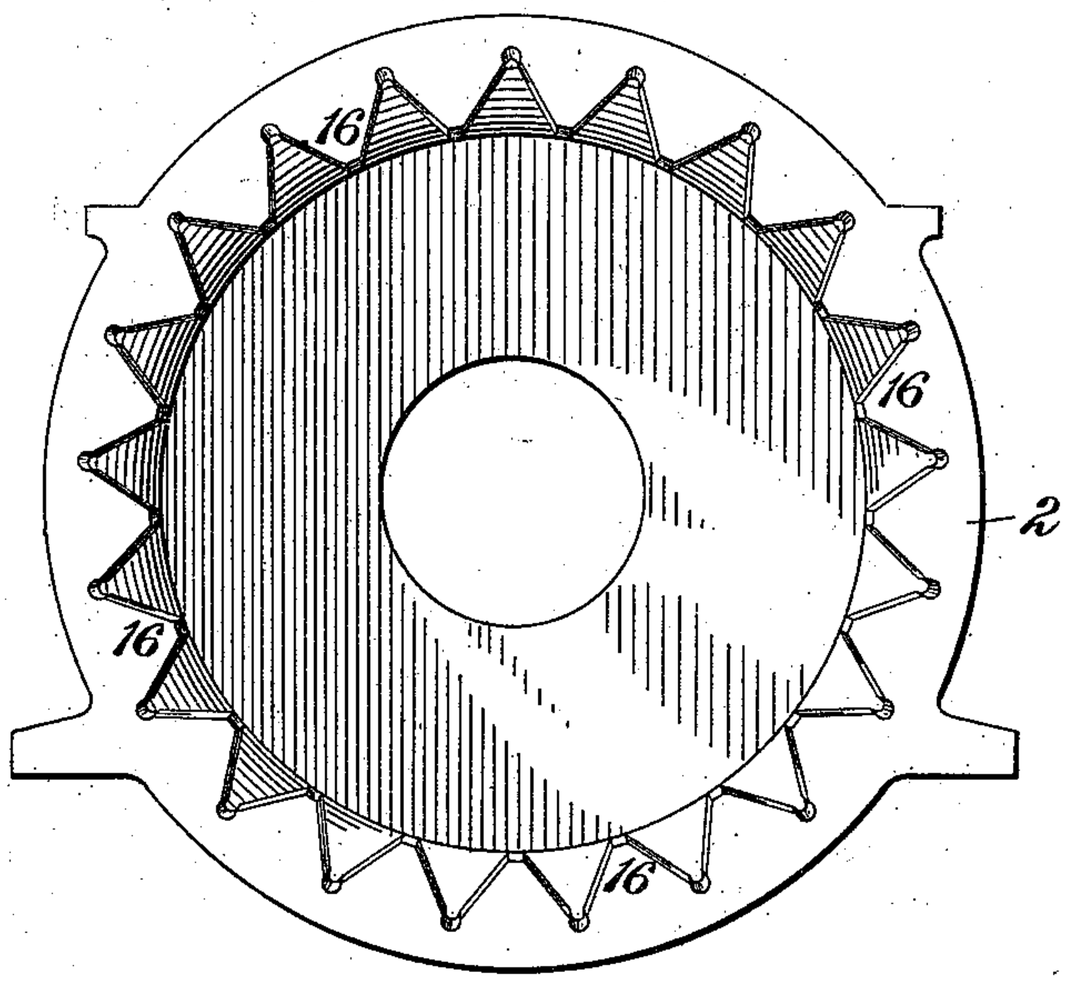


FIG. 5.



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UNITED STATES PATENT OFFICE.

FRANK MOORE, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO GEORGE WESTINGHOUSE, JR., OF SAME PLACE.

DRAW-GEAR AND BUFFING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 556,197, dated March 10, 1896.

Application filed November 4, 1895. Serial No. 567,832. (No model.)

To all whom it may concern:

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

My invention relates to improvements in draw-gear and buffing apparatus in which a friction mechanism is brought into action by impact or by a draft or pulling action for the purpose of modifying shocks and absorbing momentum.

My present invention is adapted to be employed in combination with draw-gear and buffing apparatus of the same general class as that set forth in the several Letters Patent granted to George Westinghouse, Jr., No. 391,997, dated October 30, 1888; Nos. 499,335 and 499,336, dated June 13, 1893; No. 543,915, dated August 6, 1895, and No. 545,994, dated September 10, 1895. It is not, however, limited in its application to a combination with the particular constructions shown in these patents.

The object of my invention is to increase the efficiency of the friction mechanism employed in such devices, and to this end it consists in means for effecting a quick release of the friction mechanism by relieving the frictional surfaces of pressure or effecting a reduction of the pressure by which the frictional surfaces are pressed together, and thereby permitting the automatic return of the parts to their normal positions immediately on the cessation of the pulling or buffing force by which the movement of the draw-bar or buffer from its normal position is effected; and my invention further consists in certain combinations and features of construction which are hereinafter fully set forth.

My improvement is shown in the drawings applied to an apparatus which in its principal features of construction is similar to that shown in Patent No. 545,994 aforesaid, but it is applicable to a great variety of constructions or to any construction in which two or more frictional surfaces are pressed into frictional engagement by the wedging action of a part or member which is movable relatively to the part or member which carries one or one series of the opposing frictional surfaces.

In the accompanying drawings, Figure 1 is a central longitudinal section through a draw-gear and buffing apparatus embodying my invention; Fig. 2, an inverted plan view of the apparatus shown in Fig. 1; Fig. 3, a transverse section on the line *x x* of Fig. 1, the housing and springs being removed; Fig. 4, a central longitudinal section through the housing within which the springs and friction mechanism are located; Fig. 5, an end view of the housing, looking in the direction of the arrow shown in Fig. 4; Fig. 6, a central longitudinal section through a carrier-plate on the line *y y* of Figs. 7 and 8; Fig. 7, an end view of the carrier-plate shown in Fig. 6; Fig. 8, a plan view of the carrier-plate shown in Figs. 6 and 7; Fig. 9, a central longitudinal section through one of the sets of inner wedge-bars on the line *z z* of Figs. 10 and 11; Fig. 10, an end view of the set of wedge-bars shown in Figs. 9 and 11, and Fig. 11 a plan view of a part of one of the sets of inner wedge-bars.

The construction shown in the drawings is that of a draw-gear and buffing apparatus for railway-cars, in which a draw-bar 1 and a housing 2 are supported by and movable in a main frame or casing composed of two longitudinal members 3 and 4, which are adapted to be secured to the draft-timbers and end sill of a car.

A draft-pin 5 passes through the inner end of the draw-bar and centrally through the housing 2. A head 6 on the outer end of the draft-pin 5 bears on a shoulder formed on the inner end of the draw-bar, and the inner end of the draft-pin is screw-threaded and provided with a nut, which, when the draw-bar is moved outward, bears on the inner end of the housing and transmits the longitudinal movement of the draw-bar and draft-pin to the housing. The draft-pin 5 passes through a wedge-block 8, which is centrally located within the housing, and through a spring 9, which bears at one end against the wedge-block and at the other end against the follower-plate 10. A spring 11 bears at one end

against the end of the housing 2 and at the other end against the carrier-plates 12, which surround the wedge-block 8.

A portion of the inner surface of each of the carrier-plates conforms to the conical surface of the wedge-block against which it bears, and projecting from the outer surface of each of the carrier-plates 12 is a wedge-bar 13^a, which is formed integral therewith and forms one of the inner series of wedge-bars.

With the exception of the wedge-bars 13^a, which are formed integral with the carrier-plates, the inner series of wedge-bars is divided into sets of three, each set having a curved rib 14 formed integral therewith, which rib is adapted to fit into circumferential grooves 15, formed in each of the carrier-plates on opposite sides of the bars 13^a. The wedge-bars 13^a and each of the wedge-bars 13 project into the spaces between the outer wedge-bars 16, which are formed integral with the housing 2.

The functions of the wedge-block, carrier-plates, and inner and outer wedge-bars and their relations to the housing 2, to the springs 9 and 11, and to the draw-bars are substantially the same as in Patent No. 545,994 aforesaid, and the operation is the same as in that patent, except in so far as it is affected by my present improvement.

In the patent referred to and in my present improvement, when the draw-bar is pushed inward, the follower-plate 10 is moved with it and compresses the spring 9, which, in turn, moves the wedge-block 8 inward. As the wedge-block is moved inward, longitudinal movement of the carrier-plates is resisted by the spring 11, and the wedging action between the surface of the wedge-block and the inner surfaces of the carrier-plates forces the carrier-plates and inner wedge-bars laterally outward and presses the inner wedge-bars into frictional contact with the outer wedge-bars. When the follower-plate 10 has been moved far enough to bear on the ends of the carrier-plates, the further movement of the draw-bar will move the carrier-plates and inner wedge-bars longitudinally relatively to the outer wedge-bars, and the movement of the draw-bar will then be resisted by the friction between the inner and outer wedge-bars and by the spring 11. During such inward movement of the draw-bar the inner end of the housing 2 bears against the inner end portions 18 and 18^a of the main frame or casing.

When the draw-bar is moved outward by a draft or pulling action, the draft-pin 5 moves outward with the draw-bar, the nut 7 bears on the inner end of the housing 2, the housing is moved outward and the spring 11 transmits the movement of the housing to the carrier-plates. As the carrier-plates are moved longitudinally outward they at first slide on the wedge-block 8, and by a wedging action are pressed laterally outward, causing the inner wedge-bars to be wedged between the outer wedge-bars, and as the resistance to movement between the carrier-plates and the wedge-block 8 increases the spring 9 will be compressed until the outer ends of the carrier-plates bear against the follower-plate 10. Further movement of the draw-bar will then cause the housing and outer wedge-bars to move relatively to the inner wedge-bars, and the further movement of the draw-bar will be resisted by the friction between the inner and outer wedge-bars and by the spring 11.

My present invention provides means whereby, when the friction mechanism has been brought into action by either an inward or outward movement of the draw-bar and the pressure or pull on the draw-bar ceases, the wedge-block 8 and the carrier-plates may be quickly relieved of the wedging action between them and the prompt return of the parts to their normal positions effected. In order to attain this result, in my present improvement I have enlarged the diameter of the coil of the spring 11, and within the spring 11 and surrounding the draft-pin 5 I have placed a spring 17, which is of such length that when the parts of the buffing apparatus within the housing are in their normal positions, it fits loosely between the end of the wedge-block 8 and the inner end portions 18 and 18^a of the housing 2 and exerts no pressure tending to separate them.

The length of the spring 17 and its tension are so adjusted that when the draw-bar is moved inward or outward the necessary relative movement of the wedge-block and carrier-plates may be effected to clamp the inner and outer wedge-bars together with sufficient force to produce the desired amount of friction before any very great pressure is brought on the wedge-block by the compression of the spring 17, so that any further compression of the spring 17 will not counteract the resistance of the spring 9 to such an extent as to affect or reduce the wedging action of the wedge-block.

When the draw-bar 1 and follower-plate 10 are moved inward, the compression of the spring 9 wedges the carrier-plates outward and clamps the inner wedge-bars against the outer wedge-bars, and when the further inward movement of the draw-bar and follower-plate brings the follower-plate in contact with the ends of the carrier-plates and moves the carrier-plates and inner wedge-bars relatively to the outer wedge-bars both the spring 11 and the spring 17 are compressed. The compression of the spring 17 may begin before the follower-plate 10 comes in contact with the ends of the carrier-plates, if the spring 17 is made sufficiently long; but I prefer to make it of such a length that its compression will not begin until after the follower-plate comes in contact with the ends of the carrier-plates and the wedge-block and carrier-plates are moved inward relatively to the outer wedge-bars and housing. The length of the spring 17 and its resistance to compression will depend on the degree to

which its pressure on the wedge-block must be limited and on the relative resistance to compression of the springs 17, 11, and 9.

When the wedge-block and carrier-plates have been moved inward far enough to compress the springs 11 and 17, the removal of the pressure on the draw-bar will permit the expansion of the spring 9 and the outward movement of the draw-bar and follower-plate 10. The pressure of the spring 17, acting on one side of the wedge-block against the reduced pressure of the spring 9 on the other side, will relieve the wedging action of the wedge-block on the carrier-plates, and the wedge-block and carrier-plates will then be quickly returned to their normal positions by the actions of the springs 11 and 17.

The action of the spring 17, by relieving or diminishing the wedging action of the wedge-block on the carrier-plates immediately on the expansion of the spring 9, relieves the pressure by which the inner and outer wedge-bars are clamped together and permits the spring 11 to act more quickly than it would if no means were employed to relieve the wedging action of the wedge-block.

With my present improvement, when the draw-bar is pulled outward, the nut 7 on the draft-pin 5 transmits the motion of the draw-bar to the housing 2, and the outward longitudinal movement of the housing is transmitted by the spring 11 to the carrier-plates 12. As the carrier-plates 12 move longitudinally outward they are pressed laterally outward by the wedge-block 8 and clamp the inner and outer wedge-bars together. The outward movement of the wedge-block is resisted by the spring 9, and as the draw-bar continues to move outward the spring 9 is compressed, and when the ends of the carrier-plates 12 come in contact with the follower-plate 10 the spring 11 is compressed, the housing 2 and the outer wedge-bar 16 are moved outward or to the left, as shown in Fig. 1, relatively to the inner wedge-bars and carrier-plates, and the spring 17 is compressed by its contact with the wedge-block.

When the draft or pulling action on the draw-bar ceases, the spring 9 expands and moves the wedge-block, carrier-plates, and housing inwardly, and with them the draft-pin and draw-bar. The pressure exerted by the spring 9 on the wedge-block is lessened, and as the spring 9 continues to expand the force with which the wedge-block presses the carrier-plates outward is relieved by the expansion of the spring 17, which tends to increase the distance between the wedge-block and the inner end wall of the housing, and thereby relieves the wedging action of the wedge-block, and as the springs 11 and 17 expand the parts are returned to their normal positions.

My present improvement permits the employment of a wedge-block and carrier-plates in which the angle of inclination of the wedging-surfaces may be much smaller than could be otherwise employed, and the efficiency of the wedging devices is thereby increased. If the angle of the inclination of the outer surface of the wedge-block and of the inner surfaces of the carrier-plates is made great enough to insure at all times, a prompt release of the friction devices, a much greater force will be required to secure the necessary friction, and the efficiency of the device will be much less than with my improvement. As the angle of the inclination of these surfaces is decreased to obtain the greatest efficiency of the wedging devices, the tendency of the parts to stick and prevent a prompt release increases, and this tendency is overcome by means of my improvement and a prompt release of the friction devices insured.

As shown in the drawings, the inner ends of the parts 3 and 4 of the main frame or casing extend laterally toward one another until they abut one against the other, and they are provided with lugs 20 and 21, having bolt-holes through them for the bolts 22 and 23, by means of which the inner ends of the frame are secured together. The longitudinal ribs 24 and 25 extend around and on the outside of the inner ends 18 and 18ª of the frame, and are formed integral with the semi-cylindrical portions 26 and 27, which form a central hub surrounding the draft-pin and the nut 7.

The inner end of the draft-pin 5 is screw-threaded and provided with an adjustable screw-threaded nut 7, which is adapted to bear against the inner end of the housing 2 and to transmit motion thereto when the draw-bar is moved outward. That portion of the nut 7 which bears against the housing 2 is provided with a cylindrical recess 28, of slightly greater diameter than the screw-threaded portion of the draft-pin which it covers, so that the left-hand end portion of the nut is not engaged with the screw-threaded portion of the draft-pin, but projects over and covers the screw-threads, so as to protect them from dust and dirt and from injury by contact with the housing, and, as shown in Fig. 1, a recess 29 of the same diameter is formed within the nut. The inner end of the draft-pin is turned down to a smaller diameter than the screw-threaded portion of the draft-pin, and the inner end or the extension of the nut 7 or the right-hand end, as shown in Fig. 1, fits closely around this reduced portion of the draft-pin and protects the inner portions of the screw-threads from dust and dirt.

The portion of the screw-thread on the draft-pin which is to the left of the screw-thread on the nut is necessary to permit the adjustment of the nut to take up any undue lost motion between the nut and the housing, and the recesses 28 and 29, being of greater diameter than the screw-threaded portions of the draft-pin and nut, permit the adjustment of the nut without jamming, the extent of the adjustment being limited by the length of

the recesses 28 and 29, measured in the direction of the axis of the nut.

An opening 30 is formed through the inner end of the nut to receive a pin 31, which is provided with a head which fits closely in or is but little smaller than the width of the opening, so that the nut is locked in position when the pin is in place. Measured longitudinally, or in the direction of the axis of the nut, the size of the opening 30 is such that when the pin 31 is removed the nut may be adjusted to the desired extent and the opening 30 turned into position to permit the replacing of the pin—that is, the pin may be replaced after the nut has been given one or more turns or half-turns from the position shown in the drawings, as such movement of the nut will bring the opening 30 in line with the opening through the draft-pin. On account of the comparatively small size of the screw-threads no adjustment of the nut less than a half-turn will be necessary.

I claim as my invention and desire to secure by Letters Patent—

1. The combination, in a draw-gear, or buffing, apparatus of frictional devices adapted to be forced together for the purpose of creating a frictional resistance, a device which is adapted to force the frictional devices together by a wedging action, and means for releasing or relieving the wedging action, substantially as set forth.

2. The combination, in a draw-gear or buffing apparatus, of intercalated frictional devices, a wedging device for forcing the frictional devices together to create a frictional resistance, and means for releasing the wedging device, substantially as set forth.

3. The combination, in a draw-gear or buffing apparatus, of an inner and an outer series of friction devices, carriers for the inner series of frictional devices, a wedge-block which is adapted to act on the carriers and wedge them outward to cause a frictional resistance between the inner and outer series of friction devices, and means adapted to act on the wedge-block and diminish or prevent its wedging action when the action of the pulling or buffing force ceases, substantially as set forth.

4. The combination, in a draw-gear, or buffing, apparatus, of an inner and an outer series of wedge-shaped bars, carrier-plates on which the inner series of wedge-bars bear, and by which they are moved relatively to the outer series, a wedging device for forcing the carrier-plates laterally outward and thereby pressing the inner and outer series of wedge-bars together, and a releasing device which is adapted to act on the wedging device to release or diminish its wedging action when the pulling or buffing force ceases, substantially as set forth.

5. The combination, in a draw-gear, or buffing, apparatus, of frictional devices adapted to be forced together for the purpose of creating a frictional resistance to the movement of a draw-bar, or buffer-head, a wedging device by which the frictional devices are forced together, and a spring which is adapted to act on the wedging device to prevent or diminish its wedging action when the pulling, or buffing force, by which the draw-bar or buffer-head is actuated, ceases, substantially as set forth.

6. The combination, in a nut, of a screw-threaded portion, recessed portions on each side of the screw-threaded portion which are of greater internal diameter than the screw-threaded portion, and an extension or end portion the internal diameter of which is equal to or less than the internal diameter of the threaded portion, substantially as set forth.

7. The combination, in a nut, of a screw-threaded portion, recessed portions on each side of the screw-threaded portion which are of greater internal diameter than the screw-threaded portion, an extension or end portion the internal diameter of which is equal to or less than the internal diameter of the threaded portion, and a transverse opening or passage through the extension or end portion, substantially as set forth.

8. The combination with a screw-threaded bolt, or pin, of a nut provided with an internal screw-threaded portion, recessed portions on each side of the screw-threaded portion of the nut which are of greater internal diameter than the diameter of the screw-threaded portion on the bolt or nut, an end portion or extension on the nut which is adapted to fit closely on a reduced portion of the bolt or pin, and a passage through the end portion or extension of the nut which is adapted to register with, or be placed in line with, an opening through the bolt, or pin, whereby the nut may be locked in position by a pin passing through the openings in the nut and pin, substantially as set forth.

In testimony whereof I have hereunto set my hand.

FRANK MOORE.

Witnesses:
J. SNOWDEN BELL,
F. E. GAITHER.