

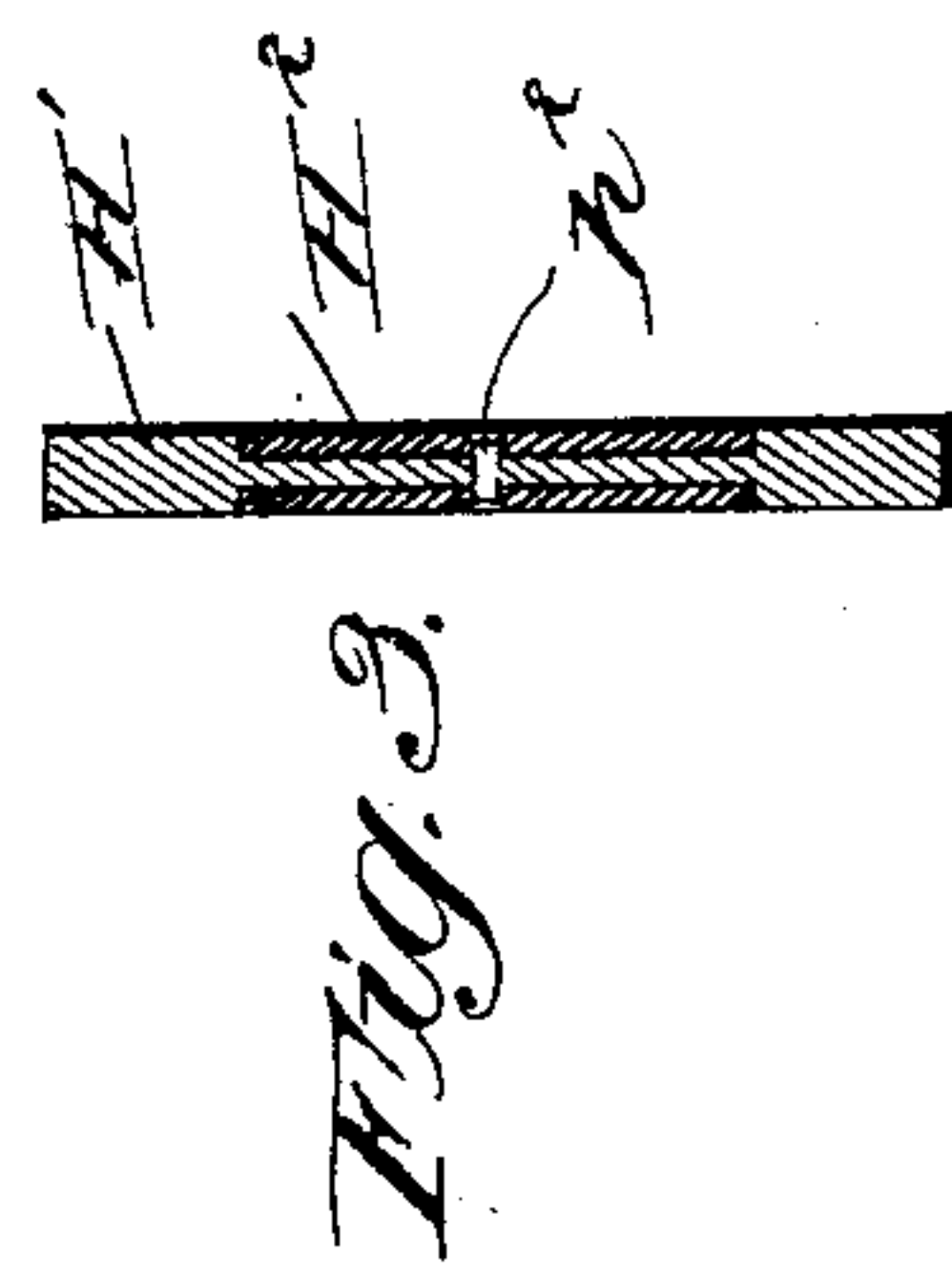
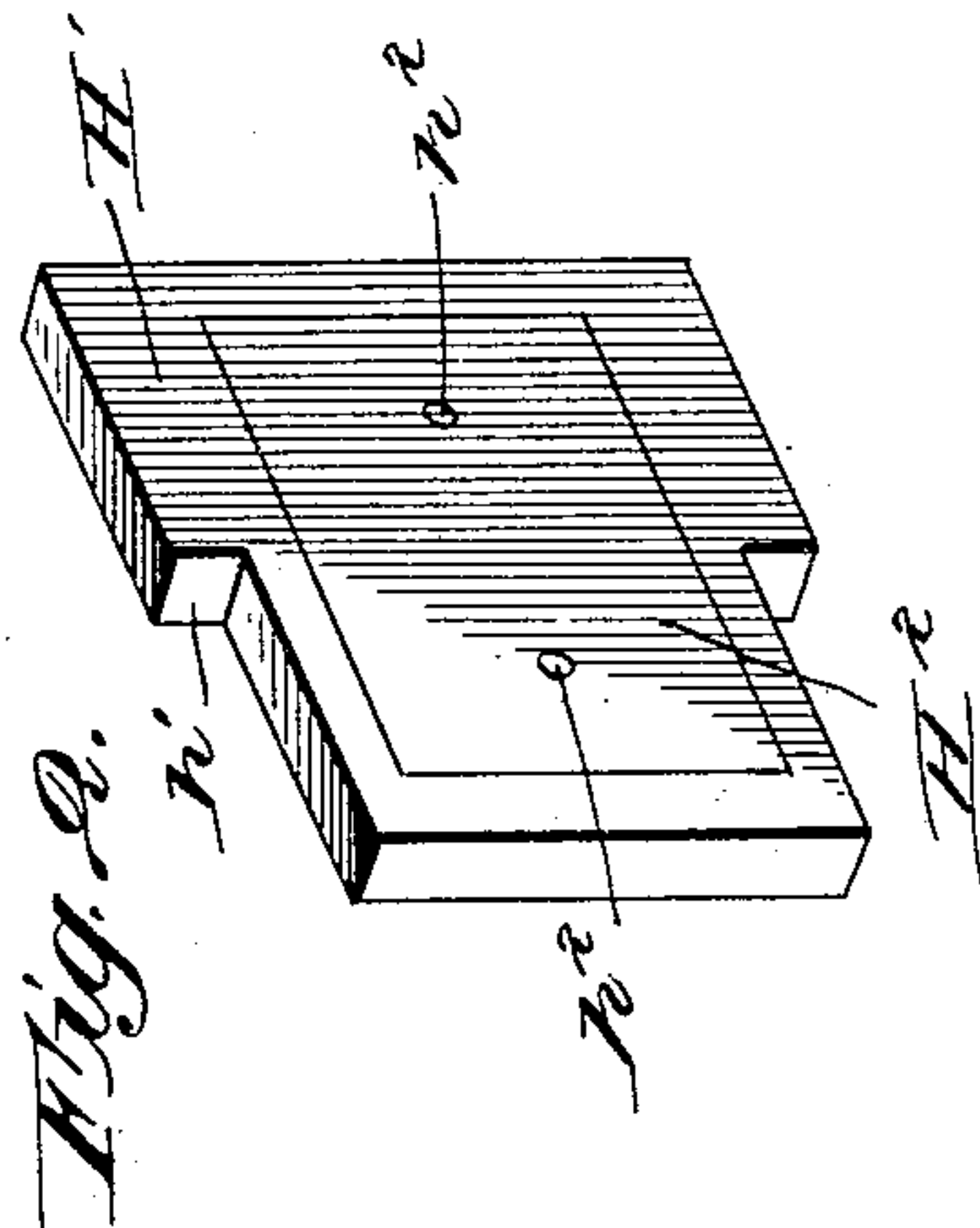
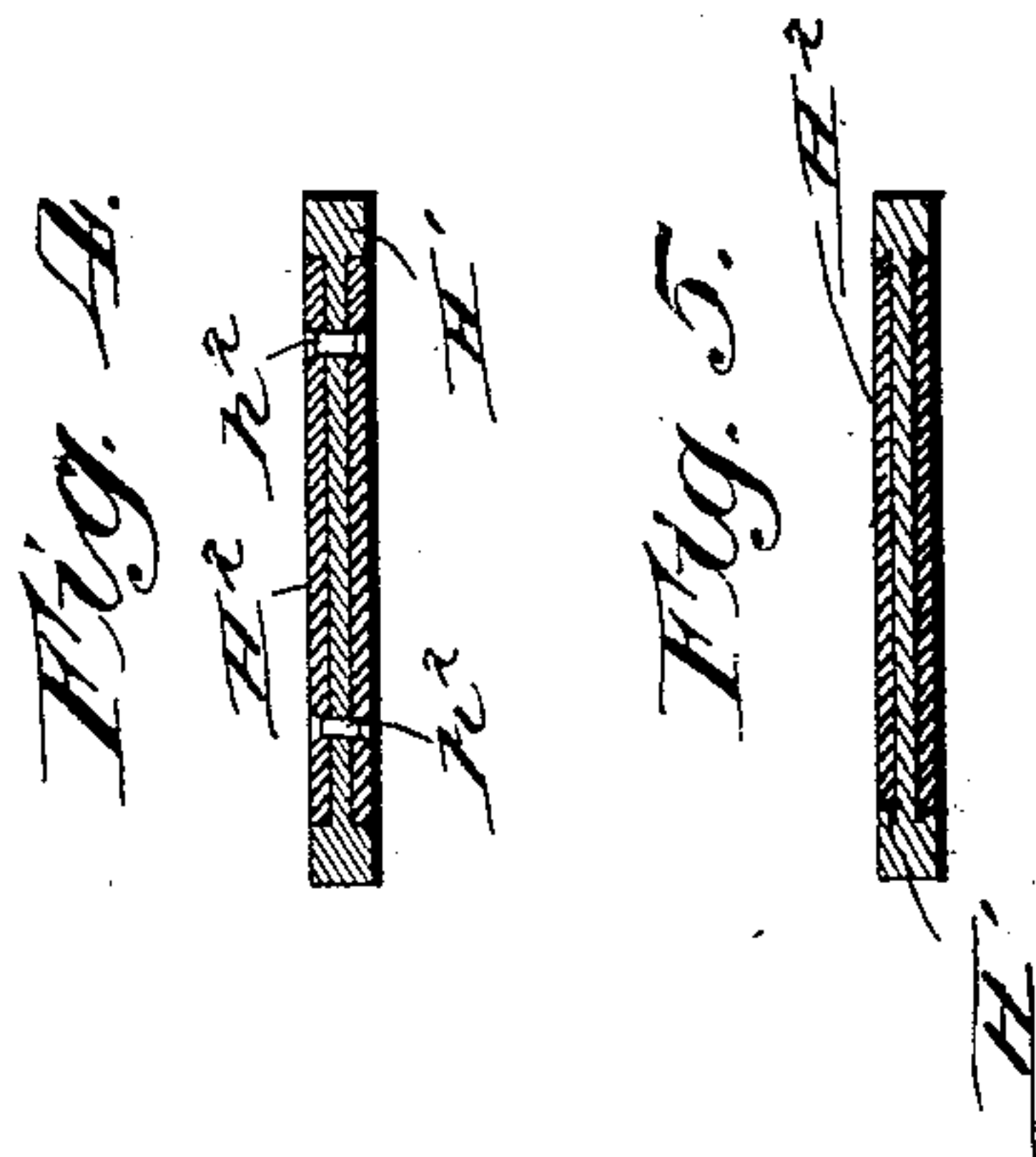
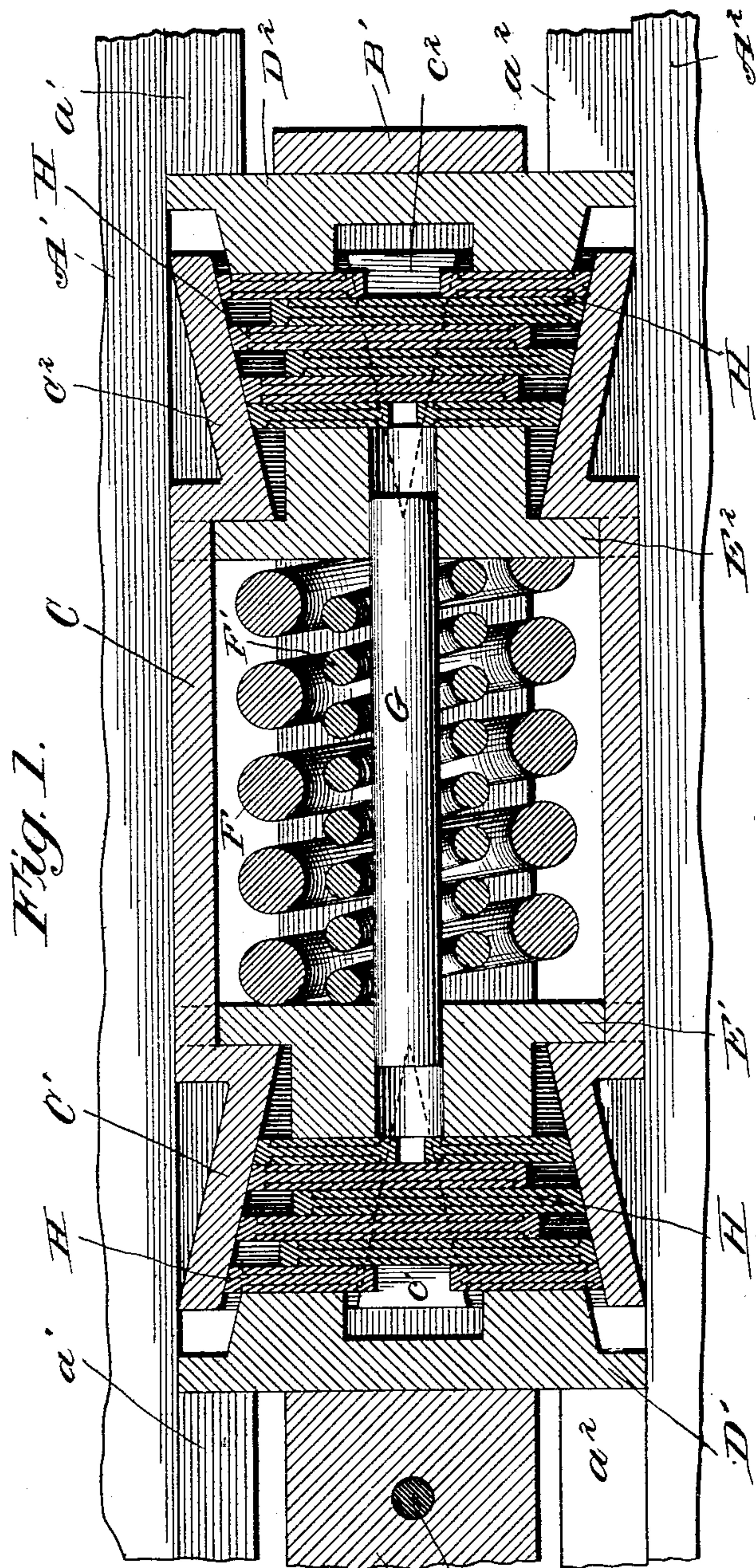
P. HIEN.

DRAW GEAR AND BUFFING APPARATUS.

(Application filed Sept. 16, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

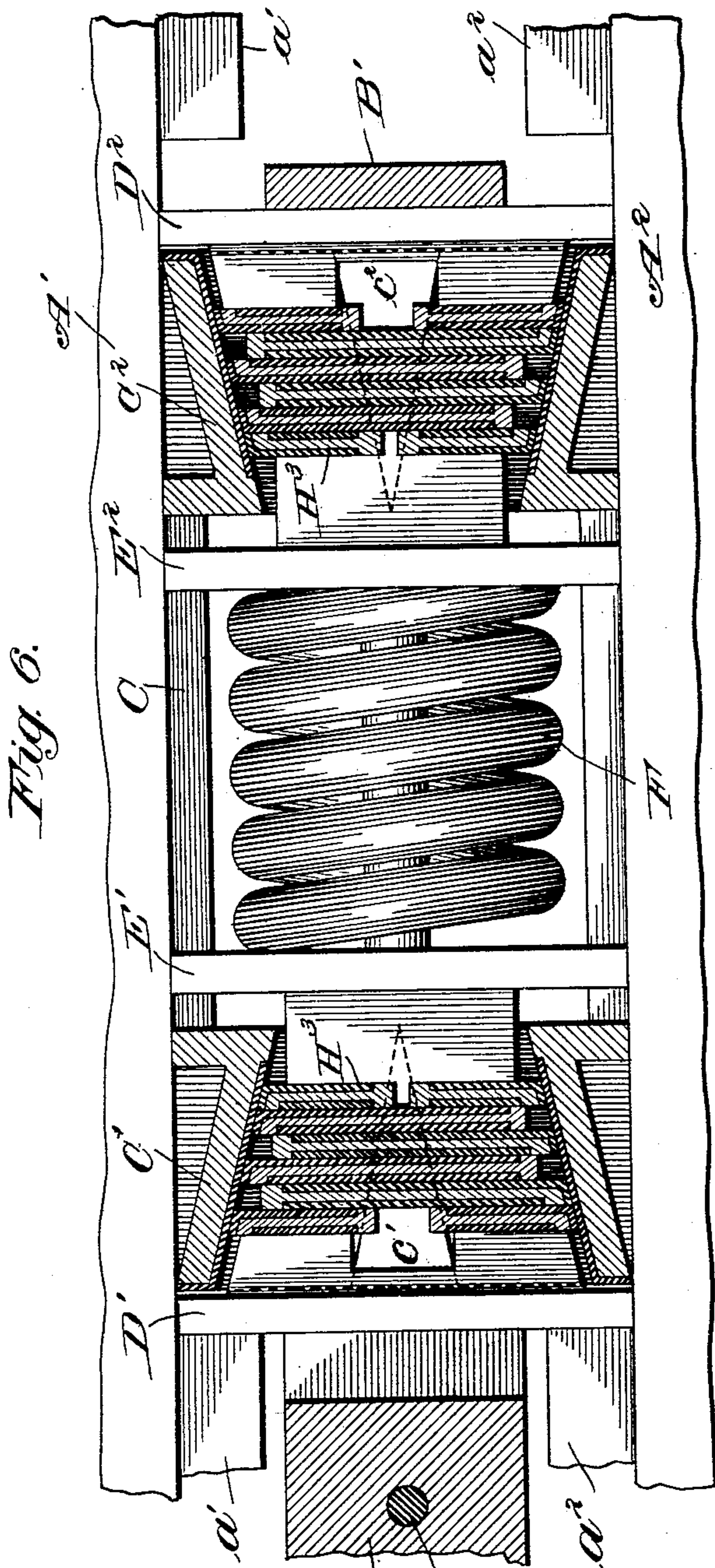


Fig. 6.

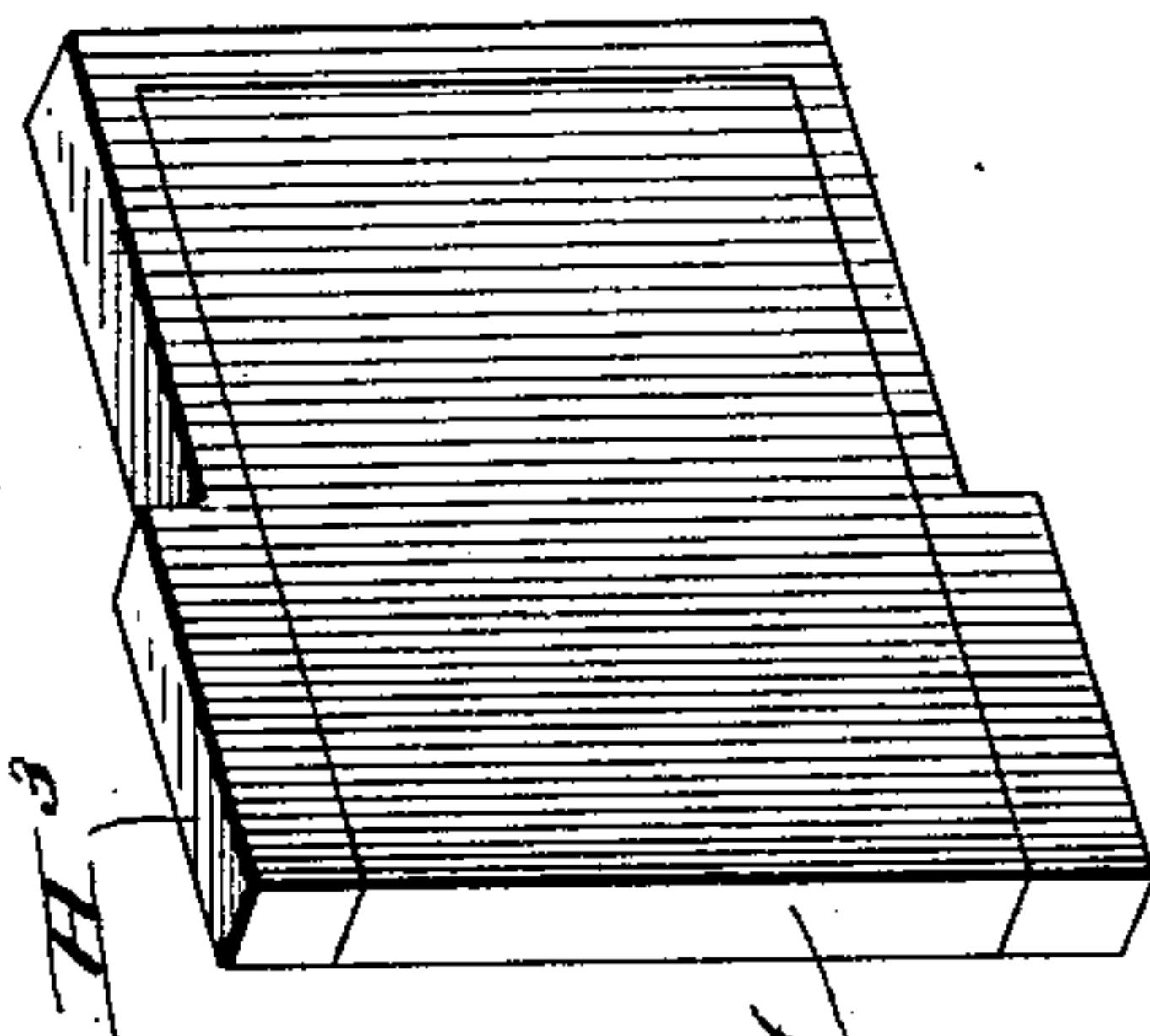


Fig. 9.

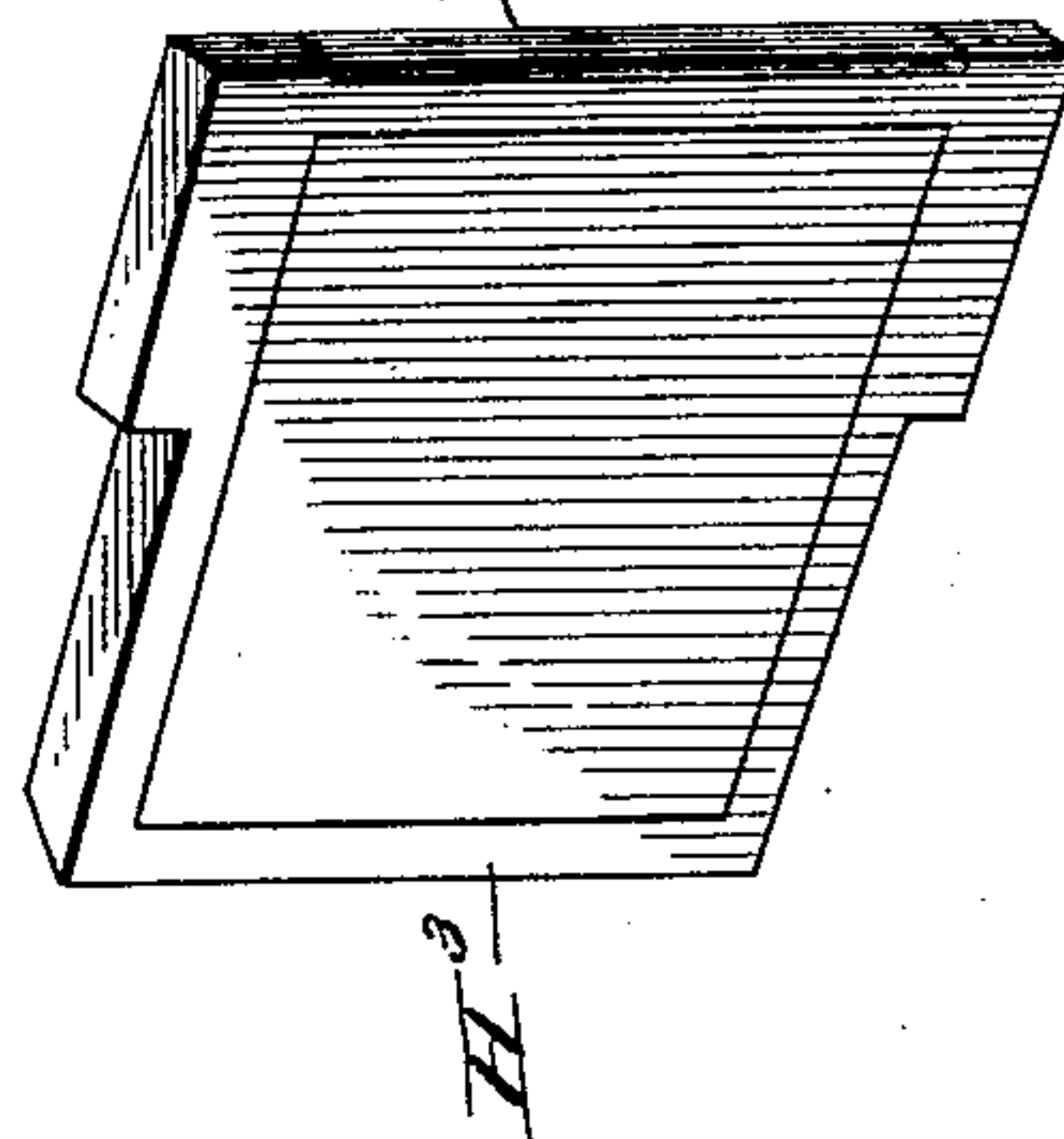


Fig. 8.

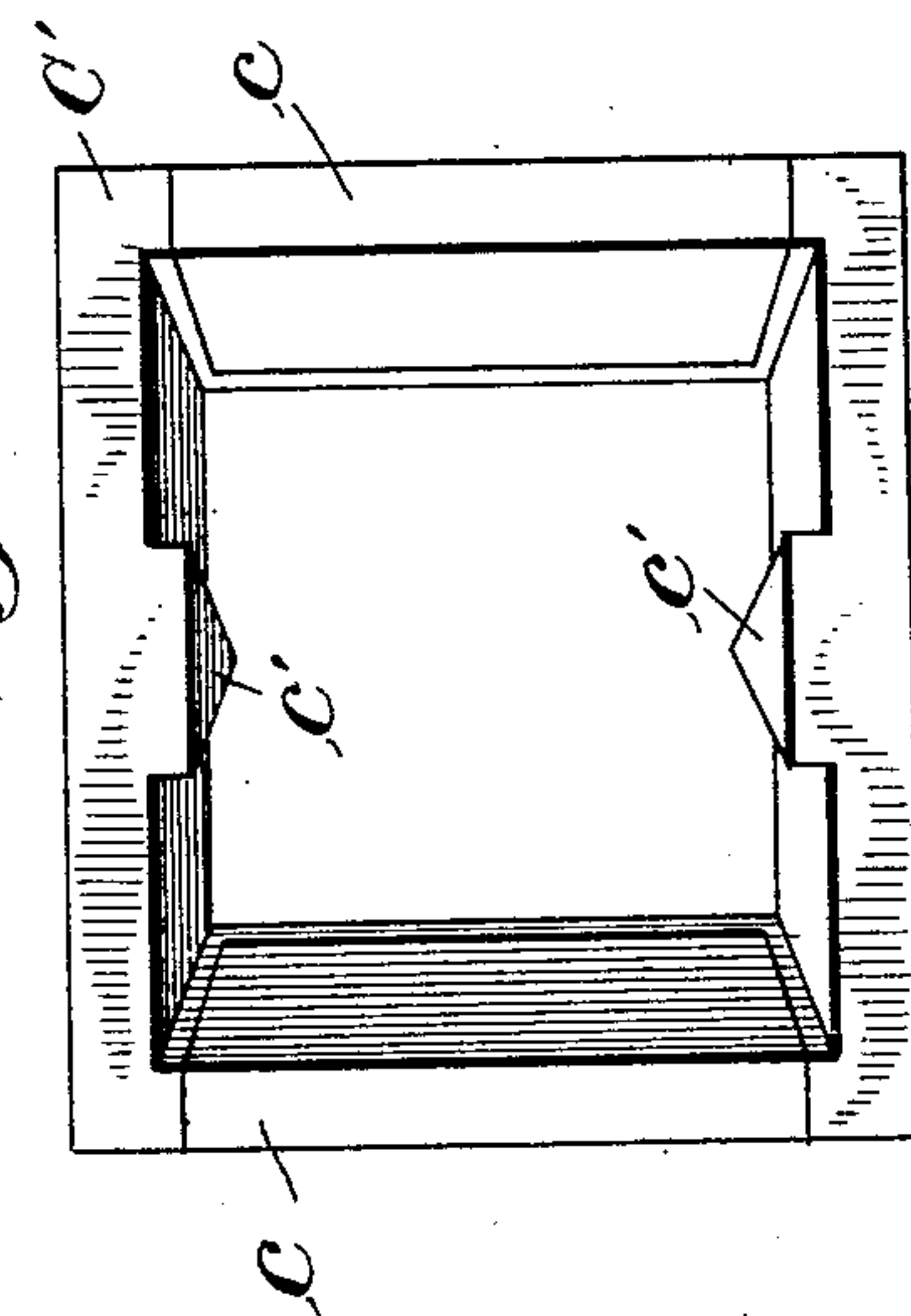


Fig. 7.

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UNITED STATES PATENT OFFICE.

PHILLIP HIEN, OF CHICAGO, ILLINOIS.

DRAW-GEAR AND BUFFING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 702,946, dated June 24, 1902.

Application filed September 16, 1901. Serial No. 75,607. (No model.)

To all whom it may concern:

Be it known that I, PHILLIP HIEN, 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 generally 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 reduce or dissipate the shocks due to the pulling and buffing force incident to the starting and stopping of trains.

An object of my invention is to provide a draft-gear or buffing apparatus of the type referred to which will produce the resistance requisite for graduating the strain between the draw-bar and the frame of the car and which will also prevent the sudden recoil of the resistance-producing elements when the strain is relieved.

A further object of my invention is to provide a friction device for use in a draw-gear and buffing apparatus of the class referred to which when forced into engagement with other similar devices will be capable of producing the requisite frictional resistance and which when moved relatively to the contacting devices will exert the necessary retardation to the movement of the draw-bar without unduly wearing away the engaging surfaces.

A still further object of my invention is to produce a friction device of the character described which will be simple in construction, inexpensive in manufacture, and durable as well as efficient in operation.

My invention, generally stated, consists in an apparatus similar to that disclosed in my pending application, Serial No. 69,991, filed July 27, 1901, and in which overlapping friction devices have frictional resistance imposed upon them by a longitudinal movement and are moved relatively transversely to forcibly retard the movement of the draw-bar relative to the draft-timbers of the car.

My invention further consists in a friction device adapted to be used in a draw-gear and buffing apparatus, composed of different materials, the body portion, which is not subjected to wear, being formed of an inexpensive material—such, for instance, as gray iron—and the engaging surfaces upon which the frictional resistance is imposed being formed of hard material, preferably steel.

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

Figure 1 is a longitudinal horizontal section through the center of my improved apparatus, so much of the draft-rigging and guides therefor being shown as is necessary to illustrate the connection of my improvement therewith; Fig. 2, a perspective view of one of the friction devices removed from the apparatus; Fig. 3, a vertical transverse section through the friction device; Fig. 4, a horizontal transverse section of the friction device; Fig. 5, a view similar to Fig. 4, showing a modification of the friction device; Fig. 6, a plan view embodying modifications of my improved apparatus with the parts shown in the position which they assume when subjected to a pulling strain, the upper walls of the end portions of the casing being removed to more clearly show the parts within; Fig. 7, a perspective view looking into the end of the casing, and Figs. 8 and 9 perspective views of a modified form of the friction device.

Similar reference characters are used to indicate similar parts in the several views of the drawings.

Reference-letters A' and A² indicate the draft-timbers of a car, to which are secured suitable guides for supporting the draw-gear and friction apparatus and suitable stops a' and a² for limiting the movement of the apparatus relative to the draft-timbers.

The draw-bar B may be connected to the improved apparatus by any suitable means—such, for instance, as a strap or yoke B', which is connected at its ends to the enlarged end of the draw-bar by a suitable fastening device b. The draw-gear and buffing apparatus is located within the strap, one of the

follower-plates D' engaging the end of the draw-bar and the other follower-plate D^2 engaging the end of the strap opposite to its connection with the draw-gear.

- 5 C indicates a casing or housing which comprises end portions C' and C^2 , preferably rectangular in shape, and side portions connecting the end portions and preferably formed integral therewith. The opposite interior
10 surfaces of the end portions C' and C^2 are inclined, while the interior surfaces of the upper and lower sides of each of the end portions are provided with wedge-shaped guides c' and c^2 , respectively. The inclined interior
15 surfaces of the end portions C' and C^2 may be provided with faces formed of hard material—as, for instance, steel—which will better withstand the wear caused by the engagement therewith of the inclined ends of the
20 friction devices. These plates c may be secured to the inclined surfaces within the end portions C' and C^2 by any suitable means and preferably extend around the ends of such inclined surfaces, as clearly shown in
25 Figs. 6 and 7, thereby more securely retaining such plates in proper position when engaged by the friction devices. Follower-plates E' and E^2 are located between the end portions of the casing and are supported by
30 and guided on the sides thereof. Interposed between the follower-plates E' and E^2 is a spring F and, if desired, an auxiliary spring F' , both of which bear at their opposite ends upon the inner faces of the follower-plates
35 E' and E^2 . A guide-rod G for preventing the displacement of the springs passes longitudinally through the centers of the springs and is supported at its ends by openings formed through the centers of the interior follower-
40 plates. The follower-plates E' and E^2 are provided with reduced extensions which project within the end portions C' and C^2 of the casing. Exterior follower-plates D' and D^2 , located at the ends of the casing, are pro-
45 vided with projecting portions, which extend slightly within the ends C' and C^2 of the casing.

The casing C is supported through its engagement with the guides secured to the
50 draft-timbers, so as to be capable of bodily movement in either direction.

A series of any desired number of overlapping friction devices are located within the end portions of the casing and between the
55 followers D' and E' and D^2 and E^2 , respectively. These overlapping friction devices may preferably be in the form of plates, each provided with beveled ends, corresponding in inclination to the inner surface of the sides
60 of the end portions of the casing and with shoulders h' , inclined to correspond with the inclination of the guide-wedges c' and c^2 . The distance between the end of the friction-plate which engages the side of the casing and the
65 shoulders h' , which engage the guide-wedges, is substantially equal to the distance between the inclined sides of the casing and the op-

posite edges of the guide-wedges. Two friction-plates H engage the extension on the fol-
70 lower-plates D' and D^2 , and two of such plates also engage the portions of the followers E' and E^2 which extend within the ends of the casing. Between the pairs of friction-plates
75 which engage the followers are interposed overlapping friction-plates, each of which extends from one of the inclined surfaces of the casing transversely across the opening formed
80 therein and terminates a distance from the opposite inclined surface of the casing sufficient to permit a movement of the plate transversely within the casing. Each of the friction-plates is preferably formed of two dif-
85 ferent materials, so that it may possess the greatest durability at a minimum expense. The main portion of each friction-plate consists of an inexpensive grade of metal—such,
90 for instance, as gray cast-iron—which is formed with recesses in the opposite faces thereof to receive a harder material capable of withstanding the wear incident to the en-
95 gagement between the faces of the friction devices. The hard wearing material, preferably steel, may be secured within the recesses in the friction-plates in any desired manner—as, for instance, by rivets h^2 , pass-
100 ing transversely through the plates, as indicated in Figs. 3 and 4—or the body portion H' of the friction-plate may be provided with overhanging edges around the recesses there-
105 in, whereby the inserted metal when cast in such recesses will be retained therein by a dovetail connection, as clearly indicated in Fig. 5.

In the modification of the friction-plates shown in Figs. 8 and 9 the inserted portion
110 on one face extends around the inclined end of such plate, thereby rendering the plate less likely to be worn away through its engagement with the inclined interior surface of the end portion of the casing. The insert on the
115 face of each friction device toward the interior followers should extend around the inclined end of each plate, as the forcible engagement between the inclined surfaces within the end portions of the casing and the ends
120 of the friction devices occurs when the friction devices are moved toward the center of the casing, and by having the plates on the surfaces of the friction devices toward the interior followers continue around the ends
125 of the devices the inserted plates are less likely to be torn from the body portions of the devices when they are forced into engagement with the inclined surfaces of the casing.

The operation of my invention, which will
130 be readily understood from the foregoing description, is as follows: When a pulling strain is exerted upon the draw-bar B , the yoke B' , through its engagement with the exterior fol-
135 lower B^2 , forces the friction-plates into engagement with each other, owing to the tension of the springs resisting the movement of the follower-plate E^2 . The inclined inner faces of the end portion C^2 of the casing,

through their engagement with the ends of the friction-plates, cause the latter to relatively slide transversely, and thereby retard the movement of the follower D^2 , and consequently the movement of the draw-bar B. The opposite interior follower-plate D' is held immovable, owing to its engagement with the stops on the draft-timbers during a pulling strain upon the draw-bar. The engagement between the ends of the friction-plates and the inclined surfaces in the end portion C^2 of the casing moves the latter bodily toward the follower D' , and thereby forces into frictional contact the friction devices within the end portion C' of the casing, such plates being forced against the follower D' by the tension of the springs exerted through the interior follower-plate E' . The friction-plates within the end portion C' are relatively moved transversely by the inclined surfaces within such end portion as the latter approaches the follower D' .

The action of my improved apparatus when a strain is exerted upon the draw-bar in an opposite direction to that above described—namely, when a relative movement takes place between adjoining cars—is similar in all respects to the operation above described which occurs when the draw-bar is subjected to a draft or outward strain, except that the follower-plate D^2 is held immovable with respect to the draft-timbers by its engagement with the stops thereon, while the follower-plate D' is engaged by the end of the draw-bar B, and thereby forced toward the follower-plate D^2 . When the strain upon the draw-bar is relieved, the follower-plates are gradually returned to their normal positions relative to the casing by expansion of the springs, such expansion moving the followers E' and E^2 outwardly, thereby returning the series of friction-plates, through their engagement with the guide-wedges c' and c^2 , to their normal positions, and through their contact with the followers D' and D^2 the latter are forced into engagement with the stops a' and a^2 on the draft-timbers. No special means are therefore required for restoring the parts of my improved apparatus to their normal positions, such restoration being accomplished by the expansion of the springs, the compression of which effected the frictional engagement between the series of overlapping plates.

From the foregoing description it is evident that I have produced a draw-gear and buffing apparatus in which a series of friction devices are brought into frictional contact by a longitudinal movement and are then relatively moved transversely to produce the requisite retardation. It is also evident that I have produced a friction device for use in an apparatus of the character referred to which will exert the necessary retardation when brought into frictional contact, and yet will be rendered inexpensive by reason of the body portion being constructed of a cheap grade of

metal within which are inserted surfaces formed of metal possessing the requisite hardness to give durability to the device.

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. I do not, however, claim herein, broadly, a draw-gear and buffing apparatus comprising a series of detached overlapping friction devices which are forced into frictional engagement and then moved transversely to the line of draft, inasmuch as I claim the structure referred to generically in my pending application, Serial No. 69,991, filed July 27, 1901.

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 hollow casing, of followers on either side of and extending within said casing, pairs of friction devices within said casing engaged by said followers, overlapping friction devices interposed between said pairs of said devices, means for moving said followers toward each other and thereby forcing said devices into frictional engagement, and means for moving the friction devices in each of said pairs toward each other and also relatively moving adjacent interposed overlapping devices transversely to the line of draft, substantially as described.

2. In a draw-gear and buffing apparatus, the combination with a casing having hollow end portions, of followers on either side of said end portions and extending within the same, pairs of friction devices within each of the hollow portions of said casing engaged by the followers on either side of said end portions, overlapping friction devices interposed between said pairs of such devices, means for forcing said devices into frictional engagement, and means for simultaneously or successively moving the devices in each of said portions toward each other and also moving relatively adjacent interposed overlapping devices transversely to the line of draft, substantially as described.

3. In a draw-gear and buffing apparatus, a friction device comprising friction-surfaces, a beveled edge, and corresponding beveled shoulders projecting from the edges of the sides thereof, substantially as described.

4. In a friction device for a draw-gear and buffing apparatus, the combination with a body portion having a beveled end and guide-shoulders projecting from opposite side edges, of friction-surfaces secured to the opposite faces of said body portion, substantially as described.

5. In a friction device for a draw-gear and buffing apparatus, the combination with a

body portion having a beveled end, of friction-surfaces secured to opposite faces of said body portion and to said beveled end, substantially as described.

5 6. In a friction device for a draw-gear and buffing apparatus, the combination with a body portion having a beveled end, of friction-surfaces secured to the opposite faces of said body portion, one of said friction-surfaces continuing around said beveled end, 10 substantially as described.

7. In a friction device for a draw-gear and buffing apparatus, the combination with a body portion having a beveled end, of friction-surfaces secured to the opposite faces of 15 said body portion, the friction-surface on the smaller face extending around said beveled end, substantially as described.

8. In a draw-gear and buffing apparatus, a 20 casing comprising a hollow end portion, having inclined interior surfaces, and wedges formed on the interior surfaces intermediate of the inclined surfaces, substantially as described.

25 9. In a draw-gear and buffing apparatus, a casing comprising hollow end portions having inclined interior surfaces, and wedges formed on the interior surfaces intermediate of the inclined surfaces, and side portions

uniting said end portions, substantially as 30 described.

10. In a casing for a draw-gear and buffing apparatus, the combination with a hollow end portion, having inclined interior surfaces, of wearing-plates secured to said inclined interior surfaces, and wedges formed on the interior surfaces intermediate of the inclined 35 surfaces, substantially as described.

11. In a casing for a draw-gear and buffing apparatus, the combination with hollow end 40 portions having inclined interior surfaces, of wearing-plates secured to said inclined interior surfaces, said wearing-plates extending around the outer ends of said surfaces, substantially as described. 45

12. In a casing for a draw-gear and buffing apparatus, the combination with hollow end portions having inclined interior surfaces, of wearing-plates secured to said inclined interior surfaces, and side portions uniting said 50 end portions of the casing, substantially as described.

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

PHILLIP HIEN.

Witnesses:

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CLARA C. CUNNINGHAM.