F. J. PARISH.

DOOR BUFFER.

APPLICATION FILED APR. 27, 1914.

1,233,116.

Patented July 10, 1917.

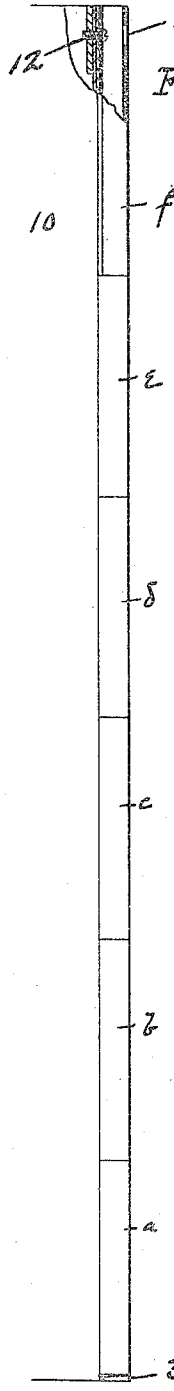


Fig. 1.

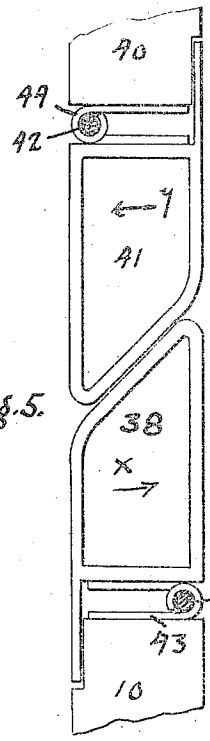


Fig. 5.

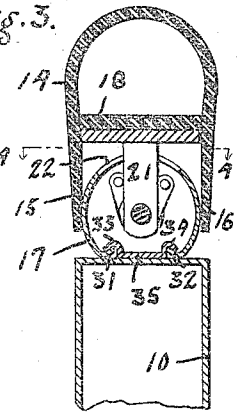


Fig. 3.

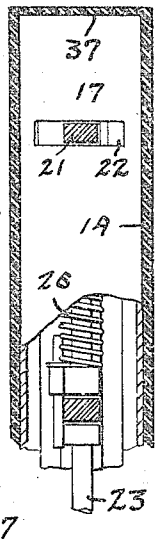


Fig. 4.

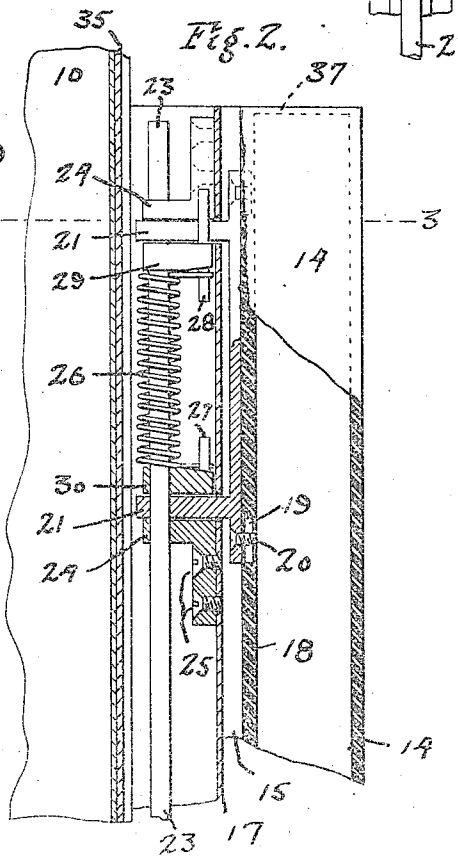


Fig. 2.

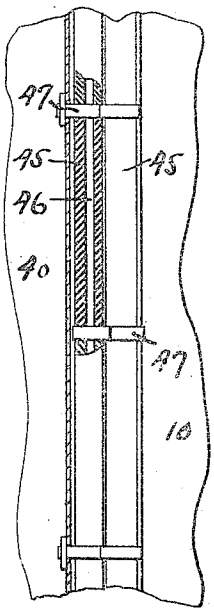


Fig. 6.

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UNITED STATES PATENT OFFICE.

FRANK J. PARISH, OF BROOKLYN, NEW YORK, ASSIGNOR TO GRINDEN ART METAL COMPANY, OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

DOOR-BUFFER.

1,233,116. Specification of Letters Patent. Patented July 10, 1917.

Application filed April 27, 1914. Serial No. 834,782.

To all whom it may concern:

Be it known that I, FRANK J. PARISH, a citizen of the United States of America, and residing in the borough of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Door-Buffers, of which the following is a specification.

My invention relates to door buffers and particularly to buffers for sliding doors such as are commonly employed in street cars, railway, passenger cars, etc. The object of my invention is to provide a buffer of improved construction incorporating novel features of safety, illustrated by way of example in the accompanying drawings, in which,

Figure 1 is a side elevation of portion of a door having a buffer in which my invention is embodied in one form;

Fig. 2 is a vertical section through portion of a buffer section;

Fig. 3 is a horizontal section on the line 3—3, Fig. 2;

Fig. 4 is a section on the line 4—4, Fig. 3, partially broken away;

Fig. 5 is a horizontal section through portion of a door and its abutment showing a modified construction; and

Fig. 6 is a vertical elevation of a similar part showing another modification.

It has become customary to provide the sliding doors of passenger cars such as employed on street railways, subways, and the like, with tubular rubber buffers in order to somewhat protect against injury the hands, arms or legs of passengers who have not completely cleared the door at the moment it is shut. These doors are commonly operated with great power, exerted either manually through lever systems, or by motor power through air pressure, electric motors and the like. While a cushioning buffer of this character may save the hand or arm from being broken or mashed, it offers no protection against the part being gripped so tightly that it cannot be withdrawn, and consequently, accidents are not uncommon which result from the person being dragged along by the car with the hand or arm thus caught by the door. Still more frequently are injuries to clothing which is thus caught by the closing door and torn. The object of my invention is to provide a buffer of such character that the hand or other part, or clothing, may be readily pulled free in spite of the fact that the door has been fully closed upon it.

In perhaps its simplest form, my invention is embodied in a buffer of this character, which, in the danger zone, is made in sections each of which is free to yield transversely to the plane of the door and independently of adjacent sections, to permit the withdrawal of a part caught thereby. Thus in Fig. 1, the door 10 is provided at its vertical edge with a tubular rubber buffer 11 comprising a plurality of sections *a*, *b*, *c*, *d*, *e* and *f*. Whether each section is fastened independently, as by screws 12 accessible through holes 13, or by a common fastening member, is immaterial. In any case, each section is laterally yieldable, through the resiliency of the rubber, to permit the withdrawal of a limb or garment caught between the edge of the door and its jamb. It is obvious that the sectional construction of the buffer permits the much more ready withdrawal of the part caught, than is the case when the buffer is a one-piece construction, since the frictional resistance between the buffer and door jamb which must be overcome to permit a section to yield is only that of the single section which engages the part caught. The remaining sections are unaffected and the withdrawal effort is exerted only upon that particular section the yielding of which is necessary to free the part caught. Thus the power required for this purpose is minimized. A second and most important effect of this construction lies in the fact that since the remaining sections of the buffer are unaffected by the deflection of a particular section, they remain in position to take up the thrust of the closing motor or power. The deflection of a single section thus does not result in a further closing movement of the door under the influence of the closing power, as would be the case were the entire buffer deflected. In the latter case, the withdrawal effort must be exerted at its maximum until the part caught is entirely freed, since with every partial deflection of the buffer as a whole, the closing motor presses the door further shut and thus maintains the pressure constant against the part caught by the door. Where a single section only is deflected, the effort to secure the release is not only less, but it needs to be exerted at its maxi-

mum only momentarily to overcome the initial frictional resistance to deflection and this resistance is not renewed after deflection since the thrust of the closing power is taken up by the remaining sections of the buffer which remain in normal position.

Various other ways of securing this action will readily suggest themselves. In Figs. 2, 3 and 4 I have shown one efficient construction for the purpose. In this form each buffer section may comprise a tubular cushion 14 with side wings 15—16 overlapping the arched metal supporting frame 17. The web 18 of the cushion may have nuts 19 embedded therein to receive the screws 20 passing through the base of the rocking lugs 21. These lugs pass through slots 22 in the crown of the arch frame 17 and pivot on a rod 23 mounted in the standards 24, the base of which is fastened by screws 25 to the frame 17. A coil spring 26 is arranged on the rod 23 between each pair of standards 24 and the free ends of the spring engaged with pins 27, 28 carried by blocks 29, 30 freely mounted on the rod 23. As many of these spring arrangements as desired may be mounted in each section. For sections of one foot length, two are sufficient under ordinary circumstances.

The arch frame 17 may extend the length of the section thus holding the wings 15, 16 of the buffer cushion 14 uniformly extended and flat. The inner edges of the arch frame 17 are preferably recurved to form engaging flanges 31, 32 adapted to slide beneath the raised angled edges 33, 34 of the base plate 35 secured against the vertical edge of the door 10. While these sections may be extended from top to bottom of the door, the danger zone within which the limbs or clothing is apt to be caught, lies below the shoulder. Consequently I prefer to provide the upper section of the door with a stationary buffer cushion of old type and provide these pivoted sections only below this level. This is advantageous for the reason that it facilitates repair or replacing of a section, since it is only necessary to unscrew and remove the upper section to permit all the lower sections to be slid up and off the base plate 35. Furthermore, it permits these sections to be made standard, and only the upper section *f* cut to length to fit doors of various heights. A stop 36 at the bottom of the base plate, prevents the several sections from sliding down below the lower edge of the door.

The operation of these pivoted sections is obvious. Upon deflection of the buffer 14, it rocks on the rod 23 through the lugs 21. These lugs engage one or the other of the pins 27, 28, depending upon the direction of deflection, and thus tension the spring 26, the other end of which is held stationary by the engagement of its pin against its standard 24. Upon the release of the section by the freeing of the part caught, the spring returns the section to normal position.

Since the buffer may be exposed to weather, it is preferable to have at least the upper end of each section closed as by a diaphragm 37 to exclude rain, snow or the like.

Obviously in this arrangement, as in that first described, the buffer may be arranged in the jamb instead of on the edge of the door, or it may be arranged on both jamb and door.

A third embodiment of my invention is shown in Fig. 5. Here the edge of the door 10 is provided with a buffer or sectional buffer 38 pivoted at 39 to swing only in the direction of the arrow *x*. The jamb 40 is provided with another cushion 41 pivoted at 42 to swing only in the direction of the arrow *y*. The meeting faces of the buffer cushions are preferably beveled to facilitate their ready separation. Springs 43—44 arranged on the pivot pins 39, 42 return the buffers to position after deflection.

In the construction shown in Fig. 6, the door 10 and the jamb 40 are provided along their meeting edges with sectional rollers 45 mounted on rods 46, resiliently supported on brackets 47. The use of rollers sacrifices some of the cushioning effect of a tubular buffer, but it does permit of the ready freeing of the part caught, and the cushion effect may be produced by a suitable cushion on the jamb.

Various other modifications will readily suggest themselves and I do not limit my invention to the details shown.

I claim as my invention:—

1. A door buffer of sectional structure comprising a rigid base plate common to a plurality of buffer sections and having a stop at its lower end, a plurality of independent frame sections, in slidable engagement with said base plate and adjustable thereon from its upper end, together with independent cushion elements carried by the respective frame sections.

2. A door buffer of sectional structure comprising a rigid base plate common to a plurality of buffer sections and having a stop at its lower end, a plurality of independent frame sections, in slidable engagement with said base plate and adjustable thereon from its upper end, together with independent cushion elements carried by the respective frame sections, and a fixed section independent of the base plate and adapted to be mounted in position after the removable sections have been attached.

3. A door buffer comprising a plurality of self-contained independent cushion sections and means carried by each cushion section to afford a pivotal support therefor.

4. A door buffer comprising a plurality

of self-contained independent cushion sections, a frame element for each section adapted to be inflexibly secured to its support, and means carried by each cushion section to afford a pivotal connection with said frame element.

5. A door buffer comprising a plurality of self-contained independent cushion sections, a frame element for each section, a fixed base plate common to said buffer sections and to which said frame elements are adapted to be detachably but inflexibly connected, and means carried by each cushion section to afford a pivotal connection with its corresponding frame element.

6. A door buffer comprising a plurality of self-contained independent, pivoted cushion sections, a base plate common thereto and means for detachably mounting the sections thereon together with a complementary cushion member mounted in extension of said pivoted sections and serving to retain the detachable sections on the base plate.

7. A door buffer having a series of pivotally mounted cushion sections yieldable transversely to the plane of the door and a complementary, buffer-completing cushion section yieldable, but without pivotal connection, substantially as described.

8. A door buffer comprising a base plate with raised margins, a sectional buffer having a segmental tubular frame the edges of which form a sliding joint with said base plate and a buffer pivoted on said tubular frame.

9. A door buffer comprising a base plate with raised margins, a sectional buffer having a segmental tubular frame the edges of which form a sliding joint with said base plate, a pivot rod carried by said frame and a buffer carrying lugs pivoted on said rod.

10. A door buffer comprising a plurality of tubular cushion members each having its upper end closed against the admission of rain.

11. A door buffer comprising a supporting frame, and a tubular member pivoted thereon and having lateral extensions embracing said frame member.

12. In a door buffer, a fixed base plate, a plurality of independent, self-contained buffer sections, each comprising a frame member adapted to engage the base plate, a cushion member and a pivoted engagement between the latter and the frame member permitting the cushion member to swing transversely of the plane of the door.

13. In a door buffer, a fixed base plate, a plurality of independent, self-contained buffer sections, each comprising a frame member adapted to engage the base plate a cushion member and a pivoted engagement between the latter and a frame member permitting the cushion member to swing transversely of the plane of the door in either direction.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

FRANK J. PARISH.

Witnesses:
WALTER ABBE,
L. H. GROTE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."