G. W. CHRISTIANS.

SHOCK ABSORBER.

APPLICATION FILED JAN. 21, 1921.

1,371,352. **Patented Mar. 15, 1921.**

Fig. 1.

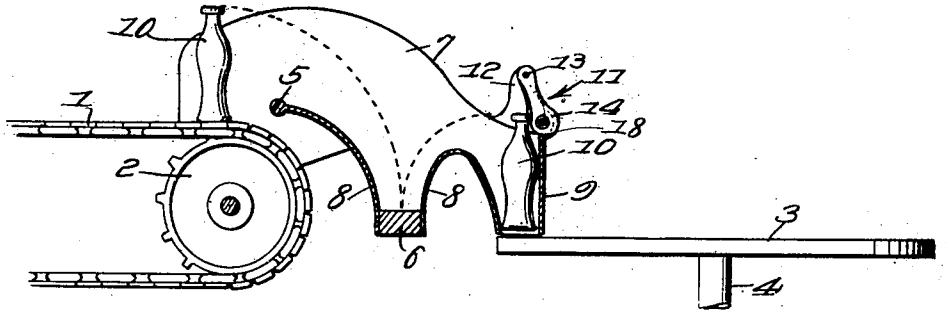


Fig. 2.

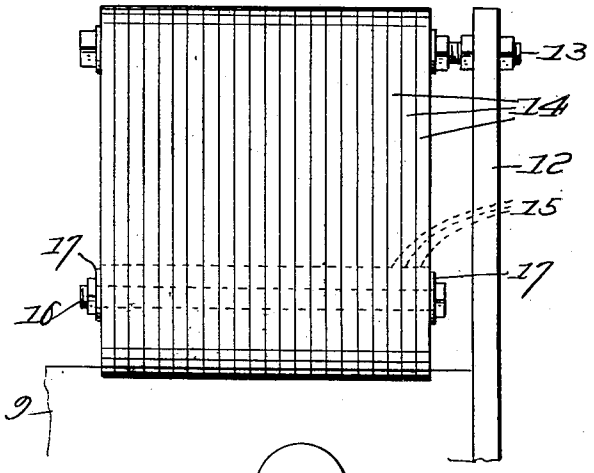


Fig. 3.

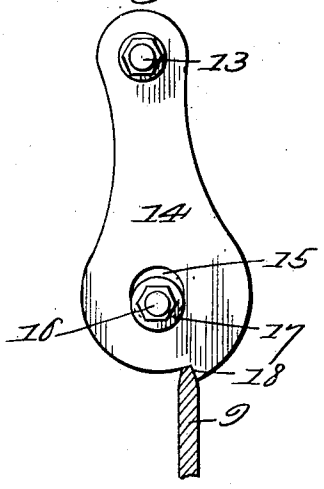
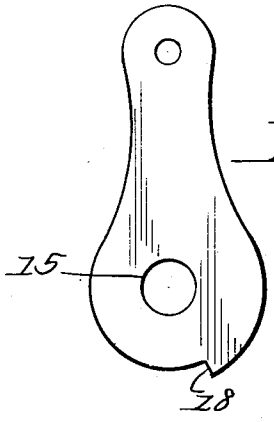


Fig. 4.



Inventor

George W. Christians

By R. E. Barry

Attorney

NORRIS PETERS, INC., LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GEORGE W. CHRISTIANS, OF CHATTANOOGA, TENNESSEE.

SHOCK-ABSORBER.

1,371,352. Specification of Letters Patent. Patented Mar. 15, 1921.

Application filed January 21, 1921. Serial No. 438,893.

To all whom it may concern:

Be it known that I, GEORGE W. CHRISTIANS, a citizen of the United States, residing at Chattanooga, in the county of Hamilton and State of Tennessee, have invented certain new and useful Improvements in Shock-Absorbers, of which the following is a specification.

This invention relates to improvements in shock absorbing mechanism and it was particularly devised to absorb shocks generated by mechanism for agitating the contents of receptacles.

The object of the invention is to provide shock absorbing mechanism which will absorb the shocks produced by fragile articles without liability of breaking or damaging such articles, and which will eliminate the rebound inherent in resilient cushioning means.

A further object of the invention is to furnish a mechanism which will gradually absorb shocks so that a substantially rigid mechanism may be provided instead of the resilient cushioning means already known.

With the foregoing objects outlined and with other objects in view, which will appear as the description proceeds, the invention consists in the novel features hereinafter described in detail, illustrated in the accompanying drawing and more particularly pointed out in the appended claims.

Referring to the drawing:—

Figure 1 is a side view partly in section of a machine for agitating the contents of filled bottles, and showing my improved shock absorbing means applied to such machine.

Fig. 2 is a front view of the shock absorber.

Fig. 3 is an end view of the same.

Fig. 4 is a face view of one of the shock absorbing elements or plates.

In the drawing, 1 designates a portion of an endless belt which travels on a sprocket 2. 3 designates a receiving table rotatable with an axle 4. Arranged between the belt 1 and table 3 is a bottle agitating mechanism including a fixed stop 5, a resilient pad 6, a side wall 7, bottom walls 8, and an end wall 9. The bottles are designated 10, and in practice bottles which have been filled with a syrup and carbonated water for instance and capped, are delivered from the capping machine (not shown) by means of the belt 1. As soon as the filled and capped bottle is moved by the endless belt 1 into contact with the fixed stop 5, the stop will function to arrest the lower portion of the bottle while the momentum of the bottle will cause said bottle to be tumbled and pitched head first onto the resilient pad 6. When the bottle rebounds from the pad 6 its bottom which is uppermost will have shifted toward the table 3, and during the rebound the bottle will assume its normal position and land in standing position on the table 3. At the time the bottle lands, its head will be thrown toward the wall 9 and to prevent the shock from injuring the bottle, I have provided the improved shock absorber 11.

As best shown in Figs. 2, 3 and 4, this shock absorber includes a standard 12 which carries at its upper end a horizontally disposed axle 13. A series of link elements or plates are pivotally mounted at their upper ends side by side on the axle 13 and they are free to swing about said axle. Each plate 14 is provided in its lower portion with an aperture 15, and passing through these alined apertures is a binding post or bolt 16 which is of less diameter than the diameters of the apertures 15 in order that the lower ends of said plates may move about the axle 13 independently of one another. Washers 17 are provided at the ends of the bolt 16 to prevent said bolt from becoming detached from the plates. A shoulder 18 is provided at the lower edge of each of said plates, and these shoulders engage the upper edge of the wall 9 and they will be held in engagement with the wall 9 by gravity.

From the foregoing I believe the construction of my improved mechanism will be readily understood by those skilled in the art but I deem it desirable to call attention to the operation of this mechanism, in order that its advantages will become more clearly apparent. When the bottle has been tumbled its neck portion will strike one or more of the plates of the shock absorber. This will cause the plate or plates struck to move with the bottle until the left-hand edges of the walls of the apertures 15 of the plate or plates struck have come in contact with the bolt 16. Then the bolt will move with the moving plates until the bolt contacts with the right-hand edges of the walls of the apertures of the remaining plates, and then all of the plates will move in unison. It will thus be seen that the laminated rela-

tively movable plates gradually absorb the shocks imparted by the bottle and prevent the bottle from being damaged.

Where resilient mechanism such as springs, is employed to absorb shocks, the constant action of the springs tends to crystallize the metal and destroy the spring action, and also causes the top of the bottle to rebound and thereby topple over on the receiving table. These defects are not apparent in my construction.

While I have shown and described the improved shock absorber used in connection with a bottle agitating mechanism, it is apparent that the construction illustrated may be used for other purposes. I am also aware that various changes and modifications may be made in the construction shown without departing from the spirit of the invention as expressed in the following claims.

What I claim and desire to secure by Letters Patent is:

1. A shock absorber including a series of relatively movable laminated plates mounted to assume a normal position under gravity influence.

2. A shock absorber including a series of pivotally mounted plates arranged side by side and having relatively movable lower ends.

3. A shock absorber including a horizontal axle, a series of plates having their upper ends pivotally mounted on said axle and arranged side by side, and means connecting the lower ends of said plates, said means permitting limited relative movement of the plates.

4. A shock absorber including a horizontal axle, a series of plates having their upper ends pivotally mounted on said axle and arranged side by side, said plates being provided with apertures, and a bolt passing through said apertures and of less diameter than the diameters of the apertures in order to permit relative movement of the lower ends of said plates.

5. A shock absorber including a horizontal shaft, a series of plates having their upper ends pivotally mounted on said shaft, means for connecting the lower ends of the plates and permitting limited relative movement of the same, shoulders provided on said plates, and a stop member adapted to be engaged by said shoulders for holding the plates in a definite normal position.

6. The combination with an agitating mechanism, of a shock absorber including a horizontal shaft, a series of plates pivotally mounted on said shaft, and means connecting the lower ends of said plates and permitting limited relative movement of the lower ends of said plates.

In testimony whereof I affix my signature.

GEORGE W. CHRISTIANS.