June 3, 1924. 1,496,112

E. A. BANSCHBACH

BUMPER

Original Filed Nov. 2, 1920 3 Sheets-Sheet 1

Fig. 1.

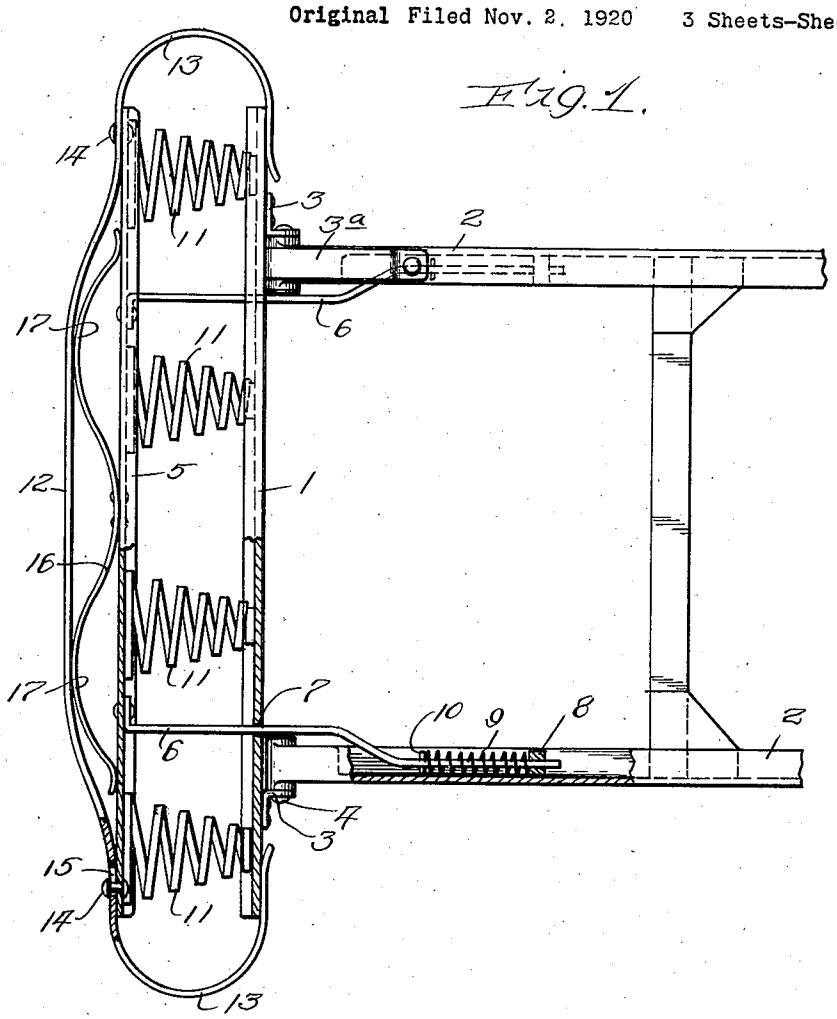
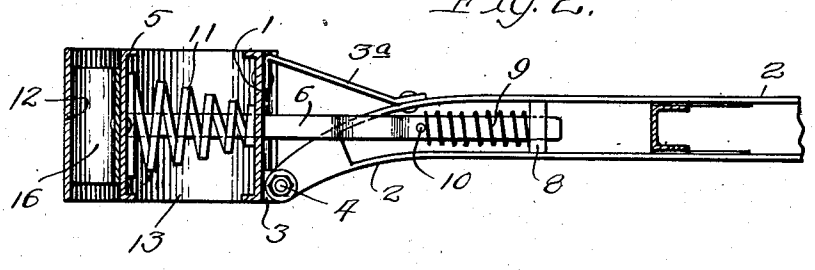


Fig. 2.



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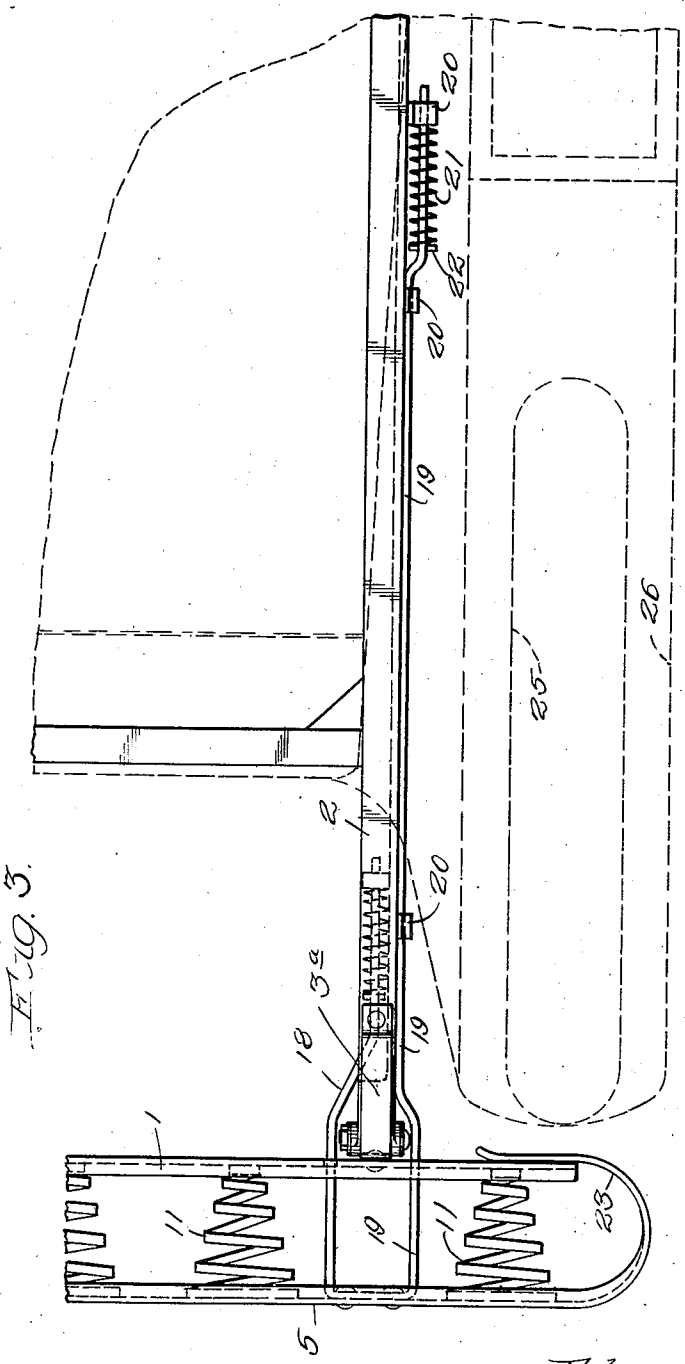


Fig. 3.

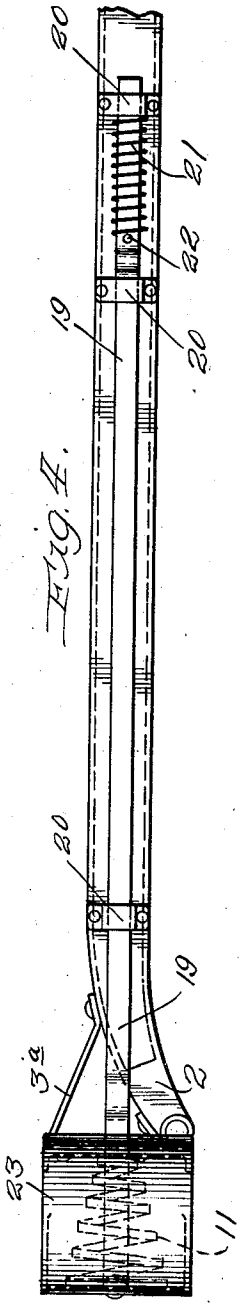


Fig. 4.

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BUMPER

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Fig. 5.

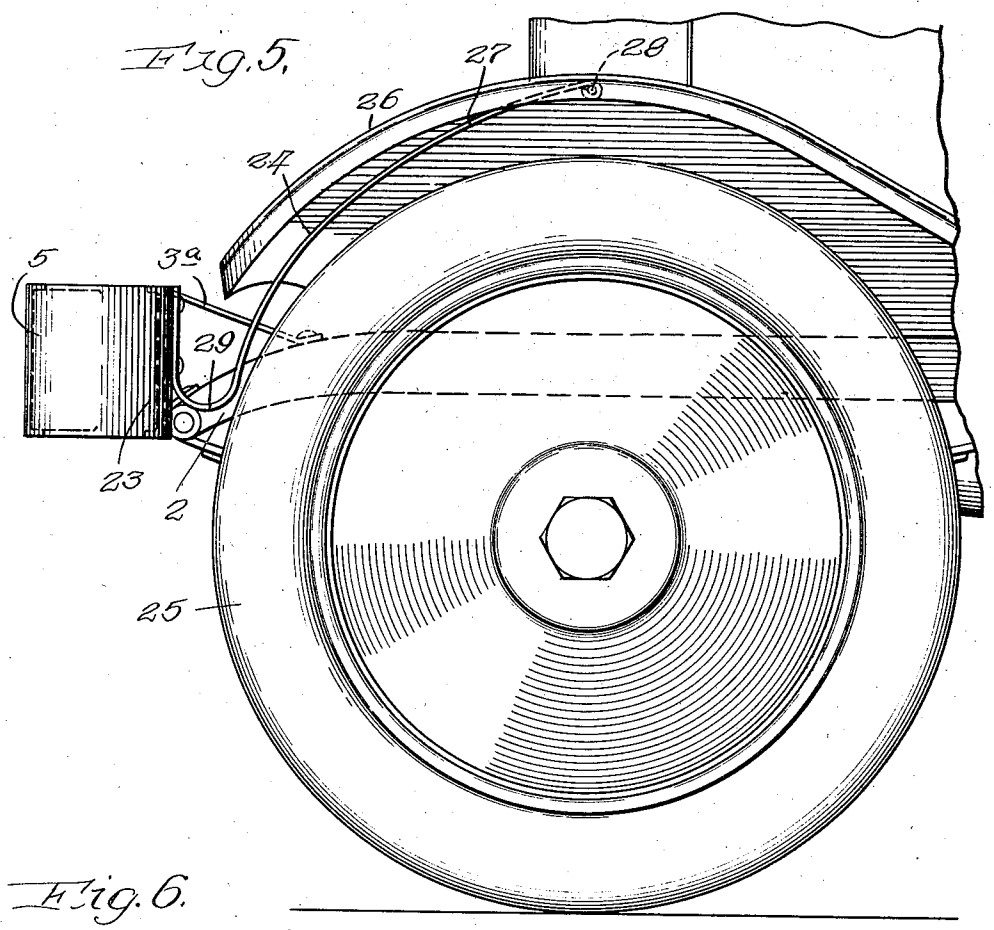
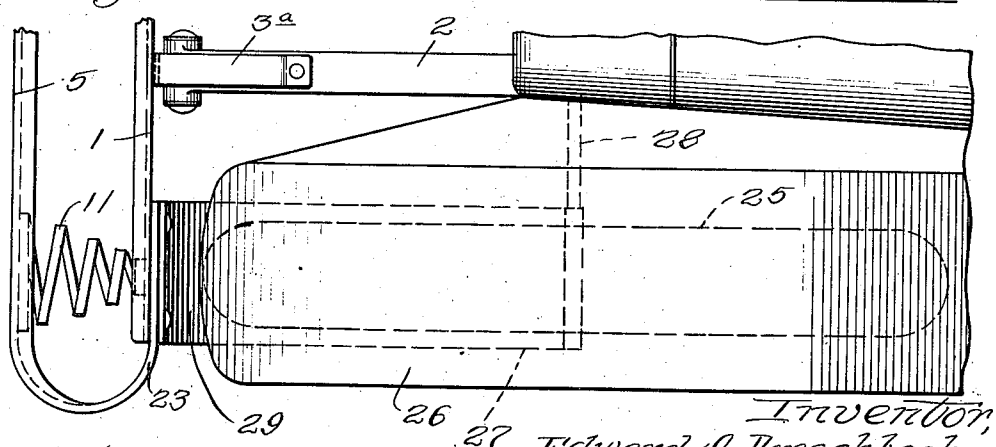


Fig. 6.



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Patented June 3, 1924. 1,496,112

UNITED STATES PATENT OFFICE.

EDWARD A. BANSCHBACH, OF CHICAGO, ILLINOIS.

BUMPER.

Application filed November 2, 1920, Serial No. 421,209. Renewed July 14, 1922. Serial No. 574,982.

To all whom it may concern:

Be it known that I, EDWARD A. BANSCHBACH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in a Bumper, of which the following is a specification.

This invention relates particularly to a fender or bumper for an automobile, although of course, it may have a more general application wherever it can be used. The principal object of the invention is to provide a new and improved construction of this kind having several different resilient constructions which are brought into action successively depending upon the intensity of the impact. The invention consists in the novel construction, combination and arrangement of the several parts.

In the accompanying drawing, Fig. 1 is a plan view with parts shown in section of a bumper constructed in accordance with the principles of my invention; Fig. 2 is a sectional view of a bumper; Figs. 3 and 4 are plan and side views respectively, of a modified form; and Figs. 5 and 6 are side and plan views respectively, of a different modification.

Many bumpers now in use are merely in the nature of fenders and have no resilient action; if they are at all resilient they usually have but a single spring action which is all right for a slight impact, but is entirely insufficient to cushion a harder impact. The present invention is designed and intended to overcome these objections by providing a plurality of springs whose actions are cumulative because they act or are brought into action successively.

In carrying out this invention, a supporting back plate 1 is mounted at the ends of automobile side frames 2 by means of brackets 3^a extending from the top of the front plate 1 to the side frame 2 and brackets 3 at the bottom of the plate through which the ordinary end bolts 4 extend, and in advance of the plate 1 a front plate 5 is supported by means of bars 6 attached to the inner face thereof and extending slidably through openings 7 in the back plate 1. The rear end of each bar is preferably offset toward and into the channelled side frame and is slidable through a fixed guide 8 therein with a spring 9 surrounding this end of the bar and pressing against a projection 10 at a distance from the end of the bar so that the outer plate 5 is pressed outwardly from the back plate 1.

Interposed between the front and back plates 1 and 5 are a plurality of coil springs 11 which are graduated in diameter from one end to the other so that they will fold compactly in spiral form when compressed. The ends of these springs are attached to the plates or to one of them in any suitable manner, and although only 4 of them are shown, any desired number of such springs may be interposed between the plates.

Supported by the front plate 5 is a guard member 12 which is bowed outwardly at the center, and has rounded portions 13 at the ends which extend over the rear side of the back plate 1 which projects laterally beyond the side frames 2. This guard member is also of spring material and is secured to the front plate by means of projecting pins 14 and slots 15 in the guard in order to permit the flattening of the bowed portion. Interposed between the guard 12 and the front plate 5 is a flat spring 16 preferably secured adjacent its center to the front plate 5 and having bowed portions 17 at each side thereof which bear against the guard 12 with the extremities bearing against the outer face of the front plate.

It will be apparent that when this bumper is engaged upon impact, the various resilient members act in conjunction to cushion the shock. The springs may be proportioned so that the coil springs 11 will first be compressed, and then if the impact is sufficient, the guard member 12 will be flattened against the front plate which in turn will be opposed by the spring 16. The springs 9 are preferably to assist in returning the supporting bars 6 and the front plate 5 to normal position, but it is obvious that these springs 9 may also be made of greater resiliency so that they will assist the spiral springs 11 in opposing the compression of the front plate against the rear one. A construction of this kind is illustrated in Figs. 3 and 4, in which the bar 18 is similar to the supporting bar 6, and in addition, there is a side bar 19 at the outside of the frame 2 supported in guides 20 and extending to a point back of the wheel where it is offset outwardly to provide space for a stiff com-

pression spring 21 which is interposed between one of the guides 20 and a projection 22 from the bar so that the spring will force the bar 19 and consequently the front plate 5 outwardly. This spring 21 may be a heavy and strong spring which will supplement the action of the spiral springs 11 in a well known manner.

Instead of supporting the front plate of the bumper by means of compression springs 9 and 21, the extremity 23 of the front plate 5 may be rounded behind the rear plate 1, as shown in Figs. 5 and 6, corresponding to the rounded extremities 13 of the guard member 12. Each extremity 23 may be connected to a flat spring 24 which is bent downwardly and then upwardly directly over a front wheel 25 and under a fender 26 therefor with the extremity 27 thereof attached to a fixed support 28 for the fender 26. This rounded front plate construction is also shown in Figs. 3 and 4, but the addition of the flat spring 24 not only adds the resilience of the flat springs 24, but also it will be observed that the downwardly bent portion 29 of this spring 24 is positioned close to the surface of the wheel 25 so that when the front plate 5 of the bumper is engaged and pressed rearwardly to a predetermined extent, the wheel is engaged by the flat spring 24 which not only adds the resiliency of the wheel in assisting the bumper action, but it also acts as a brake upon the wheel tending to stop the automobile.

In all of these forms it will be observed that the action of the different springs are supplementary to the other ones; their effect is the combined effect of all, and their action, by proportioning the strength of the springs, is made successive and cumulative. By having the two plates forced apart by the spiral springs 11 with the rounded ends 13 or 23 projecting the extremities of these plates, there is no danger of the interlocking of these bumpers with that of any other car which is so commonly seen in automobile accidents, and there is very little danger that the front of the fender 26 will be engaged when protected by these rounded bumper ends. Furthermore, it will be seen that the wheel of an automobile may be engaged by the round extremities 13 or 23 when the bumper is engaged, in the other forms as well as that shown by Figs. 5 and 6, so that in any case the final action of the bumper adds the resiliency of the tire, after which the bumper acts as a brake upon the wheel.

By connecting the outer plate to the spring 24 or to the supporting bars 19 not only is this outer plate strengthened and braced against bending up and down, but also the bars 19 strengthen the side frames 2, and by extending them for a distance along the frame, a greater leverage is exerted by it upon the outer plate 5. It is obvious that other variations in construction may be made without departing from the spirit and scope of this invention.

I claim:

1. In a bumper, a pair of plates, one attachable to the front end of a pair of automobile side frames, means for supporting the other plate in advance of the first named one, and a plurality of springs interposed between the plates and conical in form to collapse flatly when the outer plate is engaged.

2. In an automobile bumper, a plate adapted to be attached uprightly at the end of the automobile, another plate spaced therefrom in advance of the fixed plate and movable relatively thereto, a plurality of conical springs interposed between the plates and adapted to collapse into flat spiral form when the outer plate is engaged upon impact.

3. In a bumper of the class described, a pair of plates, one fixed and the other movable relatively thereto, means between the plates tending to press them apart, and resilient means extending over the ends of the plates for limiting their spaced apart position.

4. In a bumper of the class described, a pair of bumper members, one spaced from and movable relatively to the other, springs interposed between the members, and a resilient guard at the front of the movable member having extremities which extend from the front of the movable member over the rear of the other member.

5. In a bumper of the class described, a pair of upright plates, one spaced from the other and movable relatively thereto, a plurality of resilient members interposed between the plates, and a resilient guard attached to the outer member and collapsible with respect thereto in addition to the collapsing of the one plate with respect to the other.

6. In a bumper of the class described, a pair of plates, one relatively fixed and the other movable with respect thereto and normally spaced at a distance therefrom, springs interposed between the plates, a guard attached to the front of the movable plate and bowed outwardly therefrom, and a flat spring interposed between the guard and the outer plate tending to press the bowed portion outwardly.

7. In a bumper of the class described, a pair of members pressed apart and one movable relatively to the other, a plurality of springs interposed between the members, a guard attached to the relatively movable member by a pin and slot connection and having bent ends extending over the outer ends of both of said members, and a flat spring interposed between the movable member and the guard tending to press the guard outwardly from the said member.

8. In a bumper of the class described, a pair of members, one fixed with respect to the other, a plurality of springs interposed between the members, a support for the member which is not fixed comprising a pair of bars extending through the fixed member and attached at one end to the movable member, and means carried by the movable member engaging the fixed member to limit their movement apart.

9. In a bumper of the class described, the combination with a pair of plates spaced apart and one movable relatively to the other, of a pair of side frames to which the relatively fixed plate is attached, means tending to press the plates apart, and a support for the relatively movable plate which comprises bars attached at one end to the inside of the movable plate extending through the relatively fixed plate, and guides attached to the side frames through which the other ends of the bars are slidable.

10. In a bumper of the class described, a pair of supporting side frames, a bumper plate connected thereto, a movable plate spaced therefrom, springs extending between the plates tending to press them apart, means for limiting the movement apart of the plates, supporting means for the movable plate comprising bars which extend through the fixed plate with one end of the movable plate and the other end extending adjacent the side frame, a guide on the side frame through which the adjacent end of the bar extends, and a spring surrounding the bar and bearing upon a projection thereof, and against the guide, tending to oppose the compression of the movable plate toward the fixed plate.

11. In a bumper of the class described, a pair of side frames, a plate attached to the ends and side frames, a movable plate spaced therefrom, means for supporting the movable plate in advance of the fixed plate, said means including bars and springs tending to press the bars and movable plate outwardly from the fixed plate, a plurality of springs interposed between the plates, a guard having a pin and slot connection with the outer plate and bowed outwardly therefrom at the center and ends, and a flat spring interposed between the guard and the outer plate tending to preserve the bowed position of the guard, the springs and guard acting cumulatively to cushion the movement of the movable plate relatively to the fixed one.

12. In a bumper of the class described, a pair of side frames, a pair of plates, one of which is attached to the side frames and the other of which is spaced from the first plate, resilient means tending to hold the plates in a spaced relation, and additional resilient means comprising a bowed flat spring connected to the relatively movable plate to assist in cushioning any impact therewith.

13. A bumper for automobiles adapted to be engaged to the side frames thereof, comprising a pair of plates, one fixed and the other relatively movable, resilient means tending to press the plates apart, and other resilient means to limit the movement apart of the plates, the last said means being adapted to bear against the wheels of the automobile when the plates are pressed toward each other upon engagement of the movable one.

14. In a bumper for automobiles, the combination with a pair of members, one fixed and the other relatively movable, of a plurality of resilient members interposed between the plates and connected to the movable one acting in conjunction to cushion an impact, one of the resilient members being adapted to engage the wheels of the automobile for further cushioning the impact and to assist in arresting the motion of the automobile.

15. An automobile bumper, comprising in combination with an automobile frame and the automobile wheel, a movable member, and resilient means for receiving the impact due to engagement of the bumper; of means carried by the movable member and operative when the bumper is engaged to a predetermined extent to engage the tire of the wheel for further cushioning the bumper, this member then acting as a brake upon the wheel to assist the cushioning of the automobile.

16. In a bumper, a bumper bar or plate and means for supporting it, and a plurality of conical springs interposed between the plate and the support and adapted to collapse into flat spiral form.

17. In a bumper, a pair of supporting side frames, a bumper bar or plate, supporting means for the plate comprising bars extending parallel to and movable adjacent the frames and supported thereby, and springs around the bars engaging the frames tending to press the plate outward from the ends of the frames.

18. In a bumper, a bumper bar or plate, a pair of supporting side frames, supporting means for the plate, supporting bars movable adjacent the frames and supported thereby, a plurality of conical springs interposed between the plate and the supporting means, and springs around the bars tending to cushion the inward movement of the plate.

EDWARD A. BANSCHBACH.