To all whom it may concern:

Be it known that I, Watson T. Thompson, a citizen of the United States, residing at Pelham Manor, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Buffers for Vehicles, of which the following is a specification.

This invention relates to the buffers for automobiles and other vehicles which employ the usual leaf springs for resiliently supporting the bodies of the vehicles.

The object of the invention is to provide a buffer to be supported by the opposite side members of the chassis, which usually project beyond the body of the vehicle. A further object is to provide cushion means for absorbing the lighter shocks of collisions, the said means consisting of coil springs, which are carried by reciprocating parts of the buffer. A further object is to provide novel, simple and effective means for utilizing the main springs of the vehicle for absorbing the heavier shocks of the collisions, the latter means being operated by the reciprocating parts only after the tension of the coil springs has been overcome. And a further object is to generally improve and simplify the construction and arrangement, as well as to lessen the cost and increase the effectiveness of automobile buffers.

I attain these objects by the means set forth in the detailed description which follows, and as illustrated by the accompanying drawing, in which—

Figure 1 is a broken vertical longitudinal section, taken on line 1—1 of Fig. 2; showing by full and dotted lines the idle and the operated positions of the buffer and related parts. Fig. 2 is a top plan view of the same, with portions broken away to show the arrangement of certain parts. Fig. 3 is respectively a top and a side view of one of the bearing-blocks. And Fig. 4 is a similar view of one of the bell-cranks.

In the drawing, 2—2' represent the usual spaced horizontal members of the chassis or frame of an automobile running gear, which are usually supported by the common elliptical leaf springs 3—3', the said springs being mounted upon, and rigidly supported by a crossbar or beam 4, by means of clips 4'. The forward ends 5 of the springs are secured to the corresponding ends of the members 2—2' in a well-known manner, while the rear ends 3' are usually pivotally connected to the lower ends of links 5, the upper ends of said links being pivoted to the members 2—2' as at 5'. The dotted lines in Fig. 1 show the flexible nature of the last described connections.

My improved buffer mechanism consists of the following parts: 6 represents similar bearing blocks which are mounted centrally on the springs 3—3', and are notched on their top sides to receive the stirrup clips 4'. These blocks are bored out to receive bolts or pins 6', which serve to pivotally support in axial alignment similar bell-cranks 7—7', so that the said cranks may be rocked on 70 vertical planes which correspond to the longitudinal axis of the main springs. The bell-cranks 7 are yieldingly connected to the chassis members 2—2' by links 8. When the buffer mechanism is idle, the bell-cranks are 75 normally positioned as shown by the full lines in Figs. 1 and 2. 9 represents a common bumper or buffer bar, which usually extends transversely across, and some distance away from the 80 ends of the members 2 and the springs 3, and may consist of a channel-iron, or any other suitable shape or material. The bar 9 is preferably pivoted, near its opposite ends, to similar rods 10—10', by pins 9'. 85 These rods are supported by and reciprocate in similar brackets 11—11' which may be rigidly secured to the members 2, by rivets or bolts 11', the said brackets being provided with forwardly extending arms 11', and the latter having similar perforated lugs 11' in which the rods slide. Near the free ends, the rods 10 pass loosely through brackets 12—12', which are rigidly attached to the members 2—2'. The free ends of the 95 rods 10 are forked, as at 10', and the said forks are disposed in the path of lugs or bosses 7 which preferably comprise integral parts of arms 7' of the bell-cranks.

Between the bearing-lugs 11' and the brackets 12 and 12' are disposed compression coil springs 13, the forward ends of said springs bearing against similar collars 10', which are secured to the rods by pins 10', while the rear ends of the springs 13 are normally 105 in engagement with the brackets 12. By this construction and arrangement, the initial impact or shock of a collision is absorbed by the springs 13, which are compressed by the inward movement of the 110 bumper bar 9, the rods 10—10', and the collars 10'. In case the impact of a collision is
greater than the tension exerted by the springs 13, the rods 10—10' will be driven inwardly until the forks 10a engage the bosses 7c. The further inward movement of the rods 10 rocks the bell-cranks on their pivots 6', from their full line to the dotted line position, shown in Fig. 1. When the bell-cranks are thus rocked, their rear arms 7c move downwardly and correspondingly pull the members 2—2' toward the main springs 3—3'. This results in the straightening or flattening of the said springs, as shown by the dotted lines in Fig. 1. In this way, the heavier or more violent shocks of collisions are readily and effectively absorbed by the powerful main springs of the vehicle. By thus utilizing the main springs for absorbing the heavier shocks, the buffer mechanism may be constructed of relatively light parts, thereby obviating all unnecessary weight at the forward and rear ends of the vehicle, to which my improvement may be applied. By employing the bell-cranks 7c—7c', and mounting them in the novel and simple manner herein shown, when taken with the extremely simple construction and method of mounting of the buffer bar and the reciprocating rods, I am able to equip automobiles and other vehicles with my improvement by a comparatively small expenditure of money and labor. The main springs of the vehicles are generally made to withstand hard usage and are therefore capable of absorbing the shocks or impacts of any collision without danger of being impaired or broken. The disposing of the rods 10 and the bell-cranks 7, so that the said parts are normally disconnected while the bumper mechanism is idle, permits the usual functioning of the main springs without interference from the buffer parts. The dotted lines in Fig. 1 also serve to show the flexing of the main springs 3 while the vehicle is traveling over rough roads.

Obviously the details of the device may be varied within the scope defined by the appended claims without departing from the spirit of the invention.

Having thus described my invention what I claim is—

1. The combination with the side members of a vehicle frame and the main springs, of bell-cranks pivotally mounted on said springs and connected with said side members, reciprocating rods carried by said side members and normally separated from said bell-cranks, adapted to engage and rock said bell-cranks when said rods are driven inwardly by the impacts of collisions, a buffer-bar connecting the corresponding ends of said rods, and independent means for absorbing the initial shocks of collisions.

2. An automobile buffer comprising in combination a buffer-bar, similar reciprocating rods pivoted at one end to said bar and operatively supported by the side members of the automobile frame, bell-cranks pivotally supported by the main springs of the automobile in line with the said rods adapted to be rocked by said rods whenever said buffer-bar contacts violently with an obstruction, means for yieldingly connecting said bell-cranks with the side members, and resilient means for normally holding said rods out of an engagement with the bell-cranks.

3. The combination of the side members of a vehicle frame, elliptical springs supporting said frame, bell-cranks pivotally supported by said springs and rockable in vertical planes in line with the longitudinal axes of said springs, reciprocating rods supported by said members and normally spaced from said bell-cranks adapted to rock said bell-cranks whenever said rods are driven toward said bell-cranks by the impacts of collisions, means for yieldingly connecting said bell-cranks to the side members, and cushion means for absorbing the shocks of the collisions without disturbing said bell-cranks.

4. The combination with the side members of a vehicle frame and the elliptical springs, of a pair of reciprocating buffer rods carried by said side members, a buffer-bar connecting the corresponding ends of said rods, bell-cranks pivotally secured to said springs and yieldingly connected to said side members, said bell-cranks adapted to be engaged by said buffer-rod for rocking said bell-cranks in the direction for moving said side members toward said springs.

5. A buffer mechanism for vehicles, including bell-cranks pivotally mounted on the main springs of the vehicle and yieldingly connected to parts of the vehicle frame, reciprocating rods located at the opposite sides of the vehicle, said rods being normally disengaged from the bell-cranks, but adapted to rock said bell-cranks whenever said rods are driven inwardly by the impact of collisions, cushion means for normally separating said rods and the bell-cranks adapted to absorb the initial shocks produced by the collisions, and a buffer-bar connecting the corresponding ends of said rods.

6. The combination with the side members of the vehicle frame and the main springs, of a bell-crank connecting each side member with the corresponding spring, reciprocating rods normally disengaged from said bell-cranks adapted to rock said bell-cranks when said rods are moved in one direction by the impact of a violent collision, a buffer-bar for operating said rods simultaneously, and springs for moving said rods in the opposite direction and adapted to absorb the initial and lighter shocks of the collisions.
7. The combination with the side members of a vehicle frame and the elliptical springs, of a bumper-bar, reciprocating rods pivoted to one end of said bar, the other ends of said rods being forked, brackets carried by said members for operatively supporting said rods, bearing blocks mounted on said springs, bell-craniks pivoted to said blocks, the corresponding arms of said bell-craniks having lugs adapted to be engaged by said forks whenever the shocks of collisions are violent for rocking said bell-craniks, links connecting the free arms of said bell-craniks to the said members, and coil springs carried by said rods for absorbing the initial and lighter shocks of the collisions without disturbing the bell-craniks.

8. The combination with the side members of a vehicle frame and the main springs, of a bell-crank pivotally mounted near the middle of each spring, links connecting the corresponding arms of said bell-craniks with said side members, the other arms of said bell-craniks being normally free, reciprocating rods supported by said side members, the inner ends of said rods being forked and the said forks being normally spaced from the free arms of said bell-craniks, adapted to rock said bell-craniks when said rods are forced inwardly by the heavier impacts of collisions, a bumper-bar connected to the opposite ends of said rods, and cushion means disposed between the ends of each rod adapted to normally hold said forks away from the bell-craniks and to absorb the initial shocks produced by the collisions.

In testimony whereof I affix my signature.

WATSON T. THOMPSON.