Jan. 8, 1924. 1,480,086

G. A. LYON

BUFFER

Original Filed Aug. 18. 1921

Fig. 1,

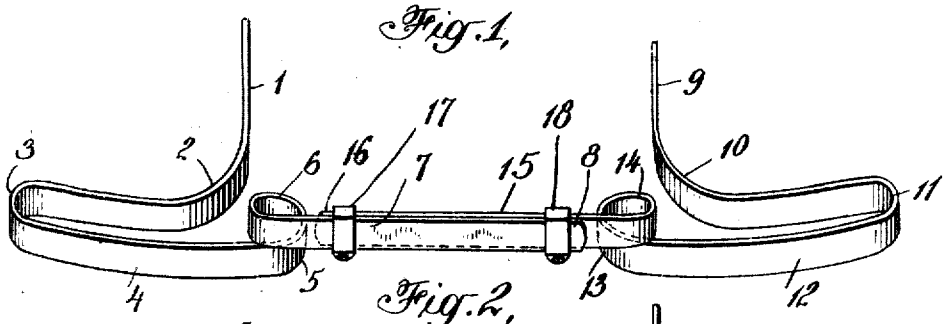


Fig. 2,

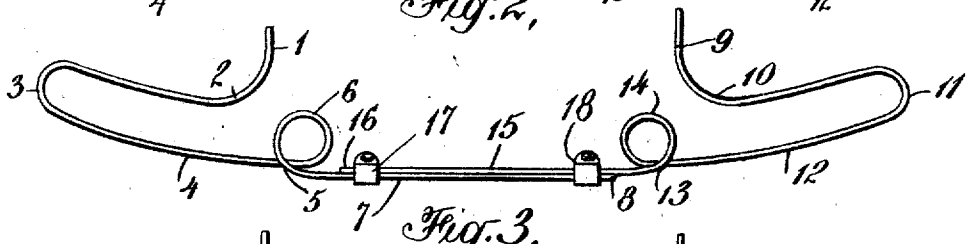


Fig. 3,

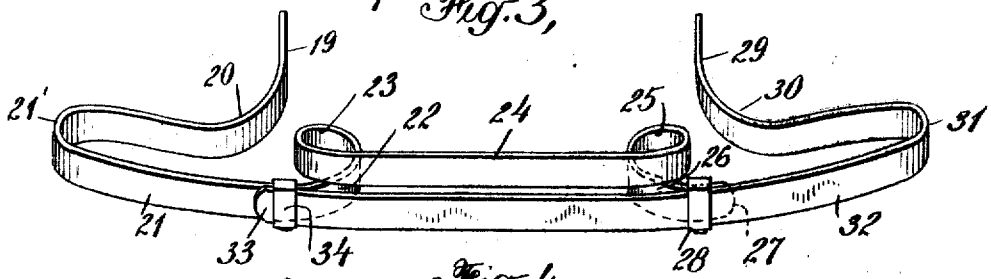


Fig. 4,

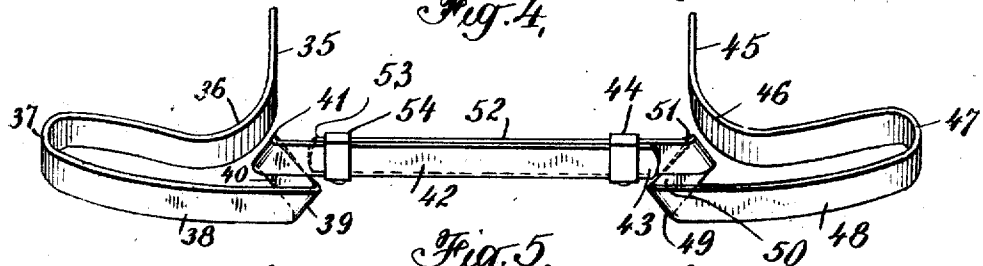
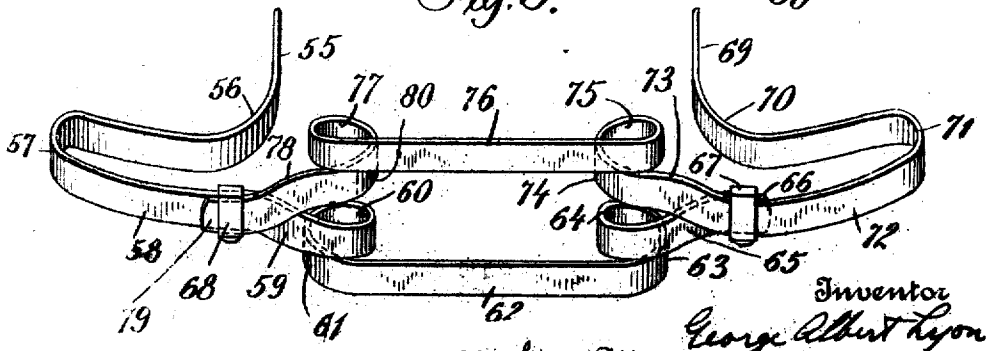


Fig. 5.



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UNITED STATES PATENT OFFICE.

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BUFFER.

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To all whom it may concern:

Be it known that I, GEORGE ALBERT LYON, a citizen of the United States, and resident of Philadelphia, county of Philadelphia, State of Pennsylvania, have made a certain new and useful Invention Relating to Buffers, of which the following is a specification, taken in connection with the accompanying drawing, which forms part of the same.

This invention relates especially to buffers or bumpers for automobiles or other vehicles in which the buffer front comprises intermediate cushioning loops or bends, so as to give an additionally resilient central portion because of these spiral or other spring coils intermediate the end loops of the buffer front which are preferably also provided. With the usual flat spring steel strip such as is used for automobile buffers, these bent, coiled or spirally twisted portions may be utilized in any suitable way to not only increase the resilient yielding of the central portions of the buffer front, but to form or carry portions thereof vertically or horizontally out of line with the other or end portions, so as to provide a front impact portion of increased vertical width such as several times as wide as the buffer strip. For this purpose the one or more front strips may have round or preferably flattened spiral or bent portions in which the axes of the spirals may be vertical, horizontal or diagonal, and may comprise two to four turns more or less depending on the spring stock and service desired; and of course, these increased resilience spiral front portions may be used with or without the yielding end loops of the Lyon type buffer which may extend out in front of the vehicle wheels in some cases. Such yielding spiral front portions may also sometimes be used in connection with another front strip or connection extending transversely at the same or a different level and the spirally arranged or supported portions preferably adjacent the center of the buffer are in such cases preferably located somewhat ahead or in advance of the other buffer front portions, so as to preliminarily yield an inch or two before the other front strips or portions are engaged under collision conditions.

In the accompanying drawing showing in a somewhat diagrammatic way various illustrative embodiments of the invention,

Fig. 1 is a perspective view showing one illustrative buffer.

Fig. 2 is a top view thereof; and

Figs. 3, 4, and 5 are perspective views showing modified constructions.

As indicated in Figs. 1 and 2 the buffer front may comprise two or more resilient loop or spiral spring portions preferably intermediate the ends of the buffer front which may if desired be formed with the usual resilient end loops 3, 11 projecting out into protective position more or less in front of the vehicle wheels. The buffer front may be supported from the vehicle in any suitable way as by attaching arms such as 1, which may be formed of spring steel strip and be provided with curved connecting portions 2 connected to or integral with the end loop 3 so as to resiliently support the outer impact receiving portion 4 of the buffer front. The other side of the buffer may have a similar arrangement formed with the same or similar spring strip and comprising if desired the attaching arm or member 9 and curved portion 10 connecting with the outer end loop 11 and adjacent impact receiving portion 12. The intermediate spiral spring portions such as 5, 6 which may be bent or formed in one or both of the spring strips are preferably arranged so that this bent portion 6 rises considerably above the level of the adjacent buffer front or impact receiving member 4, so that if desired this spring loop may be carried up above the plane of the cooperating attaching members 1, 2 so as not to interfere with the closing of the end loop and adjacent portions under collision conditions. This also serves to raise the connected central impact portion 7 of the buffer strip several inches or so above the outer end of the strip and end loop, so that this raised central impact receiving portion forms an additional raised contact portion of the buffer front which is thus given an effective vertical width of four to eight inches as desired. Furthermore this intermediate contact or impact receiving portion may be given an advanced position horizontally ahead of the outer impact receiving portions such as 4 of the buffer front, so as to be more likely

to receive the initial collision impact and exert a considerable preliminary cushioning action before the outer parts of the buffer front are engaged under collision conditions.

If desired the other front strip 12 may be formed with a similar spirally bent portion 13, 14 having a substantially vertical axis and carrying the connected intermediate contact or impact receiving portion 15 of the buffer front vertically out of line, and also is desired ahead of the connected outer impact receiving portion such as 12. These additional resiliently cushioning central contact portions may be connected in any suitable way so that they are preferably longitudinally adjustable to adjust the width of the attaching arms or members of the buffer, and if desired these intermediate or central contact strips 7, 15 may be clamped together in overlapping reenforcing position as by the clamps or connections 17, 18 which may be arranged adjacent the ends 8 and 16 of these strips. The buffer thus has a pleasing appearance and in addition to the increased vertical width of the contact portion, considerably increased resilient cushioning action is imparted to this central part of the buffer front by these intermediate spiral or other bent portions which may have any suitable form and dimensions.

As shown in Fig. 3 one of the spring strips which may have an integral attaching member and connecting bend or end loop portion 21' may have its front or impact receiving portion 21 formed with several intermediate spiral or bent resilient loop portions such as 22, 23 and 25, 26 which may similarly raise and also advance if desired the resilient central contact or impact receiving portion 24 of the buffer front. This buffer front strip may be integrally connected with both of the attaching members if desired or may be adjustably connected with one or both of these attaching members as by forming adjacent, these intermediate spiral bends or loops connector portions or ends such as 27, which may be clamped or connected in any suitable way with any portion of the buffer. In this instance the other attaching member 29 may be formed of similar spring strip and may have the connected bent and end loop portions 30, 31 yieldingly supporting the front or contact strip 33 which may extend considerably across the buffer front to about the point 33. In this way a straight strip or front connector portion is formed which may be permanently or adjustably connected or clamped to the other front portions of the buffer as by the enclosing clips or clamps 28, 34 which may provide for width adjustment if desired.

As shown in Fig. 4 the intermediate bent or spiral portions of the buffer front may be in the form of diagonally arranged spirals which may be flattened if desired, so as to give relatively flat front and rear surfaces and also minimize the horizontal extent of these bends of which one or more may be used on each side of the center of the buffer. In this case the attaching member 35 may be of spring strip integral with the bent portions 36 and end loop 37 if desired so as to support the adjacent impact receiving portion 38 of the buffer front. This may merge into the diagonally arranged spiral portions 39, 40 and 41 which may if desired be flattened considerably so long as the bends 39, 41 are not made too sharp for strength, for which reason their inner radius or curvature should not be less than about one inch or one inch and a half, depending of course, on the thickness of the strip and stock used. In this way increased resilience may be given to the connected central contact portion 42 of the buffer front which may be yieldingly supported in raised and also in advanced position if desired with respect to the other or outer impact receiving portions of the buffer. As indicated the other buffer strip may have the attaching member 45 and connected bent and end loop portions 46, 47 so as to support the outer front portion 48 about in line with the corresponding portion 38 adjacent the other end of the buffer. Similar diagonally bent or spiral portions 49, 50, 51 may also be formed in this strip to connect the portions 48 and 52 which may thus be located in raised advanced position, so as to be connected in any suitable way with the cooperating front strip 42. The enclosing clamps or clips 44, 54 may be used for this purpose adjacent the ends 43, 53 of the front strips so as to securely connect them in adjusted position, so that they are vertically rigid and this central part of the buffer front strengthened by the overlapping reenforcement which they give to each other.

Fig. 5 shows another illustrative arrangement in which the front strips may each be formed with intermediate spiral or other bent resilient portions of any suitable character which may carry the central portions of these two strips both up and down with respect to the connected end portions, so as to form separated raised and lowered contact portions if desired, which are given increased resilient cushioning action by these connecting bends. The attaching member and connected end loops portion 55, 56, 57 may have its adjacent front or impact receiving portion 58 formed with the spiral or other intermediate bent or loop portion 59, 60, 61, which may carry the connected central contact portion 62 out of line with the end portion 58. Another similar spiral or loop portion 63, 64 may serve to give a

similarly cushioning connection with the connector portion 65 of this strip which may be clamped or otherwise bolted or connected to the other connector strips employed. In this case another buffer strip which may be similarly formed of spring steel may have the attaching portion 69 and connected bend and end loop portions 70, 71 merging into the front impact receiving portion 62. This part of the buffer front may have the upwardly bent loop or spiral portions 73, 74 and 75 so that the connected front contact portion 76 may be raised considerably above the other contact portion 62, and both may if desired be supported several inches in advance of the connected outer impact receiving portions 58, 72 of the buffer front. Similar spiral loop portions 77, 80 may merge into the connector portion 78, ending if desired at about the point 79 so as to be adjustably or otherwise clamped or connected as by the clamp 68 to the portion 58 of the other strip. A similar connecting clamp 67 may adjustably connect the other strip end 66 with the portion 72, so as to securely unite the buffer front and have ample strength for resisting collision impacts.

This invention has been described in connection with a number of embodiments, forms, proportions, parts, arrangements, materials, methods of connection and use, to the details of which disclosure the invention is not of course to be limited, since what is claimed as new and what is desired to be secured by Letters Patent is set forth in the appended claims.

1. The automobile buffer formed of flat spring steel strip and comprising attaching members and connected end loops and adjacent outer impact receiving portions of the buffer front, intermediate spiral bent portions formed in the flat spring strip between the end loops and resiliently supporting in raised position the connected central contact portions of the buffer front, and a straight front contact portion substantially in line with the outer impact receiving portions of the buffer front and adjustably connected at one end to an outer impact receiving portion.

2. The automobile buffer formed of flat spring steel strip and comprising attaching members and connected end loops and adjacent outer impact receiving portions of the buffer front, intermediate spiral bent portions formed in the flat spring strip between the end loops and resiliently supporting the connected central contact portions of the buffer front, and a front contact portion substantially in line with the outer impact receiving portions of the buffer front and connected at one end to an outer impact receiving portion.

3. The automobile buffer formed of flat spring steel strip and comprising attaching members and connected loop ends and adjacent outer impact receiving portions of the buffer front and intermediate coiled portions formed in the flat spring strip between the ends and resiliently supporting in advanced position the connected central contact portion of the buffer front, and a front portion connected to the outer impact receiving portions of the buffer front.

4. The automobile buffer formed of flat spring steel strip and comprising attaching members and connected ends and adjacent outer impact receiving portions of the buffer front, and intermediate coiled portions formed in the flat spring strip between the ends and resiliently supporting the connected central contact portion of the buffer front.

5. The automobile buffer formed of steel strip and comprising attaching members and connected ends and adjacent outer impact receiving portions of the buffer front, and intermediate coiled portions formed in the strip between the ends and resiliently supporting the connected central contact portion of the buffer front.

6. The automobile buffer formed of flat spring steel strip and comprising attaching members and integral loop ends and adjacent outer impact receiving portions of the buffer front and intermediate coiled portions formed of flat spring strip between the ends and resiliently supporting in advanced position the connected central contact portions of the buffer front, and a front portion connected to the outer impact receiving portions of the buffer front.

7. The automobile buffer formed of flat spring steel strip and comprising attaching members and integral ends and adjacent outer impact receiving portions of the buffer front and intermediate coiled portions formed of flat spring strip between the ends.

8. The buffer front comprising outer impact receiving portions and adjacent connected end loops formed of flat spring strip and adapted to be connected to a vehicle, intermediate spiral portions formed in the flat spring strip between the end loops and having substantially vertical axes to resiliently support in raised position the connected central contact portions of the buffer front, and a front buffer element substantially in the same horizontal line with the outer impact receiving portions of the buffer front and connected thereto on either side of said intermediate spiral portions.

9. The buffer front comprising outer impact receiving portions and adjacent connected end loops formed of flat spring strip and adapted to be connected to a vehicle, intermediate spiral portions formed in the flat spring strip between the end loops to resiliently support the connected central

contact portions of the buffer front, and a front buffer element connected on either side of said intermediate spiral portions.

10. The buffer front comprising outer impact receiving portions and adjacent connected end loops formed of flat spring strip and adapted to be connected to a vehicle, intermediate approximately flat loop portions formed in the flat spring strip between the end loops to resiliently support the connected central contact portions of the buffer front.

11. The buffer front comprising flat spring strip outer impact receiving portions and adjacent connected end loops adapted to be connected to a vehicle to support the buffer front and intermediate spiral bent portions formed in the flat spring strip between the end loops and resiliently supporting in vertically displaced position the connected central contact portion of the buffer front, and a substantially horizontal front strip substantially in line with the outer impact receiving portions of the buffer front and connected at one end thereto.

12. The buffer front comprising flat spring strip outer impact receiving portions and adjacent connected end loops adapted to be connected to a vehicle to support the buffer front and intermediate spiral bent portions formed in the flat spring strip between the end loops and resiliently supporting the connected central contact portion of the buffer front.

13. The buffer front comprising flat spring strip outer impact receiving portions and adjacent connected end loops adapted to be connected to a vehicle to support the buffer front and intermediate coiled portions formed in the flat spring strip between the end loops to give increased resilience to the connected central contact portion of the buffer front.

14. The buffer front comprising flat strip outer impact receiving portions and adjacent connected loop ends, intermediate spirally coiled portions formed in the flat strip between the ends and resiliently supporting in advanced position connected central contact portions of the buffer front.

15. The buffer front comprising flat strip outer impact receiving portions and adjacent connected ends, intermediate coiled portions formed in the flat strip between the ends and resiliently supporting connected central contact portions of the buffer front.

16. The buffer front comprising strip outer impact receiving portions and adjacent connected ends, intermediate coiled portions formed in the strip between the ends and resiliently supporting connected central contact portions of the buffer front.

17. The buffer front comprising outer impact receiving portions and adjacent connected loop ends formed of flat spring strip and adapted to be connected to a vehicle, intermediate resilient contact portions comprising two to four spiral turns formed in the flat spring strip between said ends.

18. The buffer front comprising outer impact receiving portions and adjacent connected ends formed of flat spring strip and adapted to be connected to a vehicle, intermediate resilient contact portions comprising several spiral turns formed in the flat spring strip between said ends.

GEORGE ALBERT LYON.