

G. L. TURNER.

Car Spring.

No. { 1,587, {  
32,591. }

Patented June 18, 1861.

Fig. 1.

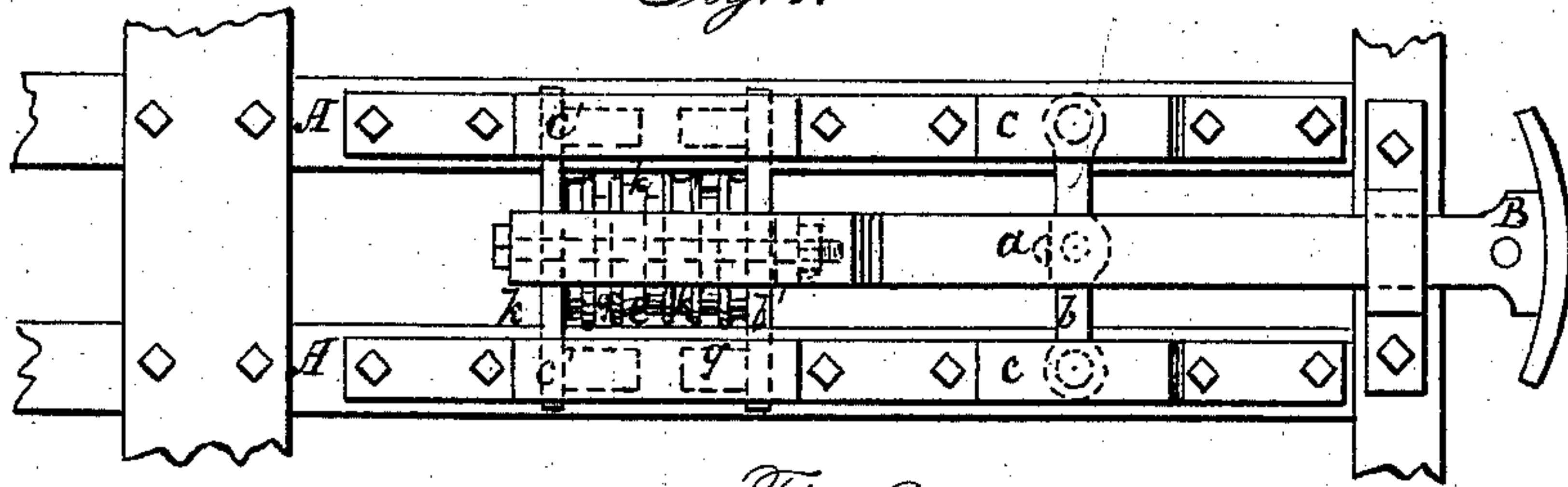


Fig. 2.

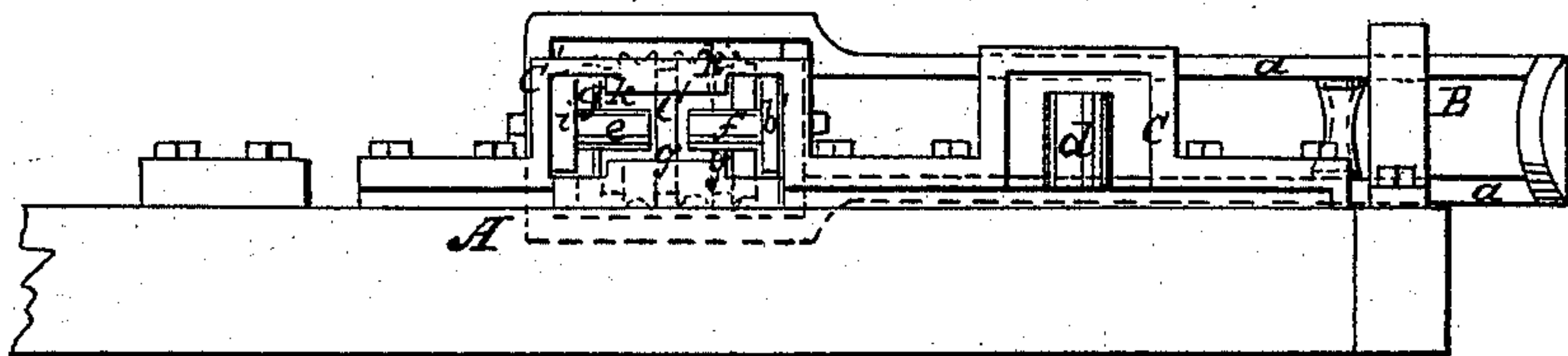


Fig. 3.

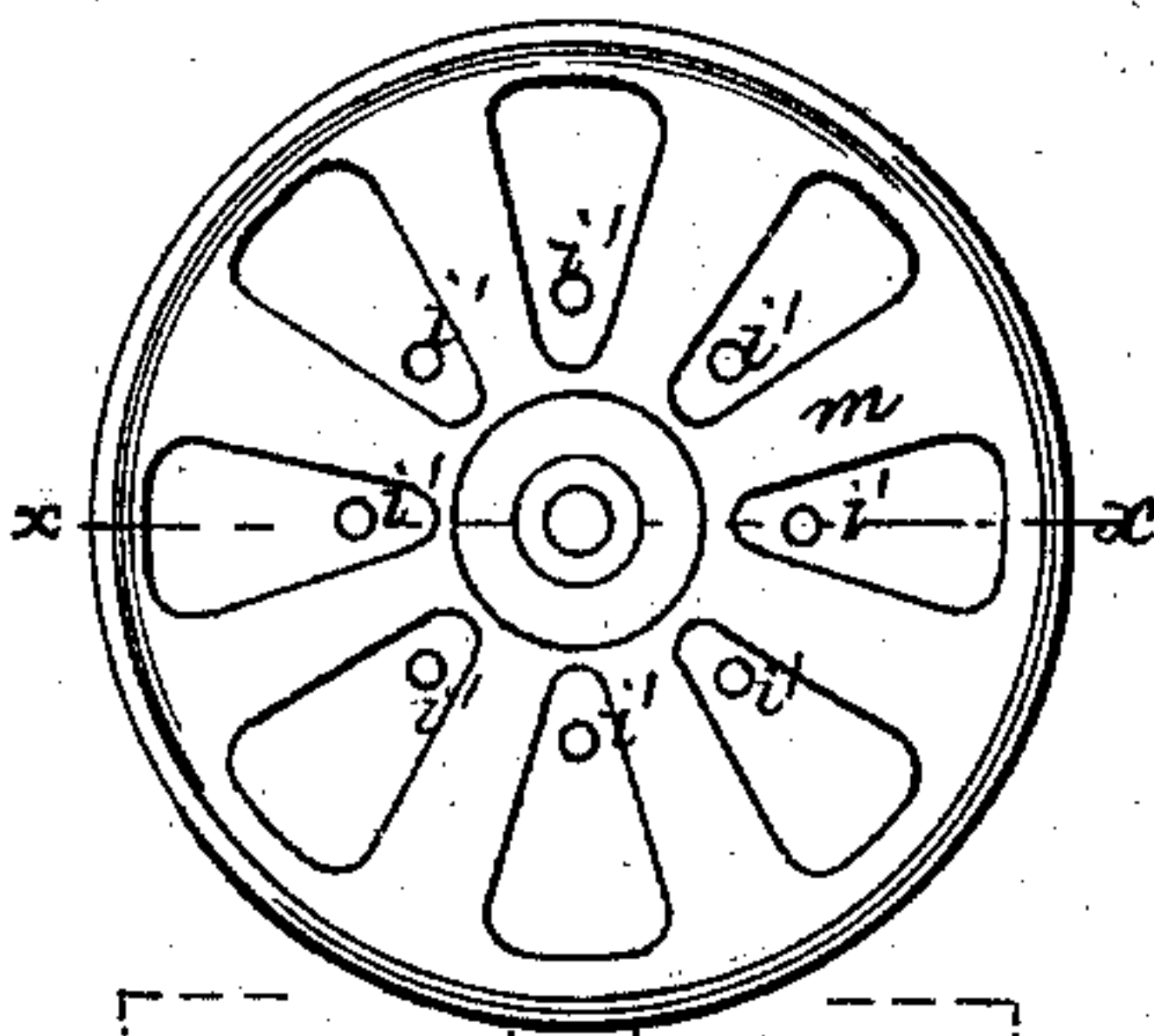


Fig. 4.

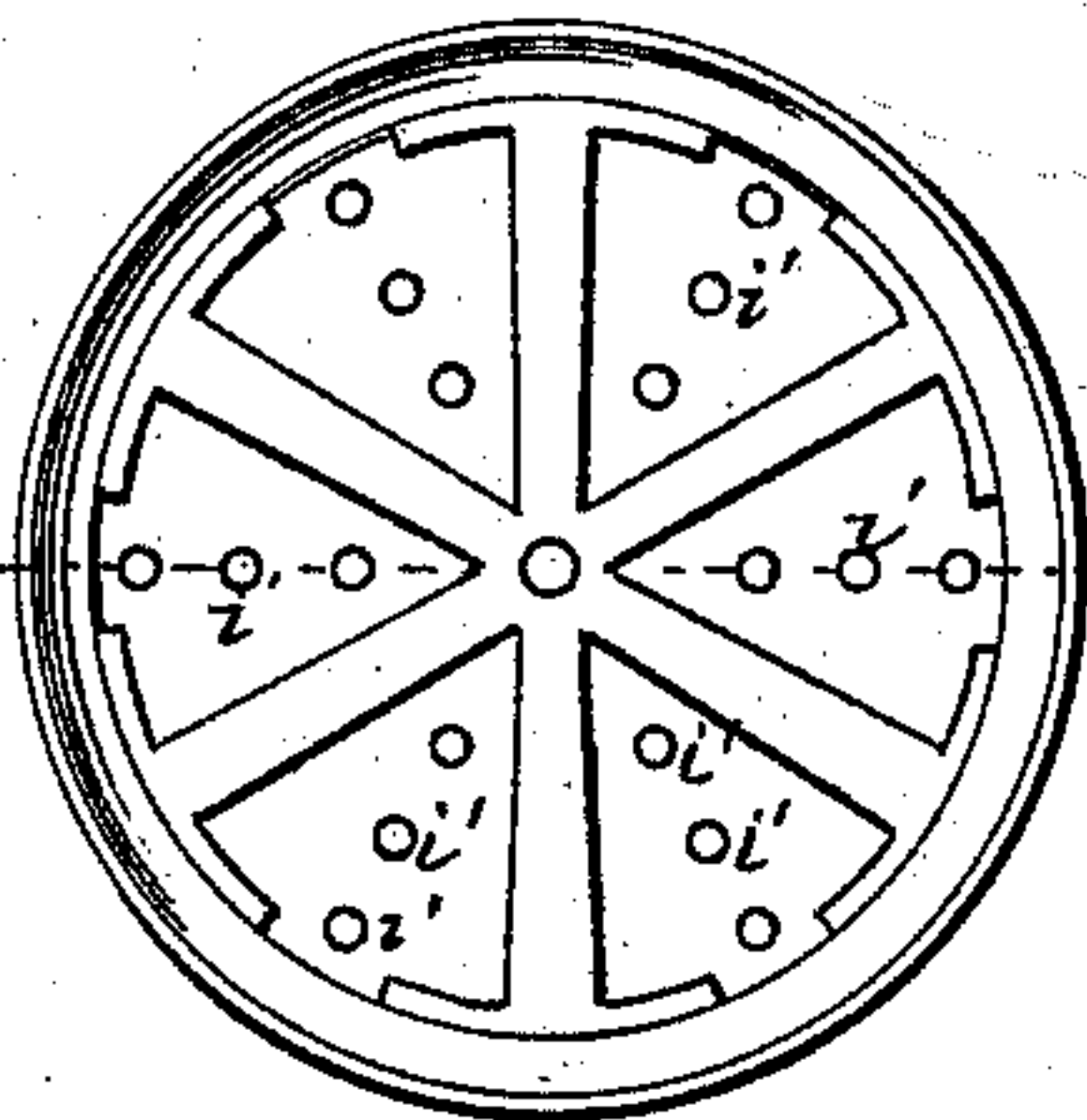


Fig. 5.

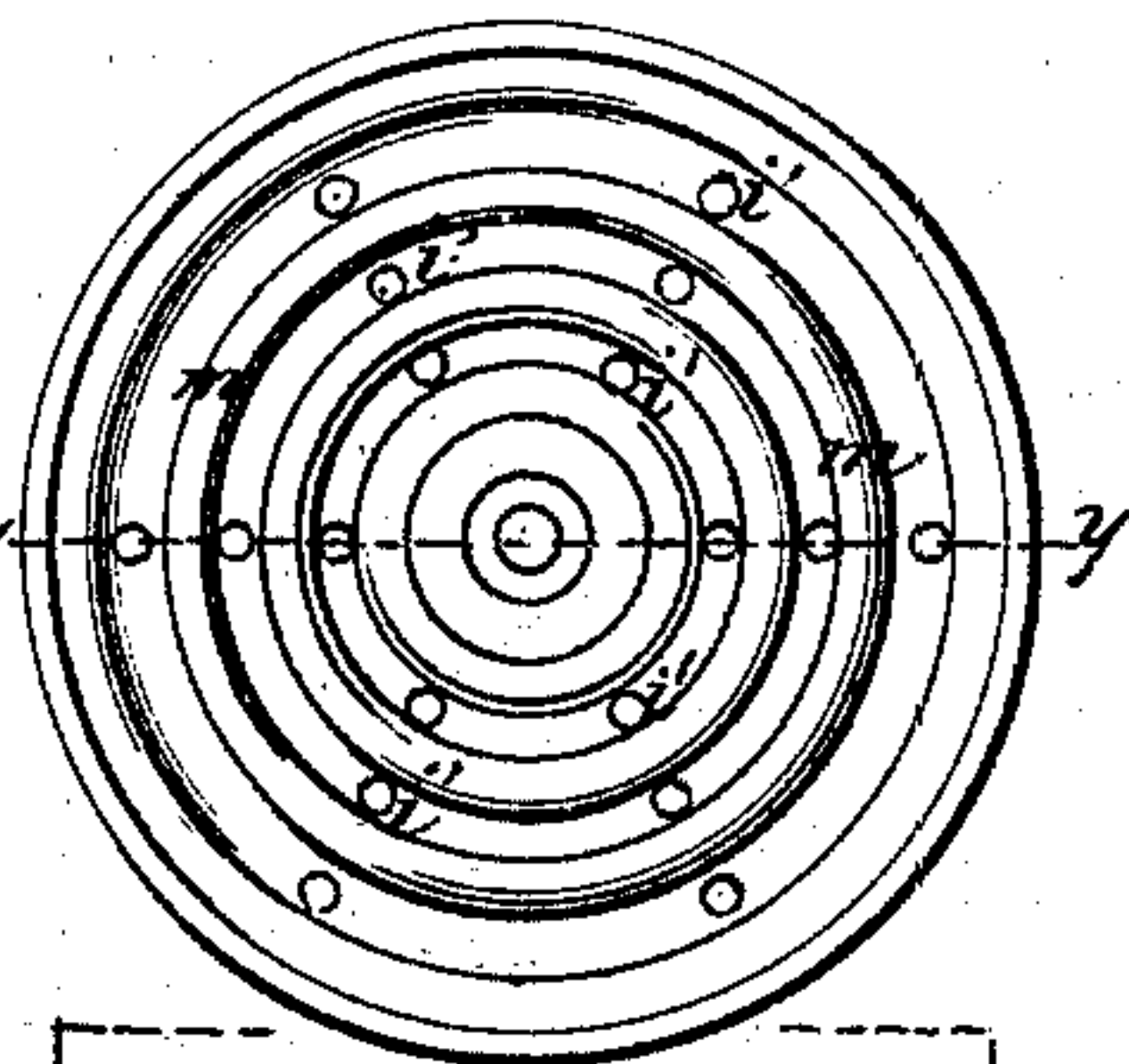


Fig. 7.

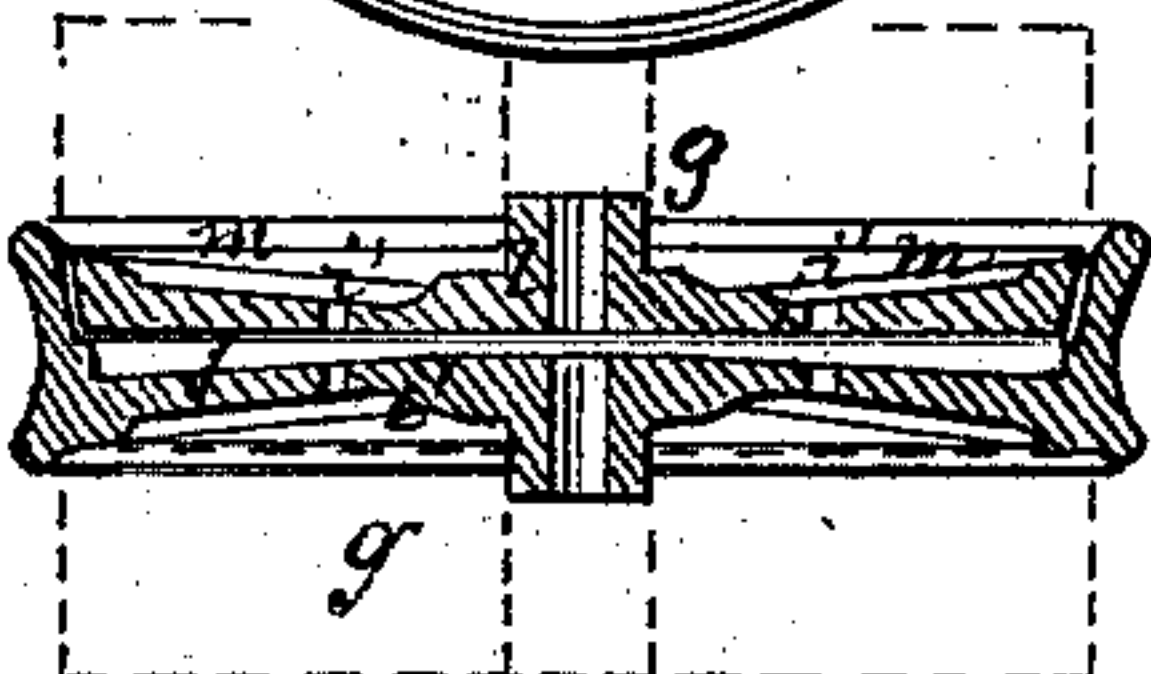


Fig. 8.

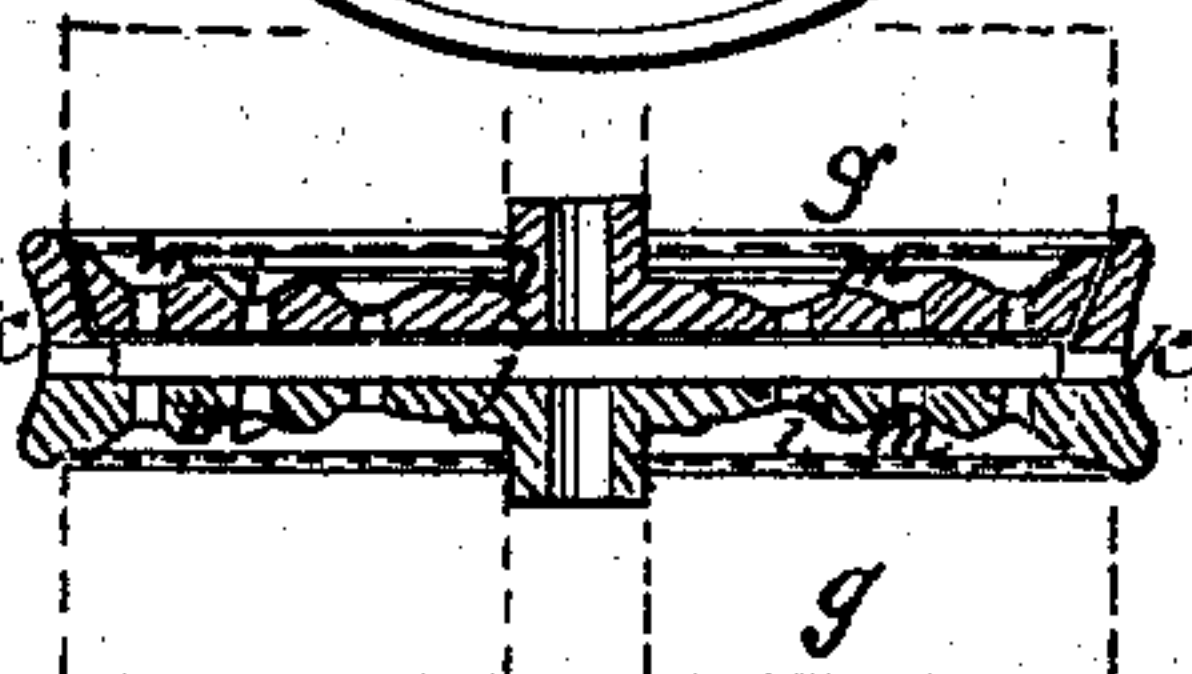


Fig. 6.

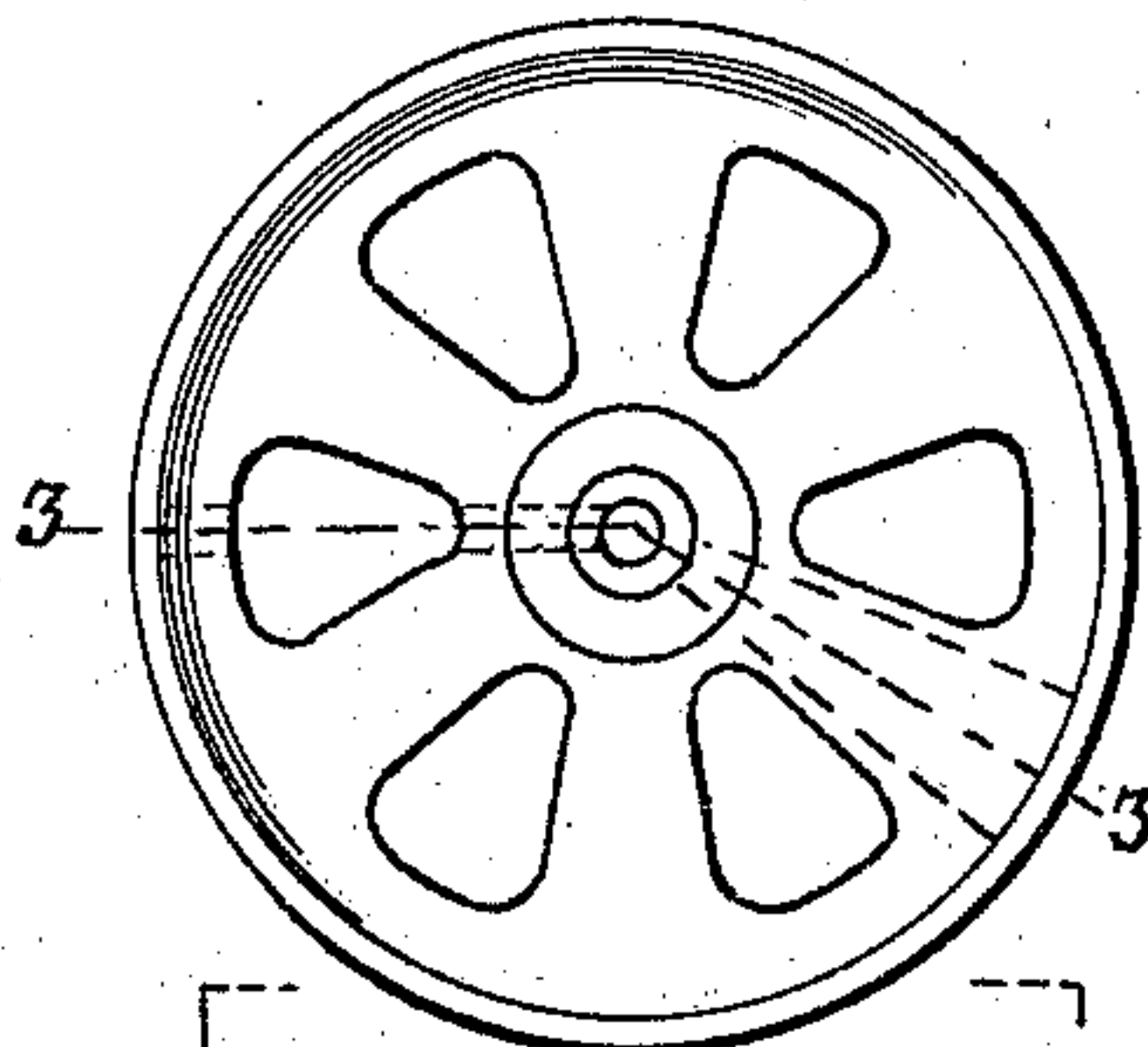
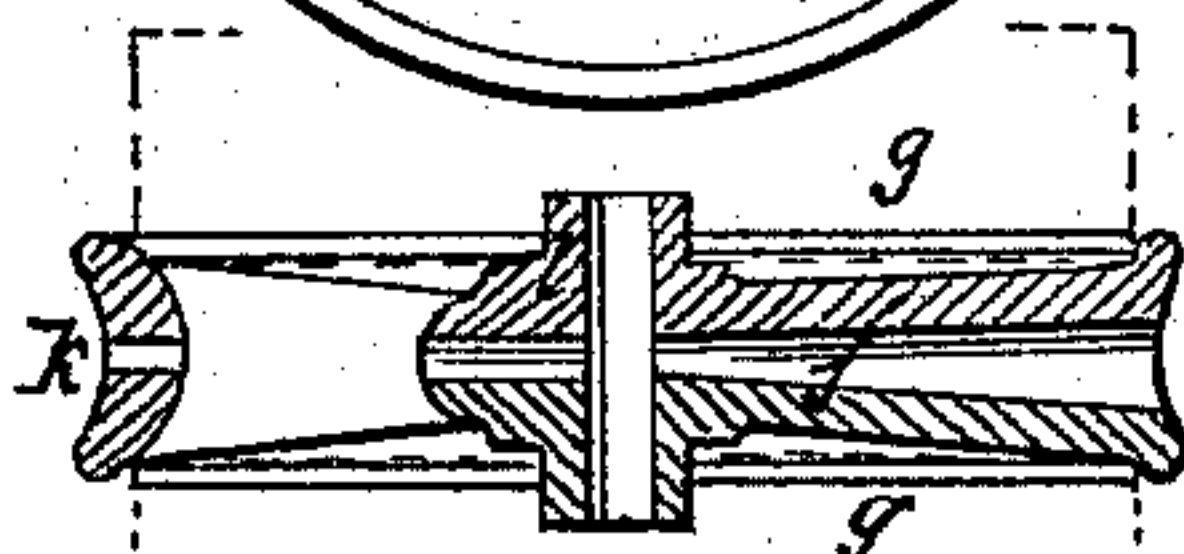


Fig. 9.



Witnesses:

*Wm. Thompson*  
*Louis A. Tucker*

Inventor:

*Greenhof L. Turner*



# UNITED STATES PATENT OFFICE.

GREENLEAF L. TURNER, OF NEW YORK, N. Y.

## CAR-SPRING.

Specification of Letters Patent No. 32,591, dated June 18, 1861.

*To all whom it may concern:*

Be it known that I, GREENLEAF L. TURNER, of the city, county, and State of New York, have invented a new and Improved Car-Spring; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1, is a plan or top view of my invention applied as a buffer spring; Fig. 2, a side view of the same; Figs. 3, 4, 5, and 6 face views of plates pertaining to the same; Fig. 7, a section of Fig. 3, taken in the line  $x, x$ ; Fig. 8, a section of Fig. 5, taken in the line  $y, y$ ; Fig. 9, a section of Fig. 6, taken in the line  $z, z$ .

Similar letters of reference indicate corresponding parts in the several figures.

The invention relates to an improvement in that class of car springs which is composed of india-rubber and metallic plates, and has for its object; first, the preventing of the rupturing of the rubber under compression, a contingency of frequent occurrence in this class of springs, and second, the preventing of an undue compression of the rubber.

The invention consists 1st, in a novel arrangement of stops as hereinafter described, and 2nd, in a peculiar formation of the face surfaces of the metallic plates, as hereinafter described, whereby the desired ends are attained.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A, A, Figs. 1, and 2, represent the longitudinal beams of a car-bed, and B, is a draw-bar fitted thereto. This draw-bar is formed of two parallel bars  $a, a$ , placed one over the other in the same plane and having cross-bars  $b, b'$ , secured between them, which cross-bars are fitted and work in guides  $c, c'$ , attached to the beams A, A, as shown clearly in Fig. 2. The guides  $c, c'$ , may be constructed of metal bars forged or bent in suitable form, as shown in Fig. 1. These guides are simply square loops and the ends of the cross-bar  $b$ , are made in cylindrical form, and these cylindrical terminations  $d$ , work in guides  $c$ . The guides  $c'$ , are of the same form as the guides  $c$ , but in the latter there are secured horizontal pins  $e, e$ , one in each guide and at its back part. To the ends of the cross-bar  $b'$ , which work in these

guides  $c'$ , there are attached horizontal pins  $f$ , which are in line with the pins  $e, e$ , as shown clearly in Fig. 2.

C, is the car spring, which is composed of india-rubber cylinders  $g, g$ , fitted between metallic plates  $h$ . This spring C, is fitted between a plate  $i$ , at the back part of the guides  $c'$ , and between the cross-bar  $b'$ , of the draw bar B. The spring C, it will be seen cannot be unduly compressed under any circumstances as the ends  $d$ , of the cross-bar  $b$ , will come in contact with the back ends of the guides  $c$ , and the ends of the pins  $f$ , of the cross-bar  $b'$ , will come in contact with the pins  $e$ , in the guides  $c'$ . These parts therefore serve as stops and effectually preclude any undue compression of the spring C. The plates  $h$ , are hollow; or, in other words, they are the sides of hollow air cylinders and are perforated as shown at  $i'$ , in Figs. 3, 4, and 5. The air chambers  $j$ , are shown clearly in Figs. 7, 8, and 9. They may have perforated peripheries as shown at  $k$ , in Figs. 8, and 9, or they may have close or tight peripheries as shown in Fig. 7. The functions of these air chambers are fully explained and covered by Letters Patent granted to me August 21st 1860. The face sides of the plates  $h$ , however are essentially different from those alluded to in my patented invention. In the present instance they are made, as shown clearly in Figs. 7, 8, and 9, a transverse section of the plates showing a straight beveled or oblique surface from their peripheries to their central hubs  $l$ .

The ends of the rubber cylinders  $g, g$ , are in planes which are at right angles to their sides and these ends are placed or bear against the faces of the plates  $h$ , as shown in red in Figs. 7, 8, and 9. By this arrangement it will be seen that the india-rubber cylinders  $g, g$ , when compressed will not bulge or expand outward in any material degree as was the case hitherto, for by the present invention the rubber will expand inwardly, when compressed, because the plane upon which the rubber is supported is a descending plane, growing deeper and deeper as it recedes from the periphery of the plate. The lateral expansion, or bulging at the periphery of the rubber disks, by which they are cracked is thus prevented and the spring thereby preserved from injury. Thus the rupturing of the india-rubber cylinders  $g$ , is effectually prevented, and this is a con-



tingency which frequently occurs with springs of this class as previously constructed.

The faces of the plates *h*, may be provided with the projections *m*, radial, annular and other forms as, and for the purposes described in my patented spring previously referred to; but it should be noticed that in my present improvement the surface of the plate upon which the rubber rests although it may be corrugated, (as in Fig. 8) it is still an inwardly descending surface. The exterior bulging or expansion of the rubber at its periphery is prevented by having the surface of the plate on which the rubber rests made inwardly descending, whether said surface be smooth or corrugated.

I am aware that plates have been made of a concave or disk shaped form, that is, with two inclined surfaces, one inclining from the center toward the periphery, the other inclining from the periphery toward the center; so as to form an annular groove or depressed space between the center of the plate and the periphery. My former patent shows this construction; so also do the patents of Vose, 1860. But neither of these prevent the outward bulging of the rubber, because the surface on which the rubber rests rises toward the center of the plate just as much as it descends from the periphery. The descent is therefore counterbalanced by the ascent, and no expansion area is obtained. Such a plate is merely a plate, with its surface corrugated with a single corrugation.

The distinctive feature of my present im-

provement consists in having the surface of the plate, upon which the rubber is supported, whether corrugated or smooth, made to descend inwardly from the periphery to the hub. The area for expansion thus deepens just in proportion as the rubber is compressed.

I do not claim broadly the employment of stops to prevent the too great compression of springs.

I do not claim broadly a car spring formed of india-rubber cylinders and metallic plates, nor do I claim using air chambers in connection with rubber springs, nor do I claim the projections *m*, for they may be seen in my patented spring of August 21, 1860, but;

Having thus described my invention, what I claim as new and desire to secure by Letters Patent; is—

1. Having the surface of the plate on which the rubber rests, made inwardly descending from periphery to hub, as and for the purpose herein shown and described.

2. The arrangement of the guiding stop bars *b*, *b'* and pins *e*, *f* with each other and with the guides *c*, *c'*, springs *C*, beams *A*, and draw bar *B*, all as herein shown and described.

3. Having the guiding stop bar *b'* arranged to swing, upon a central axis upon the draw bar *B* as herein shown and described.

GREENLEAF L. TURNER.

Witnesses:

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LEWIS A. TUCKER.