(No Model.)

H. S. HALE.

CAR SEAT.

No. 388,412. Patented Aug. 28, 1888.

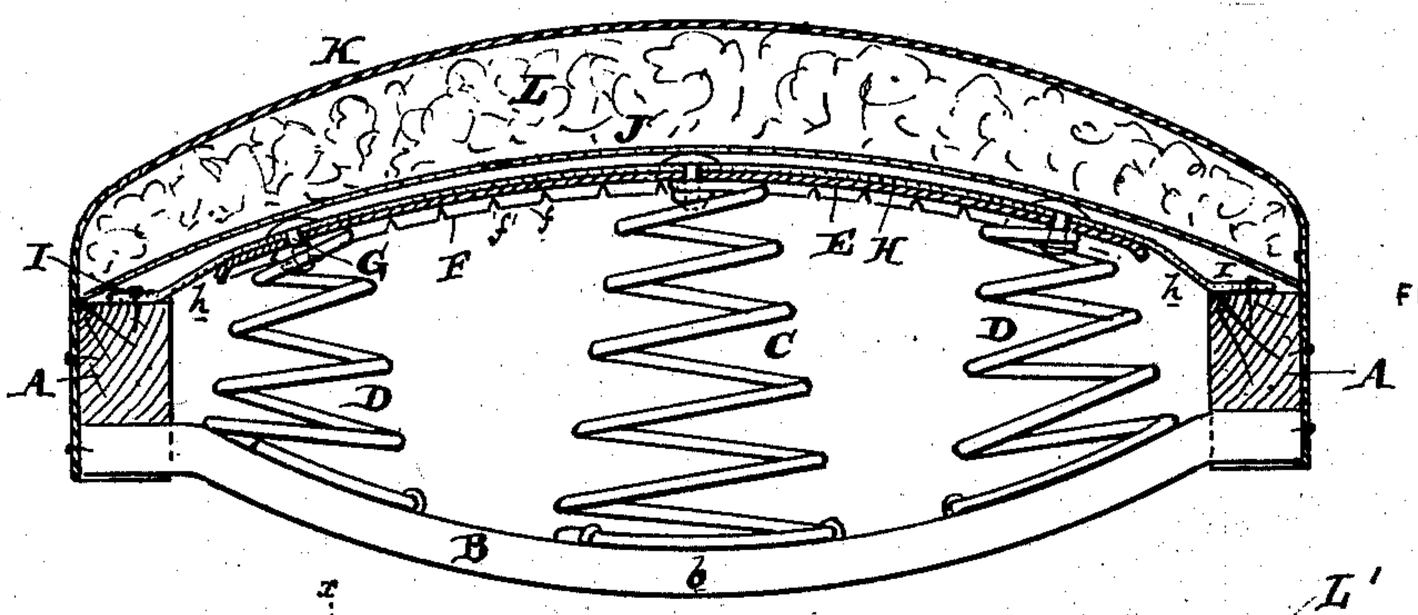


FIG. 1

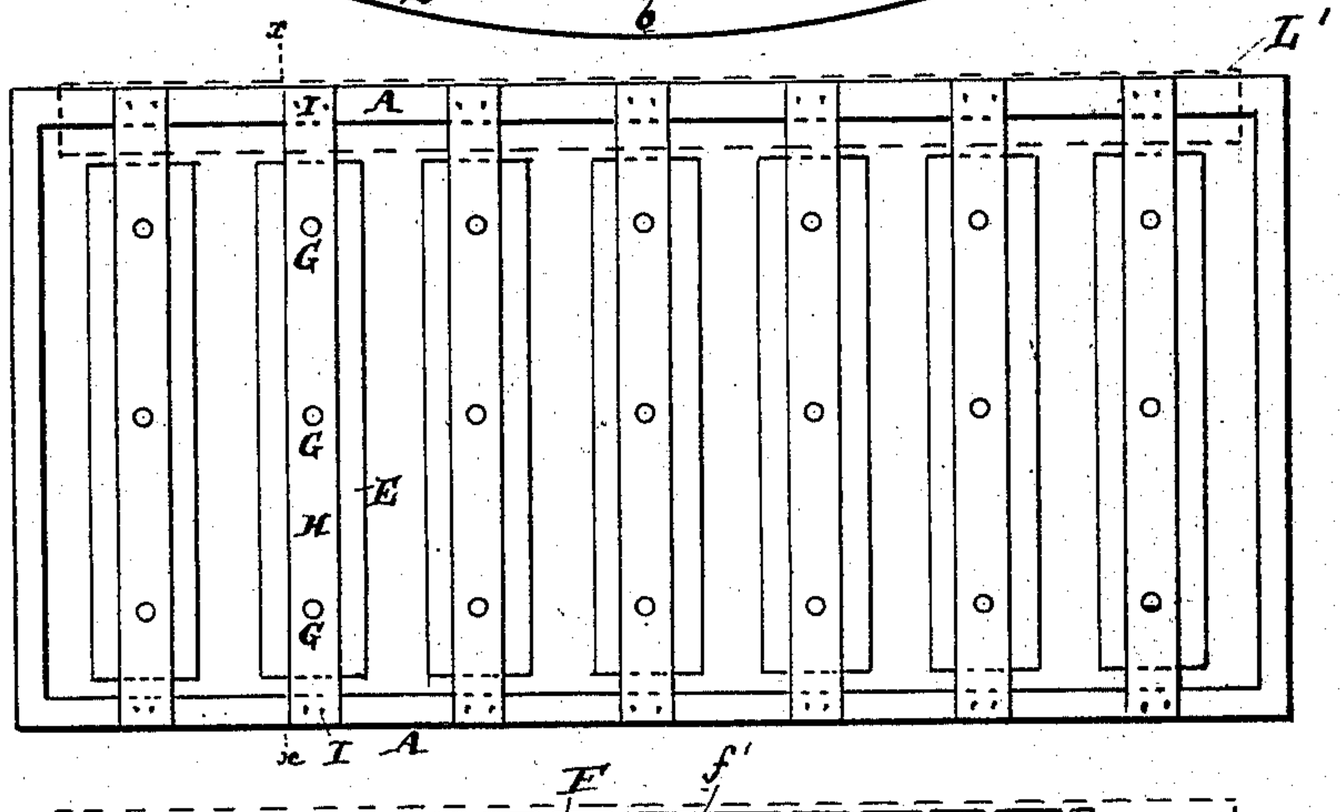


FIG. 2

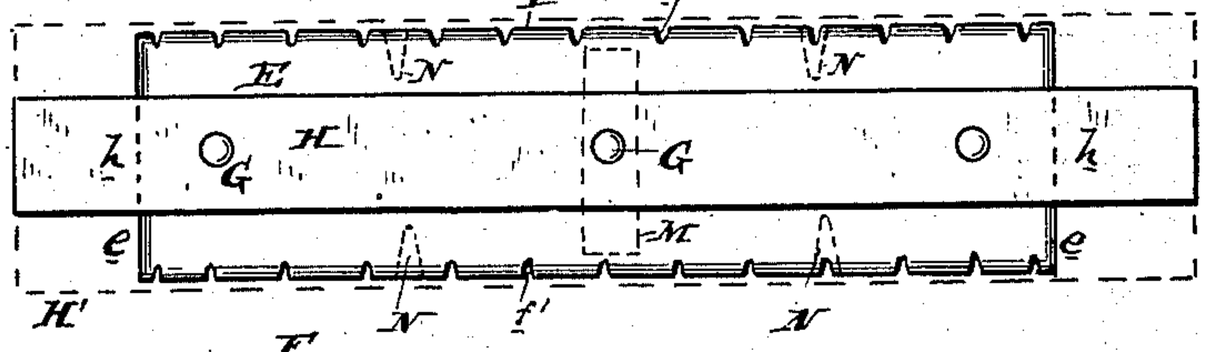


FIG. 3

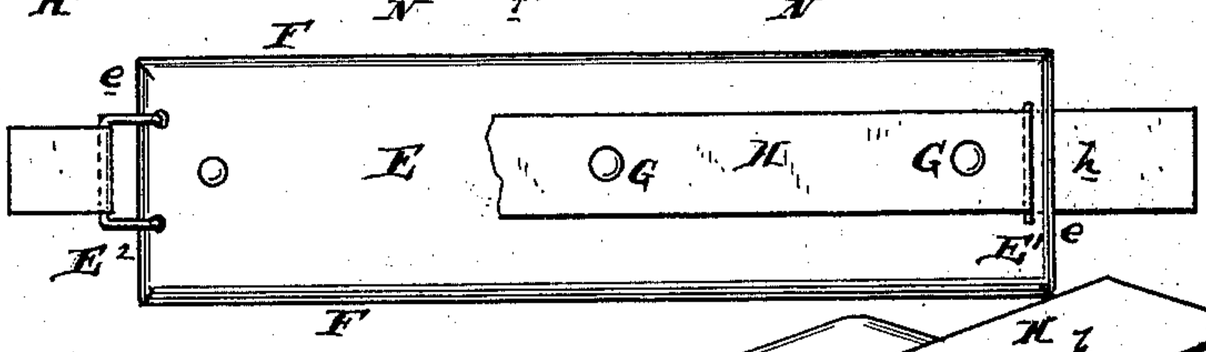
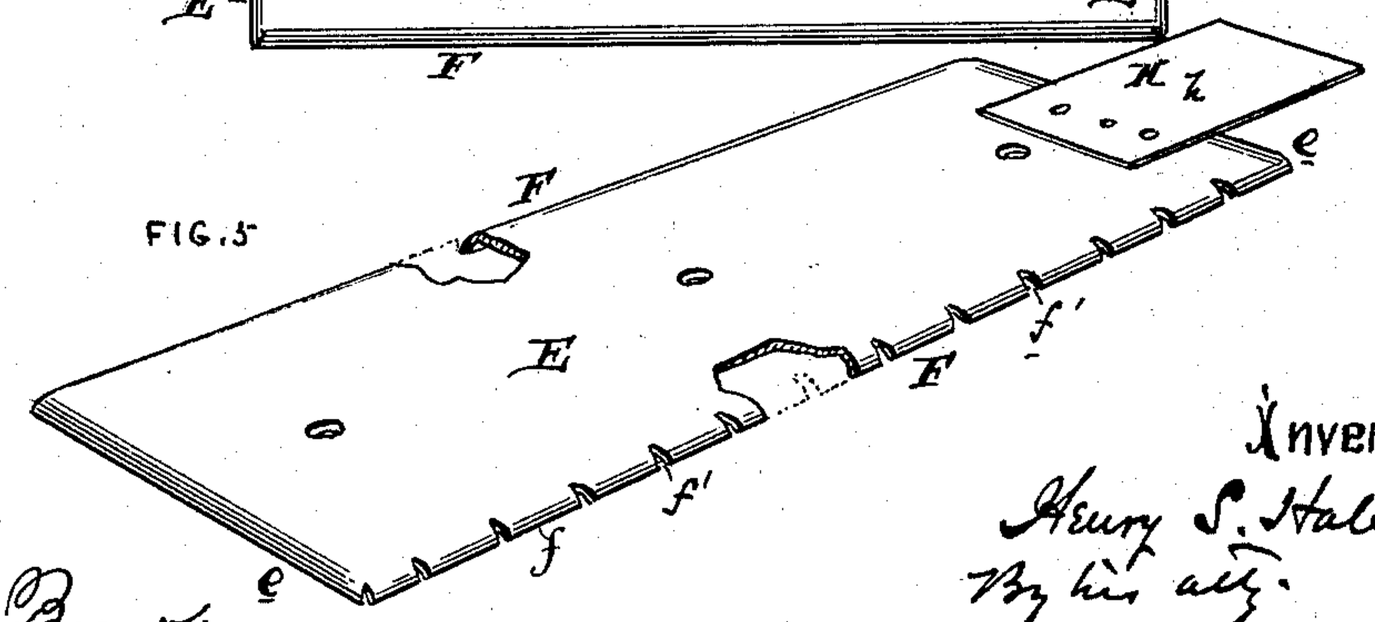


FIG. 4

FIG. 5



Attest

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UNITED STATES PATENT OFFICE.

HENRY S. HALE, OF PHILADELPHIA, PENNSYLVANIA.

CAR-SEAT.

SPECIFICATION forming part of Letters Patent No. 388,412, dated August 28, 1888.

Application filed January 7, 1887. Serial No. 223,662. (No model.)

To all whom it may concern:

Be it known that I, HENRY S. HALE, of the city and county of Philadelphia and State of Pennsylvania, have invented an Improvement in Car-Seats, of which the following is a specification.

My invention has reference to seats in general, but more particularly to car-seats; and it consists in certain improvements, all of which are fully set forth in the following specification, and shown in the accompanying drawings, which form part thereof.

Seats have heretofore been made in a large number of ways, patents on many forms of which I now control. These constructions comprehend seats in a general measure similar to the invention hereinafter set out, but lacking many of the great advantages of this my latest improvement. Heretofore the cross-bars were either curved upward or straight, as shown, for instance, in my patent No. 271,062, of 1883, either of which constructions did not give the increased capacity of the seat in the center, so necessary when the usage is so varied and rough as in railway-cars. In my patent, No. 280,740, of 1883, both the curvature of the seat and its cross-bars was downward, again failing in the present object.

In another of my patents, No. 259,533, of 1882, is shown a form of seat very similar to those above referred to, and in this case the elastic capacity is also wanting, as the cross-bars at the bottom are straight. In this last-mentioned patent the springs are connected together by very narrow metal strips, and above these are placed wide bands of textile material, such being the reverse of that set out in this application. In some forms of seats where no box-frame was used—for instance, Patent No. 246,378, of 1881—the central portion was necessarily let down to admit of a practical size of spring to make the seat acceptable, and in such construction necessitating the support of the cushion around the edges of the seat by a series of small springs. Such was the state of the art at the date of my invention, which is essentially an improvement upon these constructions.

The cushions have heretofore been supported upon wooden or card-board strips, which were directly or indirectly supported upon the springs, in many instances the strips being reenforced by narrow bars of spring metal. The cushion, however, has not been supported directly by such metal bars.

In my present invention I have endeavored to overcome the existing objections in the seats referred to and at the same time considerably cheapen the construction.

In the drawings, Figure 1 is a cross-section of my improved seat on line *x x*. Fig. 2 is a plan view of same with the cushion removed. Fig. 3 is a plan view of one section of the springs, cross-bars, and supporting-strips removed. Fig. 4 is a similar view of a modification of same, and Fig. 5 is a perspective view of one of the wide flexible metallic supporting-strips removed.

A is the box-frame of the seat.

B are the cross-bars, secured to the bottom of said frame and adapted to support the springs C D. These cross-bars are made with a downward curvature, or more preferably bow-shaped, with the middle curvature arranged downward, as at *b*. The center springs, C, are higher than the side springs, D, so as to provide for the upward curvature of the cushion-supporting strips and compensate for the downward curvature of the cross-bars.

Secured to the tops of the springs C D are the wide flexible sheet-metal strips E, preferably made shorter than the width of the seat-frame. These strips are clearly shown in Fig. 5, in which it will be seen that they are very wide and have their lateral edges *f* curved down, so as to avoid cutting the fabric which they support. These strips are made of thin sheet-steel or other flexible or spring metal, and to enable them to bend freely the curved edges *f* are notched or cut, as at *f'*. If desired, the ends may also be curved, as at *e*, to prevent cutting of the bands H, of textile material.

The bands H are of any woven or textile fabric, preferably of less width than the metal strips, and are drawn down over the ends of said strips and secured to the box-frame A at I, to give the curvature shown in Fig. 1 to said strips. These bands H and metallic supporting-strips E are secured together and to

the springs by rivets G. Spread over these bands H and resting upon the strips E is the webbing or covering J. Upon this is placed the hair or cushion filling L, and over all is placed the plush or cover K. Those portions *h* of the bands H between the ends of the strips E and the frame A are perfectly free, and allow the entire strips E to rise and fall to suit the weight when the same is excessive. It will be observed that the strips E and upholstery have an upward curvature, and opposite to the curvature of the cross-bars B, whereby the capacity of the seat in the middle is greatly increased over what it would be if said bars were straight or the curvature of the cushion and cross-bars was in the same direction.

If desired, the textile band may be made wide, as indicated in dotted lines, Fig. 3. If the band H is narrow, it may pass through a slot, E′, in the end of the strip E, as shown in Fig. 4, or these bands may be riveted to the ends of the strips E, as indicated in dotted lines, Fig. 5. Again, instead of attaching the bands directly to the strips they may be connected by links, as shown in the left-hand side of Fig. 4. It is also evident that all of the bands H might be united to form a single canvas webbing, which would be riveted to the strips. In some cases it is desired to provide the seat with spring edges, and these may be formed of similar spring-strips, E, and located, as shown in dotted lines L′, Fig. 2. The strips E may be re-enforced with wood or pasteboard, if desired.

While I prefer the construction shown, I do not limit myself to the minor details thereof, as they may be modified in various ways without departing from my invention; for instance, the sides of plates F between rivets may be notched deeply, as at N, to avoid crackling noises, or transverse supports, as indicated in dotted lines M, may be riveted under plates F.

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

1. In a seat, the combination of the box-frame, a series of bow-shaped cross-bars secured to the under side of said frame and having the middle curvature downward, a series of springs supported on each cross-bar, flexible strips secured to the upper parts of said springs, flexible connections between said strips and seat-frame, by which the said strips are caused to curve upward in the middle, and a seat-cushion or upholstering supported above said strips and with its curvature in the opposite direction to that of the cross-bars.

2. In a seat, the combination of the box-frame, a series of bow-shaped cross-bars secured to the under side of said frame and having the middle curvature downward, a series of springs supported on each cross-bar, wide flexible strips of sheet metal secured to the upper parts of said springs, flexible textile connections between said strips and seat-frame, by which the said strips are caused to curve upward in the middle, and a seat-cushion or upholstering supported above said strips and with its curvature in the opposite direction to that of the cross-bars.

3. In a seat, the combination of the box-frame, a series of bow-shaped cross-bars secured to the under side of said frame and having the middle curvature downward, a series of springs supported on each cross-bar, flexible strips of sheet metal made wide and having their lateral edges curved downward secured to the upper parts of said springs, flexible textile coverings secured to and connecting said strips, and seat-frame by which the said strips are caused to curve upward in the middle, and a seat-cushion or upholstering supported above said strips and with its curvature in the opposite direction to that of the cross-bars.

4. In a seat, the combination of the main or box frame, cross-bars secured to the bottom of said frame, springs supported on said cross-bars, wide flexible sheet-metal supporting-strips secured to the tops of said springs, and narrow textile bands extending over said metallic strips and secured on its ends to the box-frame, and upholstery directly supported upon said wide sheet-metal strips.

5. In a seat, the combination of the main or box frame, cross-bars secured to the bottom of said frame, springs supported on said cross-bars, wide flexible sheet-metal supporting-strips secured to the tops of said springs, and narrow textile bands extending over said metallic strips and secured on its ends to the box-frame, and rivets uniting said fabric to the sheet-metal strips, and upholstery directly supported upon said wide sheet-metal strips.

6. In a seat, the combination of the main or box frame, cross-bars secured to the bottom of said frame, springs supported on said cross-bars, wide flexible sheet-metal supporting-strips having their lateral edges curved downward secured to the tops of said springs, and narrow textile bands extending over said metallic strips and secured on its ends to the box-frame, and upholstery directly upon said wide sheet-metal strips.

7. In a seat, the combination of the main or box frame, cross-bars secured to the bottom of said frame, springs supported on said cross-bars, wide flexible sheet-metal supporting-strips having their lateral edges curved downward and notched secured to the tops of said springs, and narrow textile bands extending over said metallic strips and secured on the ends to the box-frame.

8. A flexible supporting-strip for a car-seat cushion, consisting of a flexible sheet-metal strip having its edges curved downward and notched to make it extremely flexible and pre-

vent injury to the textile covering when in use, substantially as and for the purpose specified.

9. In a seat, the frame A, in combination with downward-curved cross-bars secured to it at the bottom, upwardly-curved cushion-supporting strips and a series of springs interposed between them, supported upon said bars and of different sizes, the largest or highest being in the middle, whereby the vertical capacity of the seat gradually increases from the edges to the center.

In testimony of which invention I hereunto set my hand.

HENRY S. HALE.

Witnesses:
R. M. HUNTER,
WILLIAM C. MAYNE.