

(No Model.)

H. M. KEITH.
Vehicle-Spring.

No. 228,360.

Patented June 1, 1880.

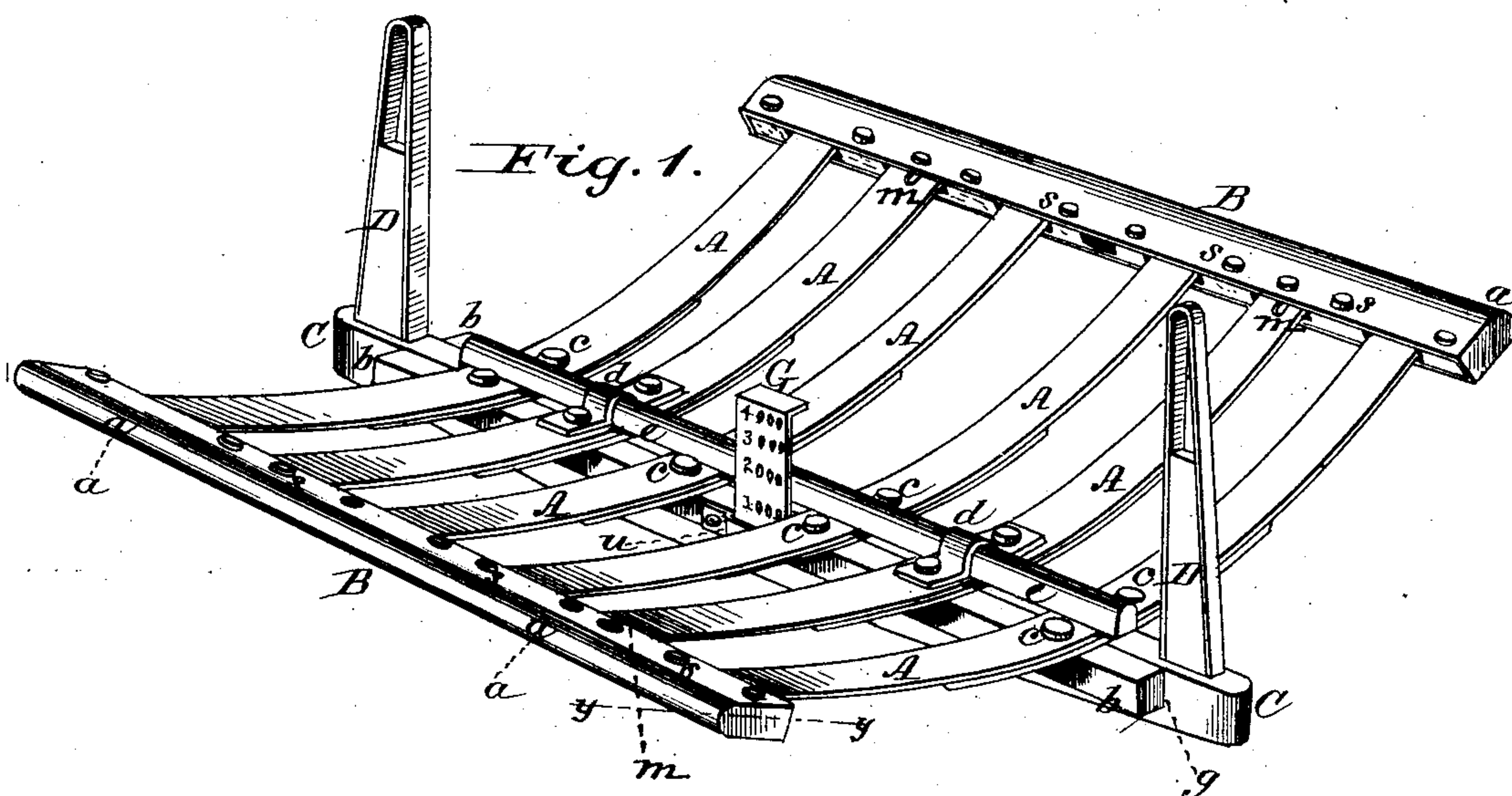


Fig. 2.

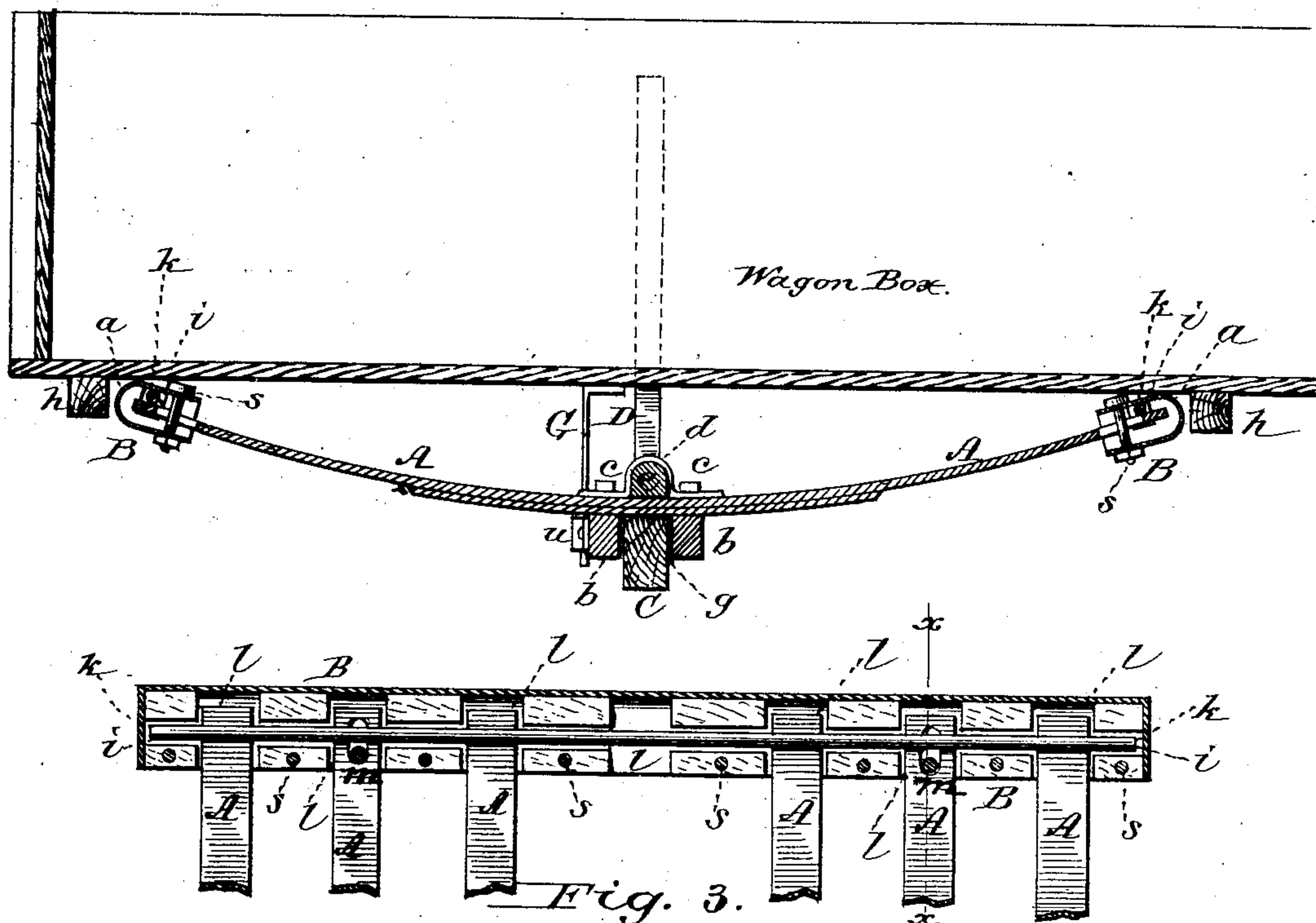


Fig. 3.

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Atty's

UNITED STATES PATENT OFFICE.

HORACE M. KEITH, OF COMMERCE, ASSIGNOR OF ONE-HALF OF HIS RIGHT
TO JOEL PEASE HARGER, OF PONTIAC, MICHIGAN.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 228,360, dated June 1, 1880.

Application filed April 9, 1880. (No model.)

To all whom it may concern:

Be it known that I, HORACE MASON KEITH, a citizen of the United States, residing at Commerce, in the county of Oakland and State of Michigan, have invented new and useful Improvements in Vehicle-Springs, of which the following is a specification.

The objects of my invention are to produce a vehicle-spring that shall carry the load with a swaying easy spring, and not with short up-and-down jerks; secondly, to render the springs capable of sustaining light or heavy loads; and, thirdly, to accomplish such results by a construction of spring which has a bearing all the way across the bottom of the wagon-body and reaching over nearly the whole length.

In carrying out my objects I have invented certain new and useful improvements, which shall be hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a view, in perspective, of my improved spring; Fig. 2, a section on the line *x x*, or in the line of the springs; and Fig. 3, a section on the line *y y* of Fig. 1.

The springs *A A A* are in the form of semi-elliptics, and, crossing the line of the bolster, are fastened at their ends in end cross-pieces, *B B*, in a manner to be hereinafter described. These end pieces, *B*, are as long as the wagon-box is wide, and are for bearing the bottom of the wagon-box directly, and their edges have a metallic rounded shoeing, *a*, for the purpose of sliding smoothly on the wagon-box bottom as the weight in the wagon increases to depress the springs, and vice versa as the weight is decreased.

Midway the length of these springs *A*, and crossing under them at right angles, are two cross-bars, *b b*, to which said springs are bolted by bolts *c*, which also fasten metallic strap-loops *d* on the top of the springs, by which a bar, *e*, is held, which latter is of sufficient height to prevent the wagon-box from weighing the springs down flat, as it arrests the downward movement of said wagon-box.

The bars *b b* are only a sufficient distance apart to form a long socket, *g*, for the bolster *C*, on which the combined spring rests, and which the series of semi-elliptic springs cross at right angles.

Upon the bottom of the wagon-box are cross-cleats *h h*, which serve as stops to the end pieces of the springs, which abut against said cleats under pressure of the load, it being designed to adjust the combined spring so that the abutting feature will be preserved. This is done by removing one, two, or more of the springs *A* when the load is light. Thus the relation of the end pieces, *B*, the bolster *C*, and the socket *g*, above described, is such that the weight of the wagon-box bearing down upon the end pieces depresses the springs, which brings said end pieces against the cleats on the bottom of the wagon-box, and then the assuring or holding line is between the bolster and plates, and the box is thus firmly held.

Referring to the manner of fastening the ends of the spring *A* in the end pieces, *B*, and the peculiar construction for that purpose, and premising that one spring at each side must always be used and as many others as are necessary for the load, the means of fastening are as follows: The end pieces, *B*, consist of hard wooden bars, as long as the wagon-box is wide, and of suitable width and thickness, which may be two and a half inches wide by one and one-fourth in thickness. In each of these pieces is a longitudinal cut-away groove, *i*, for the reception of a steel or iron rod, *k*, which runs their whole length, and acts as a roller-bearing for the movement of the spring ends. At right angles to this groove *i* are pigeon-hole notches *l*, for the reception and play of the spring ends, which enter them and pass under the roller *k*, the said wooden bars being shod with a metallic covering, *a*, on three sides and rounded, as and for the purpose described, the side toward the springs being open and unshod. This metallic shoeing is fastened, by bolts *s*, to the wooden bar, and each end spring or the next one to it is slotted at its end, as at *m*, the bolt passing through the slots. By this means the end springs are held, and the end springs being held, the holding of the middle ones follows as a matter of course. This rod or roller permits the play of the spring ends so necessary in vehicle-springs.

Upon one of the under cross-bars which form the socket for the bolster *I* provide a slide-gage, *G*, indicating the weight carried

and the number of springs to be used, as hereinafter described. The pressure of the wagon-box bearing down the slide effects this, and the slide is held from falling by its own weight
 5 by means of frictional contact with its holding-strap *u*, which embraces the gage *G* sufficiently close for such purpose, but not tight enough to prevent its sliding when urged by force.

10 The wagon-box is held from coming off sideways by the uprights *D* of the bolster.

In practice, for an ordinary two-horse wagon from six to eight of the springs *A* are required, and generally two of the combined
 15 springs, or, rather, two sets of springs so constructed, are used for each wagon, thus insuring a spring-bearing for nearly the whole superficial bottom of the wagon-box, instead of, as heretofore, having the bearing of the box on
 20 separate points. The ends of the springs working back and forward as they rise and fall under the roller *k* by the action of the load avoids almost all friction.

The springs *A* can be taken off or put on
 25 by simply putting the combined spring on the bolster, as described. The box is put on the springs, as above set forth.

The box may be lifted up and the springs taken out, there being no fastening of the
 30 springs to the box or vehicle. The box rests on the spring in four places by means of the two end pieces of each spring running all the way across.

A spring composed of a number of light
 35 springs is not as liable to break as one composed of a single heavy spring, and if broken any single broken one may be readily replaced.

The ends of the springs when the springs lengthen or contract move under the roller as
 40 easily as they would if hung on links, and these end pieces are strong, compact, and durable, and carry the box without any other arrangement, because they hold the box in its place from the bottom cleats the same as if
 45 there were no springs and no strain on the stakes to hold the box by cleats on the sides of the stakes, because they can easily be put on or taken off without any trouble.

The slide-gage *G* may have suitable figures
 50 of indication to show the distance between the top of the cleat or bolster and the bottom of the wagon-box; and through this means,

by simple calculation, it can be ascertained how many springs *A* are necessary to carry a given load. 55

I claim—

1. In vehicle-springs, the combination of end cross bearing-bars for the wagon-box with a series of semi-elliptical springs and one or more middle cross-bars, forming a bolster attachment, said springs being arranged to cross the bolster, and their connected bars forming broad cross-bearings for the wagon-box. 60

2. In vehicle-springs, the combination of 65 end bearing-bars for the wagon-box with a series of semi-elliptical springs, middle cross-bars connecting said springs with the bolster, and cross-cleats upon the wagon-box bottom, substantially as and for the purpose described. 70

3. The combination, in a vehicle-spring, of the semi-elliptical springs arranged across the bolster, and the end bearing cross-bars to which they are connected, with end roller-bearings for said springs, carried by said end bearing cross-bars. 75

4. In the vehicle-spring described, the cross-bars under the springs forming the bolster-socket, in combination with the end bearing cross-bars and the series of springs, substantially as and for the purpose described. 80

5. In the vehicle-spring described, the end bearing cross-bars shod with a metallic covering, rounded at the edge to permit of free movement, substantially as described. 85

6. In vehicle-springs, the combination of the end bearing cross-bars, a series of semi-elliptical springs crossing the bolster and held to action thereby, the socket for the bolster, the bolster, and cross-cleats upon the wagon-box bottom, all substantially as set forth. 90

7. In the vehicle-spring described, the end cross bars or bearings, provided with receiving-holes for the springs, a bearing-roller, and shod or covered with metal, substantially as 95 and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HORACE MASON KEITH.

Witnesses:

JAMES C. MACKINTOSH,
 AURE B. KEITH.