(No Model.)

W. P. HANSELL.

Vehicle Spring.

No. 230,272. Patented July 20, 1880.

Fig. 1.

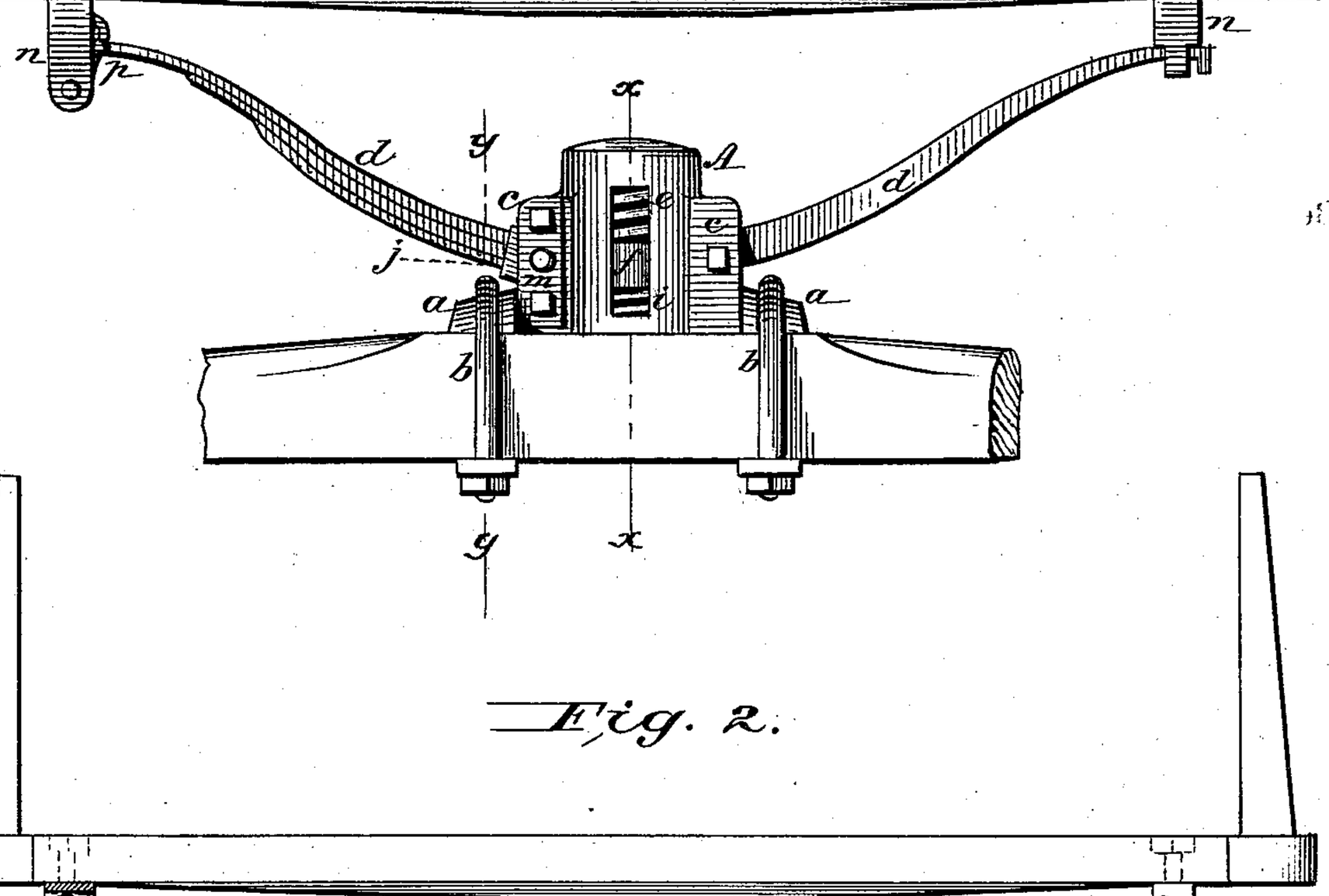

Fig. 2.

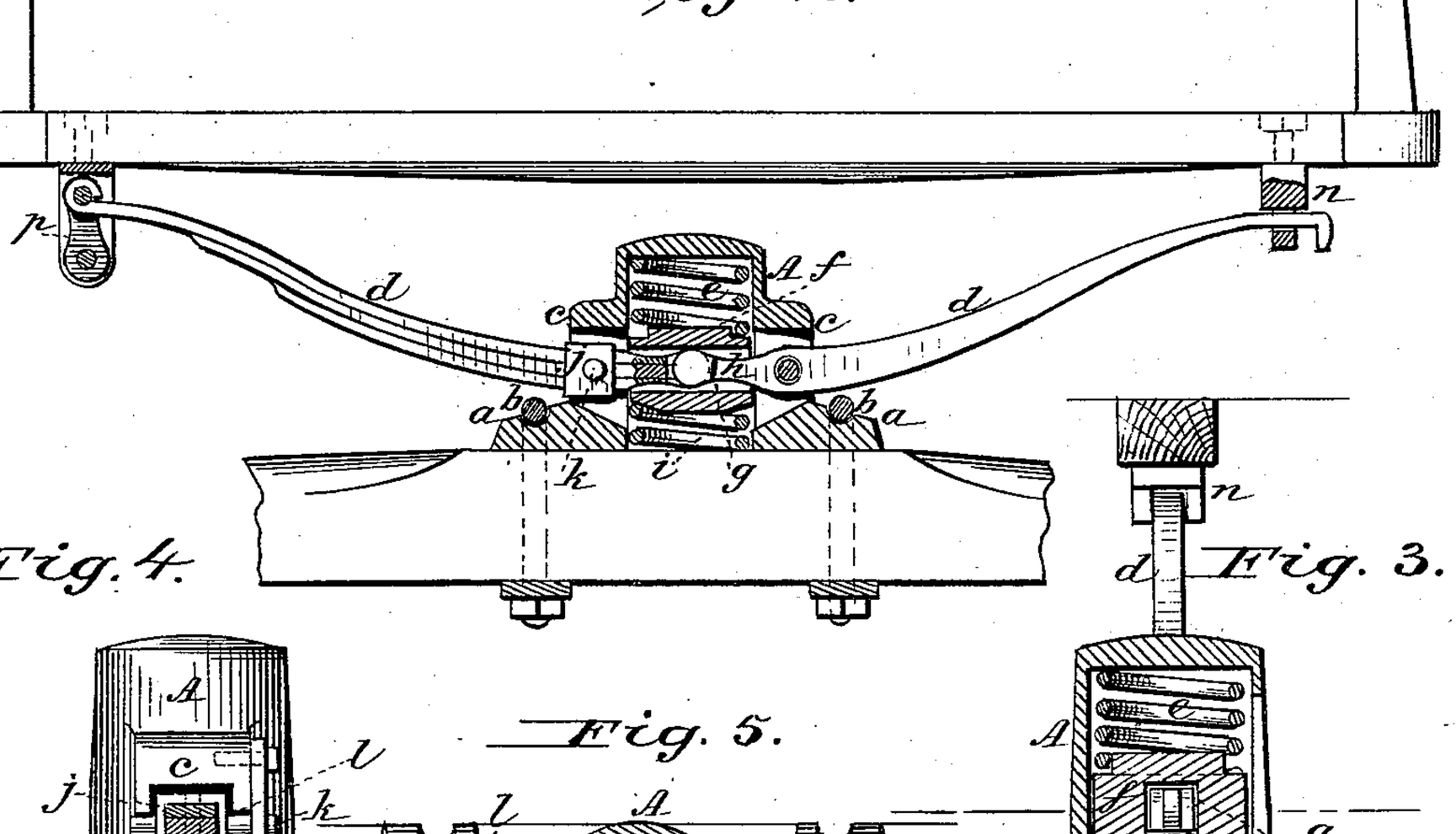

Fig. 4.

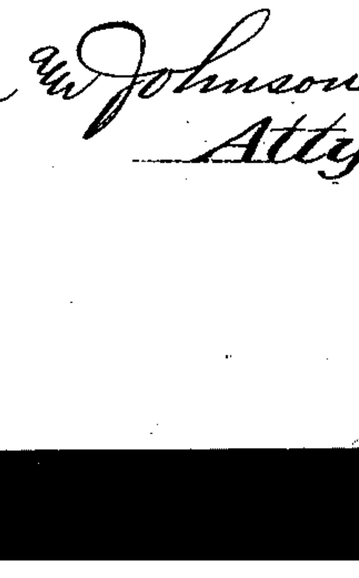

Fig. 3.

Fig. 5.

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WALTER P. HANSELL, OF PITTSBURG, PENNSYLVANIA.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 230,272, dated July 20, 1880.

Application filed June 5, 1880. (No model.)

To all whom it may concern:

Be it known that I, WALTER P. HANSELL, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Vehicle-Springs, of which the following is a specification.

My improvement relates to that style of vehicle-spring in which the body is supported upon levers pivoted to a casting and operates in connection with springs in said casting.

In my improvement the ends of the levers extend into mortises in the housing and are pivoted to side extensions thereof, with their short or free ends within a diametric groove or mortise in a follower upon which a superimposed spring exerts its force downward, being compressed against the closed top of the housing, whereby the short ends of the levers act upward upon a strong single spring, giving a free and easy movement to the levers under unequally distributed loads. The short ends of the levers meet within the follower mortise or groove with a non-connected coupling, and they fit the mortises in the follower and in the housing, so as to brace them against any side play or end thrusts of the body, while the follower is free to both rise and fall within the housing as the levers press it up or the spring forces it down.

To counteract the sudden rebound or upward jerks upon the long ends of the levers incidental to a down jolt of the vehicle, a supplemental spring is placed in the housing against the lower end of the follower, so as to resist and prevent a sudden lifting of the vehicle-body; but such spring is not designed to give any upward pressure upon the follower beyond the normal position of the levers.

It is important that the connection of the levers with the housing should be strong and durable, and not wholly dependent upon their fulcra-pins, which would be liable to be twisted or broken by the force of the end thrusts of the body upon the levers, and it will be seen that the mortised side extensions, *c c*, of the housing give a bracing support to said levers and relieve the pivot-pins of undue strain. The housing, in fact, forms a closed box for the springs, the follower, and the short ends of the levers.

Referring to the accompanying drawings, Figure 1 represents a side view of my improved spring as applied to the bolster of a vehicle; Fig. 2, a vertical section of the same, showing the levers partially depressed; Fig. 3, a cross-section on the line *x x* of Fig. 1; Fig. 4, a similar section on the line *y y* of Fig. 1; and Fig. 5, a horizontal section, showing the non-connected coupling of the levers.

A hollow metal casting, A, is formed with the two grooved wings *a a* at its base, by which it is secured to the axle-tree or bolster by means of clips *b b*, which fit into the grooves of the wings, and, in connection with clip-plates and nuts, bind the casting firmly in place, as shown.

The casting is also formed with two side boxes, *c c*, which subserve the purpose of supports or bearings for the fulcra of levers *d d*, and which also admit of the free vibration of said levers, as will be presently described.

In the upper portion of the hollow casting is arranged a spring, *e*, which may be of the spiral form shown, or which may consist of an elastic cushion, if so preferred. At the lower end of the spring is a loosely-placed follower, *f*, which is formed with a transverse passage or diameter-mortise, *g*, extending entirely through it. This passage is adapted to receive the short arms *h h* of the levers, which are passed through the boxes, so as to enter the transverse passage or mortise of the follower within the casting. Preferably a second spring, *i*, is arranged below the follower, to relieve such jar as will be incident to the reaction following a sudden down jolt of the vehicle, although this last-named spring is not absolutely essential.

I propose to use either rigid or spring levers in connection with the follower and the spring or springs arranged within the casting. To this end the side boxes, *c c*, forming part of the casting, will have somewhat modified forms of openings.

When rigid levers are employed the boxes have vertical slots, and the fulcra of the levers will consist of pins passed through the levers and the sides of the boxes, as shown in Figs. 2 and 5, the slots in the boxes admitting of a free vibration of the levers. When, however, leaved springs are used for the levers, the leaves of each spring are bound together

by a collar, *j*, formed with pivots *k*, and each side box of the housing is formed with open side slots, *l l*, so as to admit of the introduction of the pivots into the said slots.

In order to retain the pivots within the slots a plate, *m*, is formed with an opening to receive the projecting end of one of the pivots, and the said plate is bolted to one of the sides of the box, as shown in Figs. 1, 4. and 5. In either case the springs or levers connect with brackets which are secured to the vehicle-body, the connection between the two being made in such manner that when the long arms of the levers are depressed, and the upper spring within the casting compressed by the upward movement of the short arms and the follower, the said levers shall be free to have a lateral thrust through the brackets. This may be accomplished in two ways: The levers may be passed at their upper ends through loop-shaped brackets *n*, in which case the ends of the levers will be hook-shaped to prevent their withdrawal; or they may connect with the brackets by links *p*. The principle of action is, however, in either case, the same.

It will be observed that the levers are not pivoted together at their ends which enter the follower, and therefore that they will have free play therein. To bring these ends together so as to couple them loosely one of them has an end mortise and the other a tenon, so that when the several parts of the device are brought into proper adjustment the tenon of the one will project into the mortise of the other and form a bracing-coupling.

I have described the follower as being formed with a transverse passage or mortise extending from side to side; but it is obvious that a groove upon the under side of the follower would subserve the same purpose, since when the strain comes upon the outer ends of the levers the upward vibrations of the short arms of the said springs or levers would in either case force the follower against the upper spring within the casting.

When rigid levers are used their fulcra may be formed by the bottoms of the box-slots.

I may also use one lever in connection with the follower and spring, in which case each lever will connect with its co-operating follower and spring in a casting secured near each end of the axle or bolster, and the levers extending toward each other in their connection with the body; but I prefer the plan shown.

Now, it is important to notice that the follower serves as a direct connection for the lever in its function of effecting the simultaneous action of the levers, and of directly controlling the position of the body in keeping it level under unequally distributed loads.

The levers have no direct connection with or bearing upon the spring, but being controlled entirely by the follower, their action is more uniform and like the easy movement of the elliptical spring.

I claim—

1. In a vehicle-spring, the combination of the housing A, having a closed top and side mortises, with the levers *d d*, pivoted in said mortises, the follower *f*, having a diameter mortise or groove into which the short ends of the levers meet, and the spring *e*, arranged between the closed top of said housing and the follower, and adapted to exert a downward force upon the short ends of said levers, substantially as herein set forth.

2. The combination, in a vehicle-spring, of the housing A, having a closed top and side mortised extensions, *c c*, with the levers *d d*, pivoted therein, the mortised or grooved follower *f*, and the superimposed spring *e*, the short or free ends of said levers extending into and meeting within said follower mortise or groove with a non-connected or mortised coupling, all substantially as and for the purpose set forth.

3. The combination of the housing A, having a closed top and side mortised extensions, *c c*, with the levers *d d*, pivoted therein, the mortised or grooved follower *f*, into which the short ends of the levers meet, and the springs *e i*, arranged above and below said follower, substantially as shown and described.

4. The combination of the housing A, having a closed top and side extensions, *c c*, with the spring-levers pivoted therein, the mortised or grooved follower *f*, the superimposed spring *e*, and the pivoted collars or boxes *j* for said spring-levers, substantially as and for the purpose set forth.

5. A vehicle-spring consisting of the housing A, having a closed top and side mortised extensions, *c c*, the levers *d d*, pivoted therein, the mortised or grooved follower *f* and the springs *e i*, arranged above and below the follower, the short or free ends of said levers extending into and meeting within said follower mortise or groove with a free mortise-coupling, all substantially as shown and described.

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

WALTER P. HANSELL.

Witnesses:
W. H. LAWRENCE,
OLIVER FULTON.