

(No Model.)

H. C. SWAN.  
VEHICLE SPRING.

No. 377,818.

Patented Feb. 14, 1888.

Fig. 1.  $x$

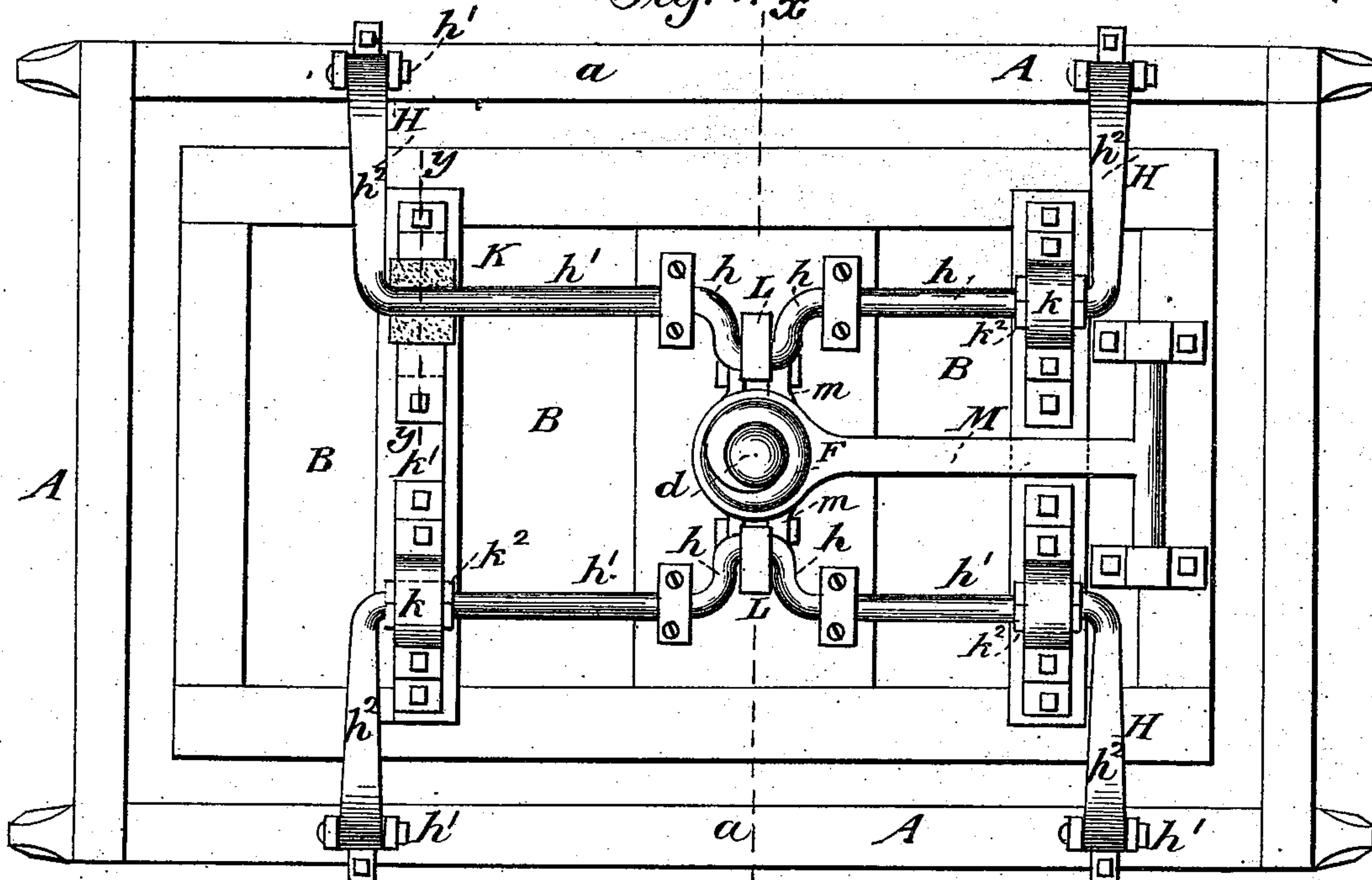
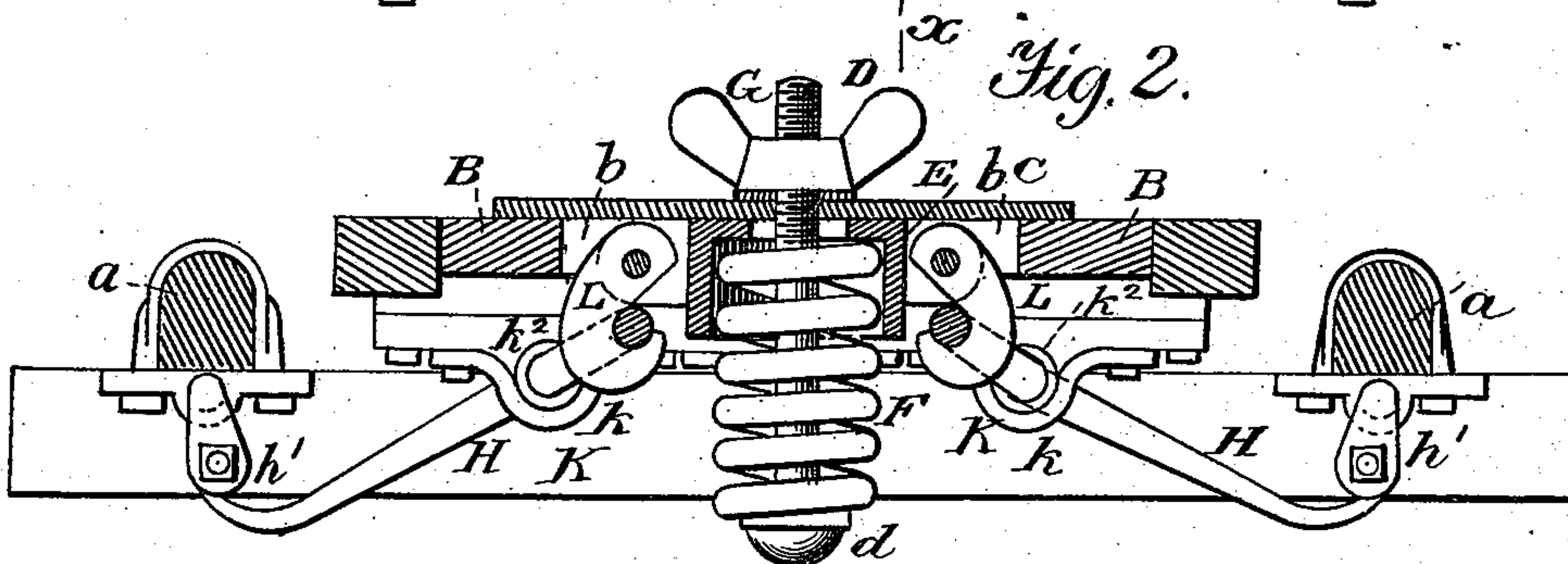
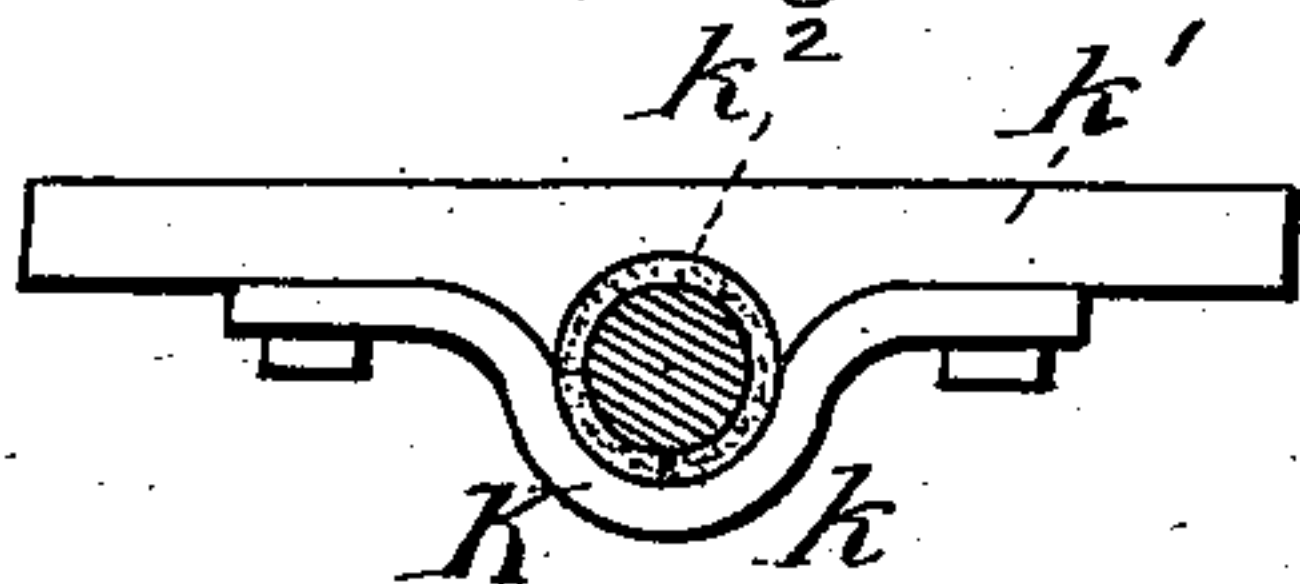


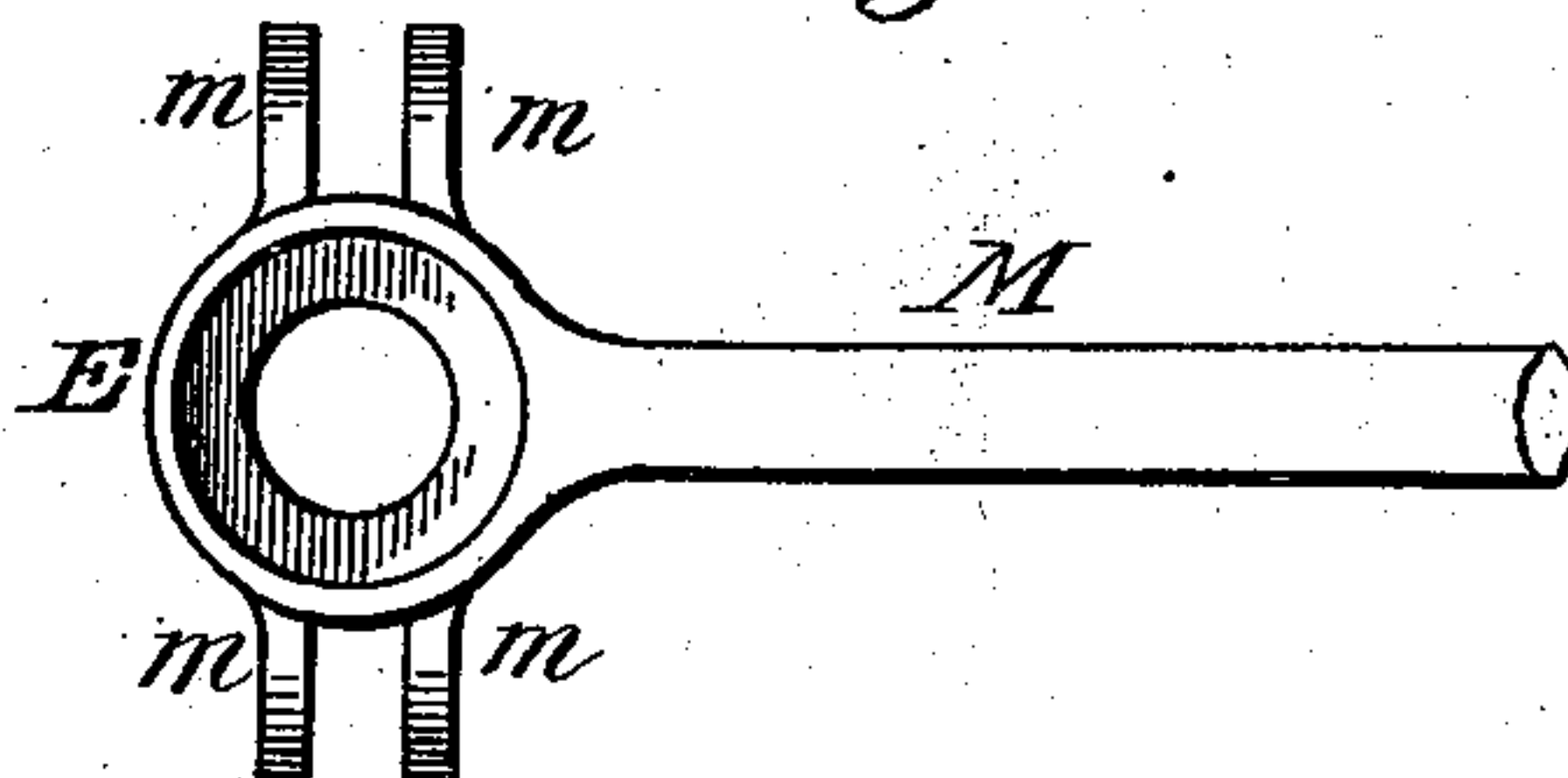
Fig. 2.



*Fig. 3.*



*Fig. 4.*



Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 377,818, dated February 14, 1888.

Application filed November 14, 1887. Serial No. 255,077. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY C. SWAN, a citizen of the United States, residing at Oshkosh, in the county of Winnebago and State of Wisconsin, have invented certain new and useful Improvements in Vehicle-Springs; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it ap-  
10 pertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specifica-  
tion.

15 The special object of the invention is to improve vehicle-springs so that the torsion-springs will not rattle in their bearings and will be securely connected with the equalizing-lever; also, to improve the construction of  
20 rock-shafts for vehicles.

Figure 1 of the drawings is a bottom plan view with a bearing in section; Fig. 2, a vertical cross-section on the dotted line  $x x$  of Fig. 1; Fig. 3, a section on line  $y y$  of Fig. 1,  
25 and Fig. 4 a detail bottom plan view of the equalizing-lever.

In the drawings, A represents the side-bar frame, and B the bottom of the vehicle. The latter has an opening,  $b$ , covered by the plate  
30 C, through which passes the threaded end of a headed screw, D. This screw also passes through the box E, in which is held the spiral spring F, surrounding said screw and compressed between the screw-head  $d$  and the  
35 spring-box E.

G is a nut, which works on the screw, so as to regulate the tension of the screw.

H H are crank rock-shafts shackled at  $h^4$  to the side bars,  $a a$ , and arranged to turn in the  
40 bearings K. These rock-shafts consist of the crank  $h$ , round arms  $h' h'$ , and the flatshackle-arms  $h^2 h^2$ . After many experiments with various forms I find these the best practically for my purpose, because their action is uni-  
45 form, while they are strong and durable. I connect the cranks  $h$  with the equalizing-lever M, whose T form prevents any lateral motion, by the pivoted hooks L, and this equalizing-lever M is provided with ears  $m m$ , across  
50 which are placed the pins  $l$ . The hooks L are so swung on the cross-pins  $l$  and between the ears  $m$  that the cranks  $h$  when resting in the hooks cannot escape therefrom on ac-

count of the said ears. The rock-shafts H require for their round arms  $h'$  a bearing, K, 55 consisting of the bottom concaved cap,  $k$ , and the top concaved base,  $k'$ , so that the arms  $h' h'$  may be laid in the concavity of the base and then be received in the cavity of the cap, subsequently placed upon it, and fastened to 60 the base.

In order to take up the wear on something which can be readily replaced, and which will prevent all rattling, I use the leather or other flexible packing  $k^2$ , which is preferably but 65 not necessarily, in a rectangular form. I first press down the middle of the strip in the concavity of the base  $k'$ , then place the round arm  $h'$  in it, next fold the ends of the strip over the arm, and, finally, fasten down the 70 cap  $k$  on the base  $k'$ . In this way the springs K can be quickly and without loss of time placed in the flexible packing, while the latter will be securely fastened around it. This obviates all liability to rattle, while the wear 75 can be readily taken up.

Having thus described all that is necessary to a full understanding of my invention, what I claim as new, and desire to protect by Letters Patent, is— 80

1. A flexible packing,  $k^2$ , having two free ends and a bearing in two concaved sections,  $k k'$ , in combination with the rock-shaft arms  $h' h'$  of a vehicle-spring, as and for the purpose specified. 85

2. In a vehicle-spring, the combination, with the rock-shaft H, cranked at  $h$ , of the hooks L and equalizing-lever M, the former pivoted between ears  $m m$  of the latter, as and for the purpose set forth. 90

3. In vehicle-springs, the spring L, coiled on a vertical bolt, the box E, placed over said spring, and an equalizing-lever attached to said box to prevent side motion, in the manner set forth. 95

4. In vehicle-springs, the lever M, having a journaled cross-bar at one end and at the other a box, E, and ears  $m m$ , to adapt it to be used as described.

In testimony whereof I affix my signature in 100 presence of two witnesses.

HENRY C. SWAN.

Witnesses:

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W. R. BROWNE.