W. S. TOTHILL.

TEETER TOTTER DEVICE.

APPLICATION FILED APR. 16, 1915.

1,168,348.

Patented Jan. 18, 1916.

2 SHEETS—SHEET 1.

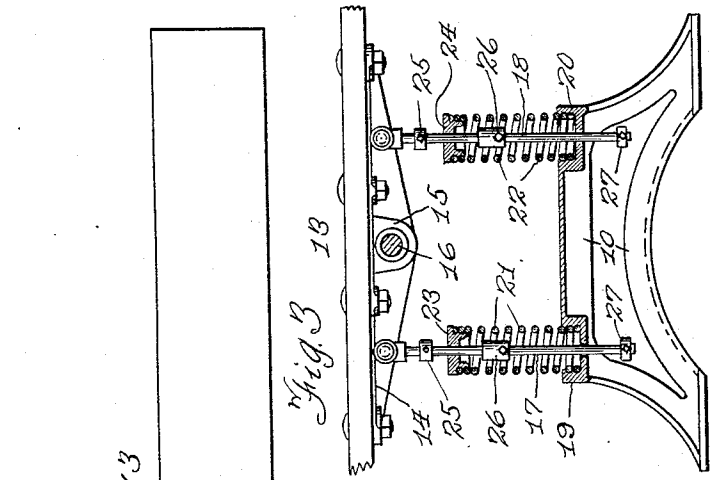

Fig. 3

Fig. 2

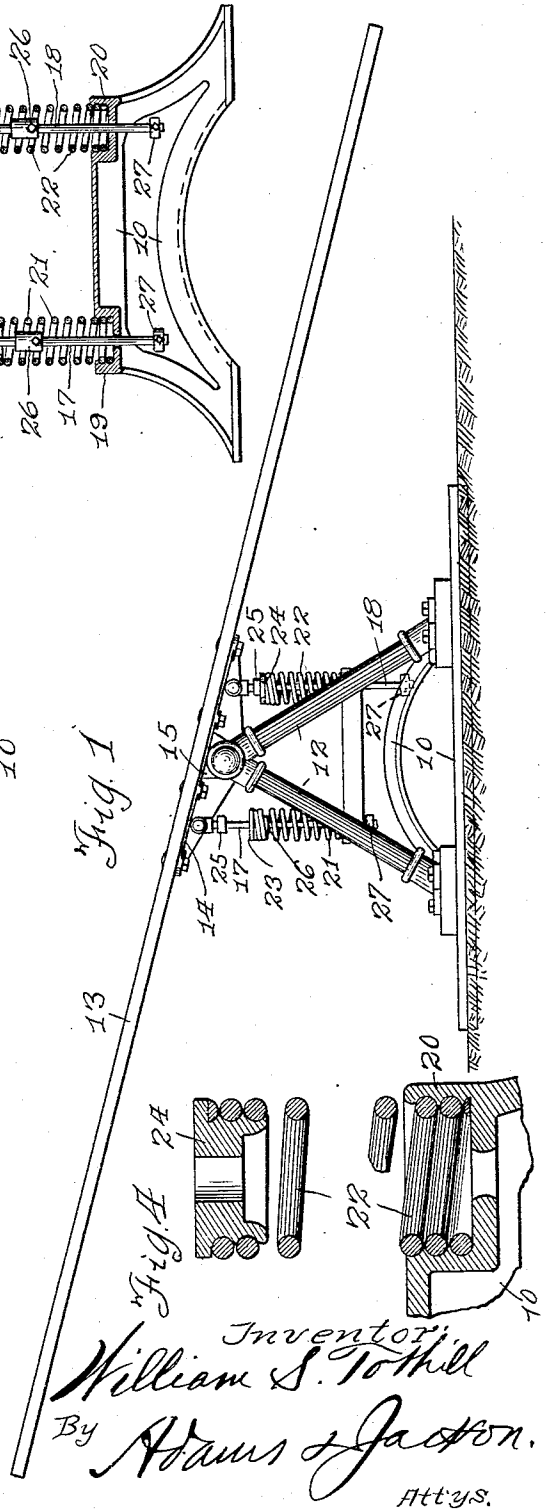

Fig. 1

Fig. 4

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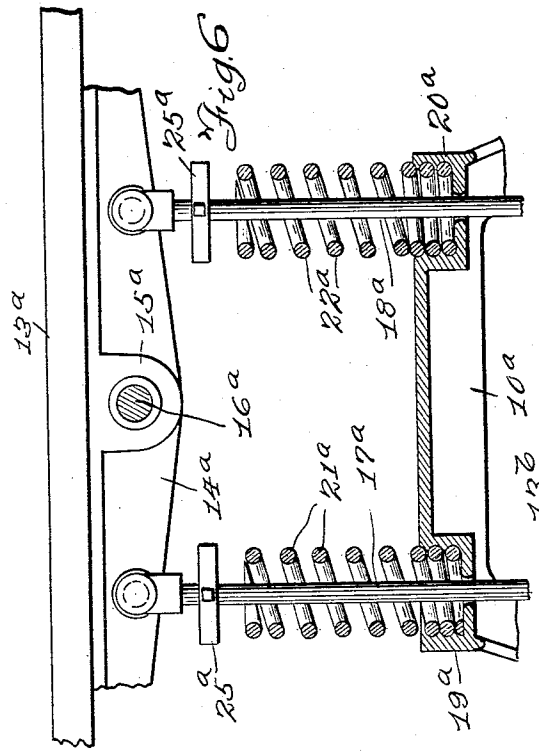

Fig. 6

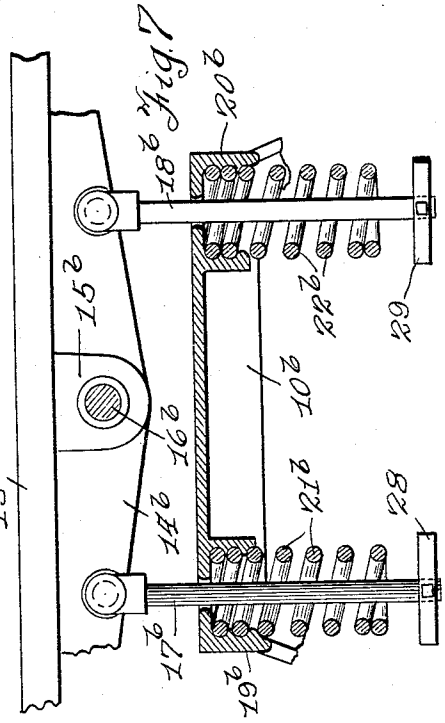

Fig. 7

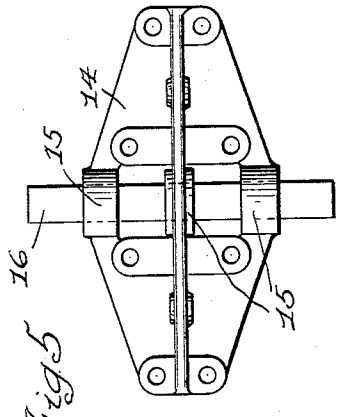

Fig. 5

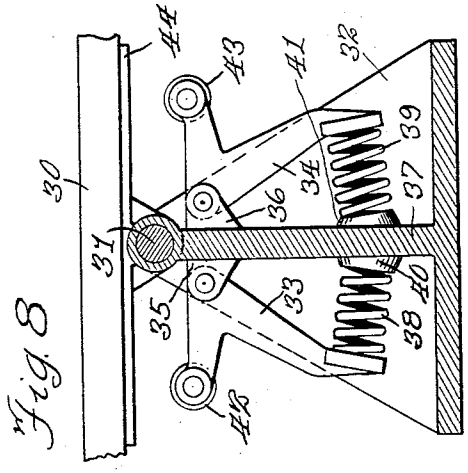

Fig. 8

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UNITED STATES PATENT OFFICE.

WILLIAM S. TOTHILL, OF CHICAGO, ILLINOIS.

TEETER-TOTTER DEVICE.

1,168,348. Specification of Letters Patent. Patented Jan. 18, 1916.

Application filed April 16, 1915. Serial No. 21,766.

To all whom it may concern:

Be it known that I, WILLIAM S. TOTHILL, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Teeter-Totter Devices, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to teeter-totter devices, and it has for one of its objects the provision of new and improved means for cushioning and limiting the movement of the swinging member relative to the standard upon which it is pivotally mounted.

It is another object of my invention to improve devices of this type in sundry details hereinafter pointed out.

The preferred means by which I have accomplished my objects are illustrated in the accompanying drawings and are hereinafter specifically described. That which I believe to be new and desire to cover by this application is set forth in the claims.

In the drawings.—Figure 1 is a side view of a teeter-totter device embodying my improvements; Fig. 2 is a top view of the device shown in Fig. 1; Fig. 3 is a longitudinal vertical section through my device, being taken substantially on line 3—3 of Fig. 2; Fig. 4 is an enlarged detail of one of the cushioning springs employed, the spring being partly broken away; Fig. 5 is a bottom plan view of the plate by which the swinging member of my device is pivotally connected to the supporting member; and Figs. 6, 7, and 8 are views similar to Fig. 3, but showing three different modifications of the device as shown in Figs. 1 to 5.

Referring to Figs. 1 to 5, in which corresponding parts are indicated by the same reference characters.—10 indicates a base of any suitable type, from which rises the supporting member of my device comprising standards 11—12. The swinging member of my device, which is pivotally mounted upon the supporting standard 11—12, comprises a board or bar 13 with a plate 14 mounted upon its under face, the plate 14 being provided with bearing lugs 15 in which a shaft 16 is revolubly mounted for supporting the bar member 13 in position upon the upper end of the standards 11—12. Pivotally connected to the bar 13 and depending therefrom, one at each side of the pivot 16, are two rods 17—18 which extend through suitable openings in sockets 19—20 carried by the base 10. Threaded into the sockets 19—20 by means of threads formed on their inner faces are two coiled springs 21—22, respectively, said springs extending upward from the base about the said rods. Caps 23—24 are secured by means of screw-threads in the upper ends of the springs 21—22, respectively, said caps being slidable freely upon the said rods. Bearing devices 25—26 are secured upon each of the rods at suitable distances, respectively above and below the said caps, — in the construction shown said bearing devices being in the form of collars adjustably secured in position by means of set-screws. Other bearing devices 27 are secured in any suitable manner upon the lower ends of the rods.

With the collars 25—26 in their preferred adjustment upon the rods 17—18 substantially as shown in Fig. 3, when the bar 13 is swung in clockwise direction in Fig. 1, at a certain predetermined point in such swinging movement the collar 25 is brought into engagement with the cap 24, whereupon the spring 22 cushions the further movement of the said swinging member. Shortly after the bearing collar 25 is brought into contact with the plate 24, the collar 26 is brought into contact with the cap 23, serving upon the continued movement of the bar 13 to expand the spring 21. The tension of the springs 21—22 is such as to cause such springs in many instances to yieldingly limit the swing of the bar 13, but if the bar is forced to the limit of its cushioned movement in clockwise direction in Fig. 1, the bearing device 27 is brought into contact with the lower face of the socket 19, serving positively to stop the movement of the said bar. When the bar 13 is swung in the opposite direction, the spring 21 will be first compressed, and the spring 22 thereafter expanded, the bearing device 27 on the rod 18 serving to limit the swing by being brought into contact with the under face of the socket 20.

In Fig. 6, which shows a modified form of my improved device, the parts which correspond to the parts of the device shown in Figs. 1 to 5, are indicated by the same reference characters, but with the addition of an exponent "*a*." The construction here shown is substantially the same as that shown in Figs. 1 to 5, with the exception that the caps 23—24 and the bearing devices

26 and 27 are omitted, reliance being placed upon the springs 21^a—22^a alone for cushioning and limiting the movement of the bar 13^a.

In the construction shown in Fig. 7, which shows another modification of the construction of Figs. 1 to 5, the parts which correspond to the structure of Figs. 1 to 5 are indicated by the same reference characters, but with the addition of an exponent "*b*." In the construction here shown the sockets 19^b—20^b open downward instead of upward as in Figs. 1 to 5, the springs 21^b—22^b extending downward from the sockets instead of rising therefrom. In this construction, the free ends of the springs 21^b—22^b are not provided with caps, the bearing devices 28—29 carried by the rods 17^b—18^b at their lower ends being adapted to engage the lower ends of the springs 21^b—22^b directly without the use of caps at the ends of the springs. As will be readily understood, upon the movement of the bar 13^b in clockwise direction in Fig. 7 to a certain predetermined limit, the cap 28 will be brought into contact with the spring 21^b for cushioning the remainder of the swing of the bar in that direction. When the bar 13^b is swung in the opposite direction, the spring 22^b will be compressed by the bearing device 29.

In Fig. 8, which shows still another form of device, a swinging member 30 is pivotally mounted by means of a shaft 31 upon the upper end of a standard 32 of a different design from that used in connection with the other devices. Bell crank levers 33—34 are pivotally mounted upon lugs 35—36, respectively, extending from opposite sides of the transversely-extending plate 37 of the standard 32. Springs 38—39 are mounted in suitable sockets 40—41 on opposite sides of the plate 37, with the outer ends of which springs the lower ends of the bellcrank levers 33—34 are adapted to contact. The horizontally-extending arms of the said bellcrank levers are provided with rollers 42—43 revolubly mounted thereon. As will be readily understood, when the bar 30 is swung in clockwise direction in Fig. 8, the said bar 30 or the plate 44 by which the said bar is pivotally mounted upon the shaft 31 will be brought into contact with the roller 43 of the bellcrank lever 34, causing the spring 39 to be compressed. Upon the movement of the bar 30 in the opposite direction, the bellcrank lever 33 will be swung against the action of the spring 38, the springs 38—39 thus serving to cushion the swing of the movable member in both directions.

By the use of my improved bearing means comprising a rod extending through the coiled spring employed, the spring is prevented from buckling, the said bearing means serving as a guide along which the spring is stressed. I do not wish to limit myself to the use of coiled springs, however, or the use of bearing means in the form of rods as shown, except as hereinafter specifically claimed.

By the use of the improved construction and arrangement illustrated in Figs. 1 to 5, each of the cushioning springs employed acts to cushion the swing of the moving member at the end of its stroke in each direction, making it possible to accomplish the requisite cushioning by the use of a single spring. I prefer, however, to use two springs, such springs being preferably arranged as shown in Figs. 1 to 5, whereby each spring assists the other in producing the complete cushioning effect. In the form of construction shown in Figs. 1 to 5 my improved devices also serve to limit the swing of the moving element, thus reducing to a very marked degree the danger incident to the use of a teeter-totter device.

That which I claim as my invention, and desire to secure by Letters Patent, is,—

1. In a teeter-totter device, the combination of a standard, a bar pivotally mounted on said standard, a spring mounted on one of said members, bearing means interposed between said spring and the other of said members, said bearing means being adapted to cause said spring to be stressed by the movement of said bar to the limit of its movement in one direction but adapted to be relieved from pressure upon said spring at the end of the movement of the bar in the other direction, and auxiliary bearing means coöperating with said first-named bearing means adapted to cause said spring to be stressed in the opposite direction by the movement of said bar to the limit of its movement in the opposite direction.

2. In a teeter-totter device, the combination of a standard, a bar pivotally mounted on said standard, a spring mounted on one of said members, and means pivotally mounted on the other member actuated by the movement of said bar to the limit of its movement in one direction to swing in contact with said spring for compressing the spring but adapted to be relieved from pressure upon said spring at another portion of the swing of the said bar.

3. In a teeter-totter device, the combination of a standard, a bar pivotally mounted on said standard, a spring mounted on one of said members, and means pivotally mounted on the other member adapted to cause said spring to be stressed by the movement of said bar to the limit of its movement in one direction but adapted to cause said spring to be stressed in the opposite direction by the movement of the bar to the limit of its movement in the opposite direction.

4. In a teeter-totter device, the combination of a standard, a bar pivotally mounted

on said standard, a coiled spring mounted on one of said members, and a bearing device mounted upon the other of said members, said bearing device being adapted to compress said spring upon a movement of the bar to the limit of its movement in one direction and adapted to expand said spring upon a movement of the bar to the limit of its movement in the other direction.

5. In a teeter-totter device, the combination of a standard, a bar pivotally mounted on said standard, a spring mounted on one of said members, a rod pivotally connected with the other member, and means carried by said rod out of contact with said spring when the bar is at one limit of its swing but adapted to stress the spring for cushioning the swing of the bar to the other limit of its movement.

6. In a teeter-totter device, the combination of a standard, a bar pivotally mounted on said standard, a spring mounted on one of said members, a rod pivotally connected with the other member and extending through a suitable opening provided by said spring, and bearing devices carried by said rod at opposite sides of said opening, each of said bearing devices being adapted to stress the spring upon a movement of the bar to the limit of its movement in one direction but adapted to relieve the pressure upon the spring at another portion of the movement of the bar.

7. In a teeter-totter device, the combination of a standard, a bar pivotally mounted on said standard, a coiled spring mounted at one end on one of said members, a rod pivotally connected with the other member and extending through said spring, a cap fixed on the free end of said spring about said rod but slidable relative to the rod, and bearing devices carried by said rod at opposite sides of said cap, each of said bearing devices being adapted to stress the spring upon a movement of the bar to the limit of its movement in one direction but adapted to be relieved of pressure upon the spring at another portion of the movement of the bar.

8. In a teeter-totter device, the combination of a standard, a bar pivotally mounted on said standard, a coiled spring mounted at one end on one of said members, a rod pivotally connected with the other member and extending through said spring, a cap fixed on the free end of said spring about said rod but slidable relative to the rod, and bearing devices carried by said rod at opposite sides of said cap and adjustable along said rod toward and from the cap, each of said bearing devices being adapted to stress the spring upon a movement of the bar to the limit of its movement in one direction but adapted to be relieved of pressure upon the spring at another portion of the movement of the bar.

9. In a teeter-totter device, the combination of a standard, a bar pivotally mounted on said standard, a coiled spring mounted at one end on one of said members, a rod pivotally connected with the other member and extending through said spring, a cap fixed on the free end of said spring about said rod but slidable relative to the rod, bearing devices carried by said rod at opposite sides of said cap, each of said bearing devices being adapted to stress the spring upon a movement of the bar to the limit of its movement in one direction but adapted to be relieved of pressure upon the spring at another portion of the movement of the bar, and a third bearing device mounted on the said rod which is pivotally mounted on one of said members adapted to engage the other member for positively limiting the swing of said bar.

10. In a teeter-totter device, the combination of a standard, a bar pivotally mounted on a horizontal axis on said standard, yielding means mounted on one of said members at one side of said axis, and bearing means operatively interposed between said yielding means and the other of said members, said bearing means being adapted to cause said yielding means to be stressed in one direction by the movement of said bar to the limit of its movement in one direction and to cause said yielding means to be stressed in the opposite direction by the movement of said bar to the limit of its movement in the opposite direction.

WILLIAM S. TOTHILL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."