J. W. SPALDING.

SPRING ATTACHMENT FOR WATER CLOSETS.

APPLICATION FILED SEPT. 13, 1909.

952,956. **Patented Mar. 22, 1910.**

Fig. 1

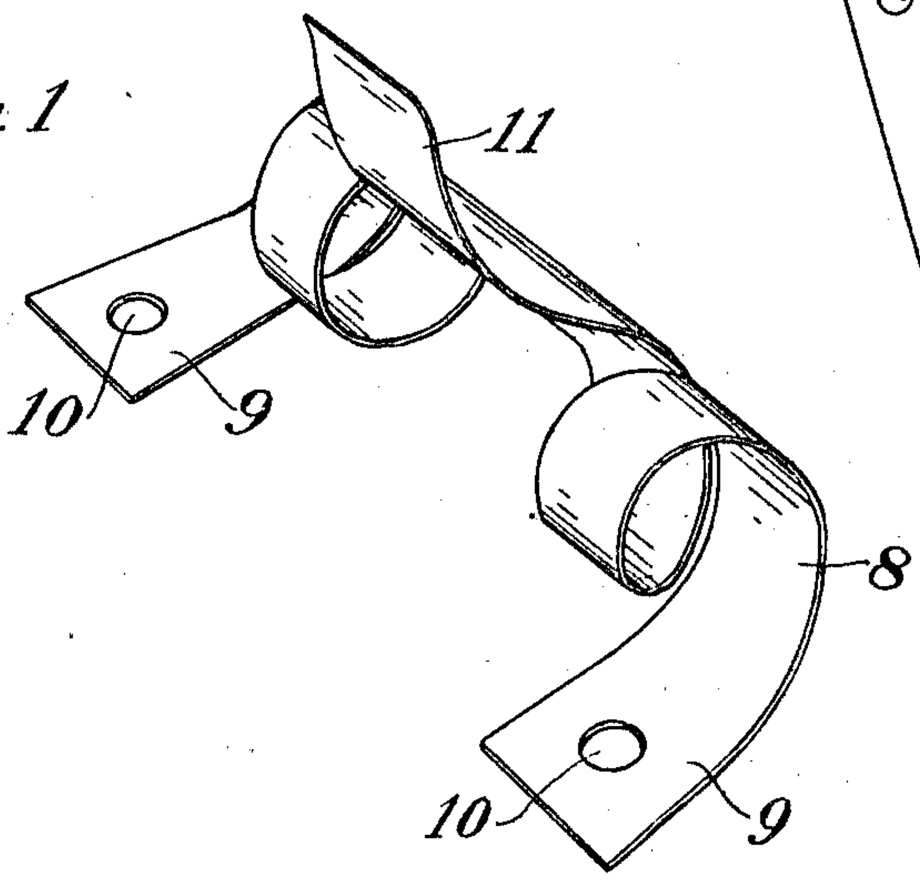


Fig. 4

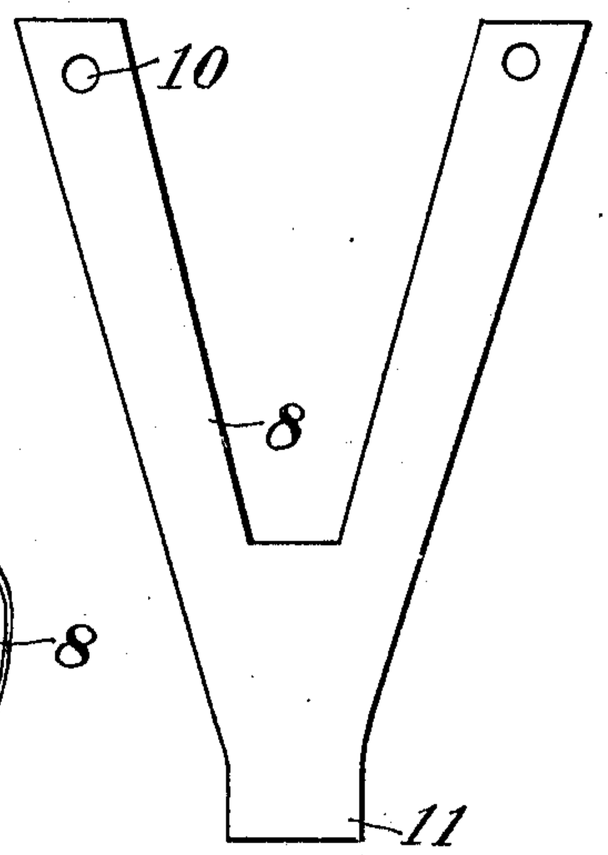
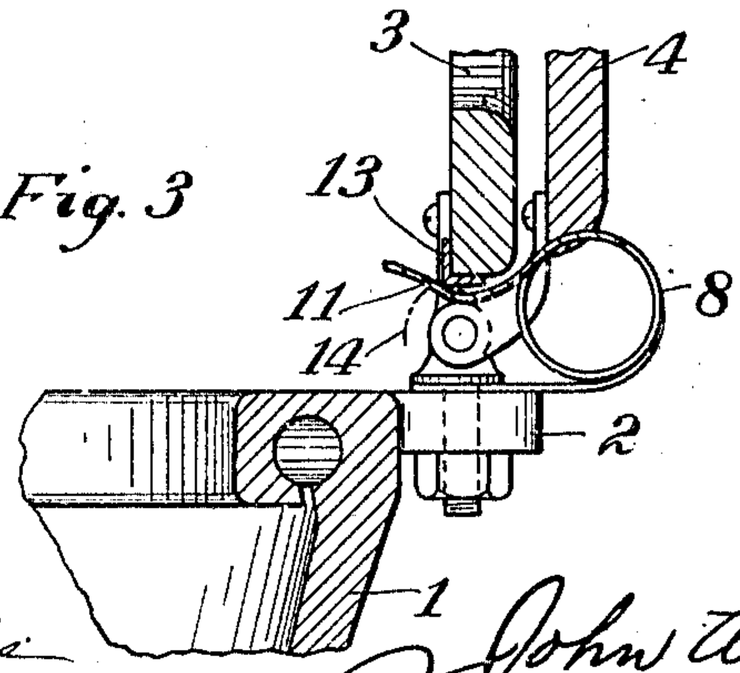


Fig. 2

Fig. 3



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UNITED STATES PATENT OFFICE.

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SPRING ATTACHMENT FOR WATER-CLOSETS.

952,956. Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed September 13, 1909. Serial No. 517,365.

To all whom it may concern:

Be it known that I, JOHN W. SPALDING, a citizen of the United States of America, and a resident of Aurora, county of Kane, State of Illinois, have invented certain new and useful Improvements in Spring Attachments for Water-Closets, of which the following is a specification.

The main objects of this invention are to provide an improved attachment for water closets, particularly adapted for retaining the seat and lid of the closet in an open position, and for yieldingly resisting the closing of the seat and lid throughout their entire range of movement, so as to prevent injury to the bowl through violent closing of the seat and lid; to provide an attachment of this kind which may be readily applied to closet fittings of usual construction, and without requiring cutting or alteration of any of the closet parts or their fittings.

A further object is to provide a specific improvement on the structure shown, described and more broadly claimed in my co-pending application for water-closet attachments, filed September 1st, 1909, Serial No. 515,624.

The foregoing objects are accomplished by the device shown in the accompanying drawings, which illustrate a specific embodiment of this invention.

Figure 1 is a perspective view of a water-closet seat spring of suitable form to carry out the purpose of this invention. Fig. 2 is a vertical section of the upper part of a water-closet bowl and its seat and lid, provided with a spring like that shown in Fig. 1. Fig. 3 is a similar fragmentary view, showing the seat and lid in an open position, and illustrating the manner in which they are held in such open position by the spring. Fig. 4 illustrates the shape of the blank from which the spring is formed.

In the form shown, the bowl 1 is provided with lugs 2, to which the members 3 and 4, hereinafter respectively referred to as the seat and lid are hinged by means of the usual hinge fittings 5. These fittings comprise headed studs 6 which extend through the lugs 2 and are secured in position by means of nuts 7.

The spring 8 which is shown in Fig. 1, is formed from sheet metal blanked out to V-shape, and having diverging legs bent to form a helical coil. The ends 9 of the legs are provided with perforations 10 of suitable size to fit the studs 6, and the middle part of the spring is shaped to form a tongue 11 which extends under the rearward edge of the seat 3 of the closet in the manner shown in Figs. 2 and 3. The helical shape of the spring gives it great resilience, even if the helical parts are of small diameter, as is desirable in order that it may be readily applied to closets which have a service pipe 12 at the rear. In the form shown, the helical parts of the spring are of such diameter as to permit them to be attached to the closets without interference with the service pipe 12. The helical form of the spring also permits the two lower end parts 9 to be sprung sidewise toward or away from each other to suit a considerable variation in the spacing studs 6 in different makes of closets.

The lower rearward corner of the seat 3 is provided with an angle-shaped wear-plate 13 and the tongue 11 of the spring is so shaped that it bears on the middle corner of the wear-plate, exerting a rearward and upward pressure thereon when the seat is in its open position.

The operation of the device shown is as follows:—To attach the spring to a closet, the studs 6 are first removed from the lugs 2, and after placing the tongue 11 in position below the wear-plate, the studs are inserted downwardly through the respective apertures 10 in the ends 9 of the spring. The studs are then inserted into the lugs 2 of the closet bowl and secured by means of the nuts 7 which cause the ends of the spring to be firmly clamped between the heads of the studs 6 and the upper surfaces of the lugs 2. When the seat and lid are in their open position, as illustrated in Fig. 3, the pressure of the spring on the wear-plate 13 holds them in this open position as will be seen from Fig. 3, and tends to return them to the open position even when they are moved forward a considerable distance from the position shown in said Fig. 3. When the seat and lid are swung down, the corner or shoulder of the wear-plate moves in the direction of the dotted arc 14 of Fig. 3, and the tongue 11 of the spring is so formed that when the seat 3 is swung toward its closed position, the first part of the movement causes the tongue of the spring to be not only pushed down but also pulled forward, thus offering gradually increasing resistance during the first part of the movement. When the seat is near its closed position, the

spring is allowed to slide backward so that the pressure of the wear-plate upon the spring is applied nearer to the end of the spring and thereby reducing the lifting effect of the spring. This construction insures that while the spring yieldingly resists the closing of the seat and lid throughout their entire range of movement, its resistance will be greater during the upper part of this range and will gradually be reduced as the seat and lid approach their closed position, so that when they are in a horizontal position the greater leverage of their weight overcomes the upward pressure of the spring to such an extent that they rest in a substantially closed position.

Although but one specific embodiment of this invention is herein shown and described, it will be understood that some of the details of the construction shown may be altered or omitted, within the scope of the following claims, without departing from the spirit of this invention.

I claim:—

1. A device of the class described, comprising a V-shaped leaf spring having its legs bent to helical form, and having a part between said legs shaped to form an extended resilient tongue.

2. The combination of a fixture, a hinged member, a leaf spring formed from a sheet of metal cut to substantially V-shape and having its legs bent to helical form, the ends of said legs being attached to said fixture, and the middle part of the spring being shaped to form a tongue, and bearing on said member in such manner as to hold it in an open position.

3. The combination of a fixture, a hinged member, a leaf spring formed from a sheet of metal cut to substantially V-shape and having its legs bent to helical form, the ends of said legs being attached to said fixture, and the middle part of the spring being shaped to form a tongue, and bearing on said member in such manner as to hold it in an open position, the helical parts of said spring being adapted to yield and permit the ends of said legs to be sprung toward or away from each other.

4. In a water-closet, the combination of a bowl, a member hinged to said bowl, a pair of spaced hinges connecting said member and bowl and each comprising a stud, and a spring formed of sheet metal cut to substantially V-shape and having its legs bent to form helices disposed in parallel relation to the axis of the hinges, the ends of said legs having apertures adapted to receive said studs and the middle part of said spring being shaped to form a tongue adapted to bear upon said member and hold the same in an open position.

5. The combination of a water-closet bowl, a member hinged thereto and having a shoulder spaced away from the axis of the hinges, a helical spring having its ends secured to the bowl and having a tongue intermediate of its ends coacting with said shoulder, the helical part of the spring being rearward of the axis of the hinges, and said tongue being adapted to bear on said shoulder to yieldingly retain said member in an open position, and being adapted to slip backward when said member is closed and thereby permit said member to remain in a substantially closed position.

6. The combination of a water-closet bowl, a member hinged thereto and having a shoulder spaced away from the axis of the hinges, a helical spring having its ends secured to the bowl and having a tongue intermediate of its ends coacting with said shoulder, the helical part of the spring being rearward of the axis of the hinges, and said tongue having a seat adapted to engage said shoulder and hold said member in an open position, and a lip on said tongue adapted to disengage said seat from said shoulder and allow said spring to yield to reduce its lifting effect on said member when said member is in its closed position.

7. A device of the class described, comprising a V-shaped spring having its legs bent to helical form and having a part between said legs shaped to form a resilient tongue, said tongue being curved to form a concave seat in its outer face and being extended beyond said seat to form a yielding lip.

8. A device of the class described, comprising a V-shaped leaf spring having its legs bent to helical form with respect to a common transverse axis, the end portions of said legs being substantially straight, and the part between said legs being shaped to form a resilient tongue extending in the same general direction as said legs and bent to form a seat concave on the side which faces away from the ends of said legs.

Signed at Chicago this 10th day of Sept. 1909.

JOHN W. SPALDING.

Witnesses:

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