

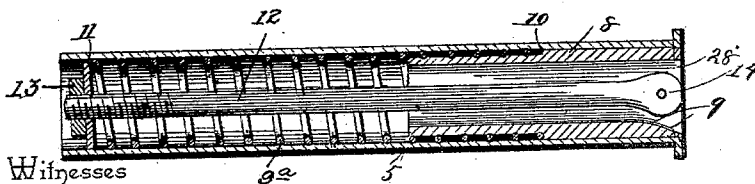
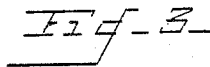
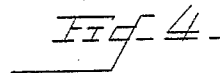
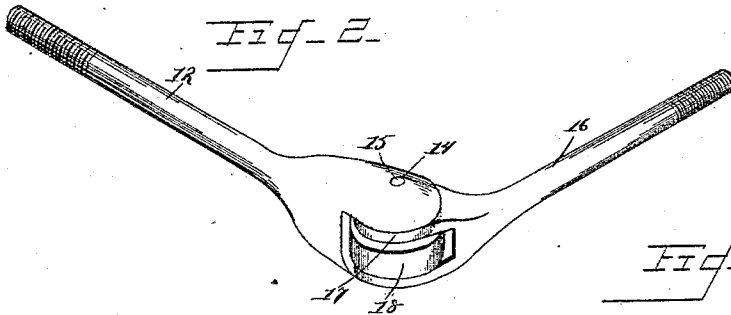
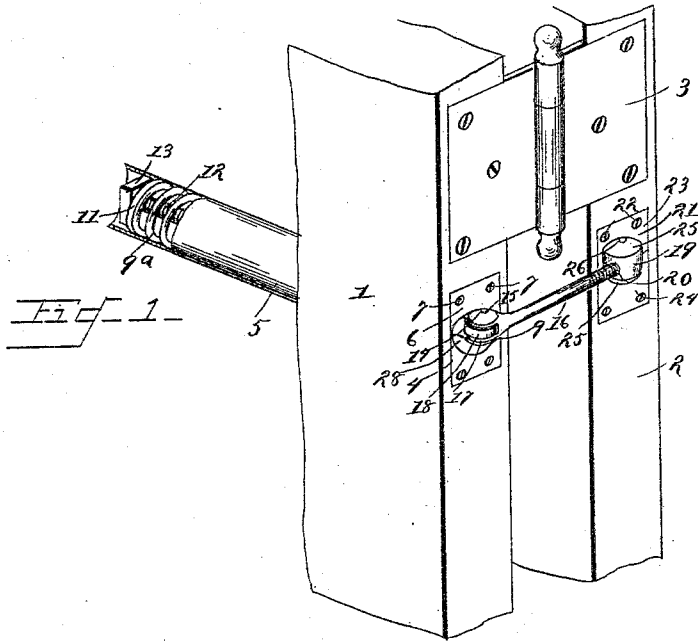
(No Model.)

2 Sheets—Sheet 1.

A. DUDDEN.
DOOR SPRING.

No. 414,384.

Patented Nov. 5, 1889.



Witnesses

Geo. C. French

W. H. Sewall

By his Attorneys,

C. A. Snow & Co

Inventor

Alfred Dudden

(No Model.)

2 Sheets—Sheet 2.

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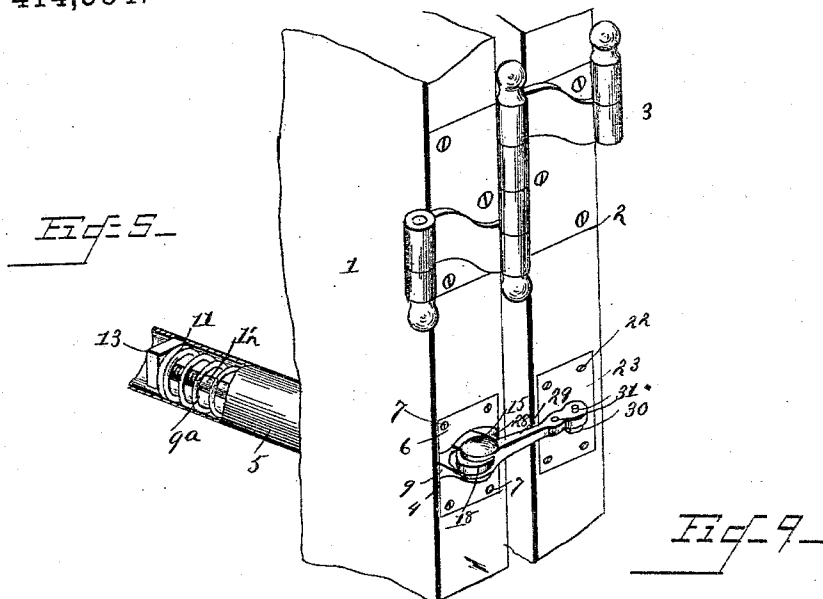


Fig-6-

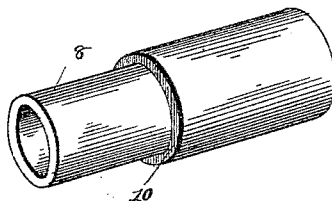
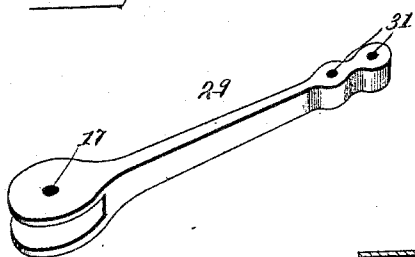


Fig-7-

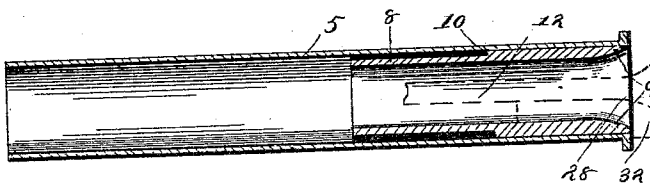
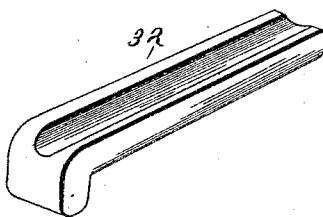


Fig-8-



Witnesses:

Geo. C. French.
W. H. Small

By his Attorneys,

Alfred Dudden.
C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

ALFRED DUDDEN, OF SANTA BARBARA, CALIFORNIA.

DOOR-SPRING.

SPECIFICATION forming part of Letters Patent No. 414,384, dated November 5, 1889.

Application filed June 28, 1889. Serial No. 315,922. (No model.)

To all whom it may concern:

Be it known that I, ALFRED DUDDEN, a citizen of the United States, residing at Santa Barbara, in the county of Santa Barbara and State of California, have invented a new and useful Door-Closer, of which the following is a specification.

This invention has relation to door-closers of that class known as "door-springs," and among the objects in view are to provide a door-closer the spring of which is concealed from view, and which is also so constructed as to act as a door-retainer—that is, to retain the door in an open position when said door is swung beyond a certain angle, usually against the base-board.

A further object of the invention is to adapt the spring for reversible doors, by which is meant doors opening in two directions, and also to provide means whereby the spring may be adjusted to give greater or less tension, in accordance with the weight of the door, and to arrange the spring in such position as to have a gradual, slow closing action, and which will not require undue force to open the same against the tension of the spring.

With these general objects in view the invention consists in certain features of construction hereinafter specified, and more particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a perspective of a door and casing provided with a connection constructed in accordance with my invention. Fig. 2 is a detail in perspective of the connection detached from the door. Fig. 3 is a central vertical section of the spring-barrel; Fig. 4, a detail of the door-plate and the hinge connecting-bar; Fig. 5, a modification showing my invention applied to double doors; Fig. 6, a modification of the connecting-bar; Fig. 7, a detail in longitudinal section of the spring-barrel employed in double doors. Fig. 8 is a detail of a locking-key, the purpose of which will be hereinafter explained. Fig. 9 is a perspective in detail of the inner guiding-barrel.

Like numerals of reference indicate like parts in all the figures of the drawings.

1 represents the door jamb or casing, and 2 the door, the two being connected by hinges

3, arranged in their usual position, and of any desired type.

The jamb 1, preferably slightly below the upper hinge of the door, is provided with an internal cylindrical recess 4, and fitted within the same is a suitable metal barrel or tube 5, terminating at its front end in a face-plate 6, perforated to coincide with the perforations of the barrel, and is secured by screws 7 to the jamb. A second and shorter link-guiding and spring-retaining barrel 8 is mounted within the barrel 5, the first-mentioned barrel being provided with an internal longitudinal track or way 9, consisting merely of a groove. Within the main barrel 5 is mounted a coiled spring 9^a, which at its forward end abuts against a stop 10, formed by an annular shoulder on the barrel 8, and at its rear end abuts against a washer 11, secured upon a screw-threaded rod 12 by means of a set-nut 13, said rod being of a length preferably reaching from the rear end of the barrel 5 and taking slightly within the small barrel 8. The threaded rod 12, which, in fact, is the tension-rod for the spring, is provided with a perforated ear 14 at its forward end, to which by a pintle 15 is pivotally secured a slightly-curved extension-arm 16. Both the ear 14 and the ear 17 of the extension-arm are bifurcated, and between the bifurcations of the latter is mounted a friction-roller 18, designed to ride in the track 9. The forward end of the curved extension-arm 16 terminates in a cylindrical perforated socket-nut 19, formed independent of the arm 16 and having a perforation 20, screw-threaded, in which is secured the said extension-arm. The forward end of the arm 16 is screw-threaded and adapted to enter the screw-threaded socket 20 of the socket-nut 19. Upon the adjacent edge of the door 2 is formed a face-plate 21, the same being secured by screws 22 to said edge, and is formed of two opposite sections 23 and 24, each of said sections being provided with a convex bearing-lug 25, having a perforation 26, into which the trunnions 27, formed at the sides of the nut 19, take, and by which said nut is pivotally connected to the door. The convexity of the nut and the lugs 25 agree, so that a substantially-hemispherical protuber-

ance is formed when the parts are in position, and when the door is closed said protuberance takes into the mouth of the barrel 8, which is flared, as at 28, for the purpose of receiving the same, and thereby permitting a close and entire shutting of the door against the jamb.

From the above description it will be seen that, the spring and its connections being located at the edge of the door, a very great leverage is obtained by grasping the handle of said door, whereby a great amount of strength is not required to open the door against the tension of the spring. It is also evident that when the door is opened wholly or beyond a parallel line the spring is distended until the roller 18 is brought to the mouth of the barrel 8, when said roller rests against the outer edge of the mouth and the extension-arm 16 acts as a brace to maintain the door in open position. When the door is ordinarily opened for the egress or ingress of a person, the roller 18 does not reach the point above indicated, and consequently the action of the spring in its retractive movement remains unimpeded by the curved arm, and the door is gently closed, the violence with which it is closed, if such it may be termed, being easily controlled by a proper manipulation of the set-nut 13 upon the rod 12. A further advantage gained by the location of the spring is that by the time the door reaches or is near its closing-point the tension of the spring is substantially exhausted, whereby an easy and noiseless closing takes place.

By constructing the barrels of iron the noise of the spring may be entirely deadened, and that in connection with the friction-roller and parts constructed as described the device may be made practically noiseless in its operation.

Referring more particularly to Figs. 5 and 6, the first mentioned shows my invention applied to a double door, and also shows what slight changes are required for this purpose. The main change is a duplication of the track 9, so that the roller may ride in either side of the small barrel and abut against either edge.

As shown in Fig. 6, I may omit the connecting or curved extension arm or bar 16, and substitute therefor the straight bar 29. (Shown in this figure.) This straight bar is especially adapted for outside doors or where it is not so important as to the finish and secreting of the various connections employed. When using the straight bar, I provide the plate 23 with simply an L-shaped stud 30, and perforate the bar, as at 31, so as to be adjustable in length and for the reception of the stud.

In Fig. 8 I have illustrated a wedge-shaped key 32, which is adapted for insertion within the small barrel and subsequent to the entire opening of the door, whereby the roller binding against the key is prevented from receding back into the barrel, and the door

is prevented from any slamming or accidental closing. Such a device is useful when adjusting, repairing, or cleaning the parts, as will be duly appreciated.

Having described my invention, what I claim is—

1. In a door-closer, the combination, with barrel 5, mounted in the bore of a door-jamb, a spring 9^a, mounted within the barrel, a rod 12, and a set-nut threaded on the end of the rod for adjusting the spring, said rod terminating in an eye, of a curved extension-arm 16, pivotally connected to said rod 12, and the nut 19, and a door-plate 23, pivotally connected with the nut, substantially as specified.

2. In a door-closer, the combination, with a plate 6, secured to the door-casing and having a barrel 5 extending within a bore of the same, of a spring 9^a, mounted in the barrel, a tension-rod 12, having a set-nut to bear against the spring and adapted to adjust the same, said tension-rod terminating in an eye, an extension-arm 16, pivoted to the door and pivotally connected with the eye of the extension-arm, and a short barrel 8 within the barrel 5, surrounding the same and having a track 9, and a friction-roller mounted upon the pintle at the intersection of the eyes of arm 16 and rod 12, substantially as specified.

3. In a door-closer, the barrel 5, mounted in the door-jamb, a coiled spring within the barrel, an adjusting-rod 12, and a washer 11 and nut 13, mounted thereon for adjusting the spring, and terminating at its outer end in an eye, a curved extension-bar 16, also terminating in an eye pivoted to the eye on the rod 12, and a threaded nut 19, having trunnions mounted on the opposite end of the bar 16, and a door provided with separable plates for the reception of the trunnions formed on the nut, substantially as specified.

4. In a door-closer, the plate 6, secured to the door-jamb, and the barrel 5, having the flared mouth 28, in combination with the coiled spring 9^a, mounted in the barrel 5, the threaded adjusting-bar 12, having bifurcated eye 14 at its front end, an adjusting-nut and washer mounted thereon, and the curved extension-arm 16, terminating in the bifurcated perforated eye 17, the pintle 15, passing through the perforation, and the roller 18, mounted on the pintle, the threaded nut 19, having the trunnions 27 mounted on the forward end of the extension-bar, and the door-plate 23, formed in sections 23 and 24, each having the lugs 25, perforated, as at 26, and curved to coincide with the exterior of the nut 19, and adapted to enter the flared mouth 28 of the barrel 5, substantially as specified.

5. In a door-closer, the barrel 5, fitted to the door-jamb, the spring 9^a, mounted in the barrel, the spring or tension arm 12^a mounted in the spring, the extension-arm 16, pivoted to said tension-arm, as at 15, and connected pivotally to the door, and the roller 18, fitted on and the pivot 15 for receiving the same, in

combination with the removable key 32, inserted within the barrel and impinged upon by the roller 18, substantially as specified.

5 6. In a spring door-closer, the barrel 8 and the spring 9^a, inclosing one end of the same, combined with the arm 12, mounted within the spring and connected thereto, the pintle 15, the extension-arm 16, pivoted thereby to the arm 12 and pivotally connected to the door,

and a roller 18, mounted on said pintle, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

ALFRED DUDDEN.

Witnesses:

FRANK SCOFIELD,
CHAS. E. FARRINGTON.