

P. E. NORDQVIST.
 DEVICE FOR PREVENTING DOORS FROM SAGGING.
 APPLICATION FILED JULY 2, 1908.

955,674.

Patented Apr. 19, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

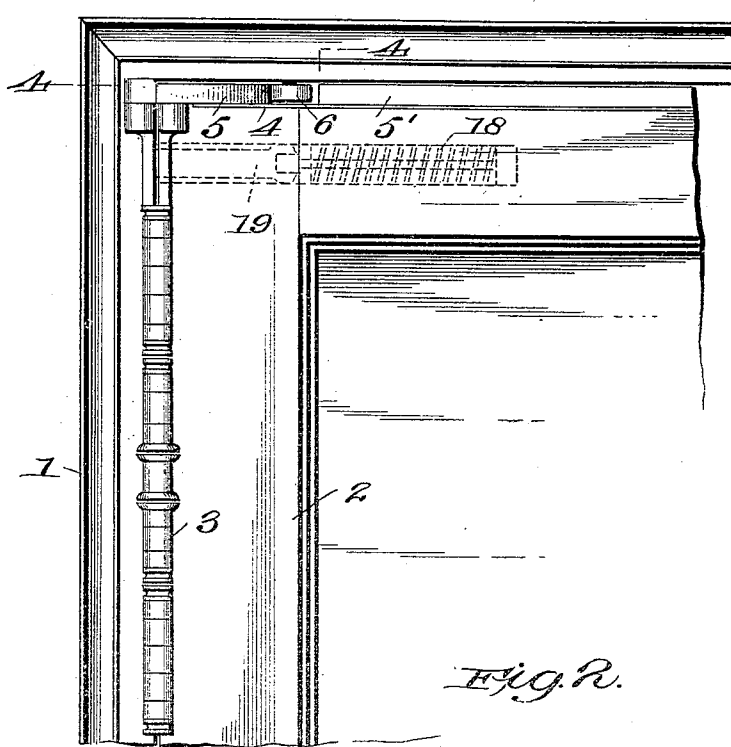
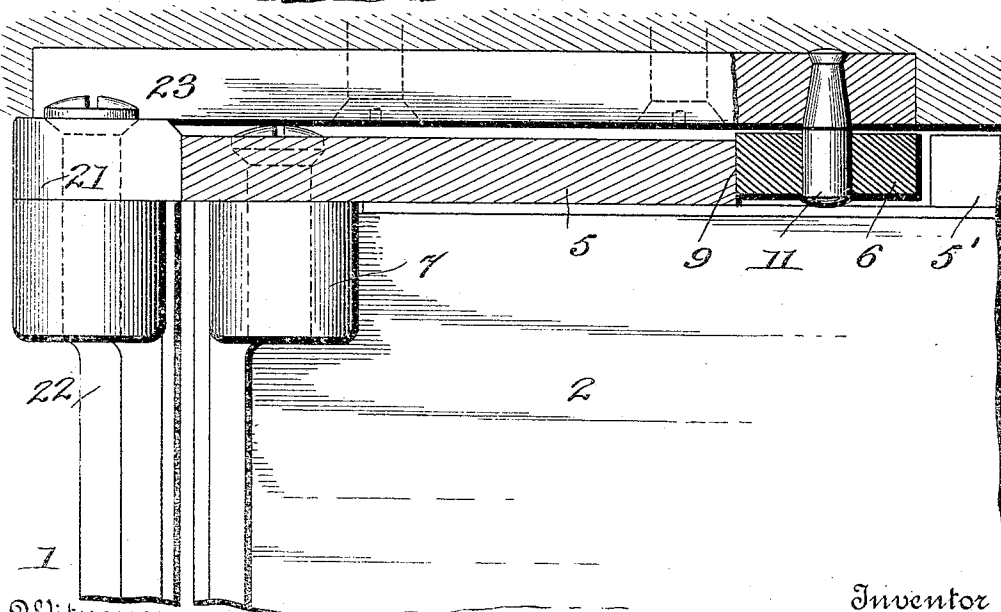


Fig. 2.



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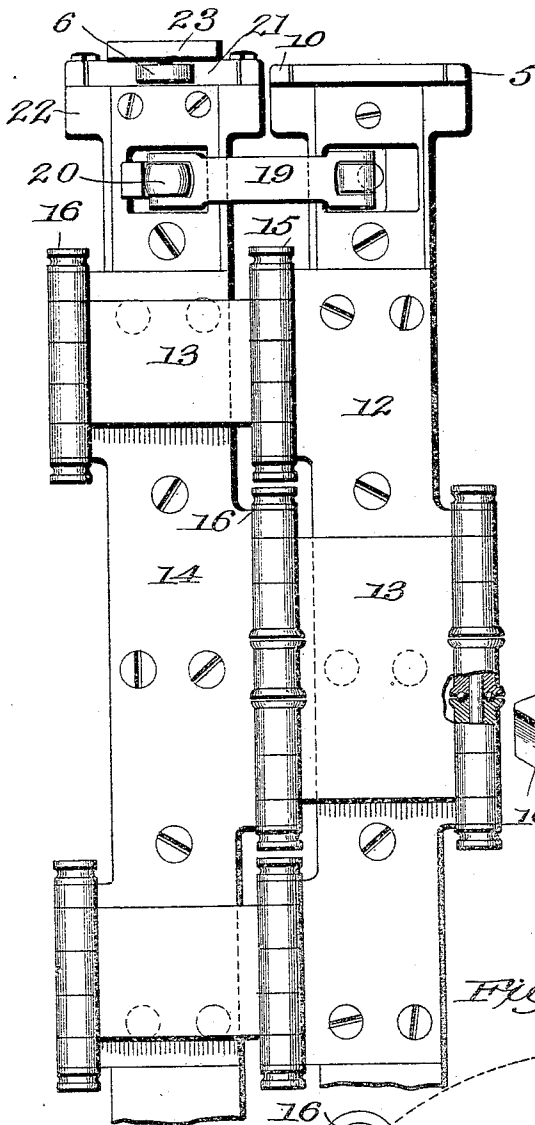


Fig. 3.

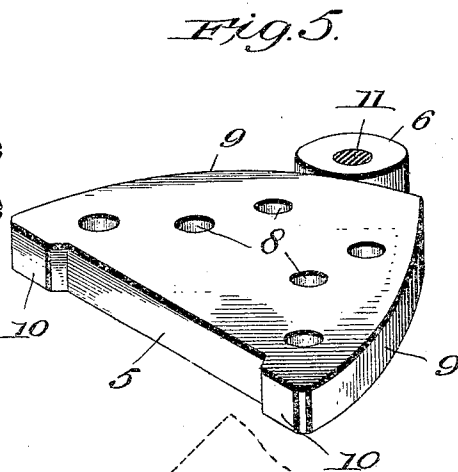


Fig. 5.

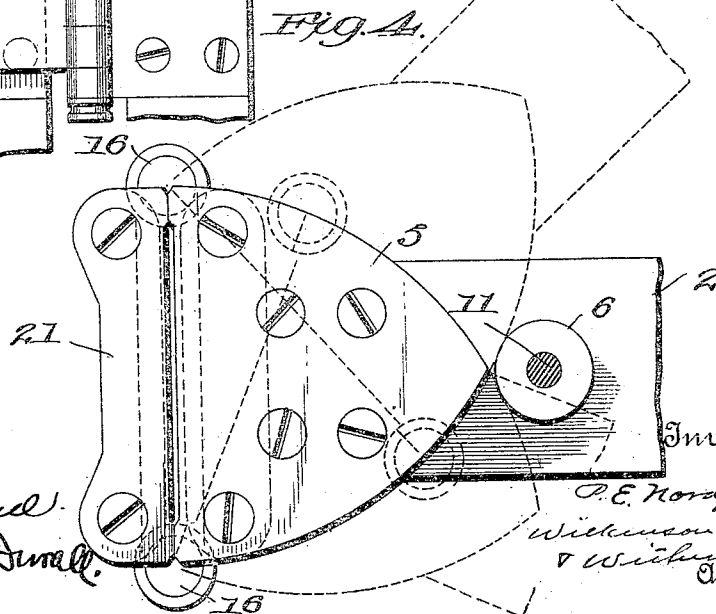


Fig. 4.

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UNITED STATES PATENT OFFICE.

PER ERIK NORDQVIST, OF SUNDBYBERG, SWEDEN, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO CONCEALED DOOR CHECK COMPANY, A CORPORATION OF NEVADA.

DEVICE FOR PREVENTING DOORS FROM SAGGING.

955,674.

Specification of Letters Patent.

Patented Apr. 19, 1910.

Application filed July 2, 1908. Serial No. 441,607.

To all whom it may concern:

Be it known that I, PER ERIK NORDQVIST, a subject of the King of Sweden, residing at Sundbyberg, Sweden, have invented certain new and useful Improvements in a Device for Preventing Doors from Sagging; and I do hereby 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 appertains to make and use the same.

My invention relates to devices for preventing doors, gates and other hinged closures from sagging, and the object of my invention is to produce such a device that will hold swinging doors firmly at a dead center; one that will be simple and efficient in action, cheap to construct; and one that is not liable to get out of order, although simple and cheap forms of hinges may be employed.

A further object of my invention is to provide a concealed device of the above nature that will be especially adapted for use in connection with a concealed door check such as that disclosed in my former Patent No. 683,972, dated October 8, 1901.

With these objects in view my invention consists in the details of construction and novel combinations of parts more fully hereinafter disclosed, and particularly pointed out in the claims.

Referring to the accompanying drawings forming a part of this specification, in which like numerals refer to like parts in all the views:—Figure 1, is a detail elevational view of a frame, and a door located therein, showing my supporting cam and roller. Fig. 2, is a detail sectional view showing my cam and roller on an enlarged scale. Fig. 3, is an elevational view showing the frame with the door fully opened, the hinges connecting the same, and a rear view of my cam. Fig. 4, is a plan view showing my cam in various positions, and Fig. 5, is a perspective view of my supporting cam and roller.

1, indicates any suitable support, in this instance shown as the frame of a door; 2, any suitable closure, in this instance a door; and 3, any suitable hinges between said support and frame. I cut away the top of the

door 2, as shown at 4, or I may provide a strip 5' on the top of the door, in order to form the cut away portion 4. In the space formed by this cut away portion 4, I locate the cam 5 and the roller 6. The cam 5 is preferably supported upon the casting 7, rigidly attached to the door, and is otherwise suitably fastened to the top edge of the door by suitable fastenings, as shown, passing through the holes 8, so as to firmly secure said cam and door together. This cam is of a suitable heart shape, provided with suitable curved faces 9 and the base contacting surfaces 10, as shown.

The roller 6 is mounted upon the pin 11, preferably rigidly secured to the casing above the door; but of course the position of the cam and roller may be reversed. That is to say, the cam may be suitably secured to the casing above the door, and the roller secured to the door, or other closure, if such construction be desired.

The hinges 3, securing the door to the casing, are preferably provided with three leaves, and are preferably secured to each side of said casing and door, as shown. That is to say, said hinges are preferably each provided with the leaves 12, 13 and 14, joined by the pintles 15 and 16. The leaves 12 being secured to the door; the leaves 14 being secured to the casing; and the leaves 13 being loose and adapted to lie between the door and casing, when the door is closed. The pintles 15 are movable with the door, while the pintles 16, lying on each side of the casing, are stationary, all as is well known in this style of hinge. When the door is closed, as shown in Fig. 4, the pintles 15 and 16 are in a straight line, and constitute centers from which the curves 9 of the heart shaped cam 5 are struck.

18, Fig. 1, represents a concealed door check, preferably of the form illustrated in my former patent above referred to, and 19 a link connecting the piston rod of said check with the lug 20 secured to the door jamb.

21 represents a plate secured to the frame or other support for my closure, and against which the contacting surfaces 10, of the heart shaped cam 5, take when the door or other closure is in its closed position. This

plate 21 is preferably secured to the casting 22, secured to the frame of the door as shown, but it may be integral therewith, or even integral with the plate 23 above the door which accommodates the pin 11 carrying the supporting roller 6.

It is well known that doors and other closures, and especially when they are heavy, will always sag unless the hinges which support the same are of a solid and costly nature. This is especially true in doors provided with door checks, which cause pulls and jerks upon the said hinges and thereby cause the same to deteriorate much faster than would otherwise be the case.

One of the main features of my invention, as above stated, consists in relieving this strain upon the hinges, especially when door checks are used, and at the same time of partially supporting the door at all times by a means entirely independent of the hinges. That is to say, the contacting surfaces between my heart shaped cam 5 and rollers 6, as best illustrated in Figs. 1 and 2, serve to effectually prevent any sagging of the door or other closure whatever, and as the surfaces 9 of the said cam substantially roll in contact with the roller 6, as the door swings upon its hinges, the said cam and roller in effect constitute a sort of hinging means for the door, which not only takes a certain amount of strain off of the regular hinges, but also receives and absorbs all of the additional strain that might be placed upon the door in a direction which would tend to make it sag. That is to say, it will be observed that my supporting heart shaped cam 5 and roller 6, not only permit the cheapest and lightest forms of hinges to be used on doors without sagging, but they also serve to take up the strains and shocks that are imparted to said hinges when door checks provided with strong springs are used.

It results directly from this structure that I may employ the most powerful door checks upon doors provided with cheap hinges, and yet at the same time always secure a perfectly even and smooth working of the door when being closed by the door check. In addition to this, by providing the base contacting surfaces 10 on the cam, which take against corresponding surfaces on the plate 21, or frame as the case may be, I am enabled to check the door completely at the moment of its closure, and without having it pass beyond the closing point, although the door may be of the style which opens with the same facility in either direction. In fact the liquid door check disclosed in my former patent above, is provided with an adjustable regulator by which I may cause the door to close violently or slowly, or in any other manner desired, and when a door provided

with this said check is also provided with my supporting cam and roller, the said door is caused to close smoothly and not to pass beyond the closing position, no matter how quickly my check may bring the door to said position. It will thus be seen that by the simple expedient of providing an inexpensive supporting cam and roller to absorb the shocks of a door check, and to take the strains off of the hinges, I am enabled to produce a door provided with a comparatively inexpensive equipment, which will work as smoothly and as satisfactorily under all conditions as a far more expensively equipped door. And, furthermore, by so locating the said roller, cam and check as to conceal them from view, the said door is given the same handsome appearance as highly expensive doors.

I do not wish to be understood as limiting myself to the exact details of construction and operation of parts above set forth, for it is evident that the same may be varied by those skilled in the art without departing from the spirit of my invention.

What I claim is:—

1. In hinged closures employing a device for preventing sagging, the combination of a suitable support; a suitable closure; a hinge secured to said support and closure; a supporting roller; and a cam adapted to contact with said roller; one of said last mentioned parts carried by said support, the other carried by said closure the two being fixed to their respective supports and adapted to receive a portion of the weight of said closure when swinging on its hinge and thereby to prevent sagging, substantially as described.

2. In hinged closures employing a device for preventing sagging, the combination of a suitable support; a suitable closure; hinges secured to said support and closure and having their pintles at each of the sides of the same; a supporting roller; and a heart shaped cam having said pintles as the centers of curvature adapted to contact with said roller and together with the latter to take the weight of said closure off said hinges and thereby prevent sagging, substantially as described.

3. In a hinged closure employing a device for preventing sagging, the combination of a suitable frame on each side of which said closure is hinged; a roller carried by said frame; and a heart shaped cam struck from the pivoted points of said hinges carried by said closure, adapted to contact with said roller, and provided with a base portion adapted to contact with said frame, substantially as described.

4. In doors employing a device preventing the same from sagging, the combination of a door frame; a door; hinges between said

door and said frame turning on centers located at each side of said frame; a roller carried by said frame above the top of said door; and a heart shaped cam struck from
5 said centers, and adapted to contact with said roller and to take a portion of the weight off of said hinges as the door swings; and said cam also provided with a base

adapted to contact with said frame when the door is closed, substantially as described. 10

In testimony whereof, I have affixed my signature, in presence of two witnesses.

PER ERIK NORDQVIST.

Witnesses:

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HARRY W. T. ROSS.