No. 627,730. Patented June 27, 1899.

C. HAFERKORN.

HINGE.

(Application filed Oct. 28, 1898.)

(No Model.)

Fig. 1.

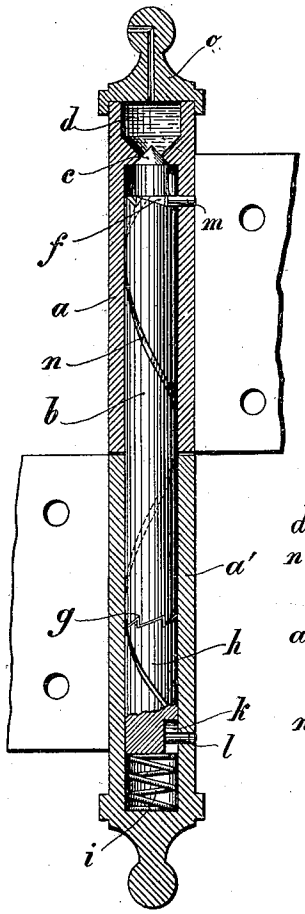


Fig. 2.

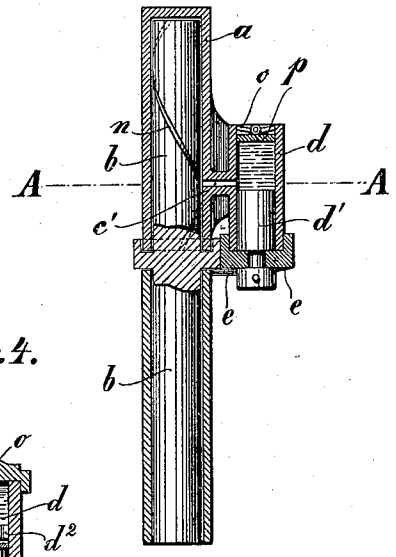


Fig. 4.

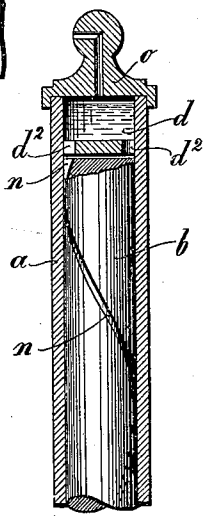
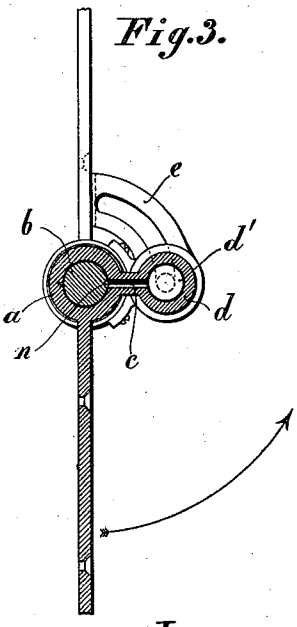


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

CARL HAFERKORN, OF WEISSENFELS, GERMANY.

HINGE.

SPECIFICATION forming part of Letters Patent No. 627,730, dated June 27, 1899.

Application filed October 28, 1898. Serial No. 694,783. (No model.)

To all whom it may concern:

Be it known that I, CARL HAFERKORN, a subject of the King of Prussia, German Emperor, residing at Weissenfels, in the Kingdom of Prussia, Germany, have invented certain new and useful Improvements in Door or Window Hinges with Lubricating-Chambers, (for which I have applied for patents in England, dated September 26, 1898, No. 20,322; in Sweden, dated September 22, 1898; in Norway, dated September 22, 1898; in Denmark, dated September 20, 1898; in Switzerland, dated September 19, 1898; in France, dated September 24, 1898; in Belgium, dated September 24, 1898; in Italy, dated September 24, 1898; in Spain, dated September 23, 1898; in Portugal, dated September 29, 1898; in Austria, dated September 19, 1898; in Hungary, dated September 20, 1898, and in Germany, dated September 16, 1898,) of which the following is a specification.

This invention relates to a door-hinge which in consequence of its internal construction is automatically oiled or lubricated whenever the door or window, as the case may be, is opened or closed. The arrangement is such that only a very small quantity of oil from the oil-chamber reaches the frictional surfaces.

In the accompanying drawings, Figure 1 is a vertical section of such a door-hinge, while Figs. 2, 3, and 4 show further modifications of the same.

As shown in Fig. 1, the hinge-pin *b*, inclosed in the tubular casing *a a'*, is furnished at its upper end with a cone *c*, which closes an oil-chamber *d*, provided in the upper end of the sleeve or casing *a*. Below the cone *c* the pin *b* has notches or recesses of cuneiform shape *f*, while its lower end is serrated, so as to form a clutch *g*, gearing with the clutch of the lengthening-piece *h*. This lengthening-piece is acted upon by a spring *i* and is guided by the slot *k* and the pin *l*, fixed to the casing *a'*. When the door is opened, the upper part of the hinge-casing *a* is caused to turn, the pin *m*, fixed thereto, turning with it. The latter pin acts thus on the cuneiform recess *f* in such a manner that the pin *b* is prevented from turning at the same time by the slot *k* and the pin *l*, but is, on the contrary, depressed, whereby the cone *c* discloses the opening in the oil-chamber *d* until a new cuneiform notch *f* comes below the pin *m*, when the pin *b* is shot forthwith upward by the spring *i* and closes again the opening in the oil-chamber. The lubricant or oil escaping from such an opening is uniformly distributed by a spiral groove *n*, formed around the hinge-pin *b* over the whole periphery of the latter. As the serrations of the clutches are cut in such a direction as to be contrary to the cuneiform notches, as soon as the door is shut, and hence when the hinge-casing is turned in an opposite direction to the former, the pin *m* is secured in the cuneiform notch *f*, and the hinge-pin is caused to turn. The serrations of the clutch *g* slide downward—*i. e.*, one over the other—and are thus disconnected from those of the lengthening-piece *h*, so that when the door is closed the oil-reservoir cannot possibly be opened. To prevent the entrance of dust and dirt in the oil-reservoir, the same is preferably closed by a lid or cover *c*. This arrangement will be found efficient not only for very fluid oils, but also for other and thicker lubricants, while by altering the cuneiform recesses or notches the upper end of the hinge-pin *b* may be arranged to act as a piston or plunger.

The modification shown in Fig. 2 differs from the arrangement of Fig. 1 in so far that the oil-chamber *d* is no longer located above the hinge-pin *b*, but is placed by the side of it. To allow when the door is moved for the escape of the lubricant from the oil-chamber *d* and for its distribution to the frictional surfaces of the hinge-pin *b* and of the casing *a*, now closed at the top of the portion of the hinge fixed to the door, the pin in the casing fixed to the door-frame is connected at about the middle of its length to a link and to a slotted guide *e*, connected thereto. This slotted guide *e* is suitably arranged on tabs projecting from the lower part of casing *a* and fixed to the door-posts, whereby the piston *d'*, located in the lubricating-cylinder *d*, is moved up and down when the door is turned to and fro. The cylinder communicates with the frictional surfaces of the door-hinge by means of the opening or duct *c'*. Furthermore, the cylinder *d* is provided at its upper opening, which serves at the same time as a feed-hole for the lubricant, with a tight cover or lid *p*, which is furnished at its outer side with two

small levers *o*, preventing a receding turn of the lid or cover. When the door, and hence the hinge, is turned, to which hinge the small cylinder *d* is fixed, the small piston *d'* is drawn out of the cylinder *d* in consequence of the somewhat-inclined arrangement of the slotted guide *e*, and the lubricant, following the said piston and drawing the lid or cover likewise with it, is fed whenever the door is moved back into the duct *c'*, whence it reaches the frictional surfaces of the hinge. The lid or cover *p* offering, with its levers *o*, a certain amount of resistance to a retrograde motion, the lubricant is compelled to pass through the duct *c'*. The lid *p* will follow on so long as there is lubricant in the cylinder *d*. As soon as the latter is empty and requires to be refilled the levers *o* of the lid or cover *p* are loosened and the lid is removed. According to this arrangement the lubricant used is liquid fat, and it has the advantages that the lubricant to be fed to the frictional surfaces is constantly held under pressure. Neither dirt nor dust can find its way to the frictional surfaces of the casing *a*, the latter being closed at the top.

Fig. 4 shows a modification of the arrangement shown in Fig. 2, wherein the oil reservoir or chamber *d* is arranged above the hinge-pin *b*. The former contains in this case one or more outlet-openings d^2, which when the upper hinge part *d* is turned come for a short time above the openings of the groove *n* and allow for this time a small quantity of oil to run out.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. A hinge provided with an oil-reservoir and means whereby the relative movements of the two parts of the hinge will cause the opening and closing of said reservoir, to permit the flow and cut-off of the lubricant to the working surfaces of the hinge.

2. A hinge provided with an oil-reservoir, a valve closing said reservoir and means for opening and closing said valve by the relative movements of the two parts of the hinge.

3. In a hinge, the combination of the two leaves thereof, a hinge-pin, means for reciprocating the pin, said pin having a valve at one end, an oil-reservoir formed in one of the hinge-barrels and having an opening with which said valve engages, said opening being controlled for lubricating the hinge, by the reciprocation of the hinge-pin, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

CARL HAFERKORN.

Witnesses:
RUDOLPH FRICKE,
K. WEINBERGER.