(No Model.)

W. K. HENRY.

SPRING HINGE.

No. 590,572. Patented Sept. 28, 1897.

Fig. 1.

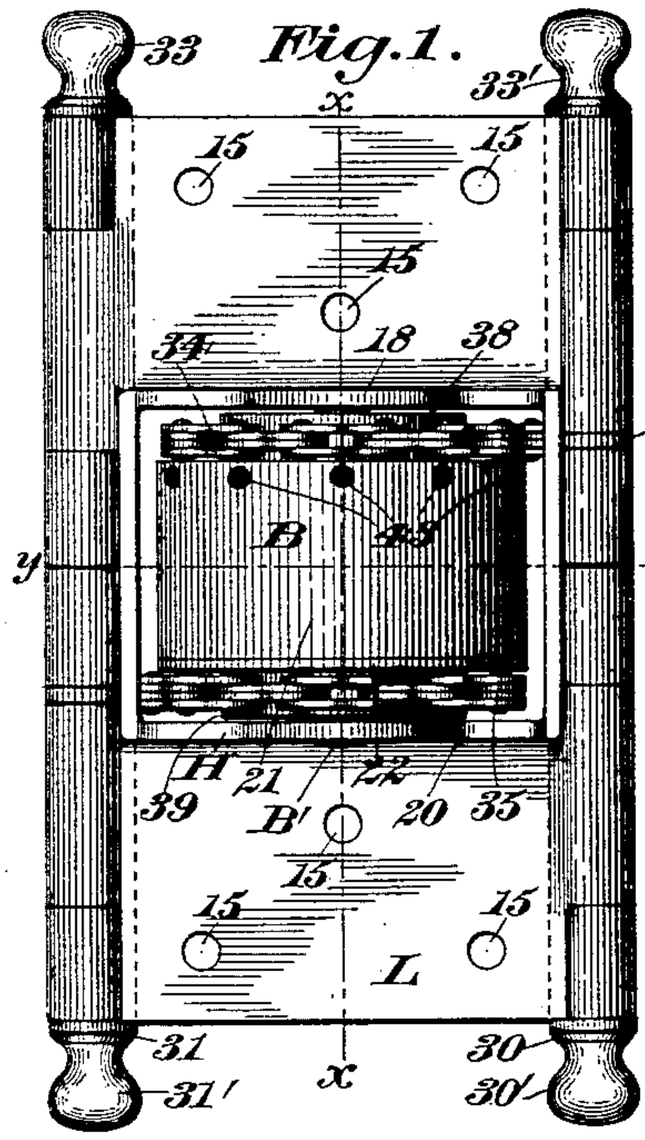


Fig. 2.

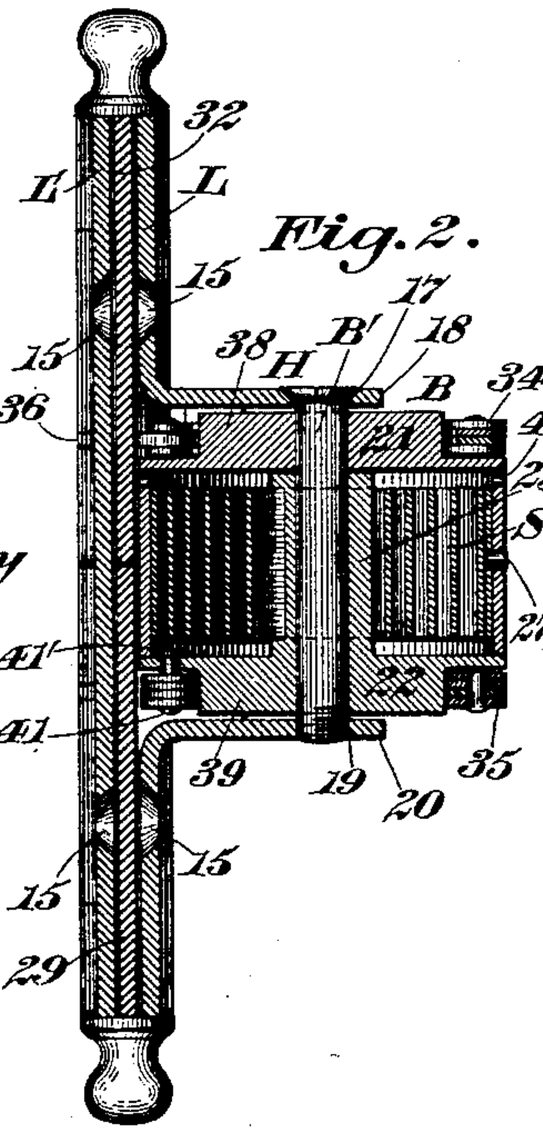


Fig. 4.

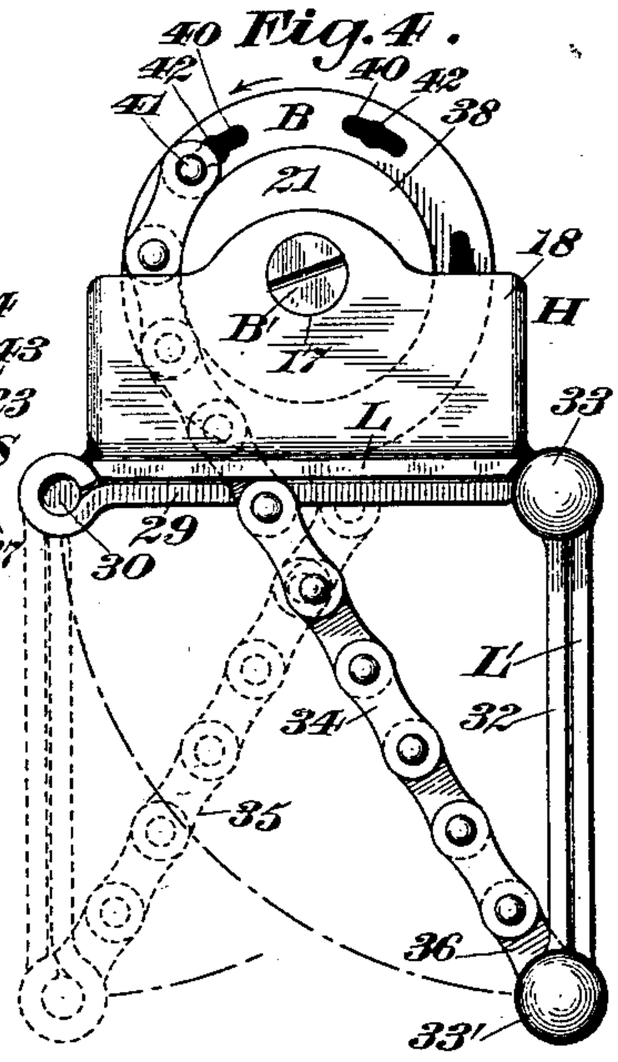


Fig. 3.

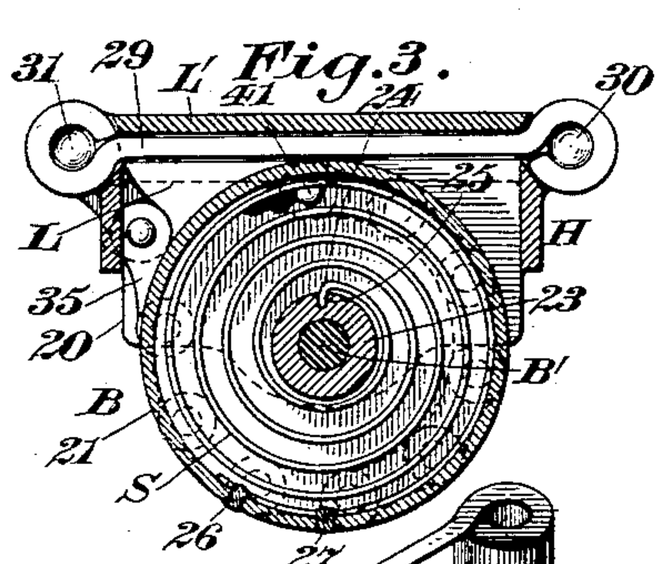


Fig. 5.

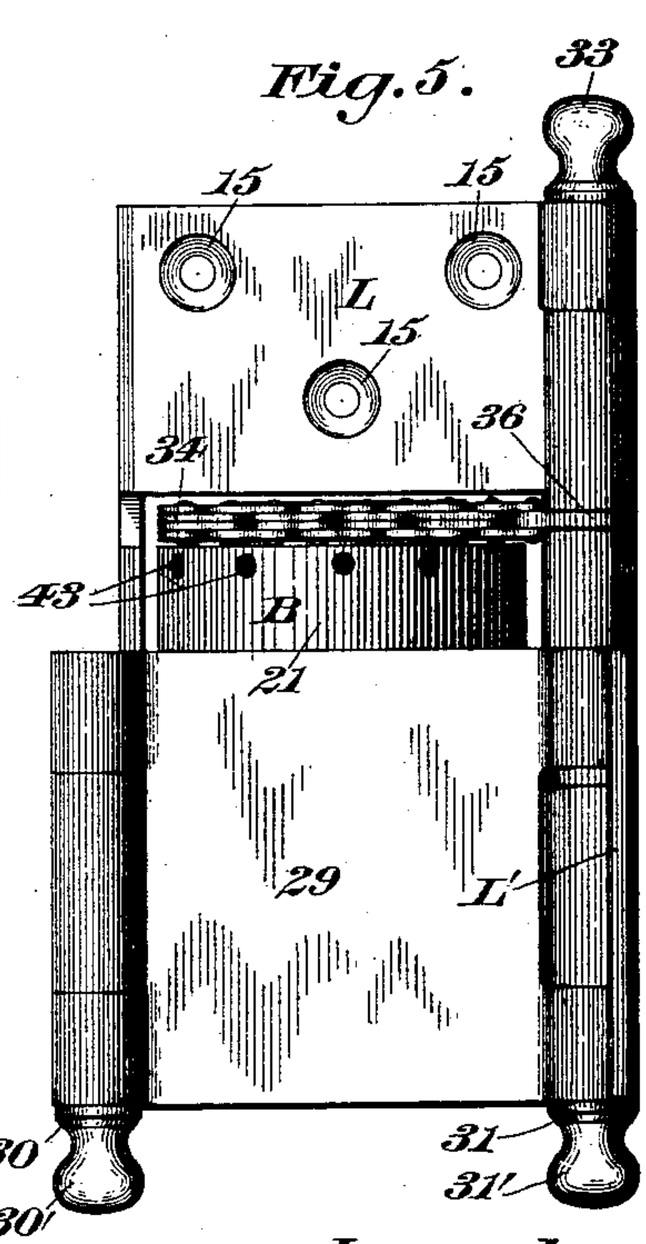


Fig. 6.

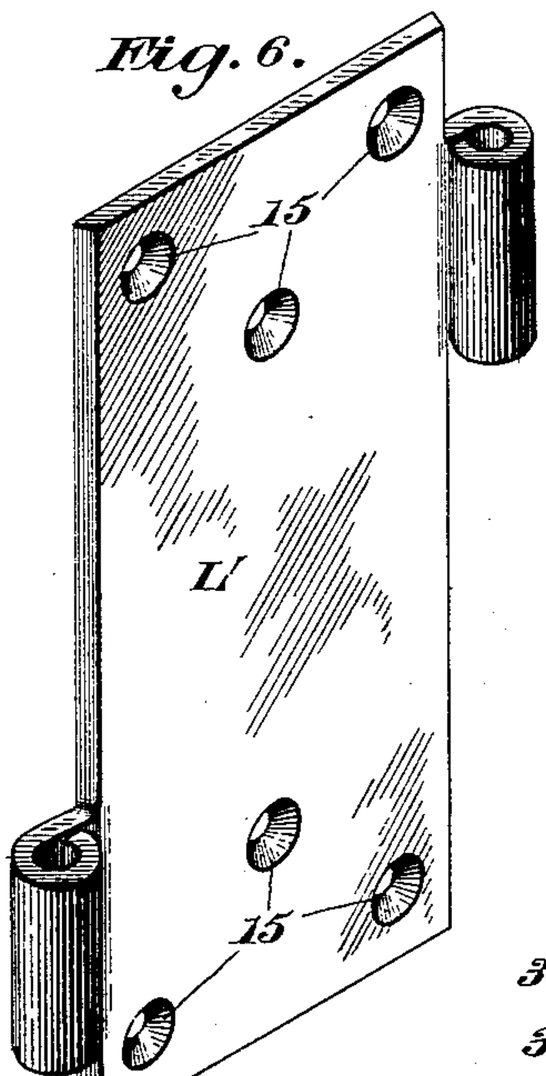
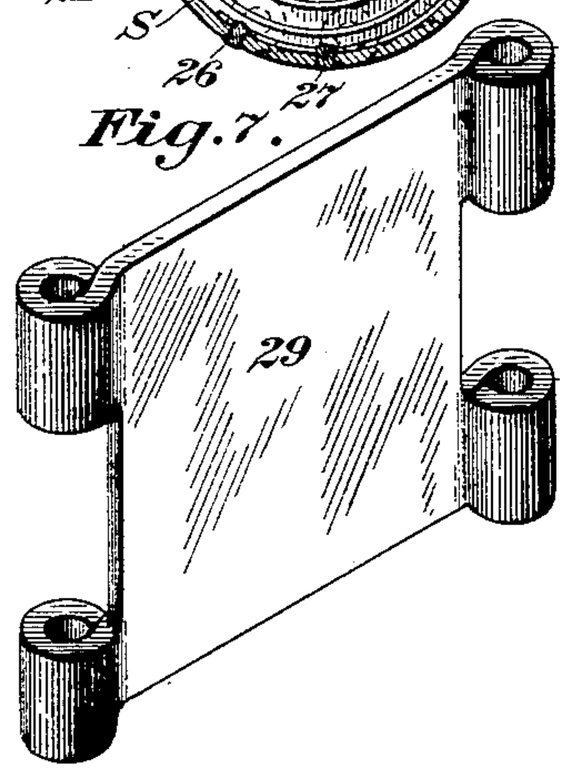


Fig. 7.



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UNITED STATES PATENT OFFICE.

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SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 590,572, dated September 28, 1897.

Application filed February 26, 1897. Serial No. 625,095. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM K. HENRY, a citizen of the United States, residing in New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Hinges, of which the following is a specification.

This invention relates to hinges for doors, &c., it being of the kind known as "double-acting spring-hinges," the internal or door-operating spring of which is adapted to return a door to its normal or closed position from whichever side it may be swung, the objects being to provide a simple and efficient device of this character constructed of a minimum number of parts and adapted to permit the action of the door without undue shock or jar and unattended by unnecessary oscillations thereof.

In the drawings accompanying and forming part of this specification, Figure 1 is a rear view of a hinge embodying my present improvements. Fig. 2 is a longitudinal central section of said hinge, taken in the line *x x*, Fig. 1. Fig. 3 is a transverse central section of the same, taken in the line *y y*, Fig. 1. Fig. 4 is a plan view showing by full and dotted lines, respectively, the action of the respective hinge members. Fig. 5 is a face view with a portion of the hinge removed to show more clearly a portion of the spring-barrel, and Figs. 6 and 7 are detail views in perspective of two of the hinge elements hereinafter more particularly described.

The present hinge is capable of efficient use in connection with various swinging structures—such as doors, gates, screens, &c.—and it includes as parts thereof two attaching leaves or flaps, which will, for convenience, be termed the "door-leaf" and the "casing-leaf," the former being preferably attached to a door and the other to a casing or door-jamb, the last-mentioned leaf carrying the barrel or drum, which contains internally the door-operating spring, the door-casing being preferably recessed, as is customary, to accommodate said spring-barrel.

The casing-leaf is designated by L, the companion leaf, or the one which is attached to the door, being denoted by L′, said leaves being furnished with a series of holes, as 15, through which suitable screws or other similar fastening devices can be passed to attach the hinge or the respective members thereof in place.

The housing for the spring barrel or drum may be of any suitable character, and it is herein represented as preferably forming a part of the casing-plate L of the hinge, although it may be removably attached to said plate, the transverse members of said housing being furnished with suitable openings for the reception of the spindle or shaft of the spring-barrel.

The spring barrel or drum consists in the present case of a cylinder made up of two rotative members, which are acted upon in reverse directions, by the spring contained therein, to pull the door shut from whichever side it may be opened. The spring-barrel B is disposed within the housing H on the casing-leaf L, its spindle or shaft being designated by B′, the latter being in the form of a screw which passes through the opening 17 in the upper member of the barrel or housing H, said screw being in threaded engagement at its lower end with the internal threads 19 in the lower transverse part 20 of said housing. (See Fig. 2.)

The spring-barrel B, as hereinbefore stated, consists of two rotative sections, and these will be respectively connected with suitable parts of the hinge, preferably by flexible connectors.

The upper of the two spring-barrel sections is designated by 21, and it consists of a semi-cylindrical shell, the lower edge of the wall of which is contiguous to the upper face of the complementary barrel-section 22, the latter consisting of a disk which has the projecting hub or sleeve 23, that encircles the spindle or shaft B′ and turns thereon. (See Fig. 2.)

The operating-spring of the hinge is designated by S and is of the flat helical kind, the opposite ends thereof being suitably secured to the rotative drum, sections 21 and 22, respectively. The spring S at one end is bent or flanged, as at 24, said portion being fixed within the longitudinal recess 25 of the hub 23 of the lower barrel-section, the opposite end of said spring being attached to the inside

face or wall of the upper drum-section 22 by suitable means, as rivets 26 and 27, respectively.

The hinge includes as a part thereof two reversely-oscillatory plates or hinge members, which are pivotally connected, respectively, with the casing and door leaves or flaps, said oscillatory plates being jointed to said leaves of the hinge at opposite sides of or above and below, respectively, its transverse axis.

The lower of the two oscillatory plates is designated by 29, it being of flat formation and adapted, when shut, to lie snugly against the adjacent flat or plane face of the casing-leaf L, as represented in Fig. 5, the companion or outer plate being designated by 32 and being coöperative with the door-plate L′.

By reason of the peculiar formation of the two reversely-oscillatory plates they have a wide bearing-surface, so that when the door reaches its normal position it will not unduly oscillate, as will be clearly obvious.

The oscillatory plate 29 is connected with the casing-leaf L of the hinge by the pintle 30, which is passed through suitable ears formed on the respective members and which has the knob 30′, by which it can be readily inserted in place. The plate 29 is also pivotally joined to the door-leaf L′ by the pintle 31, which passes through ears on the two parts, the knob of said pintle being designated by 31′. The other oscillatory plate of the hinge is denoted by 32, it being pivotally connected with the door-leaf L at a point opposite to that of the lower plate 29, the pintle connecting these parts being designated by 33, and said plate is likewise connected with the door-leaf L′ by the pintle 33′.

The reversely-oscillatory flat plates 29 and 32 will be connected with the spring barrel or drum B, the connectors between these parts being preferably flexible, such connectors being represented as the chains 34 and 35, respectively, each secured at one end thereof to the spring-barrel, the pintles which join the attaching-leaves and reversely-oscillatory plates, respectively, being secured to the opposite ends of said chains.

The chain 34 is connected at its inner end to the upper drum-section 21, the pintle 33′, that connects the plate 32 and leaf L′, passing through the opposite end link 36 of said chain, as shown in Fig. 1, and the chain 35, which winds in a direction opposite to that of its companion, will be preferably similarly attached to the lower drum-section 22, the opposite end link of said last-mentioned chain having the pintle 31, which connects the lower plate 29 and leaf L′, passed therethrough, as shown in Fig. 1.

The two chains 34 and 35 are windable on the annular portions 38 and 39, respectively, of the two drum-sections 21 and 22 and pass through recesses in the casing-leaf L. The two chains are interchangeable, they being removably attached at their opposite ends to the spring-barrel B and hinge members or plates 29 and 32, respectively. The means for securing the two chains removably to the spring-barrel is clearly illustrated in Fig. 4, wherein the upper drum-section 21 is represented as having a circular series of elongated slots, as 40, through any one of which may be introduced a pin, as 41, fixed to the inner end link of the chain. Each of said elongated slots will have at about its middle the wide portion 42.

The pin 41, which connects the chain 34 with the spring-barrel, will be preferably headed, as at 41′, (see Fig. 2,) to prevent the accidental displacement thereof when the hinge is assembled, the diameter of the head of said pin being slightly less than that of the wide portion 42 of the slot 40.

To remove the chain 34 for any purpose, the upper section 21 of the spring-barrel B will be simply grasped and turned in the direction of the arrow until the enlarged or wide portion 42 of the elongated slot 40 is opposite or in line with the head 41′ of the pin 41, at which time the pin can be easily removed, the pintle 33 being withdrawn from the link 36 to thereby permit the complete removal of the said chain, so that in case any one of the links thereof is broken a new chain can be readily substituted for the defective one.

The periphery of the upper or semicylindrical portion 21 of the spring-barrel B is furnished with a series of suitably-spaced holes or recesses 43 to receive a proper instrument whereby the said drum-section can be turned to regulate the tension of the internal spring S, either to tighten or to loosen said spring, as occasion demands.

The action of the hinge will be readily apparent from an inspection of Fig. 4 of the drawings. As hereinbefore stated, the leaf L will be preferably attached to the door-casing, the leaf L′ being fixed to the door.

In Fig. 1 the hinge is represented closed. Let it be assumed that the door (not shown) is to be swung to the right. In effecting this result it will carry the leaf L′ and upper hinge-plate 32 with it and unwind the chain 34 from the annular winding portion 38 of and rotate the upper drum-section 21, the spring S being compressed, while the lower drum-section 22 remains stationary. When the door is released, the spring S, acting through the drum-section 21 and chain 34, will promptly shut the same and bring the oscillatory plate 32 against the adjacent flat portion of the casing-leaf L′, the door being permitted to swing slightly back and forth by the plates 29 and 32, which turn on the pintles 30 and 33, the oscillations alternating and becoming less and less until they finally cease.

Having described my invention, I claim—

1. A hinge embodying two attaching-leaves one of which carries a spring-barrel consisting of two rotative sections; chains attached

to the respective barrel-sections and extending oppositely therefrom; a pair of reversely-oscillatory plates; and pintles passing through ears on the attaching-leaves and oscillatory plates, respectively, each of said pintles passing through one link of each of the chains.

2. A hinge embodying two attaching-leaves one of which carries a spring-barrel having a series of elongated slots in its opposite ends wide at the middle; a pair of chains having headed pins at the inner ends thereof seated in the elongated slots, said chains extending oppositely from the spring-barrel; a pair of reversely-oscillatory plates; and pintles passing through ears on the attaching-leaves and oscillatory plates, respectively, each of said pintles passing through one link of each of the chains.

3. A hinge embodying two attaching-leaves; a spring-barrel constructed of two sections, one of which consists of a semicylindrical shell having in its end a series of elongated slots and the other of which consists of a disk having a projecting hub and also having a series of elongated slots; a spindle on one of the attaching-leaves, passing through the two sections of the drum; a spring secured to the respective barrel-sections; a pair of chains having headed pins at the inner ends thereof seated in said elongated slots and extending oppositely from the spring-barrel; a pair of reversely-oscillatory plates; and pintles passing through ears on the attaching-leaves and oscillatory plates, respectively, each of said pintles projecting through one link of each of the chains.

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