(No Model.)

W. P. KEENAN.

SPRING HINGE.

No. 515,433. Patented Feb. 27, 1894.

Fig. 5.

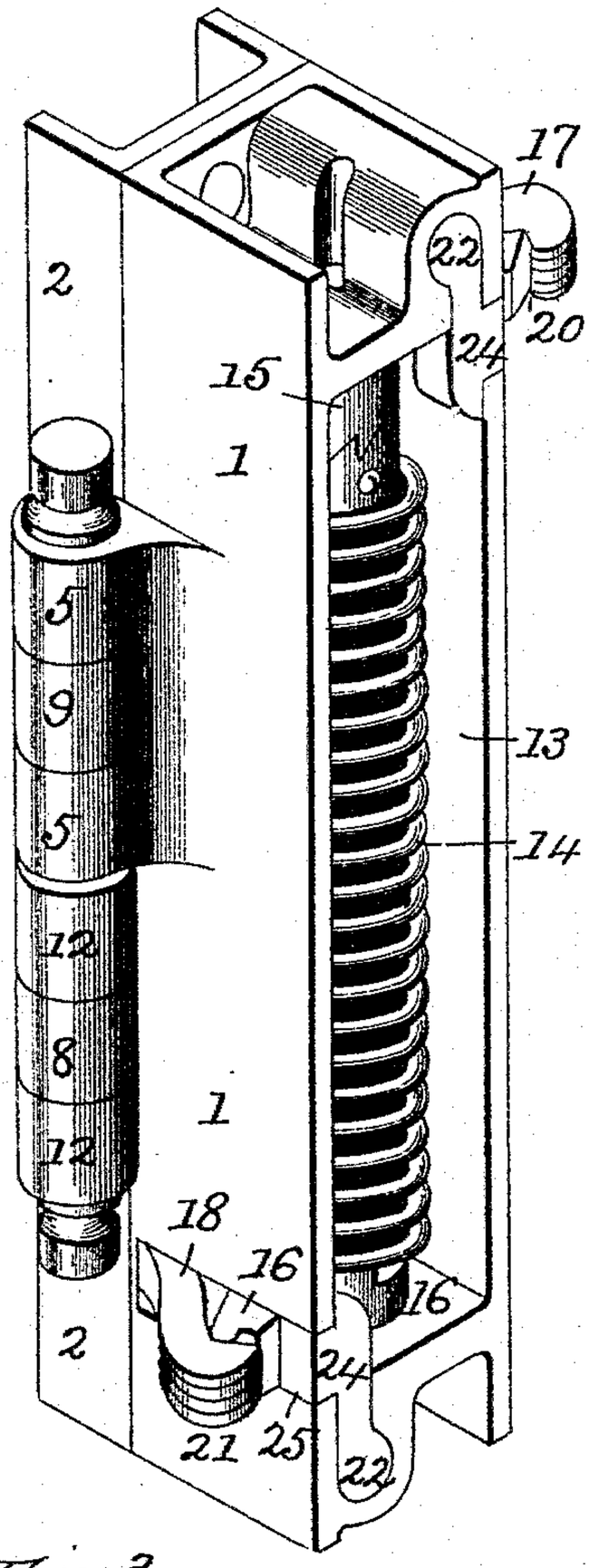


Fig. 1.

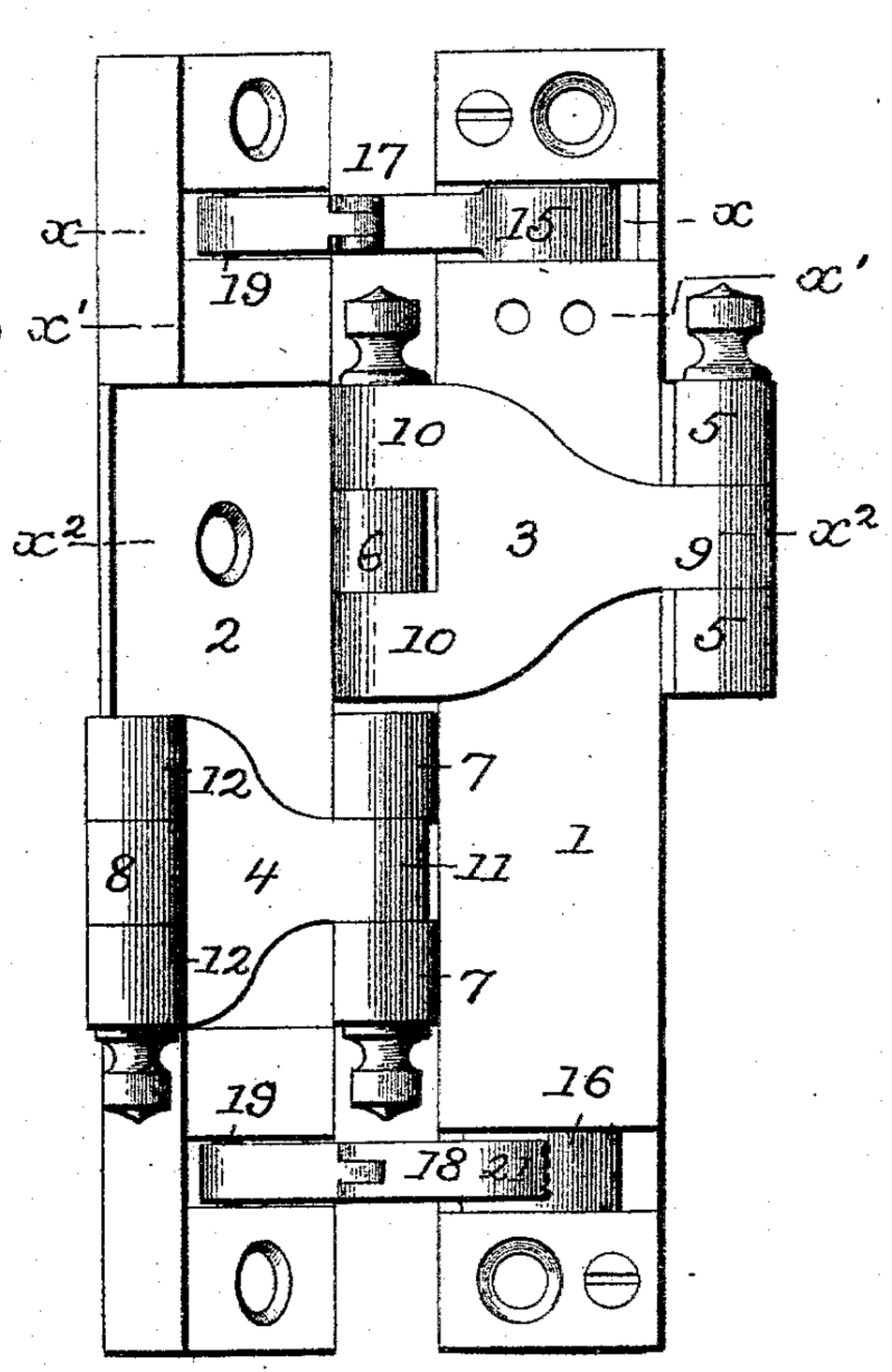


Fig. 3.

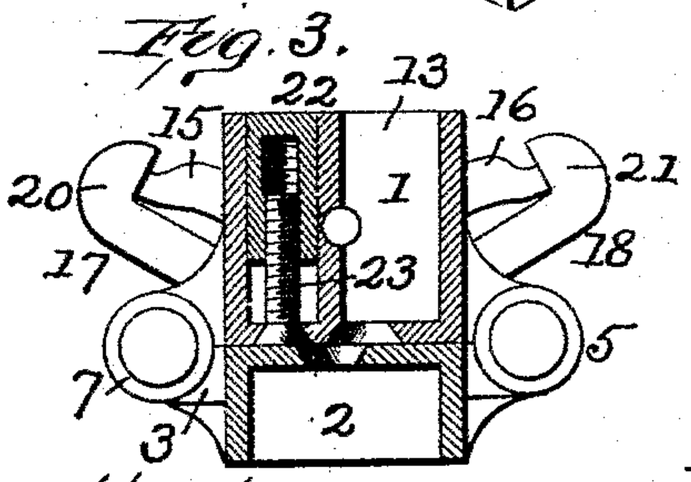


Fig. 2.

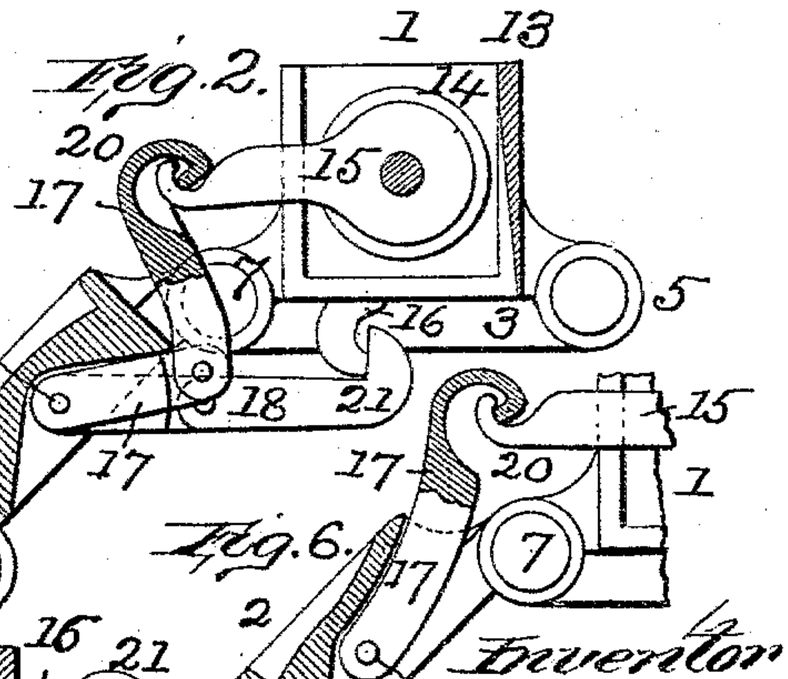


Fig. 6.

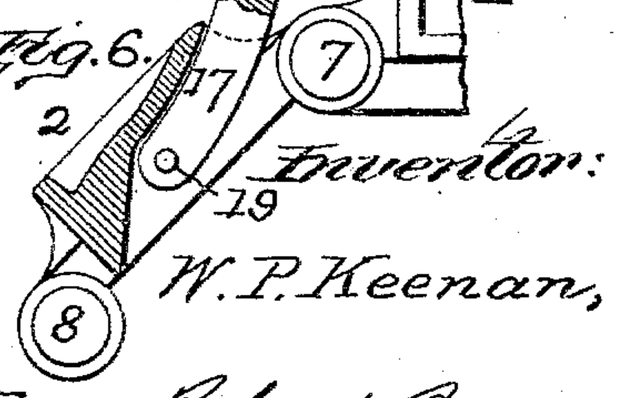
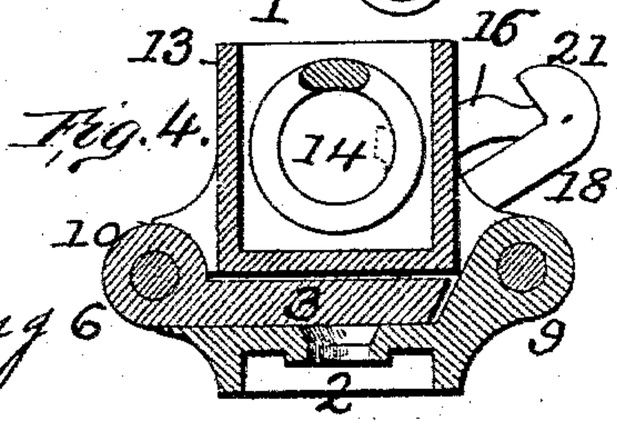


Fig. 4.



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SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 515,433, dated February 27, 1894.

Application filed June 15, 1893. Serial No. 477,765. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM P. KEENAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Spring-Hinges; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates more particularly to that class of double-acting spring hinges, in which the main fixed and movable hinge members are provided with pivot knuckles at opposite sides, and are connected together by intermediate leaves, so as to enable the door to swing in either direction, the closed condition of the hinged members being maintained by a single vertically arranged coiled spring located medially in one hinge member, with its ends attached to oppositely projecting crank-arms, that have link connections with the other hinge member, so that in the opening of the hinge in either direction, torsion will be imparted simultaneously to the spring ends in opposite directions. The object of the present improvement being: first, to provide an improved connection between the crank-arm and connecting link of such type of hinges, whereby a ready and convenient detachment of the connecting link can be effected, when it is desired to remove the closing tension of the spring from off the door, so that the same can stand open; and which is capable of ready and convenient re-engagement when required. Second, to afford a simple and efficient adjustable abutment or stop for the crank-arms of such type of hinges, by which the closing degree of the hinge members can be changed and adjusted so as to effect a proper closing of the door within its casing or framing. I attain such objects by the construction and arrangement of parts illustrated in the accompanying drawings in which—

Figure 1, is a front elevation of a double-acting spring hinge in an open condition, illustrating my present improvement; Fig. 2, a horizontal section of the same, in a similar open condition, at line x—x, Fig. 1; Fig. 3, a horizontal section at line x'—x', Fig. 1, of the hinge in a closed condition, illustrating the means for adjusting the adjustable abutment for the crank-arms of the spring; Fig. 4, a similar view at line x^2—x^2, Fig. 1; Fig. 5, a perspective view of the hinge in a closed condition; and Fig. 6, a detail section of a modification.

Similar numerals of reference indicate like parts in the several views.

Referring to the drawings, 1 and 2, are the main hinge members having on their sides an upper set of pivot lugs or knuckles 5 and 6, by which pivot connection is had with the knuckles 9 and 10, of the upper intermediate leaf 3; and a lower set of pivot knuckles 7 and 8, by which pivot connection is had with the knuckles 11 and 12, of the lower intermediate leaf 4, the connections between the knuckles, will be made by pivot pins and in the usual manner, to-wit the upper intermediate leaf 3, by means of its knuckles 9 and 10, with the upper set of knuckles 5 and 6, on opposite sides of the main hinge members, the knuckle 5 being on the member 1, and the knuckle 6 on the member 2; the lower intermediate leaf 4, is connected by means of its knuckles 11 and 12, with the lower set of knuckles 7 and 8, on opposite sides of the main hinge members, the knuckle 7 being on the member 1, and the knuckle 8 on the member 2. The present improvement in this connection relates to the formation of the intermediate leaves 3 and 4, of a bifurcated or Y-formation, with single knuckles 9 and 11 at one end of said leaves to engage with the duplicate knuckles 5 and 7 of the main hinge member 1, and duplicate knuckles 10 and 12 at the other end of said leaves to engage with the single knuckles 6 and 8 of the main hinge member 2; this formation and arrangement of the intermediate leaves 3 and 4, afford a very stiff and durable pivotal means to resist any tendency to sagging of the parts in use.

While in the drawings I illustrate the axis of the hinge knuckles as being on a line with the front face of the member 1, yet when desired such hinge knuckles may be located back from such position without departing from the spirit of my present invention.

The main member 1, is formed with a shell or housing 13, in which the operating coiled spring 14 of the hinge is arranged, its upper end being attached to the crank-arm 15, and

its lower end to the crank-arm 16, having bearing in said housing in any suitable manner.

The crank-arms 15 and 16, project through opposite sides of the housing of the spring, and their outer ends are connected to links 17 and 18, that are pivotally attached to the main hinge member 2, near the mid-width of the same by the pivot pins 19. These links 17 and 18, may in some instances be a single inflexible piece, as shown in Fig. 6, and be suitable for such uses that do not require a widely opening hinge. The formation of the said links of a flexible nature by constructing the same in sections hinged together as illustrated in Figs. 1 and 2, is of material value in the present construction in that it admits of a wide opening of the hinge without necessitating the cutting away of the main hinge members, as would be the case where an inflexible link was employed.

In the present improvement the connection between the ends of the crank-arms 15 and 16, is made by means of hook formations 20, 21, on the ends of the same, so as to be capable of ready engagement and dis-engagement as required, a dis-engagement being made when it is desired to have the door remain open, and the operating spring of the hinge dormant.

Another feature of the present improvement consists in a sliding and adjustable abutment or stop for the crank-arms 15 and 16 of the hinge, by means of which the same can be stopped at any desired point and in consequence the closed position of the door with relation to its frame or casing, regulated as desired; in this: 22, is a hollow screw-threaded plug, sliding in a suitable guideway in the hinge member 1, and engaged by an adjusting screw 23, having bearing in said head, and by rotation of which a sliding movement of adjustment is imparted to the plug 22.

In the present improved construction, the above adjustable mechanism is arranged in a plane removed from the path of the crank-arms, so as not to interfere with the movement of the same, other than the pendent arm 24, on the plug 22 that projects into the path of the adjacent crank-arm to form an adjustable stop therefor, such arm being preferably arranged to slide in and be guided by the slot 25, in which said crank-arm moves, as illustrated in Fig. 5. This means of guiding the arm 24 will be used where the box formation of the main hinge member is employed.

In cases where no box formation is employed the guiding of the arm 24 will be dispensed with.

Any usual means for adjusting the tension of the hinge spring may be employed, preferably the ratchet form partly shown in Fig. 5, as forming a part of one of the hubs of the crank-arms of the hinge.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a spring hinge, essentially as herein described, the sliding internally screw-threaded plug 22, arranged in a plane removed from the crank-arm and having a pendent abutment arm 24, in combination with the adjustable screw 23, and the operating crank-arm of the torsion spring of the hinge, substantially as set forth.

2. In a spring hinge essentially as herein described, the sliding internally screw-threaded plug 22, arranged in a plane removed from the crank-arm and having a pendent abutment arm 24, guided in the slot 25 in the box formation of the hinge member, in combination with the adjustable screw 23, and the operating crank-arm of the torsion spring of the hinge, substantially as set forth.

3. In a spring hinge essentially as herein described, the combination with the fixed and movable hinge members, of the torsion spring, and the operating crank-arm therefor, arranged on one hinge member, and a connecting link pivotally attached to the other member, the connection between said link and the crank-arm being made detachable by the hook formation on the ends of the same, substantially as set forth.

In testimony whereof witness my hand this 20th day of April, 1893.

WILLIAM P. KEENAN.

In presence of—
ROBERT BURNS,
ROBERT BURNS, Jr.