

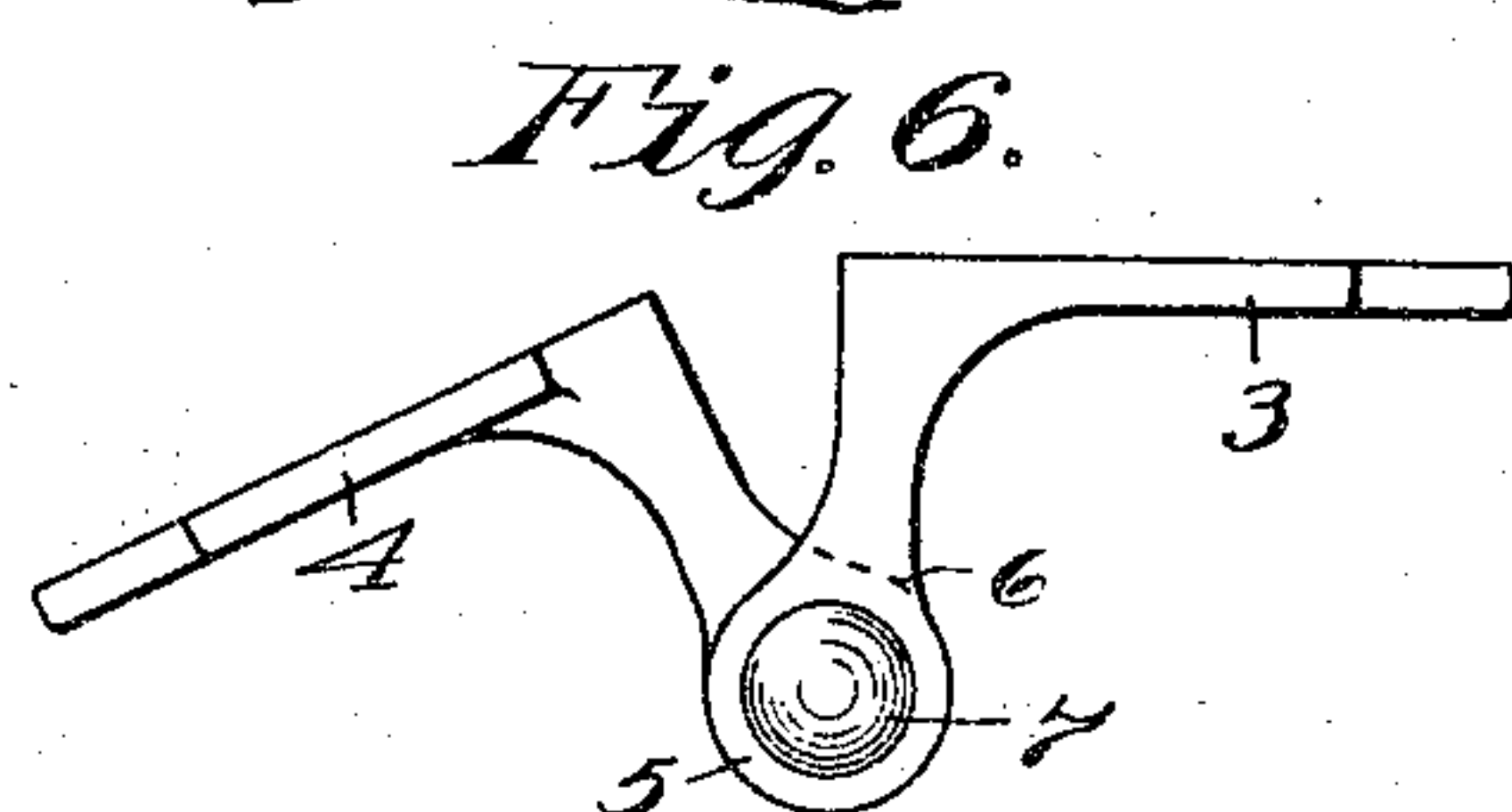
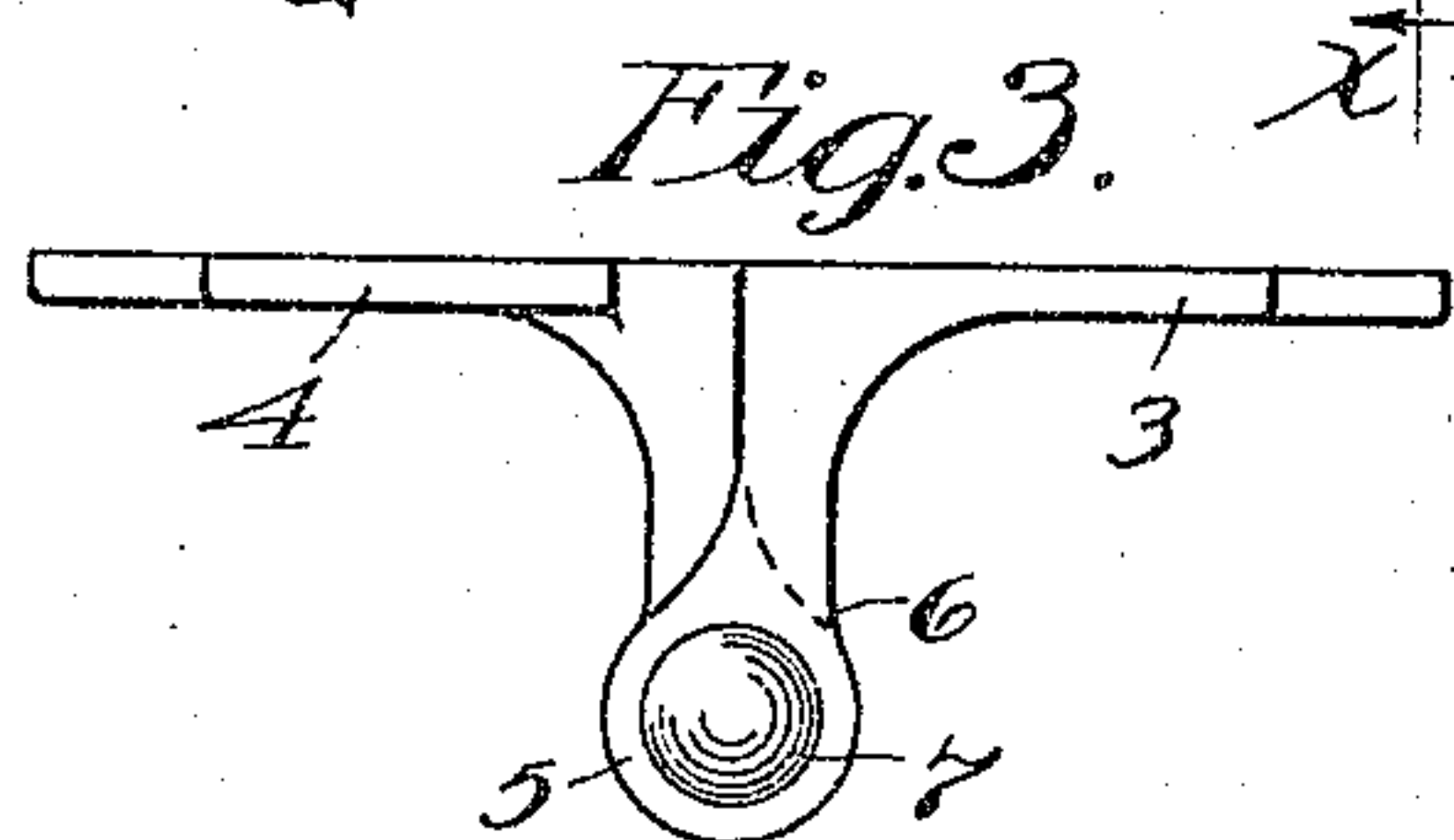
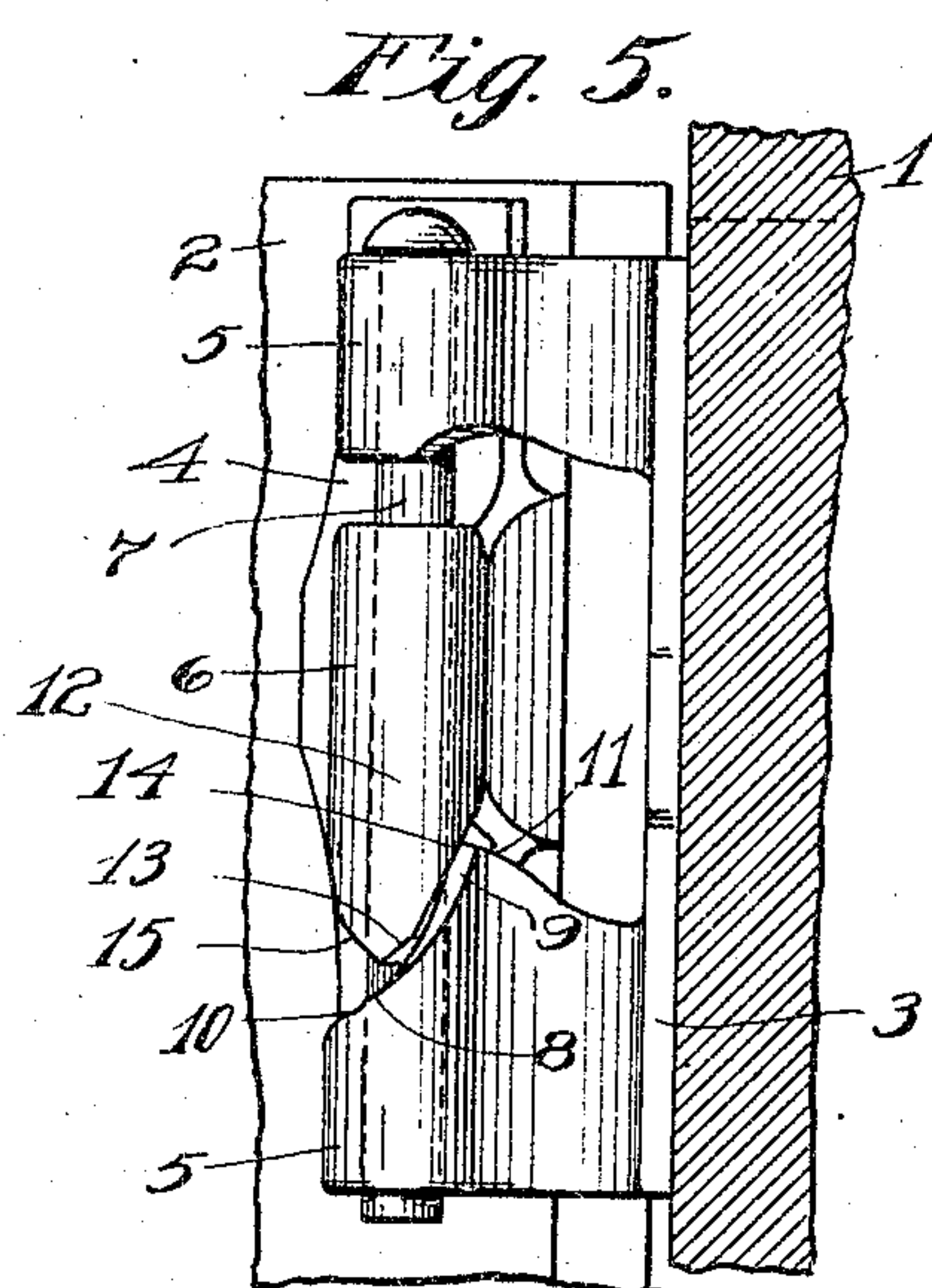
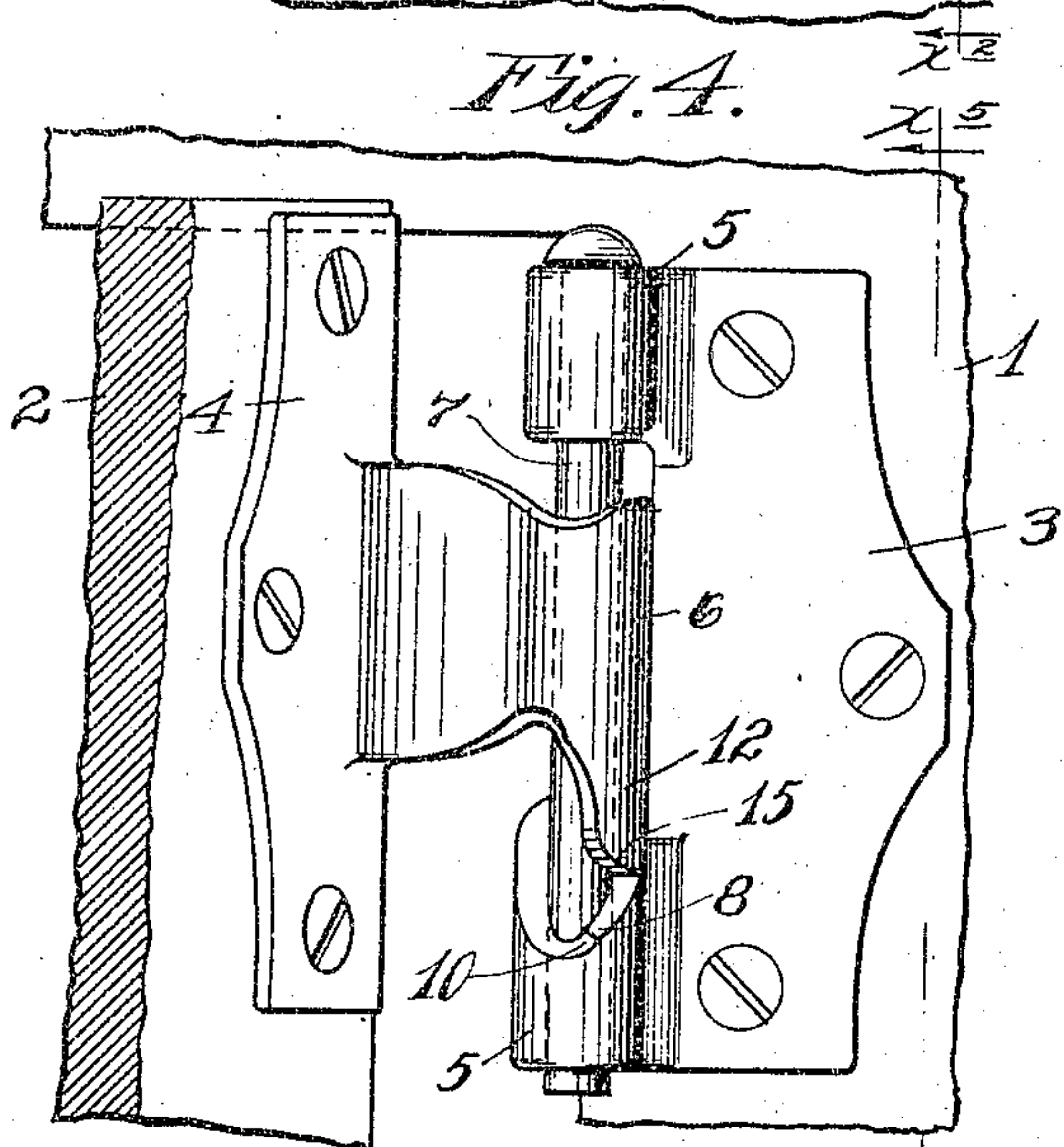
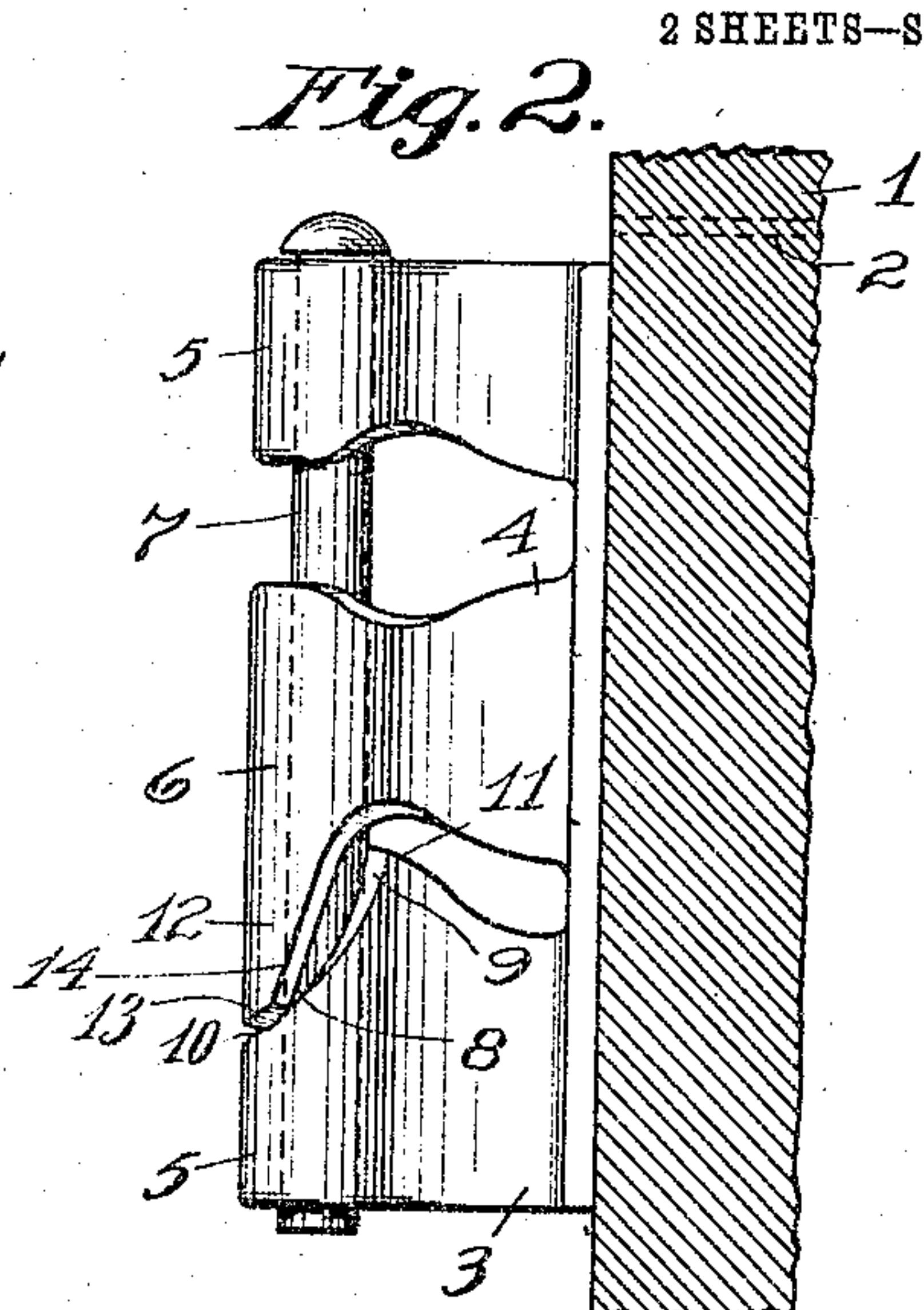
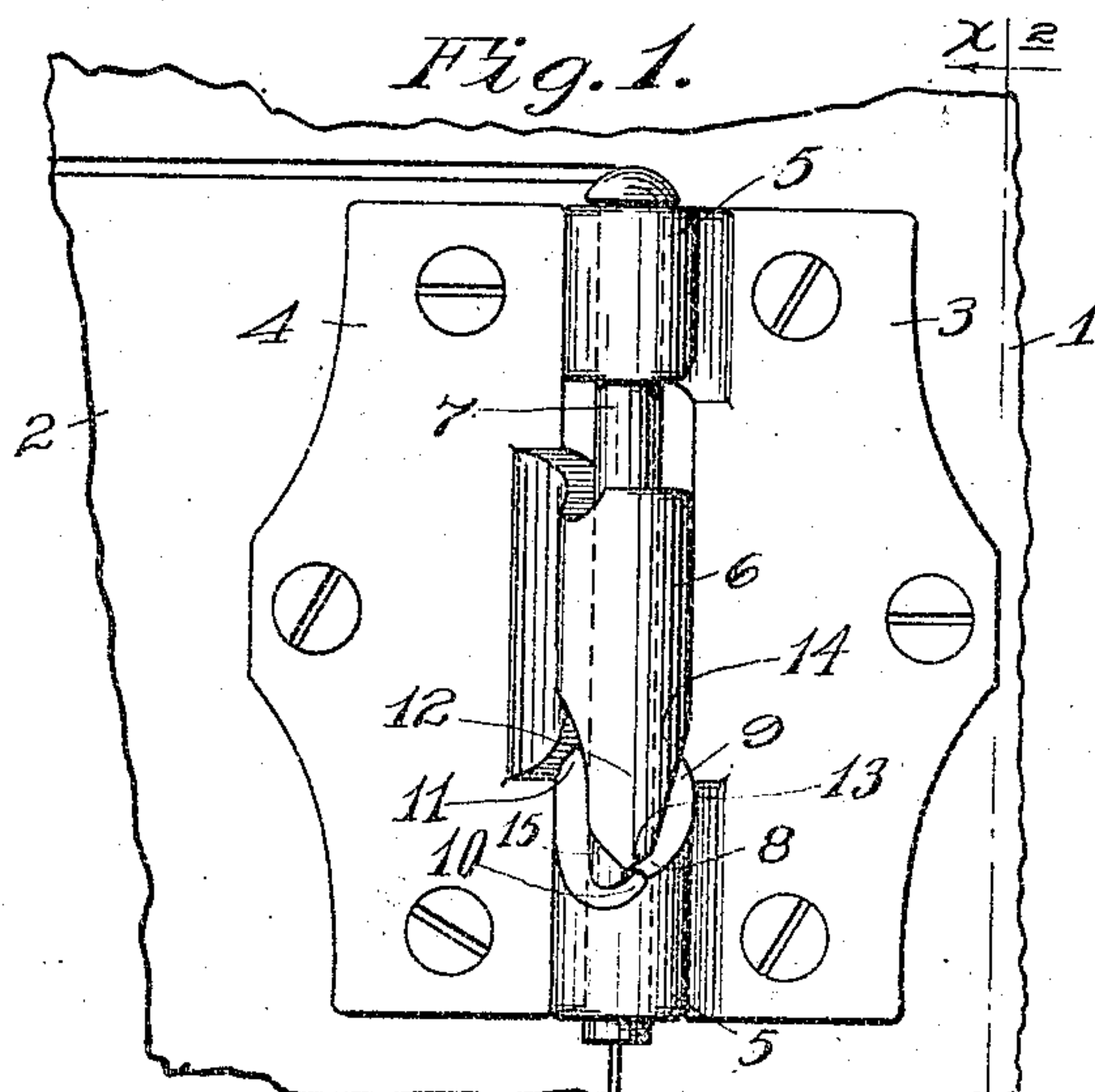
No. 785,143.

PATENTED MAR. 21, 1905.

R. G. WINTER.
HINGE.

APPLICATION FILED MAY 7, 1904.

2 SHEETS—SHEET 1.



Witnesses.
E. W. Jeppesen.
A. H. Opsohl.

Inventor:
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By his Attorneys.
William M. Mueland

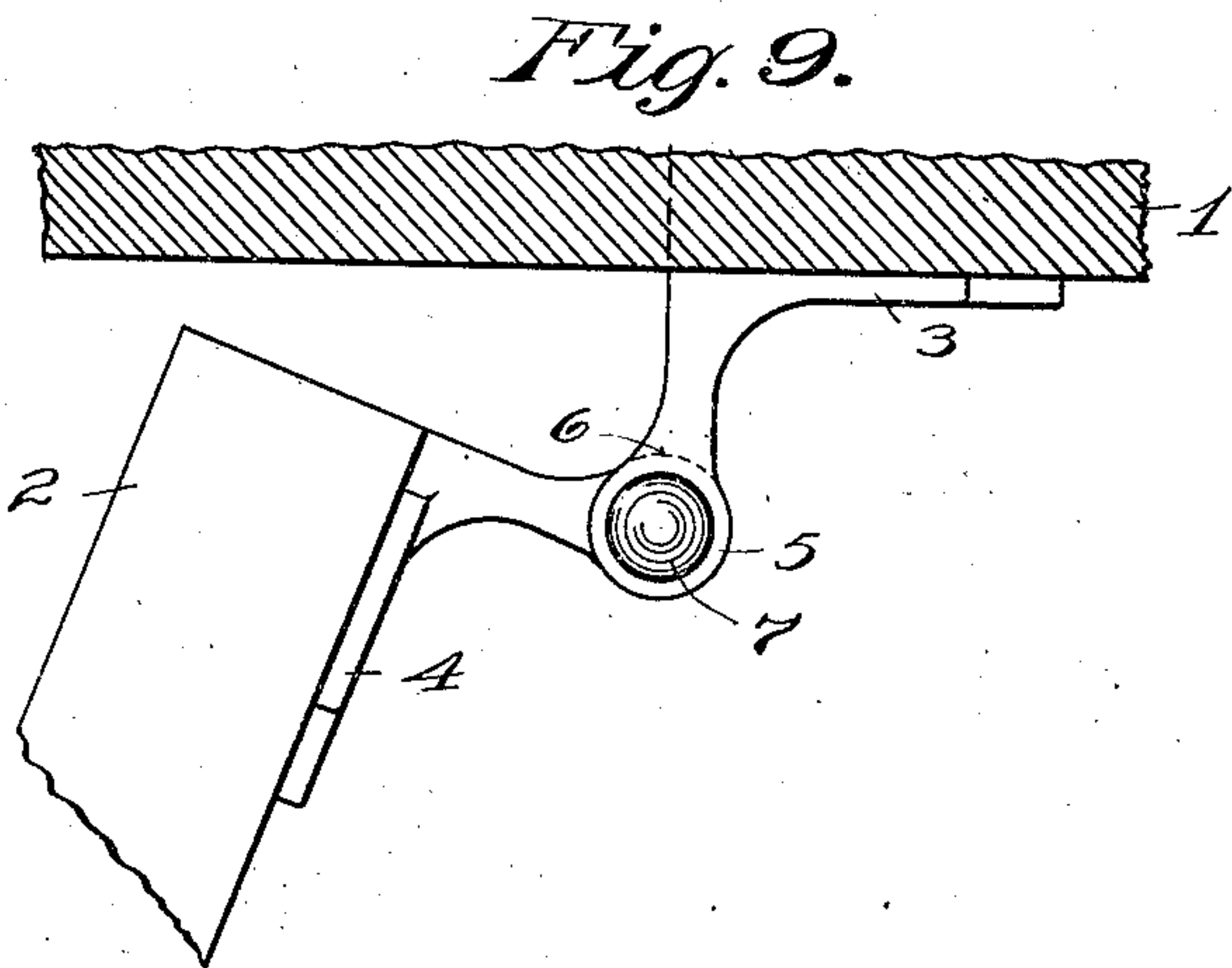
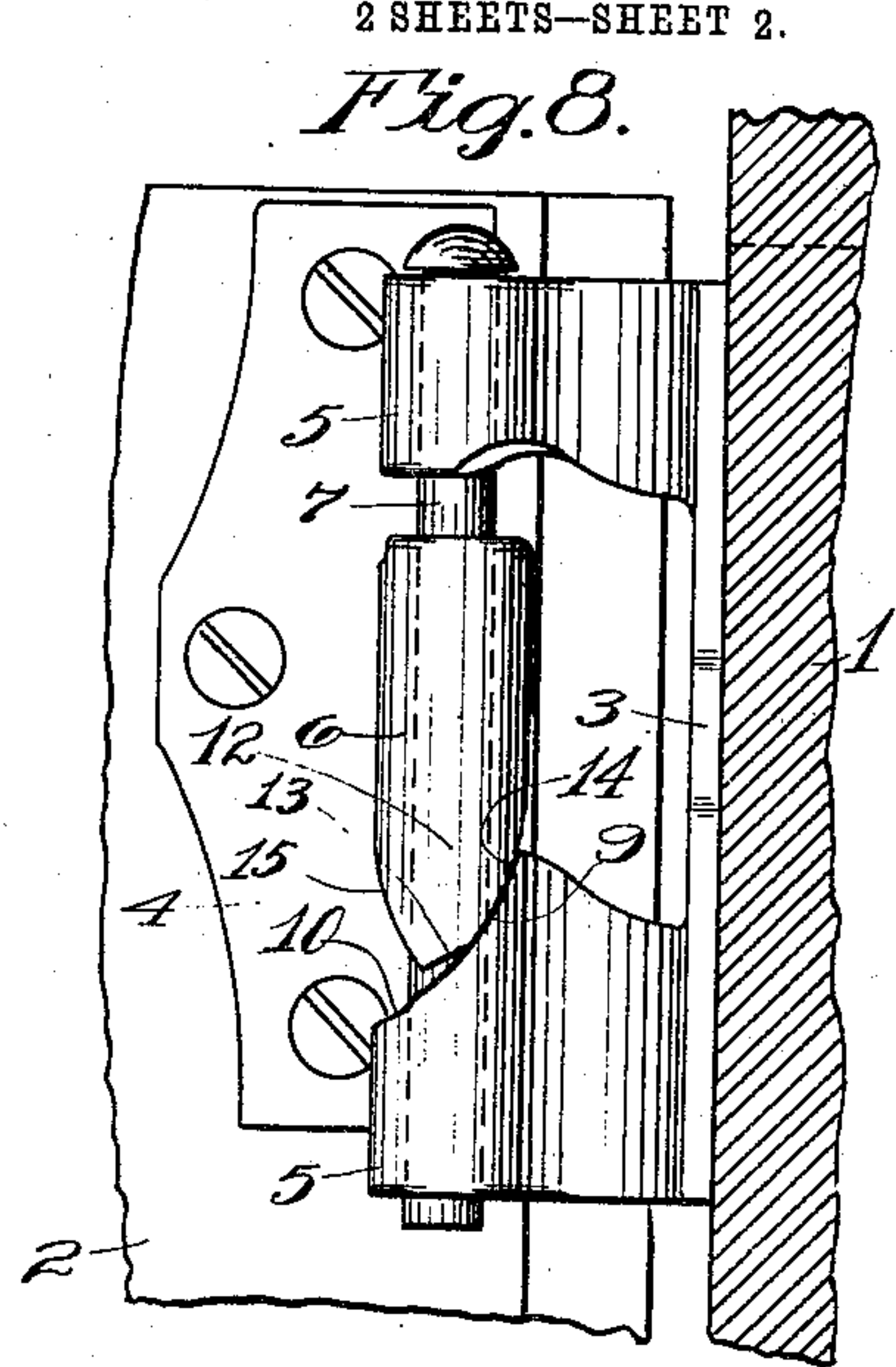
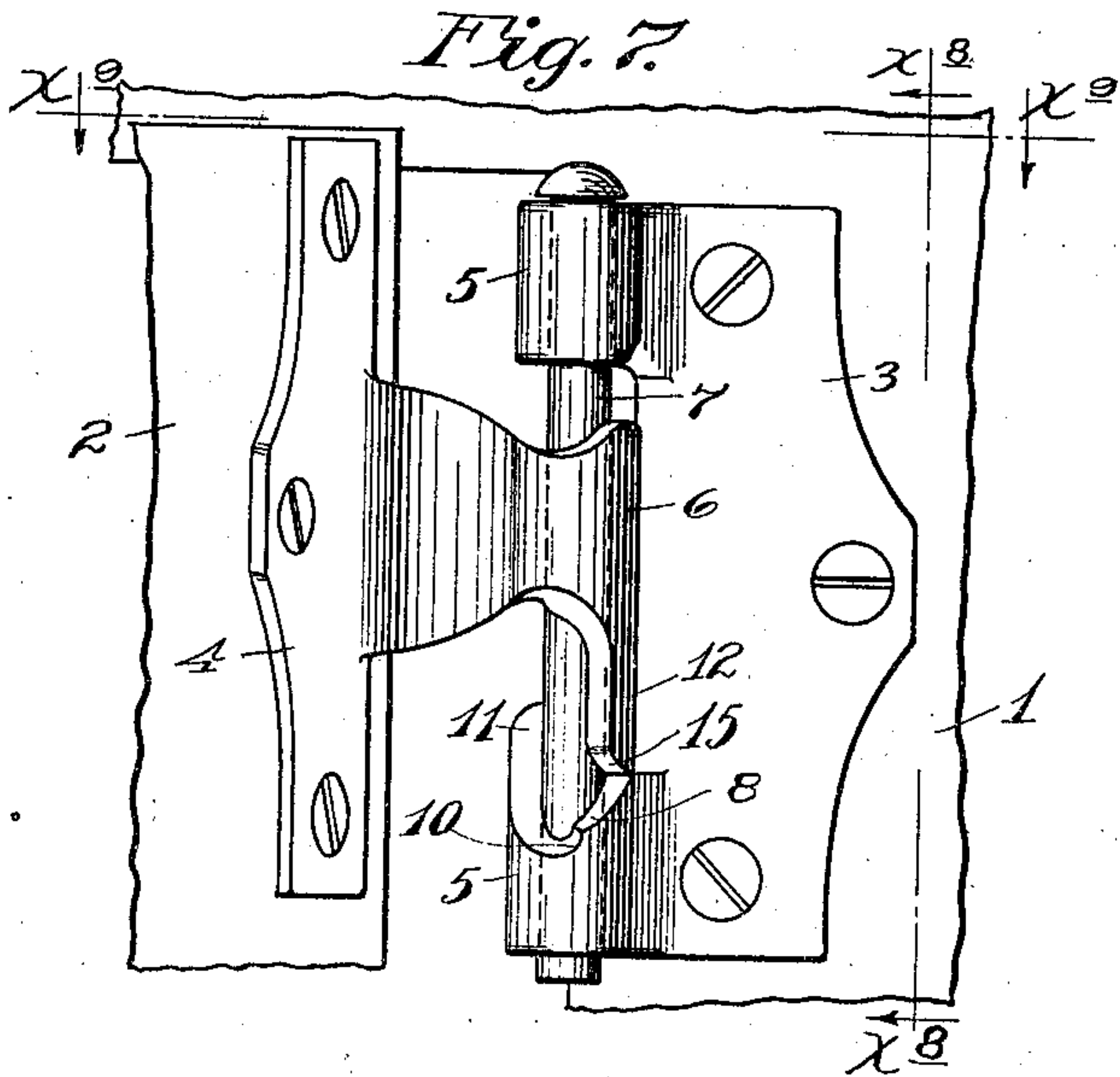
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2 SHEETS--SHEET 2.



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UNITED STATES PATENT OFFICE.

RUDOLPH G. WINTER, OF MILWAUKEE, WISCONSIN.

HINGE.

SPECIFICATION forming part of Letters Patent No. 785,143, dated March 21, 1905.

Application filed May 7, 1904. Serial No. 206,791.

To all whom it may concern:

Be it known that I, RUDOLPH G. WINTER, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Hinges; 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 present invention relates to automatic cam-acting hinges, or, in other words, to those which close or move into predetermined positions under the action of gravity and without the use of springs. In the use of hinges of this character the door or swinging member must of necessity rise as it is swung away from its closed position. One feature of my present invention is directed to an arrangement of the cooperating cam-surfaces of the hinge members, so that the door or swinging member will rise but very slightly until after it has been swung into a position clear of the cooperating door casing or frame, but will thereafter rise very rapidly and under increased tendency to close.

The invention consists of the novel devices and combinations of devices and construction of parts hereinafter described, and defined in the claims.

In the accompanying drawings, which illustrate my invention, like characters indicate like parts throughout the several views.

Figure 1 is a view in side elevation showing a hinge designed in accordance with my invention and showing a portion of a door and of a door-casing to which the hinge is applied, the said door being in a closed position. Fig. 2 is a section on the line $x^2 x^2$ of Fig. 1. Fig. 3 is a plan view of the hinge shown in Fig. 1, the same being shown as removed from working position. Fig. 4 is a view corresponding to Fig. 1, but showing the door swung partly open. Fig. 5 is a transverse vertical section on the line $x^5 x^5$ of Fig. 4. Fig. 6 is a plan view of the hinge removed from working position, the parts thereof being in the position illustrated in Figs. 4 and 5. Fig. 7 is a view corresponding to Fig. 4, but showing the door swung farther open. Fig. 8 is a transverse

vertical section on the line $x^8 x^8$ of Fig. 7, and Fig. 9 is a horizontal section on the line $x^9 x^9$ of Fig. 7.

The numeral 1 indicates a door-casing, and the numeral 2 a door, which door is supported from said casing by two or more hinges constructed in accordance with my invention and of which in the drawings only one is shown.

The numerals 3 and 4 indicate the cooperating hinge members, the former of which is secured to the casing and the latter of which is secured to the door. As shown, the hinge member 3 is provided with a pair of laterally-projecting hinge-lugs 5, while the member 4 is provided with a centrally-located single lug 6, which works between the lugs 5. A hinge-bolt 7, passed through the lugs 5 and 6, affords a pivot for the hinge member 4 and the door 2 and permits limited vertical movements thereof.

The lower hinge-lug 5 is formed with a winding cam-surface 8 9, which at its lower extremity is slightly but quite abruptly cut downward at 10. The upper extremity of this cam-surface 8 9 extends to a reverse cam-surface 11. The cam-lug 6 of the hinge member 4 is formed with a depending cam-lug 12, which is formed with cam-surfaces 13, 14, and 15. The portion 9 of the cam-surface 8 9 is much steeper than the portion 8. The cam-surface 14 of the cam-lug 12 has the same curve as the said cam-surface 9; but when the hinge stands in a position to close the door, as shown in Figs. 1, 2, and 3, said cam-surfaces 9 and 14 are held out of engagement by the engagement of the cam-nosed section 13 with the lower portion of the cam-surface 8. (See particularly Fig. 2.) Again, by reference particularly to Fig. 1 it will be noted that when the door is closed a portion of the cam-nose 13 overlies the depressed section 10 of the hub 5, so that the door is supported entirely by the cam-surface 8 and the entire weight of the door is rendered effective to hold the door closed. Furthermore, in view of this depression 10 wear of the surface 8 will not prevent this result.

In Figs. 4, 5, and 6 the door is shown as opened but slightly, and hence has been raised but slightly, and by reference to Fig. 5 it

will be noted that the cam-nose 13 still engages with the cam-surface 8 and that the cam-surface 14 has not been yet brought into contact with the cam-surface 9.

5 In Figs. 7, 8, and 9 the door is shown as turned open far enough to carry its inner corner beyond the casing, and by reference to Fig. 8 it will be noted that in this position of the parts the cam-surface 14 has been brought into
10 engagement with the cam-surface 9, so that under further opening movement of the door these relatively steep engaged cam-surfaces will cause the door to rise rapidly. When the door has been swung nearly to its extreme
15 open position, the cam-nose 13 of the hinge-lug 6 will be carried into engagement with the reverse cam-surface 11 of the lower lug 5, and this engagement will tend to swing the door to its extreme open position, and hence,
20 of course, to hold the door in its open position until force is applied thereto.

From the foregoing description it will be seen that the door is caused to rise slowly until after it has moved outward far enough to
25 clear the door casing or frame and is thereafter caused to raise a relatively rapid rate of speed, and, furthermore, it is evident that the door may be swung open quite freely until the cam-surfaces 14 and 9 are brought into
30 engagement and that under further opening movements the tendency of the door to close is materially increased. This accelerated tendency of the door to close under opening movements among other things has the effect
35 of preventing the door from being slammed into an open position and under a closing movement of the door starts the door with a relatively great force, which force gradually diminishes as the door reaches the closed po-
40 sition. This action is highly important.

As the door closely approaches the limit of its extreme opening movement the cam-nose 13 engages with the upper position of the cam-surface 9.

45 The hinge described, it will of course be understood, is capable of modification within the scope of my invention as herein set forth and claimed. The cam-surfaces of the hinge-lugs instead of being formed directly on in-
50 tegral parts of the hinge members may be formed on separable parts, as shown in my

prior application, Serial No. 184,026, filed December 7, 1903, entitled "Hinges." Again, the said novel cam-surfaces may be applied to double hinges or hinges adapting the door to
55 swing in either of two directions, which type of hinges is also disclosed in my said prior application. Furthermore, the hinge-lugs may be offset from the sides of the door in different ways. Other modifications will sug-
60 gest themselves in different applications of the hinge.

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

1. In a gravity-acting hinge, cooperating
65 cam-surfaces constructed and operating to raise the door gradually under an initial opening movement, and to cause the same to rise more rapidly under continued opening move-
70 ment, substantially as described.

2. In a gravity-acting hinge, the combination with the hinge members, one thereof having a cam-surface 8 9, the other member having a cam-nose 13 and cam-surface 14, which nose 13 and cam-surface 8 engage in one extreme
75 position of the hinge, and hold the cam-surfaces 9 and 14 out of contact, but which cam-surfaces 9 and 14 are brought into engagement by movement of the hinge members on their pivot, substantially as described. 80

3. In a gravity-actuated hinge, the combination with a pair of hinge members, the one having perforated lugs 5, and the other having a perforated lug 6 connected by a bolt 7, one of said lugs 5 having the cam-surfaces 8
85 9 and 11, and depression 10, and the said lug 6 having the cam-nose 13, cam-surface 14 and cam-surface 15, said nose 13 and cam-surface 8 adapted to normally engage and hold said
90 cam-surfaces 9 and 14 out of contact, said surfaces 9 and 14 being engageable by a pivotal movement of one hinge member with respect to the other, and said cam-surfaces 11 and 15 being engageable by an extreme piv-
95 otal movement of one of the said hinge members, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

RUDOLPH G. WINTER.

Witnesses:

R. C. MABEY,

F. D. MERCHANT.