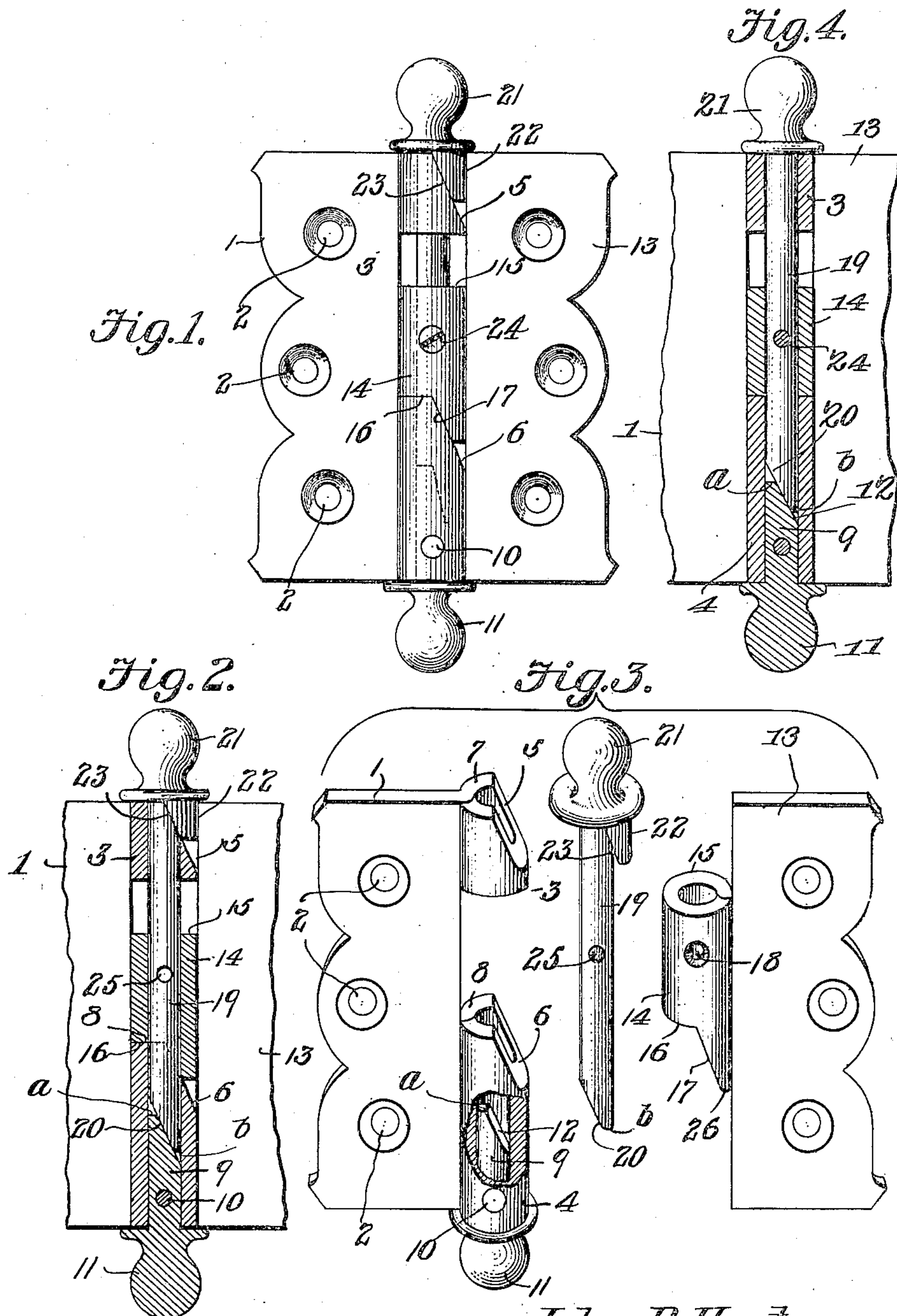


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J. R. HARTMAN.
HINGE.

APPLICATION FILED JUNE 29, 1906.



WITNESSES:

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JOHN R. HARTMAN, OF DAVENPORT, IOWA.

HINGE.

No. 879,542.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN R. HARTMAN, a citizen of the United States, residing at Davenport, in the county of Scott and State of Iowa, have invented a new and useful Hinge, of which the following is a specification.

This invention relates to gate and door hinges, and has for its object to provide certain new and useful improvements whereby the door will gravitate to a closed position and will be elevated to clear obstructions from the floor when being opened. Heretofore, hinges of this character have had relatively small flat bearing surfaces to support the hinge in its open position and have required that the swinging leaf member be swung through an arc of more than 90° before the door would stand in an open position.

In view of this objection, it is an important object of the present invention to so construct the hinge as to give the same broad bearing surfaces to support the door in a stationary position, and to enable the door reaching such stationary position when it is swung through an arc of 90 degrees.

It is also proposed to embody the invention in the nature of a butt hinge wherein the lifting action is produced by a coöperative engagement between the hinge pintle and one of the knuckles of the hinge.

A still further object of the invention is to enable the stamping of the hinge leaves from sheet metal.

With these and other objects in view, the present invention consists in the combination and arrangement of parts as will be hereinafter more fully described, shown in the accompanying drawing and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size and minor details may be made, within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawing: Figure 1 is a face view of the hinge in its closed position. Fig. 2 is a sectional view thereof taken through the knuckles of the hinge leaves. Fig. 3 is a perspective view illustrating the elements of the hinge separated. Fig. 4 is a view similar to Fig. 2 showing an arrangement of the hinge for light doors.

Similar numerals of reference designate corresponding parts in all of the figures of the drawing.

Referring at first more particularly to Fig. 3 of the drawing, it will be seen that the stationary member 1 of the hinge is in the nature of a flat plate pierced by countersunk openings 2 for the reception of screws or other fastenings. At the inner straight upright edge of this plate are two eyes or knuckles 3 and 4, each of which is formed by bending a lateral extension of the plate, from which it will be understood that it is proposed to first stamp the plate from sheet metal and then bend the eyes 3 and 4. Each eye or knuckle is in the nature of an open-ended tube, the plane of the bottom of which is disposed at substantially right angles to the plane of the plate 1, the upper outer portions of the respective knuckles being cut away or beveled as at 5 and 6. These beveled portions take away substantially one half of the tops of the knuckles leaving the other halves 7 and 8 flat, and in substantially horizontal planes when the hinge is in use.

A plug 9 is driven into the lower end of the knuckle 4 and is rigidly held therein in any suitable manner, as for instance by means of a rivet or other fastening 10. The lower end of this plug projects below the knuckle and is formed into an ornamental knob 11 of any approved shape. The function of this plug is to close the lower end of the knuckle 4 and thereby form a socket which is open at its top and closed at its bottom. The inner end of this plug is cut away or beveled, as at 12, upon the same side as the beveled portions 5 and 6 of the knuckles, and also disposed in substantial parallelism therewith.

The movable hinge member 13 is a plate of substantially the same size and configuration as the hinge member 1 and is provided substantially midway of its ends with an open ended eye or knuckle 14 bent therefrom, the top of the knuckle being flat and its lower end being cut away, as at 16, inwardly from its outer side for one-half of its width and in parallelism with the flat top 15 of the knuckle. From the inner end of the flat portion 16, the lower end of the knuckle is beveled inwardly and downwardly, as at 17, to correspond with the bevel 6 of the knuckle 4. The length of the knuckle 14 is less than the length of the

space between the knuckles 3 and 4, the difference in length being designed to accommodate the vertical movement of the hinge member 13 as will hereinafter appear.

5 About midway between the ends of the knuckle 14 there is a countersunk opening 18.

For pivotally connecting the hinge members when they have been assembled with the knuckle 14, received between the 10 knuckles 3 and 4, there is a hinge pin or pintle 19 of a diameter to fit loosely the alined knuckles, the lower end of the pintle being beveled, as at 20, to frictionally engage the beveled portion 12 in the bottom of the 15 knuckle 4. The upper end of this pintle is provided with an ornamental knob 21 serving as a handle for applying and removing the pintle. The under side of the knob 21 has a downward extension 22 having its inner 20 face beveled, as at 23, to correspond with and lie against the beveled face 5 of the knuckle 3, while the outer face of this extension is convexed to fill out the knuckle 3 across its beveled portion. After the hinge pintle has 25 been set in place, a suitable fastening 24, preferably a screw, is passed through the opening 18 in the knuckle 14 and engages the threaded opening 25 of the pintle, thereby to rigidly connect the swinging hinge member 30 13 and the pintle. With the hinge assembled, as in Figs. 1 and 2, when the hinge member 3 swings back, the lower beveled end 20 of the hinge pintle works over the beveled portion 12 in the bottom of the knuckle 4 and causes the pintle and the hinge member 35 13 to rise, whereby the door will be elevated when swinging open so as to clear obstructions upon the floor. When the door reaches a position at substantially right angles to 40 that of its closed position, the flat lower end 26 of the knuckle 14 and the flat lower end of the extension 22 of the pintle will rest upon the flat tops 8 and 7 of the knuckles 4 and 3, whereby the door will be held stationary in 45 its open position when it has been swung through an arc of substantially 90°. Upon swinging the door back towards its closed position, the beveled lower end of the pintle will ride down over the beveled portion of 50 the plug 9, whereby the door will gravitate to its closed position and will be held closed by gravitation.

It will here be explained that the lifting action is accomplished solely by the beveled 55 lower end of the hinge pintle working through the beveled upper end of the plug 9, these bars being hardened to withstand wear. The beveled portions of the knuckles are not intended to aid in the elevation of the hinge member 13, but are beveled to permit of the 60 necessary vertical play of said hinge member.

However, the flat tops of the knuckles 3 and 4 afford relatively broad bearing surfaces for the flat lower ends of the parts 22 65 and 14, when the door is open, and these por-

tions come into play when the door has been swung through an arc of substantially 90°, wherefore the door will stand open before it has been swung clear back against the wall.

By having the lifting action affected by the 70 hinge pintle and the plug 9 alone, I avoid hardening the knuckles, which materially reduces the expense in the manufacture of the hinge, and also enables the provision of relatively large flat bearing surfaces for the 75 knuckles when the hinge is open, thereby to secure a stable support for the door when the latter is open.

For light doors, such for instance as screen doors, it is not necessary to bevel the 80 knuckles 3 and 4, as shown in Fig. 4 of the drawing, it being sufficient to have the plug 9 and the pintle 19 beveled at 12 and 20 respectively, to effect the necessary elevation of the hinge member 13. In this arrangement, the 85 knuckle 14 engages or is in close proximity to the knuckle 4 when the hinge members are in alinement, there being a sufficient space between the top of the knuckle 14 and the bottom of the knuckle 3 to permit 90 of the necessary upward movement of the knuckle 14 with the hinge member 13. To support the door in its open position, the top of the plug 9 is flat, as at *a*, while the lower extremity of the pintle 19 is flat, as at *b*, so 95 that, when the door is swung open, the flat lower end of the pintle rests upon the flat upper end of the plug and thereby supports the door in its open position.

It will here be explained that the form of 100 hinge shown in Figs. 1, 2 and 3, is especially designed for heavy doors, the knuckles being provided with flat ends so as to form supports in addition to the support afforded by the flat upper end of the plug 9 and the flat lower 105 end of the pintle 19. While the plug and the pintle may have flat terminals in the form of hinge shown in Figs. 1, 2 and 3, said flat terminals may be omitted without materially effecting the utility of the hinge, as the flat 110 ends of the knuckles are sufficient to hold the door in its open position.

Having thus described the invention, what is claimed is:

A hinge comprising two leaf members, one 115 of which is provided with perforated spaced knuckles, the upper end of each of which is formed by two plain surfaces disposed at an obtuse angle to each other and which lie in planes at right angles to the planes of the leaf 120 member and the meeting edges of which are diametrically disposed across the knuckles, a plug located in the perforation of the lower knuckle and having its upper end provided with angularly disposed surfaces lying in 125 planes parallel with the surfaces of the upper ends of the knuckles, the other leaf member having a perforated knuckle which lies between the knuckles of the first said member, the lower end of the knuckle of the last said 130

member being formed by the meeting surfaces of two planes disposed at an obtuse angle to each other and which lie at right angles to the plane of the leaf member and the meeting edges of which are diametrically disposed across the knuckle, a pintle lying in the perforations of the knuckles, and having a beveled end which engages the inclined end of the plug, said pintle having at its head a
10 lug provided with a plane inclined surface

which is parallel with the beveled surface at the opposite end of the pintle.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOHN R. HARTMAN.

Witnesses:

R. V. McCORMICK,
JNO. M. HELMICK.