A. SUNDH.

GATE HINGE.

APPLICATION FILED MAR. 8, 1915.

1,180,335.

Patented Apr. 25, 1916.

2 SHEETS—SHEET 1.

Fig. 1.

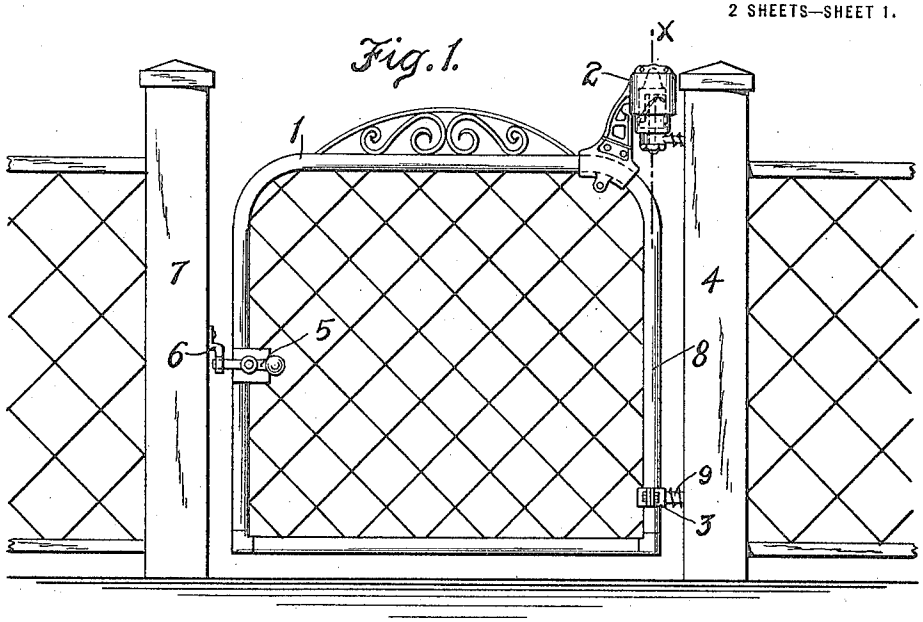
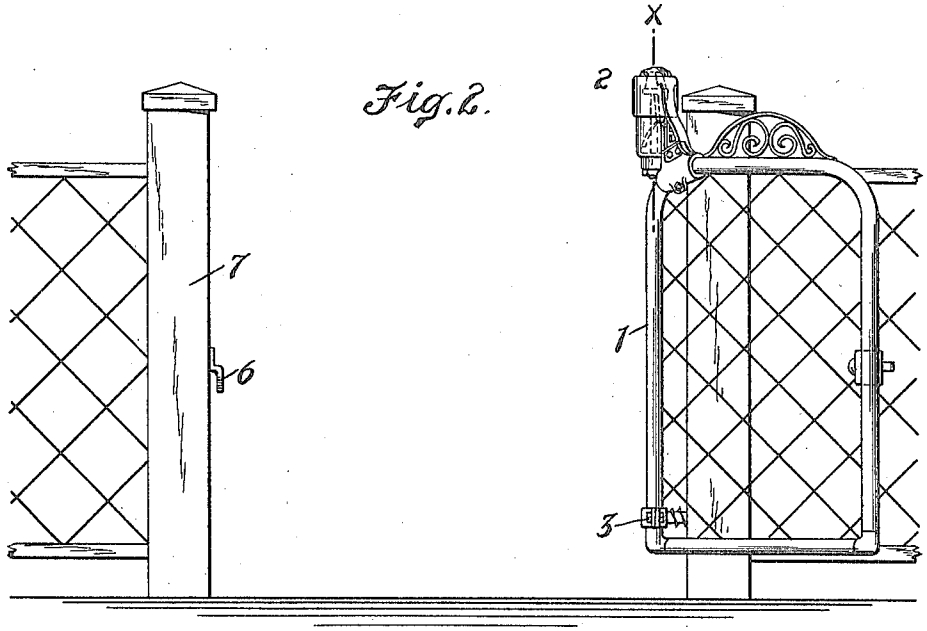


Fig. 2.



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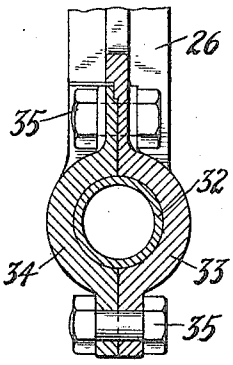


Fig. 4

Fig. 3.

Fig. 5.

Fig. 6.

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AUGUST SUNDH, OF HASTINGS-UPON-HUDSON, NEW YORK.

GATE-HINGE.

1,180,335. Specification of Letters Patent. Patented Apr. 25, 1916.

Application filed March 8, 1915. Serial No. 12,883.

To all whom it may concern:

Be it known that I, AUGUST SUNDH, a citizen of the United States, and resident of Hastings-upon-Hudson, in the county of Westchester and State of New York, have invented a certain new and useful Gate-Hinge, of which the following is a specification.

My invention relates to hinges of the gravity operated type, adapted to permit a gate or door attached thereto to swing to closed position by gravity when released after being swung open in either direction.

I have herein shown a hinge constructed in accordance with the principles of my invention and particularly adapted for mounting a gate.

It is often desirable that a gate shall be not only self closing when opened a moderate distance, but also that it may be self holding in an open position when swung wide open. A feature of my invention is the provision of means to effect this operation.

In carrying out the invention, one of the relatively rotatable hinge parts is provided with a cam track surounding a central vertical pintle, on which track runs the coöperating rotatable hinge member. The track is formed with a low point with which the said coöperating member engages when the gate is closed, and the track inclines upward in both directions from said low point to cause the gate to be lifted as it swings open. Beyond said inclines the track has a dip or depression to permit a small drop of the gate when it swings back beyond a normal open position and thereby holds the gate open. The cam track is mounted within a casing containing lubricating oil, and is made in a separate piece from the casing, which arrangement is important in facilitating the manufacture of the hinge, and also to enable the hinge track to be made of hardened steel or other suitable material different from the casing and providing a hard durable bearing surface.

Another feature of the invention is the provision of a split cover or cap connected to the rotatable hinge member by means of lugs on the latter which enter internal recesses in said cap, thereby locking the cap and said hinge member together.

Other features and advantages will appear hereinafter.

In the accompanying drawings, Figure 1 is an elevation view of a gate and hinge, the gate being in closed position. Fig. 2 is a similar view with the gate swung back to an open position in which it is self holding. Fig. 3 is a part sectional view of the hinge and adjoining parts. Fig. 4 is a sectional view of a bracket connected to the gate. Fig. 5 is a sectional plan view of means for connecting the hinge to the gate post. Fig. 6 is a part sectional view of the hinge, the view being at right angles to that of Fig. 3.

The gate 1 is connected by upper and lower hinges 2 and 3 to a gate post 4. The gate is normally fastened in closed position by a latch 5 held by a keeper 6 on a post 7. The lower hinge 3 may be in the form of a strap surrounding the upright rod 8 of the gate frame permitting the latter to rotate and move up and down freely in said strap. The latter may be connected to the post 4 by a screw 9. The weight of the gate is supported by the upper hinge 2 which comprises a stationary member or part 10 mounted on a support 11 in the form of a screw driven into the post 4 and formed with a squared opening 12 through which projects the squared head 13 on the lower end of the part 10. A nut 14 secures the part 10 in position. The stationary hinge member 10 is in the form of a cylindrical receptacle to contain a lubricating oil 15 in which the bearing parts of the hinge are immersed. Within the casing 10 is an annular bearing piece 16, the upper surface of which forms a track or cam bearing surface on which runs a rotary hinge part or member 18. The bearing ring 16 is preferably made in a separate piece from the casing 10 and is seated therein and is held against rotation by a rib or flattened portion 19 of the casing. The ring 16 is preferably made of hardened steel to provide a hard durable bearing surface. A central vertical pintle 20 which is preferably secured to the rotatable member 18 projects downwardly within a bearing socket formed by a central sleeve or tube 21 projecting upwardly from the bottom of the casing 10. Said socket may be continued downward through the head 13 if desired.

The annular track comprises a low point 22 with which the bearing arm 17 of the rotating part 18 engages when the gate is in closed position. From the point 22, the track inclines upwardly in both directions. These inclines 23 terminate in high points

24 with which the arm 17 may engage when the gate has been swung open through an angle of somewhat over 90 degrees. Beyond the high points 24, the track again curves downward as at 25, so that when the gate is swung wide open as indicated in Fig. 2, the arm 17 engages the depression 25. The gate is carried on the hinge part 18, and is lifted as it swings open because the part 18 rides up an incline 23. If the gate is released before the bearing arm 17 has been carried up to a high point 24, the gate is automatically returned by gravity. If the arm 24 is carried beyond a high point, the gate tends to swing farther open by gravity, and the gate is automatically held open. The bearing surface of the track is preferably grooved and the bearing end 17 rounded to fit the groove. This construction insures the end 17 running true on the track. By making the cam track on the stationary part of the hinge, the central bearing point 22 on which the bearing 17 rests while the gate is closed, is the lowest point on the track. With this arrangement, the contacting bearing surfaces remain immersed in the lubricating oil even when the supply of oil is low. This arrangement possesses an important advantage over one in which the annular bearing surface is formed on the rotating hinge member, which results in bringing the central bearing point at the highest part of the track, so that the bearing surfaces may become dry as the gate often remains closed for long periods, resulting in friction and cutting or wearing of the bearing surfaces when the gate is again operated. This difficulty is avoided in the present arrangement by which the movable bearing surface remains lubricated until the supply of oil is practically exhausted.

The gate is attached to the hinge by means of a connector comprising a bracket 26 which may be formed integral with one of the parts of a split cap or swinging casing 27 which covers and telescopes with the stationary casing 10. The cap 27 is formed with a recess 28 to receive the upper rounded end of the rotatable hinge part 18, which arrangement permits a limited relative tilting movement of the gate and hinge part 18 in the plane of the gate for automatic adjustment, but prevents independent rotation of the cap 27 and hinge part 18 about a vertical axis. Lugs 29 formed on the part 18, enter recesses 30 in the cap 27, thereby locking the cap to the hinge part 18. To permit the assembling of the parts when this construction is employed, the cap 27 is preferably made in two parts, their engaging faces being in a vertical plane, said parts secured together by bolts or rivets 31.

The bracket 26 may be secured to the gate frame 32 by means of a sleeve comprising a section 33 integral with the bracket, and a removable section 34, said sections clamped to the gate by bolts 35.

The hinge 2 is located above the gate with its axis in vertical alinement with the inner vertical member 8 of the gate frame, as indicated by the broken line x—x. With this arrangement the gate may be hung close to the gate post 4, and the space between the gate and post remains constant as the gate swings.

Various modifications may be resorted to within the scope of my invention.

What I claim is:—

1. A gate hinge comprising in combination, a central guiding spindle or pintle, a socket to receive said pintle, a stationary hinge part having an annular bearing track surrounding the pintle and socket and spaced therefrom, a gate carrying hinge part rotatable about the axis of said spindle and having a bearing surface to run on said track, the track having a low point with which said bearing surface engages when the said rotatable part is in its normal central position, the track having inclines extending upwardly in opposite directions from said low point to cause said rotatable part to ride up an incline when rotated in either direction from said central position, and means forming a receptacle to contain a lubricating oil in which the track, said socket and pintle and said bearing surface are immersed.

2. In a hinge, the combination of relatively rotatable hinge parts, a central spindle carried by one of said parts, the other part comprising a socket in which the spindle rotates, one of said parts comprising a cam track surrounding said socket and formed as a separate piece therefrom, and the other part having a bearing surface to run on said track, said spindle forming a guide for said last named part to guide said bearing surface as it runs on the track.

3. In a hinge, the combination of relatively rotatable hinge parts, a central spindle carried by one of said parts, the other part comprising a socket in which the spindle rotates, one of said parts comprising a cam track concentric with the spindle, and the other part having a bearing surface to run on said track, the surface of said track being in the form of a curved groove or hollow extending longitudinally of the track and along which said bearing surface travels during the relative rotation of the hinge parts, said bearing surface being rounded to conform to said groove.

4. In a hinge, the combination of a casing forming a receptacle for a lubricant, an annular bearing piece formed separately from the casing and seated therein and freely removable therefrom, said casing and bearing piece formed to prevent ro-

tation of the bearing piece in the socket, said bearing piece having an annular cam track, and a coöperating bearing piece arranged to run on said track.

5. The combination with a gate, of a hinge by which the gate is mounted and supported to swing open in either direction from a central or normally closed position, said hinge comprising a stationary casing, a bearing piece removably seated in the casing and interlocking therewith to prevent rotation of the bearing piece in the casing, said bearing piece having an annular bearing surface or track, and a rotatable hinge part connected to rotate with the gate and supporting the weight of the gate, the rotatable hinge part having a bearing surface to run on said track, the track being formed with a low point on which the rotatable part bears when the gate is closed, said track inclining upwardly in both directions from said low point whereby the gate is lifted as it swings open in either direction and automatically returns by gravity to closed position when released while the rotatable hinge part is on one of said inclines, said inclines terminating in high points at such position that they are engaged by the rotatable part when the gate has been swung through an angle of about 90 degrees, the track beyond said high points having a downward dip or depression permitting the gate when swung beyond a high point position to move downward sufficiently to retain the gate in open position.

6. In a hinge, the combination with a stationary part and a rotatable part, said parts having coöperating bearing surfaces, a casing forming a receptacle to contain a lubricating oil in which said bearing surfaces are immersed, a split cap telescoping with said casing, and means to clamp the parts of said cap together and secure said rotatable hinge part thereto.

7. In a hinge, the combination with a stationary part and a rotatable part, said parts having coöperating bearing surfaces, a casing forming a receptacle to contain a lubricating oil in which said bearing surfaces are immersed, a split cap telescoping with said casing, the parts of said cap each formed with an internal recess or socket, the rotatable hinge part comprising lugs to enter said sockets, and means to clamp said parts of the cap together and thereby prevent the said hinge part from becoming disconnected from said cap.

8. In a hinge, the combination with a stationary part and a part rotatable about a vertical axis, means to guide said rotatable part, said parts having coöperating bearing surfaces, a casing forming a receptacle to contain a lubricating oil in which the bearing surfaces are immersed, a two part cap telescoping with the casing, means to secure the parts of said cap together, means to form an interlocking connection between the cap and the rotatable hinge part when the parts of the cap are secured together, said cap and rotatable hinge part having coöperating bearing surfaces formed to permit a limited rocking movement of the cap relative to the rotatable hinge member to allow self alinement of the hinge parts but forming a positive driving connection between the rotatable hinge part and the cap to cause the latter to rotate with the rotatable hinge part.

Signed at New York city, in the county of New York and State of New York this 3rd day of March A. D. 1915.

AUGUST SUNDH.

Witnesses:
WALTER C. STRANG,
JAMES G. BETHELL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."