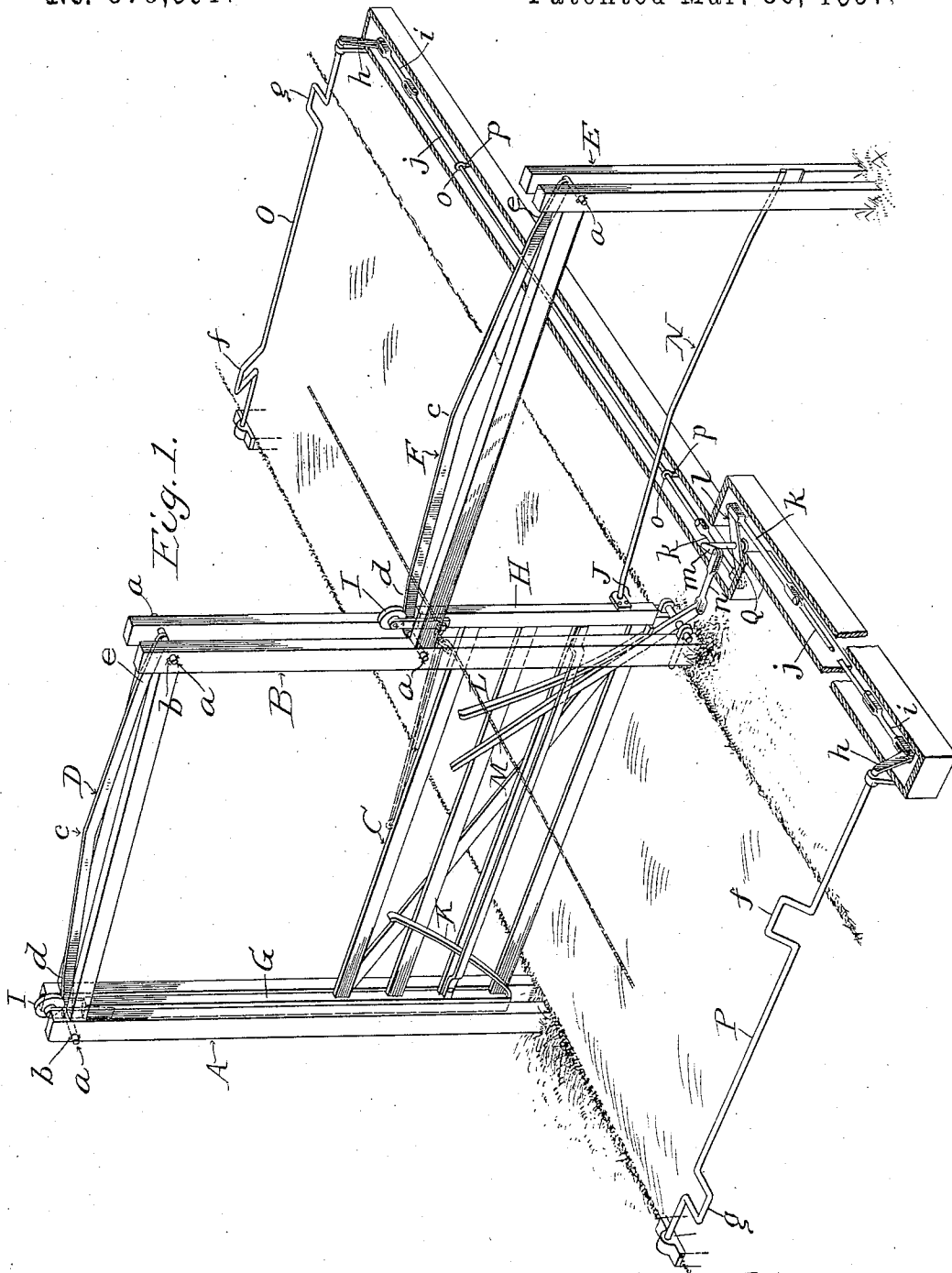


A. W. McCURDY.
GATE.

No. 579,891.

Patented Mar. 30, 1897.



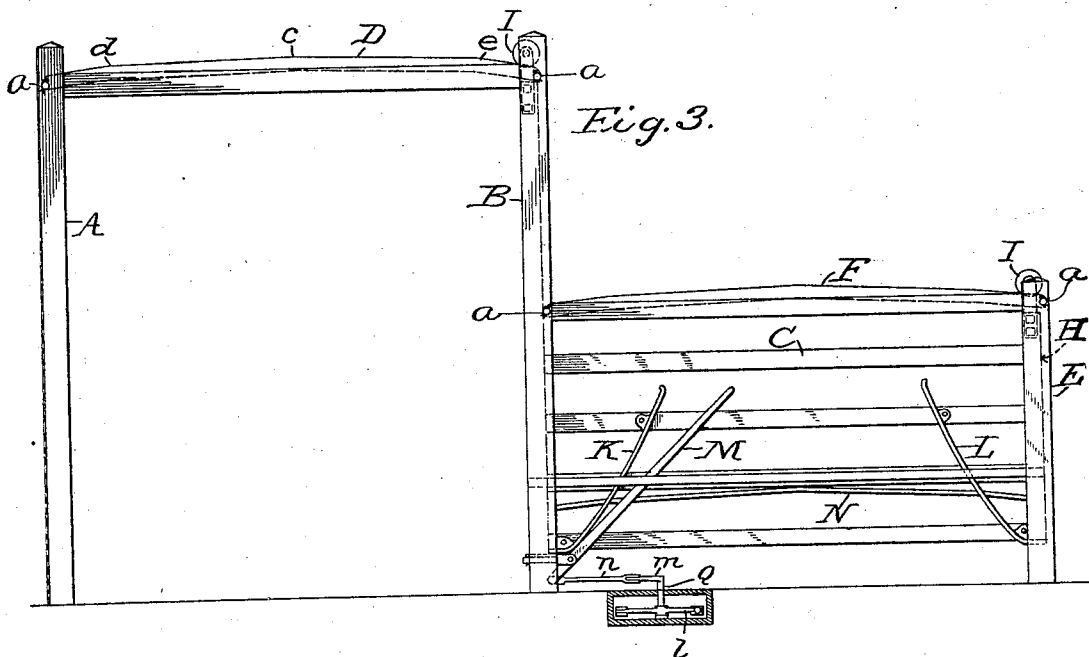
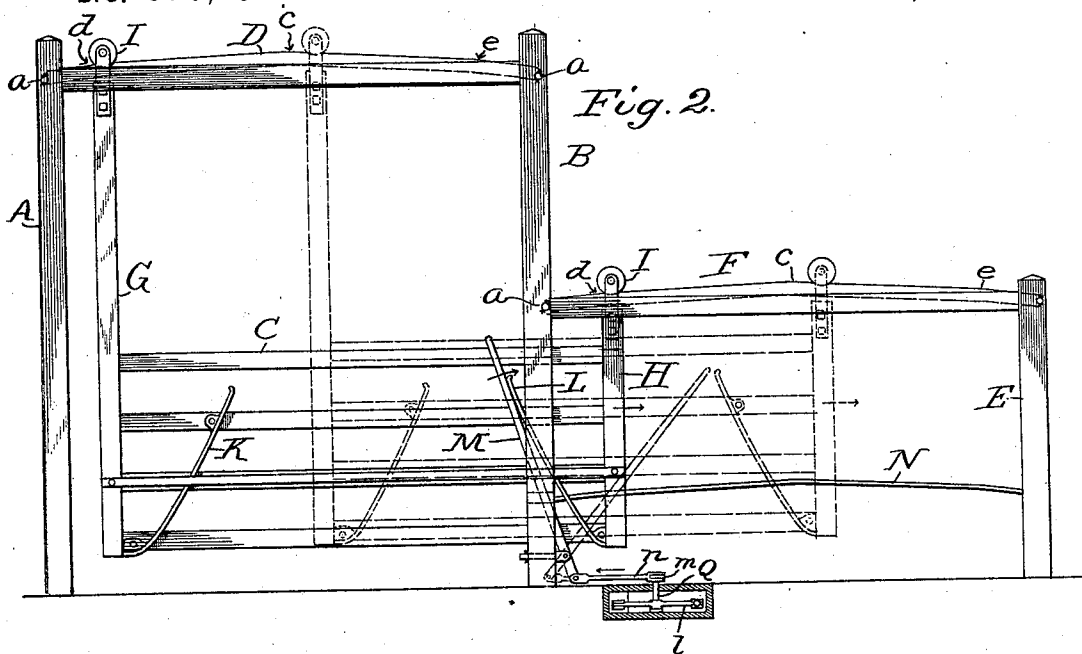
Attest;
C. B. Burdine
D. E. Burdine

Inventor;
Arthur W. McCurdy,
by *Dodger & Sons,*
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ATTEST:
C. C. Burdine,
D. E. Burdine.

INVENTOR:
Arthur W. McCurdy,
BY *Dodget & Sons*,
ATTYS.

(No Model.)

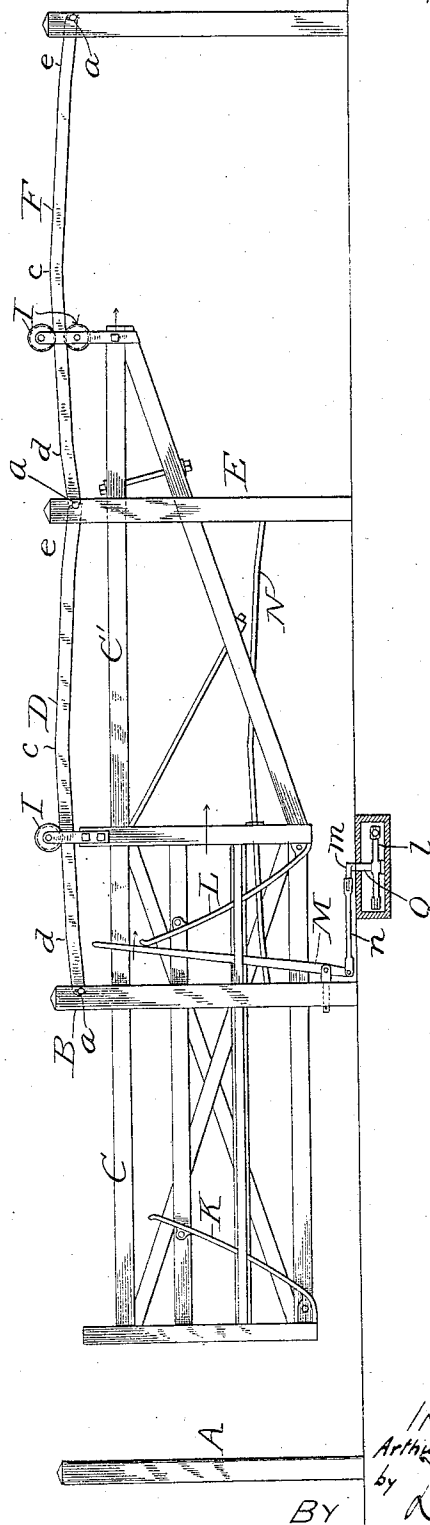
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Fig. A.



ATTEST:
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UNITED STATES PATENT OFFICE.

ARTHUR W. McCURDY, OF WASHINGTON, DISTRICT OF COLUMBIA.

GATE.

SPECIFICATION forming part of Letters Patent No. 579,891, dated March 30, 1897.

Application filed February 15, 1897. Serial No. 623,487. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR W. McCURDY, a citizen of Great Britain, temporarily residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Gates, of which the following is a specification.

My invention pertains to automatic gates, and more particularly to that class in which the gate is arranged to move longitudinally upon a track.

The invention consists in a novel form of track for the rollers of the gate and in improved mechanism for setting the gate in motion and giving the impulse necessary to insure its proper travel.

In the accompanying drawings, Figure 1 is a perspective view of a gate embodying my invention, showing the gate closed; Fig. 2, an elevation of the same, illustrating the manner of opening; Fig. 3, a similar elevation, but showing the gate fully open and the parts in position to begin the closing movement; Fig. 4, a view illustrating a slight modification of the gate.

In constructing a "self-acting" gate, as such gates are commonly called, it is important to insure the complete opening and closing in order that vehicles may not collide with or that stock may not pass through them. Since the general adoption of bicycles it has become more than ever important that the power required to effect the opening or closing be reduced to a minimum in order that the rider may run his wheel over the actuating cranks or levers with ease and with safety both to himself and to his vehicle.

It is well understood that the greatest difficulty in actuating a gate through the aid of a vehicle is in overcoming the inertia of the gate and starting it on its way, the power required to keep it in motion being relatively slight.

My invention aims to afford a varying leverage greatest at the outset and decreasing as the gate gets under motion, so that adequate power shall be afforded to start the gate and that the motion shall be accelerated and made sufficient to cause a full travel of the gate to the end of its runway. In this way I am enabled to produce an actuating mechanism

which offers no material obstruction to the passage of even the lightest of vehicles, bicycles, and others and which, nevertheless, insures the full opening and closing of the gate.

The novel construction is well illustrated in the drawings, wherein A and B indicate two posts, one at either side of the road or way, and C a gate designed to close the space between said posts. The posts A B are preferably made double—that is to say, they are each composed of two parallel members, as seen in Fig. 1, the gate being arranged to pass between said members, as indicated.

The gate C may be of any convenient design and material, and, being in its preferred form suspended, need not be braced to any great extent, though this is a matter of option.

The posts A B are tied together by cross-bars at their upper ends and, further, by a metallic rail or track bar D, which is preferably formed with lateral arms or projections *a a* to pass through the members of the posts A B, as in Fig. 2. The ends of arms *a a* are perforated to receive split pins *b*, or they may be screw-threaded to receive nuts, or any other convenient fastening may be employed. The cross-section of the rail may vary, though a flat upper face is deemed best, and the depth and thickness should be such as to preclude sagging or bending.

The rail is highest at its mid-length and inclines thence downward toward its ends, the inclination being uniform to points some distance from each end and then becoming sharper and more pronounced. Thus in Figs. 1, 2, 3, and 4 *c* indicates the high central point, and *d* and *e* the points at or from which the inclination increases.

E indicates a third double post, between which and post B extends a second track or rail F in all respects like rail D, but usually placed at a lower level as a matter of convenience and economy of construction.

The end bars or uprights G and H of the gate are each furnished with a roller I, one to traverse the track D and the other to run upon rail F. These rollers may be seated in slots in the upper ends of the posts G H or they may be carried by strap-irons or hangers, as indicated.

Below the rail F is a guide bar or rod N, corresponding in form or bend with the rail F, but advisably of lighter weight. The gate C is provided with a block or guide-piece J, perforated or slotted to receive or to encircle the guide-rail N, whereby the lifting of the rollers I I from the rails or tracks and the play or lateral swinging of the gate under pressure of the wind are precluded.

Upon one face of gate C, I secure two curved bars K and L, of wood, metal, or other durable material, each extending from a point at or near one of the lower corners of the gate inward and upward, as shown, a quite wide space being left between their upper ends.

M indicates a throwing-lever pivoted between the parallel members of post II and resting normally against the inner face of curved bar L near the lower extremity of the latter and at a point near the pivot-axis or fulcrum of lever M. This fulcrum may be in the form of a round rod passing transversely through and firmly secured in the lever M or of any other approved construction, and it may be carried in eyes or hangers secured to post II, as shown, or otherwise supported.

It will be seen that if lever M be quickly moved toward the bearing-bar L, with which it is normally in contact, it will tend to move the gate in an opening direction. It will likewise be observed that at the commencement of such movement the pressure against bar L will be at a point close to the fulcrum of lever M, whence it follows that great leverage will be afforded to start the gate and to carry its rollers up the steeper inclines between the ends of the rails D F and the points *d d* thereof. Once under motion the gate moves very freely, and the lever M, working upon the curved face of bar L, takes constantly a higher point of bearing until finally, with an accelerating motion imparted to the gate, the lever M breaks contact with the curved bar L. This motion is sufficient to carry the rollers I I over the crests or high points *c c* of rails D and F, and the momentum, aided by the downward inclination of rails or tracks D and F to points *d* and *e* and reinforced by the steeper incline after passing said points, causes the gate to continue its movement to the end of the runway.

It is important that the gate shall fully open and fully close, as otherwise vehicles would be apt to collide with it in passing through, though nearly open, and animals would be able to force the gate back and pass through, though it be nearly closed. A steep inclination from the mid-length of the rail toward each end would involve the exercise of undue power in operating the gate and would cause it to close with too great force and concussion. To insure the full closing or opening, the short steeper incline is provided, so that when momentum is dying out and is liable to be offset by friction it is revived and gravity is caused

to act with increased effect, thus effectually closing or opening the gate, as the case may be, to its utmost extent.

The distance between points *d e* of each rail and the proximate end of such rail is usually from a foot to a foot and a half, and hence if the gate be impelled to within that distance of its extreme travel, either by the well-known means of ropes passing through suitable pulleys or by means of the mechanism herein described, it will, unaided, travel the remaining distance. This is a feature of marked importance for the reasons already stated, and for the further reason that it lessens the liability of the gate being partly opened or partly closed through the rebound due to its reaching the stop or stops at the end of its runway. These terminal inclines are to be distinguished from mere notches or depressions designed to receive the rollers at the extreme limits of the runway and to hold the gate against endwise movement until the rollers are lifted out of the notches. Such notches not only necessitate an undue expenditure of power in starting the gate, but they also involve either a steeper incline of the main body of the rail or a liability of the gate to stop short of its full run.

It will be observed that there is a considerable space between the curved bars or bearing-plates K and L, and that as a consequence the gate may be opened manually a distance sufficient to permit the ready passage of persons without affecting and without being interfered with by the throwing-lever M or the mechanism connected therewith.

Lever M may be moved about its pivot by any suitable means. I prefer, however, to employ the common cranked rock-shafts with suitable intermediate connections between them and the lever M and have shown such construction in the drawings.

O and P indicate rock-shafts extending transversely across the roadway, one on either side of the gate, and each provided with crank-arms *f* and *g*. These shafts are located at such distances from the gateway as to afford time for the full opening of the gate between the time the vehicle-wheel encounters the actuating crank-arm *f* and the time that the draft-animal or the vehicle, moving at a fair gait, reaches the gateway. The crank-arms *f f* serve to open and the crank-arms *g g* serve to close the gate. Hence the former are located at the right-hand side of the road with reference to the direction of approach to and the latter at the right-hand side with reference to the direction of departure from the gateway. The driver or rider is thus enabled to keep on the proper side of the roadway at all times.

Of course in those places where the rules of the road require that vehicles keep to the left the crank-arms may be transposed from the positions indicated.

Each rock-shaft has at one end a radial arm

h, which is connected by a link *i* with a rod *j*, extending to and connecting, through the medium of a second link *k*, with one or another radial arm *l* of a horizontal lever carried by a vertical rock-shaft Q. Rock-shaft Q is journaled in suitable boxes or bearings and is furnished with a third arm *m* at right angles to arms *l*, and this third arm is connected by a link *n* with the lower and shorter arm of lever M.

From the construction thus set forth it follows that when the gate is closed the parts will occupy the positions indicated in Fig. 1, the crank-arms *f* standing in an upright, or nearly upright, position. If now a vehicle approach the gate and its wheel be caused to encounter and press upon the arm *f* in its path, the rock-shaft O or P will be given a quarter-turn, swinging backward its arm *h*, and, through the connections *i*, *j*, and *k*, drawing upon arm *l* of the vertical rock-shaft Q, imparting a quarter-revolution to said shaft, and, through arm *m* and link *l*, giving a quick throw to lever M. This, as already explained, starts the gate with great power and quickly accelerates its motion, carrying it beyond crests *c c* of the track-rails, from which point momentum and gravity, reinforced after passing points *d* and *e*, complete its movement. In thus actuating rock-shaft Q the rock-shaft O or P not acted upon by the vehicle is given a quarter-turn through its connection with the rock-shaft Q, and the crank-arm *g* thereof is raised to an upright position in the path of the oncoming wheel. As the wheel passes over the arm *g* all parts are restored to the position indicated in Fig. 1.

It is obvious that the application of the invention admits of variations, as, for instance, by forming the gate C with an extension C' and placing the rollers I I upon said extension to run upon rails D and F wholly at one side of the driveway. This construction is shown in Fig. 4 and is advantageous in those places where unobstructed head-room is required for vehicles laden to a great height, as hay-wagons and the like. It is of course necessary in such case to have one roller I work beneath rail F, as shown.

The track-rails are preferably made of metal, but may be of wood or other suitable material faced with metal or not, as found expedient in any given case.

The actuating-rods may be covered in boxes or carried through pipes to protect them from the weather and from snow and ice, or they may be merely carried through eyes or staples *o* upon short posts or blocks *p*. If the boxing be used, it should be open at bottom to permit water to sink into the soil or to drain off, though by carrying the rods upon raised blocks or posts all difficulty from water, snow, and ice may be avoided.

It is preferred to use split pins throughout for connecting and fastening the parts, as when spread slightly they cannot drop out or

be lost, as is the case with bolts and nuts. This, however, is not essential, and bolts may be used if desired.

I have shown by dotted lines in Fig. 1 the simple rope-and-pulley arrangement for opening and closing the gate, but as this arrangement of rope and pulley is not in itself claimed by me further description is deemed unnecessary.

Having thus described my invention, what I claim is—

1. In an automatic gate, the combination of suitable posts or uprights; tracks or rails extending between said posts or uprights and inclining downward from a medial point to a point some distance from each end, and thence inclining downward more sharply to the end of the track; and a gate provided with rollers to traverse said tracks.

2. In combination with supporting tracks or rails D, F, each inclining downward gradually from a point *c* to points *d* and *e* on opposite sides of point *c*, and from said points *d* and *e* inclining downward more sharply; a gate provided with rollers to traverse said rails; mechanism for moving said gate along its track or rails; and means substantially such as described for actuating said mechanism from a point distant from the gate.

3. In combination with tracks or rails D, F, having gradual inclines from their mid-length to points some distance from their ends, and sharper inclines from said points to the ends of the tracks; a gate arranged to traverse said tracks; curved bearing-bars carried by said gate; and a throwing-lever arranged to bear against one or another of said bearing-bars and thus to move the gate.

4. In combination with tracks or rails, a gate arranged to traverse said tracks and provided with curved bearing-bars; and a throwing-lever located between said bearing-bars and arranged to bear upon one or the other when the gate is at either extreme of its travel, at a point near the fulcrum of the lever; and to bear upon said bars at progressively higher points as the gate moves from its extreme position in opening or closing, finally parting contact with the bearing-bar.

5. In combination with a longitudinally-movable gate provided with fixed bearing-bars K and L, approaching each other more nearly at their upper than at their lower ends, an intermediate throwing-lever M, arranged substantially as described and shown to bear upon said bars alternately.

6. In combination with a longitudinally-movable gate; fixed, upwardly-converging bars K and L secured to said gate and separated from each other a considerable distance; and a throwing-lever M located between and arranged to act upon said bars alternately, the gate moving a limited distance after the lever has come to rest.

7. In combination with gate C having rollers I I, tracks or rails D and F; guide-rail N;

and a guide block or bar perforated or slotted to permit the passage through it of the guide-rail N; whereby the rollers II are kept upon the track-rails and play of the gate is prevented.
5

8. A gate rail or track highest at its mid-length inclining gradually downward from said highest point to points at some distance

from its ends, and thence inclining downward more sharply toward its extremities. 10

In witness whereof I hereunto set my hand in the presence of two witnesses.

ARTHUR W. McCURDY.

Witnesses:

HORACE A. DODGE,
DUDLEY E. BURDINE.