ROBERT T. BOWNE.

Improvement in Gates.

No. 114,101. Patented April 25, 1871.

Fig. 1.

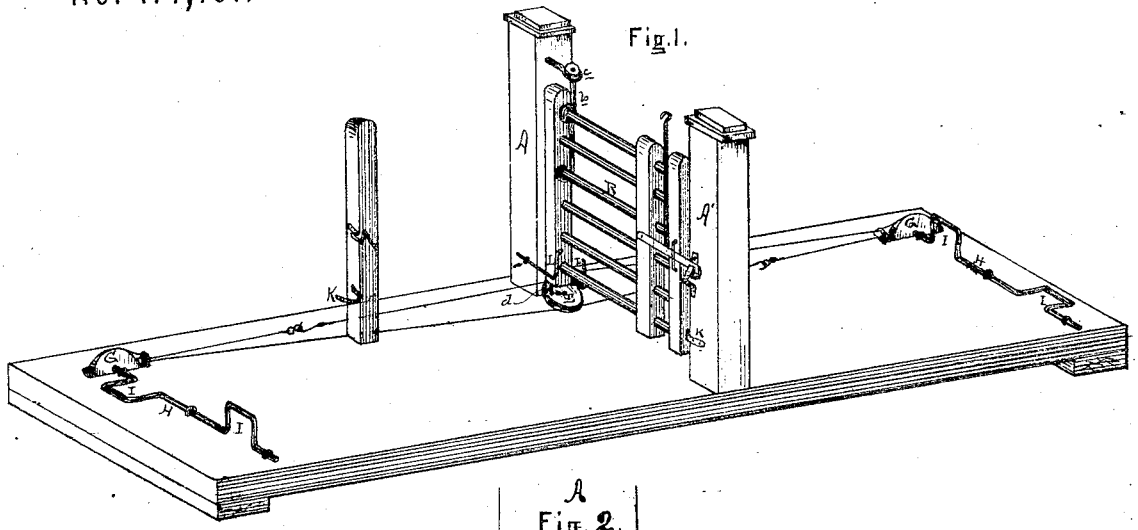


Fig. 2.

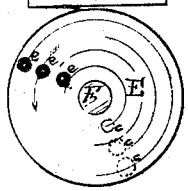


Fig. 3

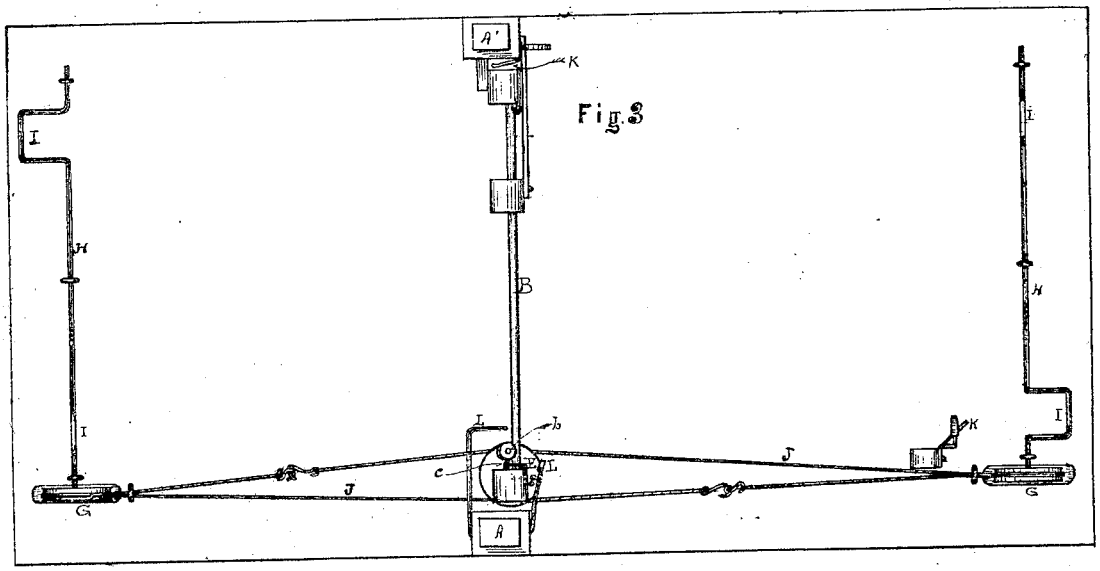
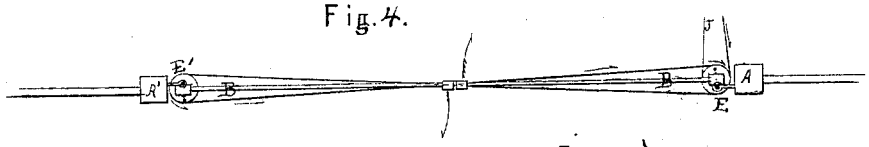


Fig. 4.



Witnesses
E. H. Harthurst
E. Bruce Kear

Inventor
R. T. Bowne
By his atty R. D. O. Smith
613 Cutler St.

United States Patent Office.

ROBERT T. BOWNE, OF FALLSTON, MARYLAND

Letters Patent No. 114,101, dated April 25, 1871.

IMPROVEMENT IN GATES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, ROBERT T. BOWNE, of Fallston, in the county of Harford and State of Maryland, have invented a new and useful Improvement in Automatic Gates; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, in which—

Figure 1 is a perspective view of my improved gate.

Figure 2 is a plan of the movable step for the lower pintle of the gate.

Figure 3 is a plan of my gate.

Figure 4 is a plan, showing the method of extending my invention to a double gate.

My invention relates to that class of gates known as automatic; and

It consists in novel devices for throwing the point of support outside the center of gravity, so that the weight of the gate will cause it to open; also, in arranging the movable support for the bottom pintle so that the weight of the gate will not cause a reaction, if the moving force is not continued, until the gate has swung part-way open; also, in temporary fulcrums to facilitate the starting of the gate either to open or close; also, in stationary cams which impart the initial movement of the gate to open or close; and, finally, in the means employed to operate a double gate with the force that is employed if the gate is single.

In automatic gates as hitherto constructed there have been several defects, which are removed in my invention.

First, where wires or cords have been employed to operate the mechanism and set the gate in motion, said wires or cords have been left more or less slack, so that there is some lost motion. When this slack is taken up by the motion of the mechanism it is necessarily accompanied by a jerk, which, as well known, is a most effective way of applying force, and most destructive to the parts subjected to it. Hence, mechanisms so arranged are peculiarly liable to disarrangement.

It is also known that where the parts of an automatic gate are adjusted and arranged to move easily it is necessary to maintain the moving force until the inertia of the gate has been overcome, or its gravity will cause a reaction of the mechanism and the gate will not swing. It has, therefore, been necessary in easy-moving gates to use considerable caution in applying the moving force, or to employ a latch, which will prevent the reaction of the mechanism.

Other gates are constructed so as to act with so much friction that any reaction is thereby prevented, but they require no further reference. These two are the principal sources of difficulty in operating the automatic gates which have been before the public, and they are both completely obviated by my invention.

That others may more particularly understand my invention, I will particularly describe it.

In the drawing the proportions of the parts represented are not the correct proportions for a working gate.

A A′ are the gate-posts, and

B is the gate, of ordinary construction.

The gate B is hung to the post A, and the upper pintle *b* is placed on the outside of the gate-frame and rests in the loop *c* projecting from the post A.

The lower pintle *d* is placed on the inner side of the gate-frame and rests in a step, *e*, made in a movable wheel or disk, E. When the gate is closed, as shown, its pintles are arranged so that it shall stand upright; and, as is well known, if the relative position of the pintles is changed by the movement of either one toward the vertical line of the other, the gate will be inclined and its gravity will cause it to swing open. When open, a reverse movement of the pintles will cause the gate to close.

The disk E may move upon a center-pin, F, (see fig. 2,) and it may be provided with a stop, of any proper construction, to limit its motion, if such device shall be found to be necessary. Ordinarily, the connection with its motors will be sufficient to limit its motion and hold it in proper position. Several step-holes *e* are provided in the disk E, so that the gravity of the gate, to open or close it, may be increased or diminished, as may be required.

The disk E is grooved on its edge, so that it may be moved in either direction by a direct pull by a cord which passes around the disk and communicates with a motor of some proper description placed at a distance from said disk.

The most convenient and effective motor is a pulley or grooved disk, G, placed at the end of the crank-rod H, which is laid across the road-way at such distance from the gate as will permit ample space for the team to be clear of the gate while it swings, and after the wagon-wheel has passed over and depressed the crank I.

The motion of the pulley G cannot exceed one quarter revolution, and it must, therefore, be somewhat larger than the disk E, as it is required that said disk shall move through rather more than one quarter revolution. Practically the disk E may be eight inches and the pulley G twelve inches in diameter.

It is required that the disk E shall move through rather more than one quarter revolution because, to prevent any reaction, as before alluded to, it is required that the lower pintle *d* should be carried past the center F of the disk each time it is moved. The gravity of the gate is then exerted to keep the disk in that position. This would not be the case if the moving force should be removed before the point of support *e* had passed the center F.

The wires or cords J are strained tight, so that, when the pulley G is moved, its motion is instantly transmitted to the disk E and to the opposite pulley and crank-rod without lost motion or jerk.

With this arrangement of devices the gate will be opened by the depression of the proper crank, I, without regard to the shortness of time during which said crank is kept depressed. With other automatic gates which open easily it is necessary to retain the wagon-wheel upon the crank until the gate has swung partly open or shut, as the case may be. This is a feat somewhat difficult to perform. With my gate the simple passage of the wagon-wheel over the crank will suffice.

When the disk E begins to rotate, the first movement imparted to the gate is an elevation of its front end, because the lower pintle *d* is carried away from the post A. This elevation of the front end of the gate lifts the latch out of its keeper, so that it may be at liberty to swing.

I find it advantageous to affix the cam K to the post A′, so that, when the front end of the gate begins to rise up, it will encounter said cam and be pushed aside, thus imparting to it its initial movement in the direction in which it is to swing. This is quite important, as the inertia of the gate is overcome by the same force which depresses the crank, and its swing motion will be greatly facilitated thereby.

Sometimes, when the gate is required to swing against the opposing current of air, it may be that its gravity alone will not be sufficient to overcome the resistance of the air. I have, therefore, fixed the stationary fulcrums L, against which the motion of the disk will carry the rear end of the gate and accelerate its swing motion by the application of positive force. This application of force will impart momentum to assist the force of gravity in overcoming any resistance of the atmosphere.

When it is desirable to employ a double gate, as shown in fig. 4, they may be operated by the same power by means of a wire running from the disk E to the opposite disk E′. The two gates will then swing in opposite directions.

Having described my invention,

What I claim as new is—

1. In connection with the gate B the movable disk E, bearing the lower pintle *d*, arranged in combination with pulleys G on the end of crank-rods H, and tense cords or wires J, to move through more than one quarter revolution to carry the pintle past the center F, substantially as and for the purpose set forth.

2. In combination with an automatic gate the cams K, substantially as and for the purpose set forth.

3. In combination with an automatic gate the fixed fulcrums L, as and for the purpose set forth.

Witnesses: ROBT. T. BOWNE.

LEWIS R. KEIZER,

W. PAINTER.