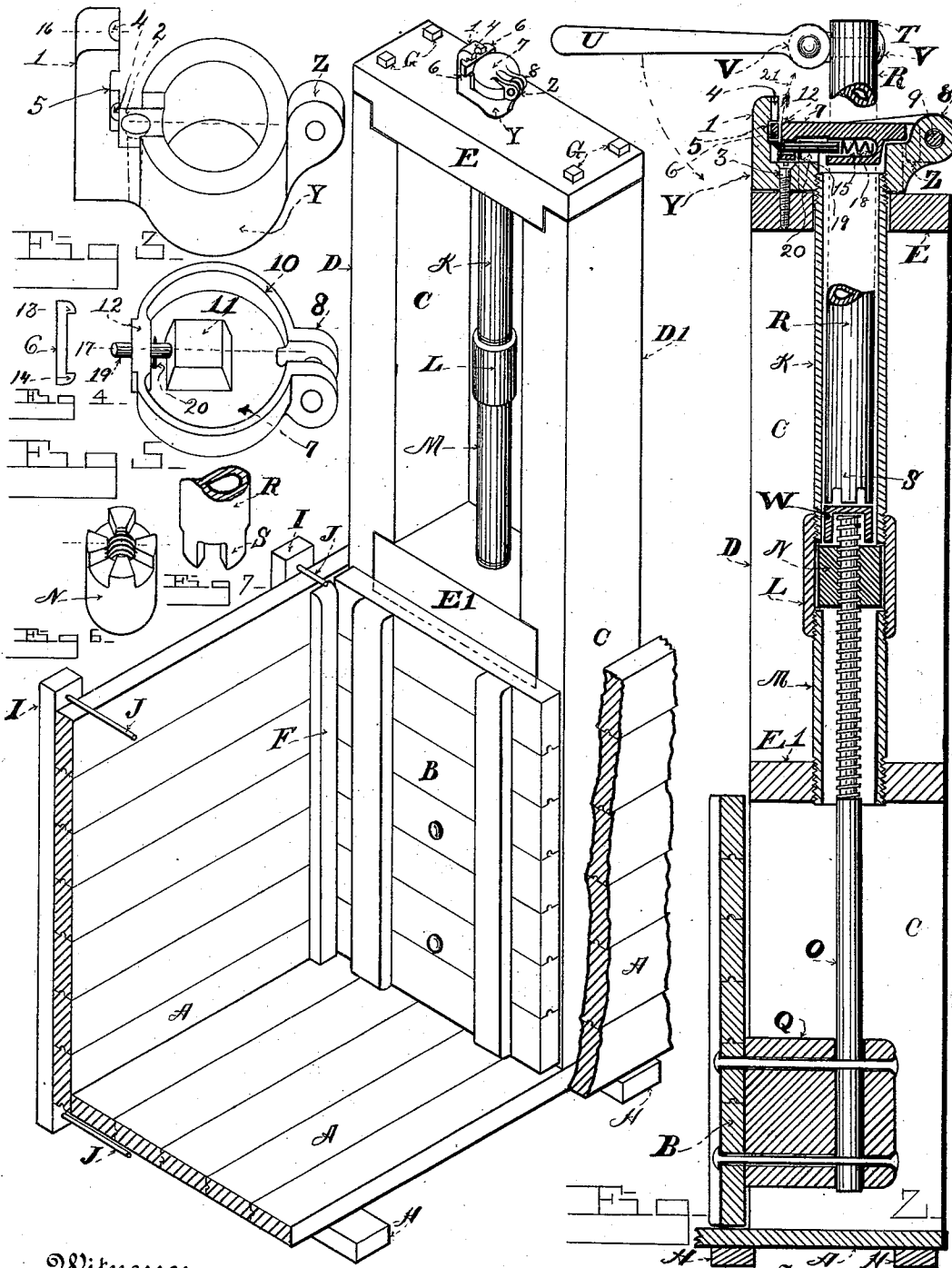


(No Model.)

F. C. BROWN.
HEAD GATE OPERATING MECHANISM.

No. 547,909.

Patented Oct. 15, 1895.



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HEAD-GATE-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 547,909, dated October 15, 1895.

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To all whom it may concern:

Be it known that I, FRANK CORNING BROWN, a citizen of the United States of America, residing at Highlandlake, in the county of Weld and State of Colorado, have invented certain new and useful Improvements in Head-Gate-Operating Mechanism; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in head-gate-operating mechanism and magnetic and mechanical seal-locks for them.

The objects of my invention are, first, to provide a strong, durable, and simple mechanism for raising and lowering the head-gate and one which will readily permit the gate to be raised and lowered any fractional part of its lift; second, to provide a mechanical seal-lock which when locked must be broken to gain access to the operating mechanism; third, to provide a magnetic seal which cannot be applied until the mechanical lock is broken and which cannot be broken except with a magnetic key.

I attain these objects by the mechanism illustrated and described in the accompanying drawings and specification, in which—

Figure 1 represents a perspective view of improved head-gate-operating and seal-lock mechanism. Fig. 2 represents a sectional elevation of the same drawn to a larger scale and with the mechanical seal-lock secured to the top cross-piece in a position at right angles to that shown in Fig. 1, in order to secure the best cross-section view of it in this view. Fig. 3 represents the base of the mechanical seal-lock in perspective. Fig. 4 represents an elevation of the sealing-key. Fig. 5 represents the cover of the same in perspective. Fig. 6 represents a perspective view of the operating-nut. Fig. 7 represents a fragmental view of the lower end of the magnetic key wrench for turning the operating-nut.

Similar letters and figures of reference refer to similar parts throughout the several views.

Referring to Fig. 1, A represents a fragment of a sluice-box of an irrigating-ditch,

one side of which is broken away in order to clearly show the head-gate B.

C represents the head-gate frame. It consists of the standards D and D' and the cross-braces E and E'. 55

F designates a guide-cleat. It is secured to the side of the sluice-box. It forms with the side of the gate-frame a vertical runway for the gate. These boxes and gates are used to measure and control the quantity of water flowing from the main ditch to each farmer buying water under it. The gate-frame is bolted together by suitable bolts G. The sluice-box rests on sleepers H and is braced together by the side pieces I and rods J. Through the center of the top cross-brace E, I make an aperture, in which I place a piece of pipe K, which I thread at both ends. This pipe is adapted to fit fully, but to turn freely in said aperture. The lower end of this pipe screws into a coupling L, which is threaded to a second piece of pipe M. This second piece of pipe screws tightly into the cross-brace E'. These pipes and couplings constitute a chamber, in which the operating mechanism is confined between the ends of the pipes K and M to rotate. In this coupling I place a nut N, which has a central interiorly-threaded hole therethrough. On the upper end of the nut I form a clutch-surface, which consists of two or more recesses and a similar number of projections, each occupying an equal portion of its upper surface. This nut supports a threaded lifting-rod O, which is secured to the lower part of the gate through the medium of a block Q, through which the rod passes, by suitable rivets or bolts. 60 65 70 75 80 85 90

R designates a magnetic key or wrench, which I have represented with a portion broken out of it, but have connected the parts by dotted lines, which indicates that it extends above the pipe K and frame C. This rod is adapted to be inserted in the pipe to turn the nut; but the rod cannot be inserted into the pipe K unless the seal of the lock at the upper entrance of it be broken and its cover be swung back in the direction of the arrow out of the way. This lock will be fully described hereinafter; but, assuming that it is unlocked and its cover is open, I will continue the description of the magnetic key, 95 100

which consists of a rod of iron or steel in the form of a tube, but preferably tubular at its nut-engaging end for a short distance and solid the remainder of its length. At one end S it is formed with a clutch-surface in order that it may register with the recesses and projections of the nut, so that if the key-clutch end be placed in engagement with the clutch projections of the nut and rotated toward the right it will rotate the nut and will thereby raise the gate, and if toward the left it will close it. At the upper end T of the key I provide means for manually turning the magnetic key, which preferably consists of a handle U, of suitable length, pivoted to an eye V, which is riveted to the end of the key, and this connection allows the handle to swing down alongside the key, and it can be conveniently carried in a pocket. Over the top of the lifting-rod O, I place a thimble W, which is kept there to prevent the application of the key to the nut except the thimble first be removed. I remove the thimble from the pipe by magnetism, forming of the lower end of the key a magnet. I have magnetized a common piece of tubing at the end formed to register with the clutch-surface of the nut, but secure a better magnet by boring a hole in the end of a bar of iron or steel far enough to allow the lifting-rod O to enter a distance equal to the lift of the gate, and then by dividing the end into two or four equal clutch projections, (four beingshown,) and by then hardening and magnetizing this clutch end. The thimble is made of wrought or cast iron. Consequently when the magnetic key is inserted in the pipe K and lowered to the thimble it adheres to it by magnetic attraction, and the key and thimble can then be lifted out of the pipe and the thimble taken from it and the key again inserted in the pipe and placed in engagement with the nut.

In order to prevent the manipulation of the head-gate should the ditch superintendent forget to return the thimble by dropping it into the pipe after setting the gate, and also to prevent mischievous persons from filling the pipe with dirt or stones, I have found it necessary to provide the entrance to it with a lock, and I preferably use in carrying out this feature of my invention a seal-lock, which I construct in the following manner: Upon the upper threaded end of the pipe K, which projects above the cross-brace E, (shown plainly in Fig. 4,) I screw a base-piece Y, which is provided with an interiorly-threaded hole therethrough adapted to fit the pipe. On one side an ear Z is formed and upon the opposite side a projection I, which extends first outward and then upward. Through the outward-extending portion of the projection I bore a hole 2, adapted to receive a wood-screw 3, which is turned into the cross-brace to prevent the base Y from being unscrewed from the pipe. In the upward extension of the projection I form a vertical recess 4 and intermediate of the top of the upward part of

the projection and the top of the outward-extending projection a horizontal recess 5, which is adapted to receive a breakable sealing-key 6. (Shown in Fig. 4.)

7 designates a cover, which is shown clearly in Fig. 5. This cover is provided with ears 8, which are adapted to be pivoted to the ear Z by a rivet 9. The cover is formed with a rim 10 to set down over the edge of the base. Approximately in its center on its under side I form a boss 11. On the rim a tangent portion 12 is formed parallel to the adjacent side of the boss. This tangent portion is about the length of the seal-key between its heads 13 and 14, and at the ends of the tangent portion an inward step is formed in the rim to give a clearance space between it and the heads of the sealing-key, so that when one of the heads of the sealing-key is struck with a hammer to break it it breaks over the edge of the tangent portion, the clearance space allowing it to do so. Through the tangent portion and into the boss I drill a hole 15. (See sectional view in Fig. 2, which is a sectional view of the cover and base, taken on lines 16 and 17 of Figs. 3 and 5, respectively.) In this hole in the base I place an expansive spring 18 and place a pin 19 through the hole in the tangent portion and in the hole in the boss against the spring and cause it to hold the spring in compression by placing a stop-pin 20 through the pin 19 on the inner side of the tangent portions. The pin 19 extends beyond the tangent portion into the vertical recess 4, and as the spring 18 holds the pin constantly extended its full stroke when the cover is swung back in the direction of the arrow 21 it travels up in this recess across the recess in which the seal-key rests. The seal-keys 6 are made of cast-iron. They have a head formed at each end 13 and 14. They are adapted to rest in the recess 5 with their heads extending around each side of the projection, which prevents their being moved sidewise of the projection out of the recess. Certain characters or the monogram of the company upon whose ditch they are used can be cast on them, so that if keys are found differing from those of the company's in the lock it will indicate that they are being tampered with. To lock the cover to the base, and thus seal the opening into the gate-operating mechanism, the cover is lifted and swung back. A sealing-key is then inserted in the recess and the cover returned, when the pin 19 contacts with the key. It is forced back into the hole in the boss, compressing the spring therein until it rides over it and passes under it, when the cover is closed down. It is then impossible to remove the key or to open the cover until one of the heads of the key is broken off and the remainder is withdrawn laterally from the recess. When this is done, the cover is thrown back and the magnetic key is then inserted and the thimble lifted out and the magnetic key again inserted and the nut turned by it to raise or lower the gate,

which can be left at any part of its lift, as the position in which the gate, its lifting-rod or nut is left has no connection whatever with the locking mechanism. The ditch superintendent is the only person intrusted by a company with the seal-keys and with a magnetic key, and while this mechanism can be applied to gates of all sizes it will be most generally used on boxes and gates of twenty inches capacity, (miners' inches), and in a ditch several miles long some fifty or more gates would have to be raised and closed each day, which would necessitate the breaking and sealing of each gate twice. The seal-keys are inexpensive, however, the one illustrated in Fig. 4 being about one-half full size. A farmer attempting to steal water, which attempts are always made in the night-time, and which he can only accomplish by raising the gate from a closed position or from the position in which the superintendent has set it, and to avoid detection the gate and seal-lock must be reset before daylight, must first break the mechanical seal. He cannot screw the base off the pipe, as the screw 3 secures it to the cross-brace, and the screw cannot be removed when the cover is locked. Consequently he must break the seal-key. This he cannot replace without an exact duplicate, which he does not possess, and a strange key is easily detected; but having broken the seal he is still baffled, as he does not possess a magnetic key to remove the thimble from the pipe. Consequently he cannot even attempt to steal water without leaving evidences by which he is liable to detection and prosecution.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A head gate operating mechanism comprising a suitable gate and supporting frame, a threaded lifting rod secured to said gate, a nut arranged and adapted to rotate on said rod and raise or lower said gate, a clutch surface on the upper end of said nut, a thimble constructed of magnetic material adapted to cover the end of said rod and the clutch end of said nut, a magnetized key having a clutch end adapted to register with the said clutch end of the nut whereby the magnetic thimble may be raised from said rod and nut, a suitable housing or chamber arranged to suitably confine the said parts and means for locking the entrance into said chamber to said thimble and nut, substantially as described.

2. A head gate operating mechanism comprising a gate and a supporting frame, a threaded lifting rod secured to said gate, a piece of pipe secured to said frame and surrounding the upper portion of the said lifting rod, a coupling threaded to the end of said pipe, a second or upper piece of pipe threaded to said coupling and supported by said gate frame, a nut seated in said coupling between the ends of said pieces of pipe, and threaded to said lifting rod, a suitable wrench or key

connecting surface on the upper end of said nut, a wrench or key adapted to register with and turn the same, having its nut connecting end magnetized, a magnetic thimble adapted to fit in said upper pipe and over the end of said rod, and concealing said nut, a base secured to the upper end of said upper pipe having a projection containing a recess adapted to receive a breakable sealing key, a cover pivoted to said base and adapted to cover the entrance to said pipe and operating mechanism, a spring actuated pin in said cover, a breakable sealing key adapted to rest in said projection and in and over the path of said spring pin, whereby said cover is sealably locked to said base and the entrance to said pipe is closed, and means for securing said base to the supporting frame independent of its connection to said pipe.

3. The combination with the gate and frame, of the incasing chamber comprising the pipes and the coupling, the threaded rod and nut confined therein, and means for operating the same.

4. The combination with the gate and frame of a chamber adapted to incase the operating mechanism and lifting rod secured to said gate and extending into said chamber, mechanism within the chamber controlling the position of said gate and rod, a magnetic thimble, washer or plate adapted to be placed in said chamber and to cover, conceal, and prevent operative engagement with the actuating mechanism of the gate, and a magnetized bar for removing said thimble, washer or plate from said mechanism and chamber, and means for operating said mechanism after said thimble has been removed to raise and lower the gate, as herein set forth.

5. The combination with the head gate of a suitable supporting frame, a chamber adapted to contain the gate controlling mechanism, a magnetic device adapted to cover and protect said mechanism against manipulation until removed, and a magnetized device, key or wrench adapted to remove said magnetic covering.

6. The combination with the gate of a suitable frame for supporting the same, mechanism for manipulating and controlling the gate, a chamber adapted to contain said controlling mechanism, a magnetic device adapted to cover and shield said mechanism from manipulation until it is removed, a magnetized device, or key-wrench adapted by magnetic attraction to remove said magnetic device from said chamber, a suitable wrench for operating said gate controlling mechanism, a cover adapted and arranged to cover and control the entrance into said chamber to said magnetic covering device and said gate controlling mechanism, and a breakable key arranged and adapted to sealably lock said cover over the entrance into said chamber to said operating mechanism.

7. The combination with the gate and frame, of the gate operating mechanism and the in-

casing chamber substantially as shown and described, the base secured to said chamber and frame, the cover having a spring actuated pin and a breakable key adapted to sealably lock said cover to said base.

8. The combination of the gate, the frame, the pipes and coupling adapted to form the incasing chamber, the lifting rod and nut, means for operating the same, the thimble, means for removing the said thimble substantially as herein described, the base secured to the top of the pipes having a lateral and vertical projection, a horizontal recess in said projection adapted to receive a breakable key, a breakable key adapted to said recess, a cover pivoted to said base, a spring actuated pin in said cover adapted to spring over and lock under said breakable key, and means for securing said base to said frame independent of said pipe, when said cover is locked to said base.

9. The combination of the gate and frame, the threaded gate lifting rod, the nut having a clutch surface upon its upper edge, the pipes and coupling surrounding and supporting said nut and rod, the magnetic thimble, the mag-

netized key wrench having a clutch end adapted to register with said clutch surface of said nut, the base secured to the upper end of said pipes and frame and having a lateral and vertical projection, the recess, the breakable key adapted to said recess, the cover having pivoted connection with said base and a spring actuated locking pin, and the said breakable key adapted and arranged to sealably lock said cover to said base and close the entrance in said pipes to the operating mechanism.

10. The combination with the gate and frame, of a chamber adapted to contain the gate controlling mechanism comprising the pipes K and M and the coupling L.

11. The combination with the gate and frame, of the pipes K and M, the coupling L, the base and cover, the breakable key, and means for sealably locking the same with said breakable key.

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

FRANK CORNING BROWN.

Witnesses:

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GEORGE R. CARDWELL.