(No Model.)

2 Sheets—Sheet 1.

J. B. TAINTER.

CANAL LOCK.

No. 344,879. Patented July 6, 1886.

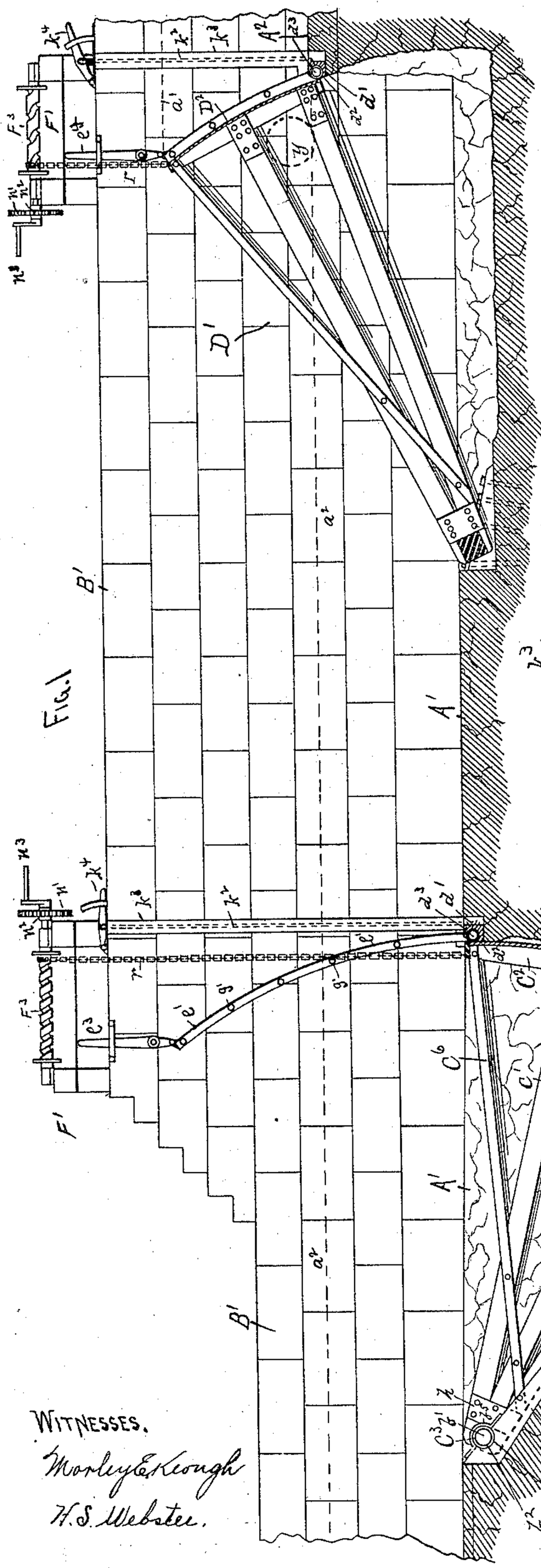

FIG. 1

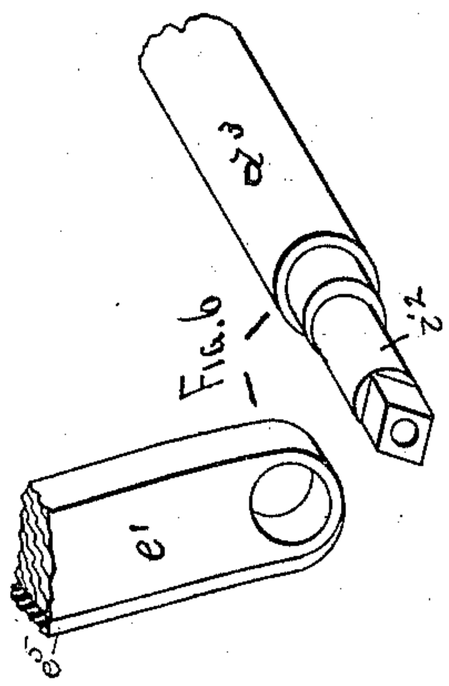

FIG. 6

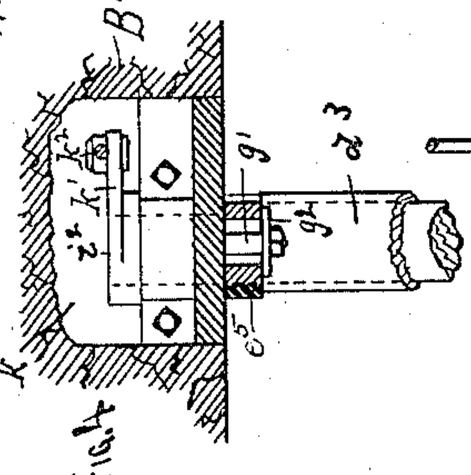

FIG. 4

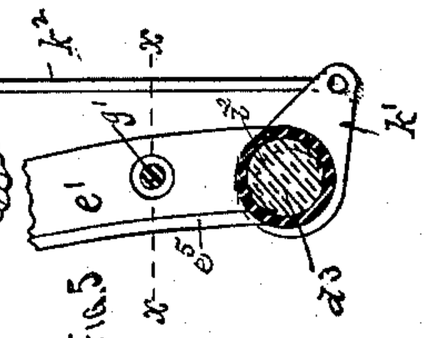

FIG. 5

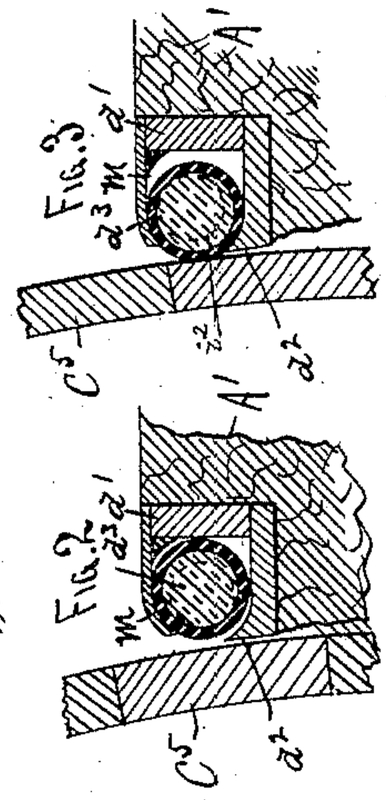

FIG. 3

FIG. 2

WITNESSES.

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Atty.

(No Model.)

2 Sheets—Sheet 2.

J. B. TAINTER.

CANAL LOCK.

No. 344,879. Patented July 6, 1886.

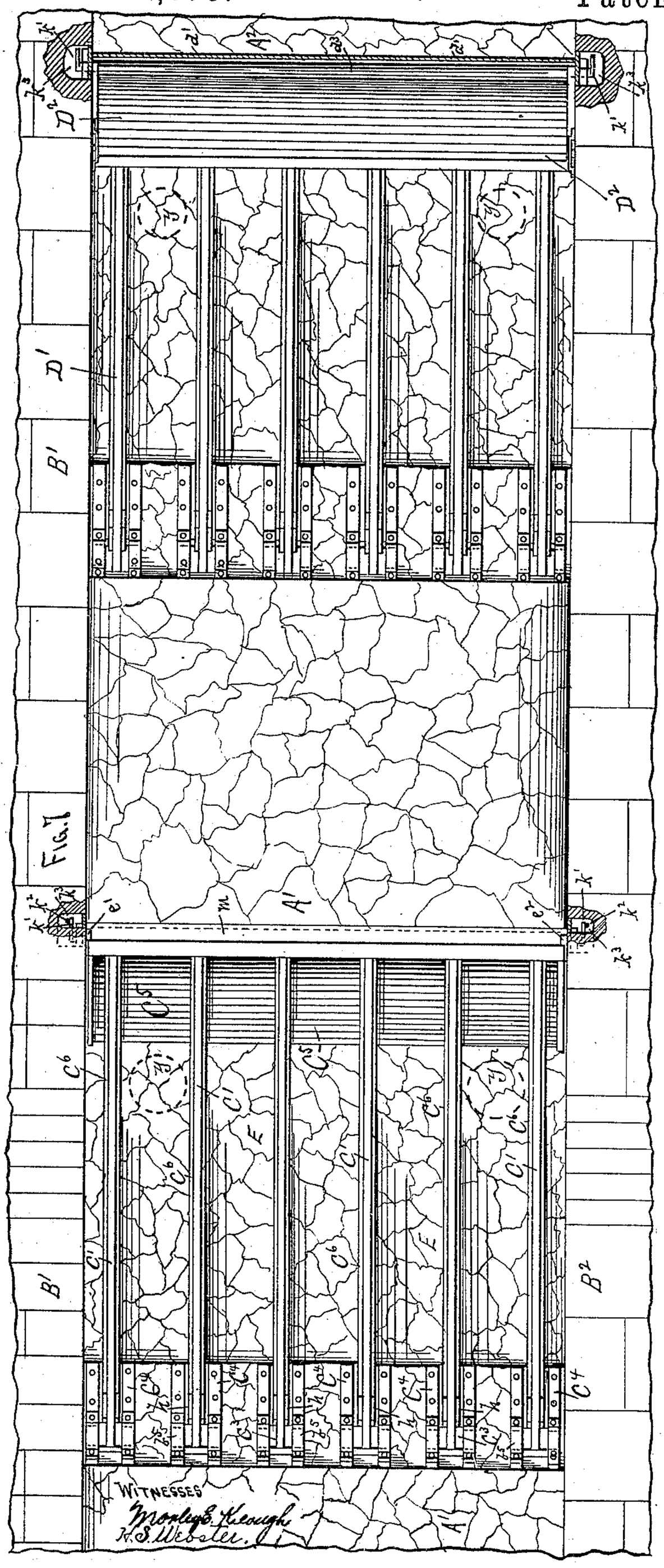

FIG. 7.

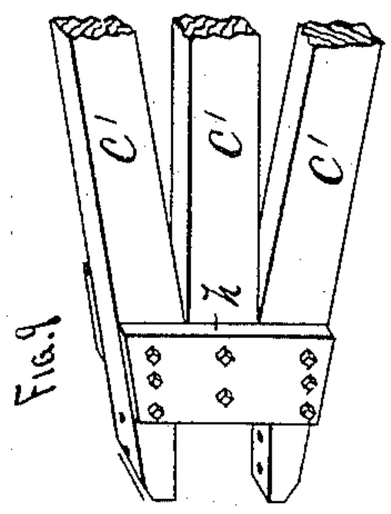

FIG. 9.

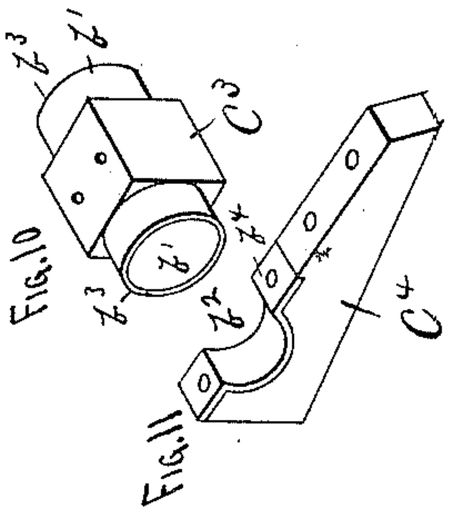

FIG. 10.

FIG. 11.

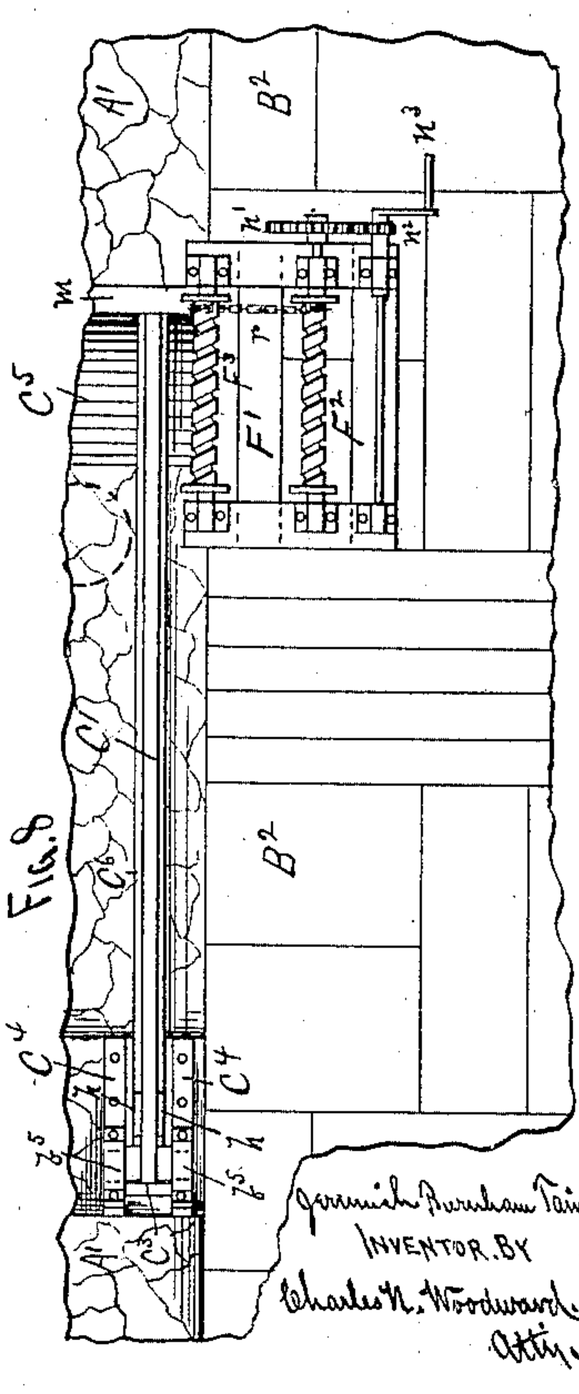

FIG. 8.

WITNESSES
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UNITED STATES PATENT OFFICE.

JEREMIAH BURNHAM TAINTER, OF MENOMONEE, WISCONSIN.

CANAL-LOCK.

SPECIFICATION forming part of Letters Patent No. 344,879, dated July 6, 1886.

Application filed December 2, 1885. Serial No. 184,531. (No model.)

To all whom it may concern:

Be it known that I, JEREMIAH BURNHAM TAINTER, a citizen of the United States, residing at Menomonee, in the county of Dunn and State of Wisconsin, have invented certain new and useful Improvements in Canal-Locks, of which the following is a specification.

Figure 1 represents a longitudinal sectional view of a lock with my improved gates arranged therein. Figs. 2, 3, 4, and 5 are enlarged details of the packing mechanism. Fig. 6 represents the two principal parts of the packing mechanism in perspective and disconnected. Fig. 7 is a plan view of Fig. 1 with the gate-hoisting mechanism removed. Fig. 8 represents a plan view of a portion of one side of the lock and a portion of one of the gates, illustrating the manner of arranging the hoisting mechanism. Figs. 9, 10, and 11 are enlarged perspective detail views illustrating the manner of constructing the bearings of the gates.

A′ represents the bed of the lower level of the canal. A^2 represents the bed of the upper level, and B′ B^2 the walls of the lock. The water-line of the upper level is represented by dotted lines *a′* and the water-line of the lower level by dotted line a^2. This represents an ordinary single lock of a canal with a rock bottom and stone side walls; but of course it will be understood that the gates are equally applicable to any construction of canal and lock.

The lower gate consists of sets of arms C′, each arm of each set attached by one end to a separate curved rib, C^2, and all the arms set converging at their other ends and secured together by side plates, *h*, and adapted to embrace and be attached to square timbers or blocks C^3, each of the latter provided on its end with bearings *b′*, adapted to rest in cavities b^2 in chocks or blocks C^4, fastened to the bed A′ of the lock.

Each of the bearings *b′* will be provided with a metal ferrule, b^3, and each of the cavities b^2 will be provided with metal straps b^4, the two metal parts b^3 b^4 thus working in contact, so that no wear comes upon the wood of the bearings or chocks.

Straps or caps b^5 serve to hold the blocks C^3 in place in the chocks.

Across the curved ribs C^2 are fastened the facings C^5, the whole forming a gate with a curved upstream surface adapted to be raised and lowered in the arc of a circle, of which the bearings *b′* are the center.

C^6 represents the braces for supporting the upper edge of the gate.

The upper gate, D′, is constructed in a similar manner to the lower gate, except that it is only one-half as large horizontally, or with a face, D^2, one-half as high as the face C^5 of the lower gate, for the reason that it is required to be raised and lowered through only one-half the space of the lower gate, as hereinafter shown.

Beneath the lower gate the rock is excavated, as at E, to receive the gate when lowered down, so that the upper line of the gate will be on a line even with the lower level, A′, of the bed of the canal, to enable boats to pass freely over it.

The chocks C^4 are arranged, as shown, to fit into cavities formed for them in the rock bed of the canal, so that the chocks are firmly supported, and the strains borne by the rock and not by the bolts securing the chocks.

When the bed of the canal is of a soft formation, it will be necessary to form a timber-and-pile foundation for the chocks C^4.

Along the upper edge of the excavation E, and also along the edge of the upper level, A^2, the rock is cut out and a square box, *d′*, inserted into each of said cut-out portions, these boxes having their edges next the facings curved upward, as shown at d^2 in Figs. 2 and 3. Within each of these boxes *d′* is fitted a roller, d^3, the ends of each roller journaled in the ends of its respective box, these journals being eccentric to the rollers, as shown in Figs. 2, 3, 5, and 6, so that when the latter are revolved their surfaces will be moved toward and away from the facings of the gate. This movement is clearly illustrated in Figs. 2 and 3, wherein the roller is shown in Fig. 2 moved away from the facing C^5, and in Fig. 3 it is shown reversed and in contact with the facing. By this simple device a packing is formed between the gate-facing and the bed of the canal, to prevent the passage of the water from one level to the other.

To form packings between the ends of the facings C^5 and D^2 and side walls, B′ B^2, I pivot

upon the ends of the rollers d^3 curved strips $e' e^2$, the convex edges of the strips adapted to fit the curved surfaces of the facings C^5 and D^2 and form a water-packing, to prevent the water from passing between the ends of the gates and the walls B′ B². The strips $e' e^2$ are attached to walls B′ B² at intervals by bolts g', the holes in the strips through which the bolts fit being larger than the bolts, so that the strips may play back and forth upon the bolts. Large washers g^2 will be placed between the nuts of the bolts g' and the strips, to cover the bolt-holes and prevent the passage of the water through them. These washers g^2 will be large enough to keep the bolt-holes covered at all times during the movement of the strips $e' e^2$.

Opposite the ends of the rollers d^3 cavities are formed in the walls B′ B², in which the eccentric bearings i^2 of the journals of the rollers are set, and on each of the journals a crank-arm, k', is secured, and provided with a rod, k^2, leading up through a channel, k^3, to the tops of the banks of the canal, and there provided with a lever, k^4, by which it may be raised and lowered to oscillate the rollers, and thus pack or unpack the joint between the gates and the bed of the canal.

As before stated, the lower ends of the strips $e' e^2$ are journaled upon the rollers, so that the lower ends of the strips will be moved inward and outward with the rollers, the upper ends of the strips being adapted to be moved inward and outward by levers $e^3 e^4$, as shown. By this means the strips $e' e^2$ and rollers d^3 may be moved away from their contact with the facings C^5 and D^2, when the gates are to be raised and lowered, to prevent unnecessary friction and wear between the parts.

The rollers d^3 are shown in Figs. 2, 3, 4, 5, and 6 covered with soft rubber or other similar suitable packing to insure a tight joint against the facings, and the strips $e' e^2$ are also shown provided with packing-strips e^5, of rubber or other similar suitable material.

m represents a strip of rubber, leather, or other flexible material, attached by its rear edges to the rear side of the box d', and lying loosely upon top of the rollers d^3, to prevent sediment from working in behind the rollers, and also to partially encompass the rollers by the pressure of the water, and thus assist in holding them down in the boxes.

On top of the walls B′ B², opposite the movable end of each gate, will be erected a hoisting-frame, F′, supporting a spirally-grooved drum, F², adapted to be revolved by gears n' n^2 and crank n^3 and a correspondingly-grooved guide-roller, F³, the latter projecting slightly over the edge of the wall and adapted to support the hoisting-chains r on their way from the upper outer corners of the gates to the drums F². By this arrangement the gates may be elevated, the spiral grooves in the drums F² causing the chains to be wound evenly thereon, the spiral grooves in the carriers maintaining the chains in a position at right angles to the drums.

In the drawings in Fig. 1 the upper gate is shown raised and the lower gate lowered, which is the position in which they will be placed when a boat is to be "locked" upstream. After the boat has passed over the lower gate the latter will be raised and the packing-roller d^3 and packing-strips $e' e^2$ closed and the upper gate slowly lowered, which will allow the water from the upper level to flow over the gate into the space between the gates, and gradually raise the water therein until it is level with the water in the upper level, as indicated by the dotted line a', when the boat can be floated out of the lock.

When a boat is to be "locked" downstream, the lower gate is raised and the upper gate opened and the boat floated in between the gates. The upper gate is then raised and packed and the lower gate lowered, the water between the gates finding its level at a^2, when the boat can be floated out of the lock.

The usual valves and conduits may be arranged, through which to fill and empty the space between the gates; but the levels may be changed, as described, by allowing the water to flow over the upper edges of the gates.

The gates may be made of iron, if preferred, or partially of wood and partially of iron. If made wholly of wood, it will be necessary to attach weight to sink them, which would not be necessary if they were made of iron, but, on the contrary, iron gates would require to be supplied with buoys to assist in raising them.

The location of the buoys or weights is indicated by dotted lines at y in Figs. 1 and 7.

Having thus described my invention, what I claim as new is—

1. In a canal-lock, the gate adapted to be submerged in the canal, and elevated and depressed to change the level of the water in the canal, said gate consisting of arms C′, ribs C^2, facings C^5, and braces C^6, each of said arms and braces attached by one end to said ribs, and converging and united at their other ends to blocks C^3, having bearings b', adapted to be journaled in bearing-blocks C^4, said bearing-blocks embedded in the bed of said lock, whereby said gate is supported from the bed of the canal, substantially as set forth.

2. A canal-lock gate having a curved face, which is raised and lowered in the arc of a circle concentric with the face of the gate, in combination with a packing-roller mounted in the bed of the canal and in contact with the face of said gate, substantially as set forth.

3. A canal-lock gate having a curved face, which is raised and lowered in the arc of a circle concentric with the face of the gate, in combination with a packing-roller eccentrically mounted in the bed of the canal and in contact with the face of said gate, substantially as set forth.

4. The combination, with a canal-lock gate formed of an arc of a circle, and pivoted at its axial point and submerged in the canal,