

G. Heath,

D. Streets, Street 1.

Canal Lock.

No. 109899.

Patented Dec. 6. 1870.

Fig. 1

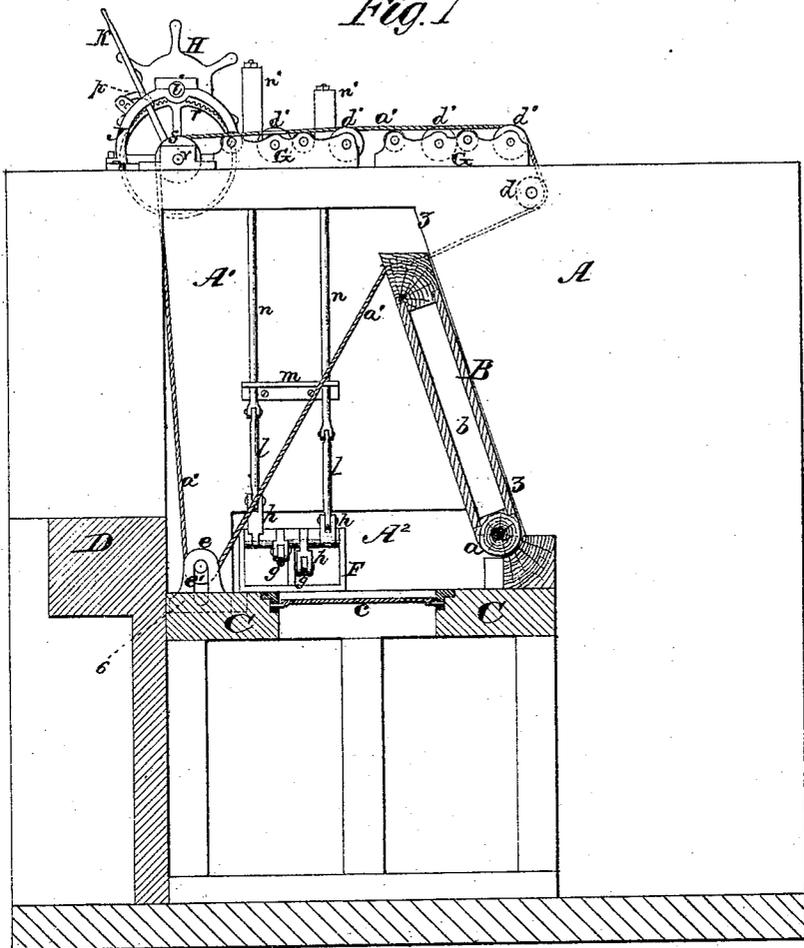
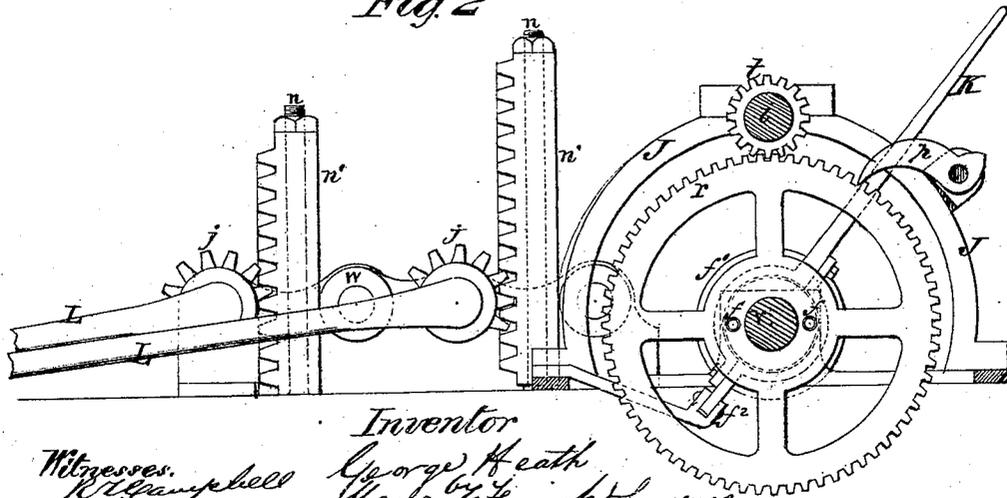


Fig. 2



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Fig. 3.

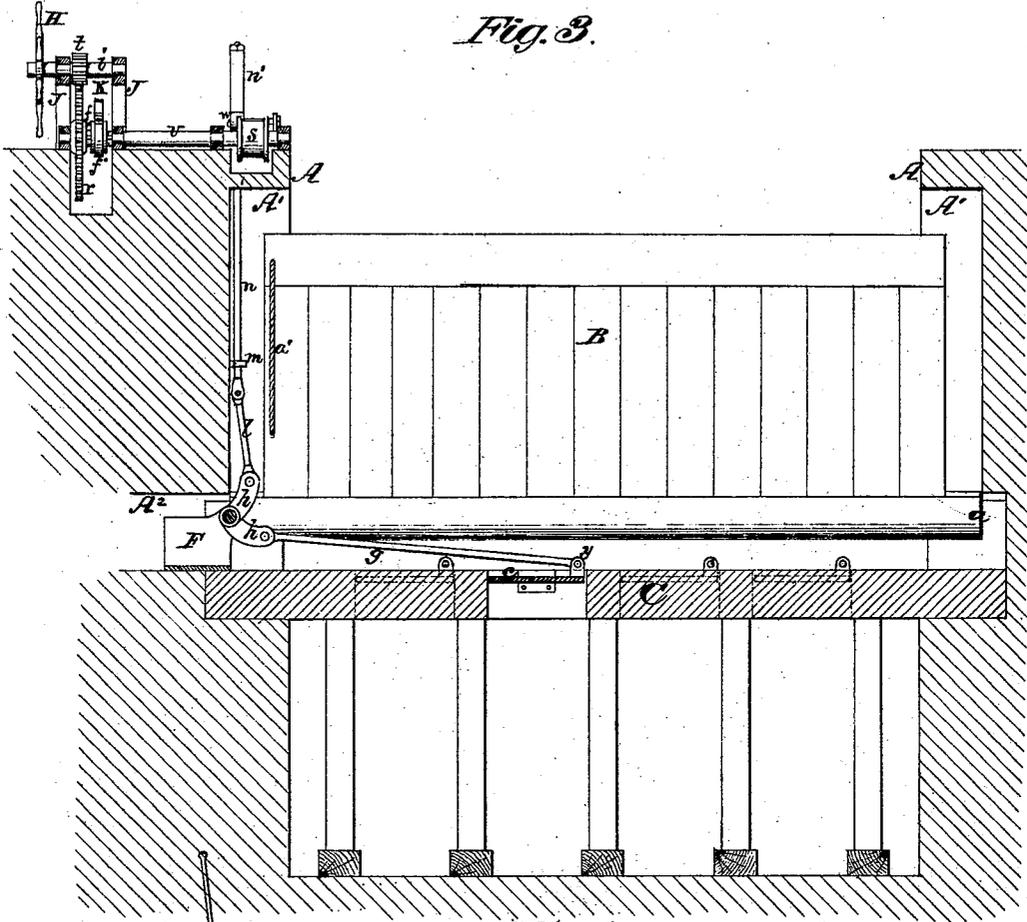
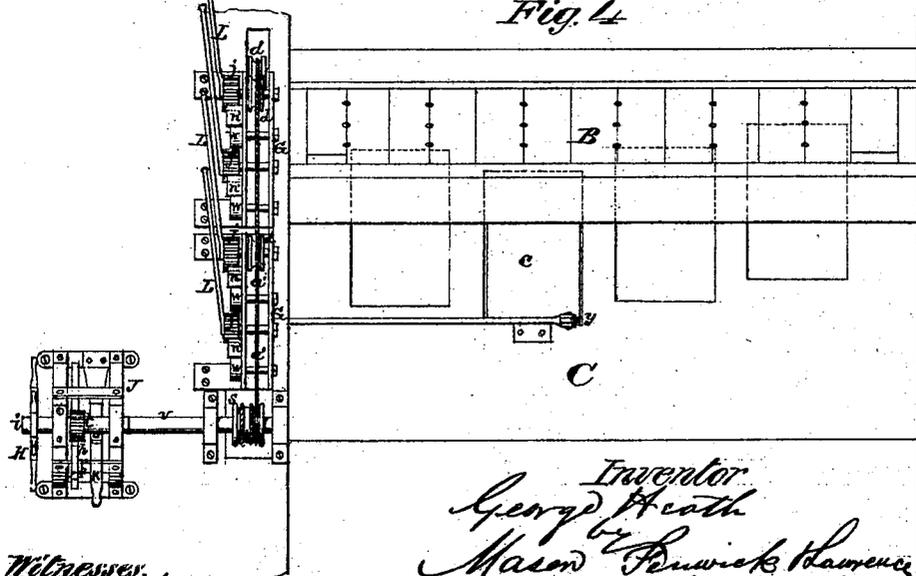


Fig. 4.



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GEORGE HEATH, OF ANNAPOLIS, MARYLAND.

Letters Patent No. 109,899, dated December 6, 1870.

## IMPROVEMENT IN CANAL LOCKS.

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, GEORGE HEATH, of Annapolis, in the county of Anne Arundel and State of Maryland, have invented certain new and useful Improvements in Canal Locks; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1, plate 1, is a section taken vertically and longitudinally through the lock.

Figure 2, plate 1, is a view in detail, and partly in section, of several of the devices for operating the gate and also the valves.

Figure 3, plate 2, is a vertical transverse section through the lock and gate-operating mechanism.

Figure 4, plate 2, is a plan view of the lock.

Similar letters of reference indicate corresponding parts in the several figures.

The first part of my invention relates to a floating self-closing tumble-gate, constructed and operating in a novel manner, and also to devices which are designed for facilitating the management of the tumble or dump gate of canal locks, that is to say, gates which, when they are open, drop down into the lock below the breast-wall so that boats pass over them.

The object of this part of my invention is to save time, labor, and water in opening and shutting a tumble gate, by constructing such gate so that it will possess sufficient buoyancy to close itself when released from the devices used to hold it in position when open; and also by the employment, for the purpose of opening and keeping open this gate, of a chain which passes over pulleys, one of which is keyed on a shaft that is rotated by means of spur-wheels provided with a pawl, a clutch, and a hand-wheel, and another of which is hung in such manner that it operates by its gravity to take up the slack in the chain while the gate is being opened, as will be hereinafter explained.

The second part of my invention relates to a mode of operating valves which are applied to a horizontal platform constructed in front of the gate, and the object of the same is that the valves may be opened from a position upon the lock-wall upon one side of the gate, each valve being controlled independently of the other by means of a lever and rack and connecting-rods, the latter being attached to the valve and also to a crab or right-angular lever, as will be hereinafter explained.

To enable others skilled in the art to understand my invention I will explain its construction and operation:

In the accompanying drawing—

A A represent the vertical side walls, extending down as far as the horizontal valve-platform C, and receiving the ends of the gate B.

The recesses also leave abutments *z z*, against which the gate abuts when shut, as shown in fig. 1.

Hitherto the practice has been to provide the tumble or dumping-gates with vertical abutments, so that when these gates were shut they stood perpendicular or nearly so to the bed of the canal. One objection to this plan is that surplus water flows over the tops of the gates upon the boats in the lock.

It will be seen that the abutments *z z* are inclined, and that the gate B, when shut, assumes such position, thus preventing the surplus water flowing over its top from being received upon a boat in the lock, and also requiring a less amount of movement to open and shut the gate.

With the inclined gate B the water which escapes over its top will flow gently down its upper side and will not cause any material commotion in the water below.

This gate B is hinged below *a a a*, in the well-known manner of hinging the tumble-gates, and it is made sufficiently buoyant to float in the water and shut itself when released from the devices which are used to hold it open.

This gate has attached to it a chain, *a'*, which is passed around and guided by pulleys, *d, d', e*, and *s*.

The chain is passed several times around the pulley *s*, which latter is keyed on a shaft, *v*, that is mounted in bearings upon the lock-wall and operated as will be hereinafter explained.

The pulley *e* is applied to a bearing which has vertical slots, *e'*, through which the journals of this pulley pass.

The bearings or standard-box is arranged in a depression or well, *6*, made into the platform C, and the pulley *e* is allowed to rise and fall as the gate B is swung open and shut. The weight of pulley *e* thus arranged and mounted keeps the chain under tension.

This arrangement of the pulley and bearing in the well or recess is very important, as it allows of the gate being lowered to or below a horizontal position.

The pulley *d* is inserted into the cap timber of wall A, in line with but below the level of the gangs of pulleys, *d d'*, which latter have their bearings in long standards, *G G*, which are firmly secured down in place above the recess A.

The flanged pulley or winding-drum, *s*, is keyed on a horizontal shaft, *v*, which is supported by suitable bearings, and which has a large toothed-wheel, *r*, applied loosely on it, and also a sliding clutch, *f*.

To this clutch a lever, *K*, is applied, by means of which the clutch-pins *f f* can be introduced into holes made in the hub of the wheel *r*, as shown in fig. 2, thus engaging the wheel *r* with its shaft *v*.

Above wheel *r*, and engaging with it, is a pinion, *t*, which is keyed on the shaft *i* of a hand-wheel, *H*.

Shaft *v* has its bearings in a frame, *J*, to which is applied a pawl, *p*, that can be made to engage with the teeth of the large spur-wheel.

It will be seen from the above description that when the wheel *r* is engaged with its shaft *v*, the gate *B* can be lowered to a horizontal position by turning the hand-wheel *H*, and held in this position by means of the pawl *p*; also, that the gate will float to the surface of the water and shut against the inclined abutments *z z* by simply disengaging the clutch *f* from wheel *r*.

Openings are made vertically through the platform *C* for the purpose of allowing water from a higher level to flow into the pond below. Each opening is provided with a valve, *c*, which is suitably pivoted at its end and provided with a lug, *y*, to which a rod, *g*, extends laterally across the platform *C*, and is pivoted to one arm, *h*, of a "crab" or right-angular lever, the other arm of which has pivoted to it a pitman *l*.

This pitman *l* is pivoted at its upper end to the lower extremity of a vertical rod, *n*, that is guided by a bracket, *m*, below, and by an anti-friction roller, *w*, above.

The upper part of rod *n* has a tooth-rack applied to it, the mode of applying which is not claimed under this application, the teeth of which are engaged by a toothed-segment, *j*, on the end of a hand-lever, *L*.

The anti-friction roller *w* and the segment of lever *L* have their bearings in a long standard, *G*, secured in position on top of the cap-timber *A*<sup>3</sup>, and canal-wall *A*.

The drawing shows but one valve, but it will be understood that each opening through the platform *C* is provided with a valve, and with devices, as above described, for operating it.

The crab or angular lever consists of a tube having two arms, *h h*, on it at the required angle, and this crab or lever is applied to and supported by a bearing-box which is arranged in a sub-recess, *A*<sup>2</sup>, made into the side wall *A*. By this means a right-angular movement

can be obtained with very little friction, and as each valve is provided with separate devices for operating it, a sudden rush of water into the lower pond from the higher one is prevented. Furthermore, it will be seen that all the valves can be operated from the side of the lock, and each independent of the other.

Having described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The chain *a'*, pulleys *d e s*, and self-closing tumble-gate *B*, in combination with the spur-wheels *t r*, pawl *p*, clutch *f*, and hand-wheel *H*, all arranged and operating substantially in the manner shown and described.

2. The gravitating pulley *e* in combination with the tumble-gate *B* and its chain *a'*, substantially as described.

3. The combination, with the buoyant self-closing tumbling-gate *B*, of the releasing clutch *f'*, or both the releasing clutch *f'* and the pawl *p*, and suitable intermediate mechanism for lowering the gate, substantially in the manner described.

4. The combination of crab-lever *h h*, rods *n* and *g*, rack *n'*, and toothed-lever *L*, with the valve *c* of canal-lock platform *C*, substantially in the manner shown and described.

5. The arrangement of two or more crab-levers on the same shaft, and extending rods vertically up from and horizontally out from said levers, and connecting each of said rods with its own independent rack and toothed-lever, and with its own independent valve, all in such manner that a series of valves on the canal-lock platform *C* may be separately or successively opened or closed from one side of the lock, as set forth.

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Witnesses:

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