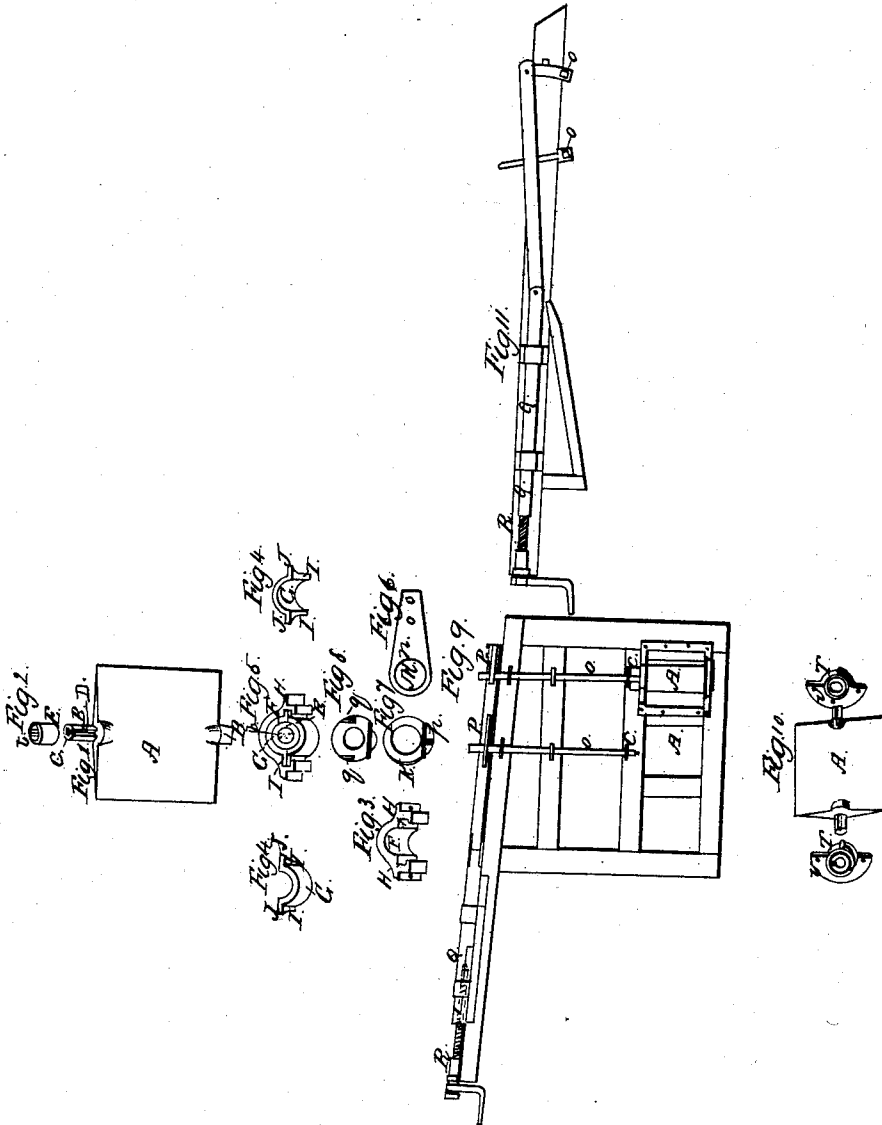


F. LIVINGSTON.
CANAL LOCK GATE.

No. 687.

Patented Apr. 13, 1838.



UNITED STATES PATENT OFFICE.

FRANKLIN LIVINGSTON, OF WATERFORD, NEW YORK.

CANAL-LOCK GATE.

Specification of Letters Patent No. 687, dated April 13, 1838.

To all whom it may concern:

Be it known that I, FRANKLIN LIVINGSTON, of the town of Waterford, in the county of Saratoga and State of New York, have invented a new and useful improvement to prevent the gudgeons, steps, and collars of paddle or valve gates, such as are used in canal navigation for filling and emptying canal-locks, from wearing and also an improvement for opening and shutting the same by the horizontal application of the screw and lever combined, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

The nature of my improvement consists in the application of friction boxes and collars to the gudgeons (or pivots, collars, and steps, of paddle gates). The improvement of opening and shutting the same consists in the application of a screw and nut attached to a lever, to be applied to gates standing perpendicular.

To enable others skilled in the art of making lock gates to make and use my improvement and invention I will proceed to describe the construction and operation of the same.

I construct my gate, or gates, gudgeons, steps and collars in any of the known forms, and to the gudgeons, steps, and collars I apply thereto friction boxes and collars varying at the same time, the size and shape of said friction boxes and collars to suit the gudgeons of the gates. The gates may be made in any suitable form and the gudgeons or pivots on which it turns may be attached in such a manner as would suit the constructor best, and the gudgeons may be attached to any part of the wicket gate, or cast on the gate, and they may be made of any suitable kind of metal and so may the gates be made of metal (either cast or wrought iron, or wood and iron combined).

I will describe a gate together with the gudgeons or pivots on which it turns made of an entire piece of cast metal, the gudgeons cast on the gate. The following is a description of one two feet square, the plate A Figure 1 should be about one inch and a quarter thick in a line with the gudgeon B. The vertical edges of the gate or plate should be from half to five eighths of an

inch thick, and increased in thickness toward the middle, so as to make the front and back of the plate a little convex instead of flat. The top gudgeon should be three inches long and three and three fourths of an inch thick in diameter, in the top of this gudgeon is a mortise C one inch and a quarter square, and nearly three inches deep to admit of a wrought iron rod that is to turn the gate, where the gudgeons join the gate it should be increased gradually in thickness to the full diameter of the gudgeons, so that there may be no weak place in consequence of any sudden offset in the metal, and on the side of this gudgeon there must be a crease or groove cast or made in it so as to receive a corresponding tongue F cast or made on the inside of the friction box E Figs. 2 and 5 that surrounds this gudgeon and protects it from wearing. The bottom gudgeon B Fig. 1 should be about two inches thick where it joins on to the gate and slanted off to about one and a half inches at the lower end and two inches long.

The collar F Figs. 3 and 5 in which the upper gudgeon works should afford to it a bearing of about three inches—it may be formed one half in the metal-frame that surrounds the sluice or may be firmly fastened to it. Where there is no metal frame then this collar is a separate piece of casting about twelve or thirteen inches long, having a bearing of about three inches fastened to the top of the sluice by means of bolts and nuts or spikes, and in this collar there is an inner collar, G Figs. 4 and 5 of corresponding circle to the inside of the collar F and outside of box E—said inner collar being designed to protect the outer collar from wearing. The collar has projecting shoulders with grooves H Figs. 3 and 5 cast upon the face or front side to receive the inner collar G. This friction collar G Fig. 4 is intended to secure the collar F from wearing:—it may be made in many ways, and of different kinds of metal. It must be made to suit and fit the circle in the collar F and at the same time to correspond with the friction box E (that protects the gudgeon from wearing) this friction box, or bush E is a circle, the inner friction collar G Figs. 4 and 5 is made in two parts each a half circle with tongues I on each end

dropping into corresponding grooves in the outer collar F so as to keep the inner collar to its place, and on the end of the tongues there are small projecting points J to keep the inner collar from dropping below the top of the outer collar; this collar ought to be made about one half inch thick, the thickness and size, may however be varied to suit any size gudgeon; and the other section of the collar G is made in the same shape and size in every particular as the one just described so that when these two sections or semi-circles are put in their places they form a circle around the friction box or bush that surrounds the gudgeons of the gate. I prefer thus to make these two sections of the same size and shape on account of requiring but one pattern for both, thereby avoiding any mistake should one break or be worn out, and it become necessary to replace it by another under water, and again when repairing the canal in the spring (as is usual) there will be but one kind of collar to carry about by the workmen, by this method all confusion or mistake is avoided.

The friction box E that surrounds the upper gudgeon (and protects it from wearing) may be made of cast, or any other metal, and must be about $\frac{1}{2}$ an inch thick of the same length and a little larger in diameter so that it may be slipped off and on easily by means of the thumb and finger at pleasure under water and on the inside there must be cast *t* a tongue to correspond with the groove in the gudgeon by which it is made fast to it and kept from turning, and when the gate is turned this box turns with the gudgeon and the wearing thus takes place on the outside thereof and not on the gudgeon, and likewise the outer collar F is in a similar manner protected from wearing by the inner collar G.

The step M Fig. 6 to receive a friction box Fig. 7 and bear up the gate and rod that is to govern the gate, should be cast of metal of suitable size and shape firmly fastened to the bottom of the sluice by bolts. This step should not be less than one and a half inches thick where it receives the friction box (the hole in the same being governed in size according to the size of the friction box and gudgeon that it is to receive, twelve inches long and beveled off toward the back end one inch thick and three broad with two $\frac{3}{4}$ inch holes in it to secure it to the girt at the bottom of the sluice—and in said hole M Fig. 6 there must be a notch or groove *n* cast or made in the side thereof to receive a corresponding tongue *p* on the friction box Fig. 7 that enters or sets in to this step to prevent it from turning and wearing.

The friction box Fig. 7 that sets into the above described step is made of cast iron, and has a flange K cast on it of about 2

inches broad, and all parts of it is about one half inch thick, this box has a bottom to it (thereby increasing its durability) and a tongue *p* cast or fastened on the outside to correspond with the groove cast in the step, by which it is held stationary, in the hole of the step, consequently the step cannot wear, and the flange to the box may be made larger or smaller as the nature of the case may require; but the box and the hole in the step must always be guided in size according to the size of the lower gudgeon of the gate.

The friction box Fig. 8 (for preserving the lower gudgeon from wearing) is made a little larger than the gudgeon and the hole in the box must be a little ovaling on the front side of the box, so as to let the gate pitch a little forward to clear the collar above, that it may be taken out and another one put in its place with ease, and about one sixteenth of an inch deeper, also with a bottom so that the bottom of the gate rests on the flanges of this friction box and this box must be set into the beforementioned friction box (that preserves the step from wearing) consequently must be of such size as to be inserted into the before mentioned box, and the flanges must correspond in size to each other so that the bearing and wearing will be equal, and on the top part of the flange (one each side) there must be steadying pins or knobs *q* cast of about half inch high, so that by means of said pins when the gate is in its place the gudgeon will set in this friction box and as the gate turns this box is made to turn on the friction box that protects the step from wearing, consequently the friction or wearing comes on the two friction boxes thereby both the lower gudgeon of the gate and the step is entirely protected from wearing. These wicket gates A Fig. 9 are turned by insetting vertical rods O, into the socket C of the gudgeon and fastening on the tops of said rods horizontal arms P at right angles to the same the ends of said arms being attached to a horizontal rod Q moved by a horizontal screw R turning in a nut which thus turns all the gates together.

The boxes for horizontal gates will be made similar to those represented at Fig. 10, in which the inner box S on the gudgeon is made like box E Fig. 2—and the outer box T in which said box S turns has a tongue on the outside fitting into a corresponding groove in the collar *g* fastened to the frame of the main gate.

The invention claimed and desired to be secured by Letters Patent consists,

1. In the construction and arrangement of the inner collar G and box or bushing E for preventing the wear of the upper gudgeon and collar of canal valve gates; also as ap-

plied to the gudgeons of horizontal or vertical wicket gates; as before described in Fig. 10.

2. In the construction and arrangement of boxes for preventing the wear of the steps and lower gudgeons as before described.

3. The mode of opening and shutting ver-

tical wicket gates by the screw working horizontally as before described in Fig. 9.

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Witnesses:

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