(No Model.)

N. W. KROUSE.

CUT-OFF VALVE FOR TANKS.

No. 400,920. Patented Apr. 9, 1889.

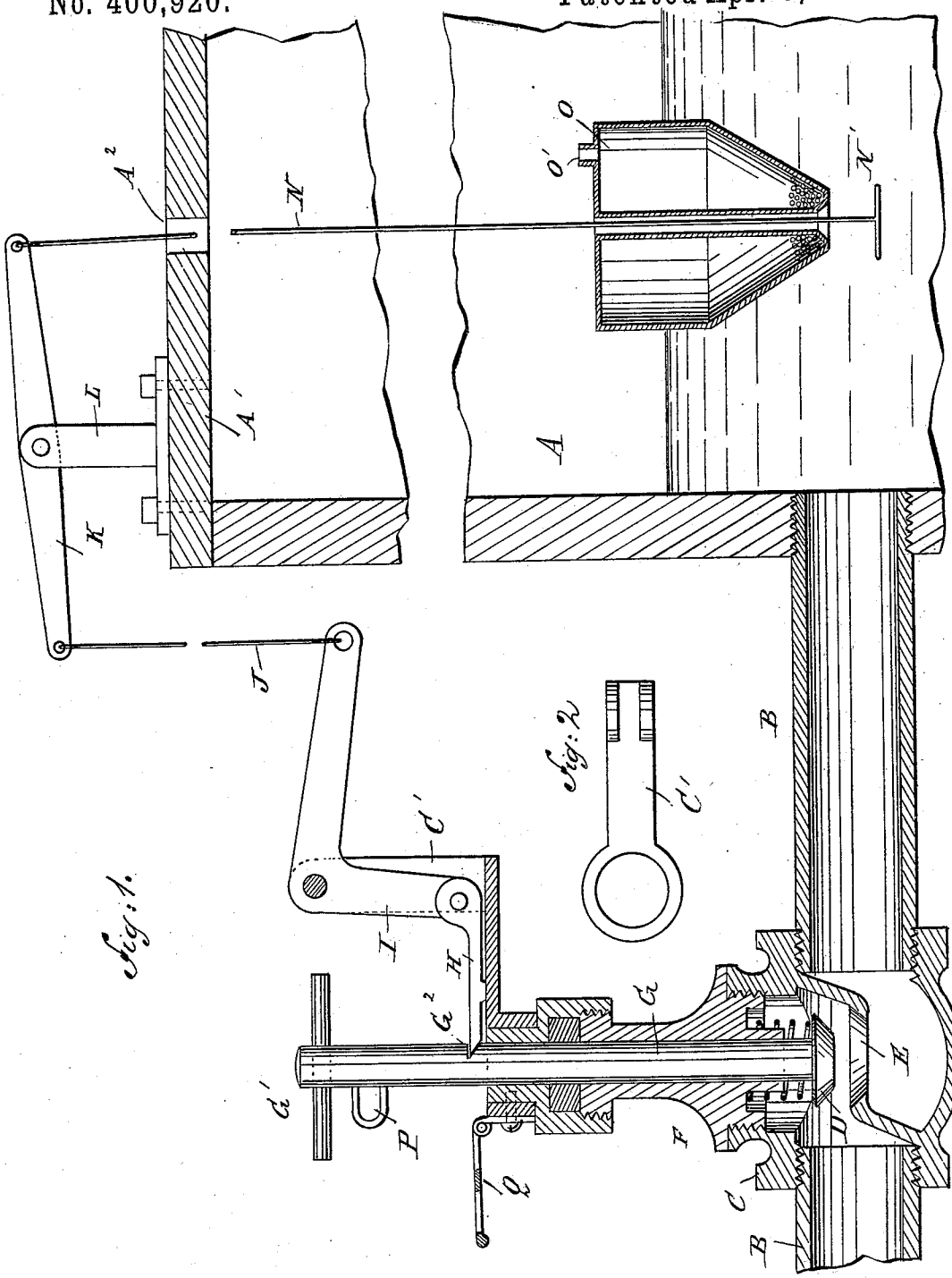

Fig. 1.

Fig. 2.

WITNESSES:

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CUT-OFF VALVE FOR TANKS.

SPECIFICATION forming part of Letters Patent No. 400,920, dated April 9, 1889.

Application filed July 11, 1888. Serial No. 279,620. (No model.)

To all whom it may concern:

Be it known that I, NATHANIEL W. KROUSE, of Washington, in the county of Washington and State of Pennsylvania, have invented a new and Improved Cut-Off Valve for Tanks, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved cut-off valve specially adapted for oil-tanks, and serving to close the valve in the pipe-line automatically as soon as the oil has been drawn off into the pipe-line with which the tank is connected.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in both the figures.

Figure 1 is a sectional side elevation of the improvement, and Fig. 2 is a detail plan view of one of the brackets.

Oil-tanks connected with pipe-lines are generally placed on the lowest ground on the oil-field or region in which the oil-wells are located, in order to have the advantage of gravitation in running the oil from the well-tanks to the nearest station. Gravitation alone does not fully accomplish the object, and consequently vacuum-pumps are generally employed to assist in forcing the oil from the tank through the pipe-line to the nearest station. If the tanks were all upon the same level and one tank emptied as rapidly as another, the vacuum-pumps could operate uniformly; but as the tanks are not usually on the same level the high tanks are emptied first and break the vacuum by admitting air at the tank-connection, thus making the pumps almost useless.

The object of my invention is to shut off the tanks as soon as they begin to admit air into the outflow-pipe.

The oil-tank A, of the usual construction, is connected near its bottom with the pipe-line B, in which is placed, near the tank A, a valve-casing, C, containing a valve, D, adapted to be seated on the seat E in the said casing C. A spring, F, acting against the back of the valve D, serves to force the valve D against its seat E. The valve D is secured on the valve-stem G, extending upward through suitable bearings in the valve-casing C, being provided at its upper end with a handle, G′, for raising the stem G and its valve D.

On the stem G, outside of the casing C, is formed a notch, G^2, adapted to be engaged by the end of a bolt, H, mounted to slide horizontally on a bracket, C′, held on the upper end of the casing C. The bolt H is pivotally connected with one end of a bell-crank lever, I, fulcrumed on the bracket C′, and connected by its other arm with an upwardly-extending rod, J, connected with a horizontally-extending lever, K, fulcrumed on a bracket, L, secured to the top of the cover A′ of the oil-tank A.

The inner end of the lever K is connected with a downwardly-extending rod, N, passing through an aperture, A^2, in the cover A′, reaching to within a short distance of the bottom of the tank A, and being provided at its lower end with a horizontally-extending arm, N′. On the rod N is mounted to travel loosely up and down a float, O, of any approved construction and resting in the oil of the tank, being provided at its top with a filling-opening, O′, through which shot or other like weight can be introduced into the float O or removed from the same to increase or diminish its weight, according to the specific gravity of the oil in which it is used.

On the valve-stem G is secured a staple, P, adapted to engage a hasp, Q, hinged on the bracket C′, and serving to lock said valve-stem G in position.

The operation is as follows: When the tank A is filling with oil, the valve D rests on the seat E in the casing C, thus closing the pipe-line B. The bolt H is then disconnected from its notch G^2 in the valve-stem G, and the valve D is held on the seat E by the spring F. The stem G is locked by the hasp Q engaging the staple P by means of a suitable padlock or other device. When the operator desires to run the oil from the tank A into the pipe-line B, he unlocks the hasp Q, pulls the valve-stem G upward by taking hold of its handle G′, so that the valve D is unseated, and the oil from the tank A may flow through the

pipe-line B. When the valve-stem G is moved into its uppermost position, then the bolt H engages the notch G^2 of the valve-stem G, thus locking the latter in its outermost position, as is plainly shown in Fig. 1. When the tank empties, the float O sinks with the level of the oil in the tank until the level of the oil is near the opening of the pipe-line B into the tank A. The float O then rests on the cross-arm N′ of the rod N, and as soon as more oil flows into the pipe the float O exerts a downward pressure on the rod N, thus actuating the lever K, the outer end of which pulls the rod J upward, so as to impart a swinging motion to the bell-crank lever I, which withdraws the bolt H from the notch G^2 of the valve-stem G. The moment the bolt H is withdrawn the spring F presses the valve D and its stem G downward, and the former is seated on its seat E, thus closing the pipe-line B and preventing a further outflow of oil from the tank A. Thus the automatic operation of the device, as described, not only stops the outflow of the oil from the tank A into the pipe-line B, but it also prevents air from passing through the tank A into the pipe-line B and rendering the vacuum-pumps useless.

I do not limit myself to the special construction shown for connecting the float O with the bolt H. As the specific gravity of the oil is much less than that of water and varies a little in the oil from the different fields of production, it may be necessary to change the form of the float, and to make an air-tight vessel buoyant enough to carry sufficient weight to disengage the bolt H from the valve-stem G.

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

1. The combination, with an oil-tank and a pipe-line connected with the said oil-tank, of a valve located in the said pipe-line, a spring pressing against the said valve, a bolt engaging the stem of the said valve, and a float operating on the said bolt to withdraw it whenever the oil in the tank reaches a low level, substantially as shown and described.

2. The combination, with an oil-tank and a pipe-line connected with the said tank, of a valve located in the said pipe-line, a spring pressing against the said valve, a valve-stem supporting the said valve and provided with a notch, a bolt engaging the notch of the said valve-stem, and a float held in the said tank and operating on the said bolt to withdraw it whenever the oil in the tank reaches a low level, substantially as shown and described.

3. The combination, with a valve located in the pipe-line, of a spring pressing against the said valve, a bolt adapted to engage the stem of the said valve, and a float located in the oil-tank and operating on the said bolt to withdraw it whenever the oil in the tank reaches a low level, substantially as shown and described.

4. The combination, with a float held in the oil-tank, of a rod on which the said float is guided loosely, a cross-arm secured on the lower end of the said rod, a lever connected with the said rod, a bell-crank lever connected with the said lever, a bolt pivotally connected with the said bell-crank lever, a valve-stem having a notch engaged by the said bolt, a valve secured on the said valve-stem and adapted to open and close the pipe-line, and a spring pressing the said valve downward on its seat in the pipe-line, substantially as shown and described.

5. The combination, with a float held in the oil-tank, of a rod on which the said float is guided loosely, a cross-arm secured on the lower end of the said rod, a lever connected with the said rod, a bell-crank lever connected with the said lever, a bolt pivotally connected with the said bell-crank lever, a valve-stem having a notch engaged by the said bolt, a valve secured on the said valve-stem and adapted to open and close the pipe-line, a spring pressing the said valve downward on its seat in the pipe-line, and a lock for locking the said valve-stem in place, substantially as shown and described.

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Witnesses:
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GEO. O. JONES.