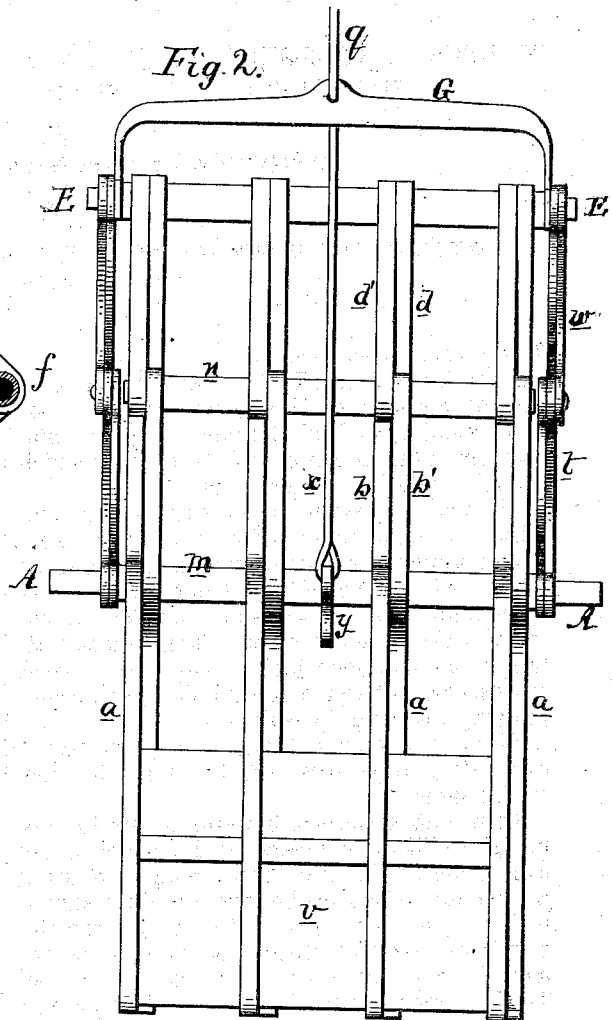
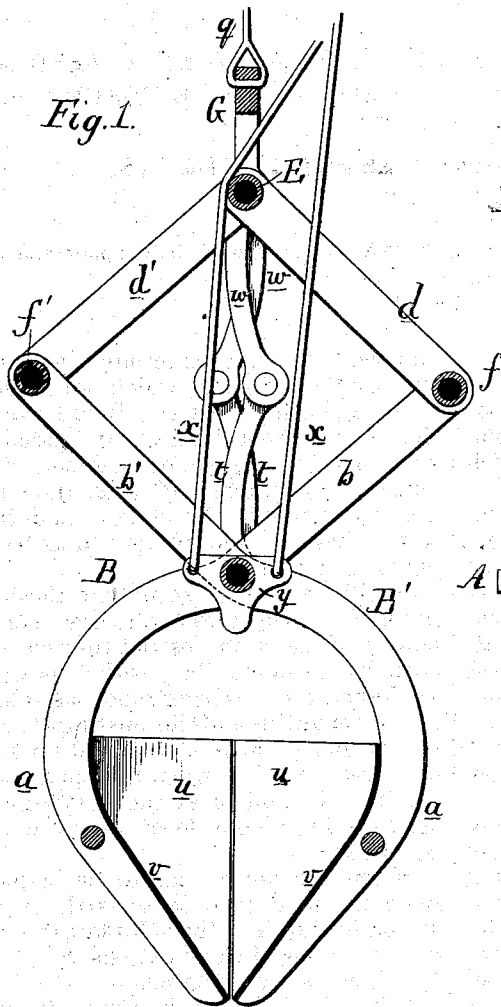


W. J. HOLROYDE.
Grapples for Dredgers.

No. 155,725.

Patented Oct. 6, 1874.



Witnesses.

Harry Smith
Hubert Howson

Walter J. Holroyde
by his Attys
Hewson and Son

UNITED STATES PATENT OFFICE.

WALTER J. HOLROYDE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND FRANKLIN B. COLTON, OF SAME PLACE.

IMPROVEMENT IN GRAPPLES FOR DREDGERS.

Specification forming part of Letters Patent No. **155,725**, dated October 6, 1874; application filed August 26, 1874.

To all whom it may concern:

Be it known that I, WALTER JAMES HOLROYDE, formerly of Worcester, England, but now residing at Philadelphia, Pennsylvania, have invented an Improved Grapple, of which the following is a specification:

The main object of my invention is to simplify the construction of that class of excavating apparatus which consists of jaws to be opened when lowered to the material to be removed, and then closed, so as to seize the material prior to being raised. This object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 is a vertical section of my improved excavating apparatus, and Fig. 2 a side view of the same.

To a central shaft or spindle, A, are loosely hung two sets of levers, B B', which cross each other at the said shaft. The lower arms *a* of these levers are bent to the form shown in Fig. 1, so as to form jaws for seizing the earth, stones, and other materials to be removed from the beds of rivers, canals, &c. To the upper arm *b* of each lever B is jointed a link, *d*, by a shaft, *f*, common to all the links, and to the upper arm *b'* of each lever B' is hinged a similar link, *d'*, by the shaft *f'*, and the upper ends of all these links are connected to a shaft, E, to which is also hinged a bail, G, as shown in Fig. 2. The sets of levers are maintained at a proper distance apart by sleeves *m* on a shaft, A, and by similar sleeves *n* on the shafts *f f'*, there being like sleeves on the shaft E, as distance-pieces between the links. In connection with the above-described apparatus there are two drums, one for hoisting and the other for lowering, the hoisting chain or rope *q* being connected to the bail G,

and the lowering-rope terminating at its lower end in two ropes, *x x*, which are connected to a link, *y*, on the shaft A. In order to prevent the jaws *a* from coming into actual contact with each other, I use on each end of the apparatus the links *t t* and *w w*, the former being connected to the shaft A and the latter to the shaft E, and all four links being connected together.

It will be readily seen that these sets of links, while they permit the free opening and closing of the jaws, restrict the closing of the same by assuming the position shown in Fig. 1. When the lowering-rope has sole control of the apparatus and the hoisting-rope is loose, the weight of the links *d d'* and arms *b b'* will open the jaws; but when the apparatus is under the sole control of the hoisting-rope and the lowering-rope is loose, then the jaws will be closed.

When the device has to be employed for removing sand, mud, loose earth, or gravel, I attach to the jaws the sideplates *v v* and end plates *u u*, for obvious reasons.

I claim as my invention—

1. The combination, in a grapple, of the levers B B', connected to the shaft A, links *d d'*, hoisting-rope *q*, attached to said links, and lowering-rope *x*, secured to the shaft A, all as set forth.

2. The combination of the system of levers B B', shaft A, and links *d d'* and shaft E, with the links *t t* and *w w*.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WALTER J. HOLROYDE.

Witnesses:

WM. A. STEEL,
HUBERT HOWSON.