

I carry the object of my invention into effect by making a hull somewhat similar to those at present in use, but I construct therein a well passing through the hull. Above this well I erect a staging which supports guide-rods extending above and below the hull. Suitable guys steady and support the guide-rods, and the depth of the same may be varied to suit the depth at which it is required to work. The guide-rods are connected together at their ends, and stiffened by cross-rods. The bucket is secured to a vertical and hollow shaft, and revolves with the same within brackets provided with friction-wheels, which are flanged to roll upon the aforesaid guide-rods.

The bucket is made cylindrical in shape, and has its bottom provided with hinged flaps which may fall down to form a cutting edge, and with a screw-like action may scoop up material into the bucket. When the bucket is loaded, the flaps are closed by means of a shaft which passes down to the bucket through the hollow shaft before mentioned. A crank handle is used at the top of this inner shaft to revolve the same, and by means of a screw-thread formed upon the lower extremity, the said shaft engages with a nut and links which are connected to the flaps. This said nut is of peculiar construction, being made in two halves, which may be held to their work by a strap, but when this strap is lowered the two halves of the nut will separate under the action of suitable springs and thus be disengaged from the shaft.

The flaps being closed, the bucket is raised by means of a chain passing to a winch over a pulley attached to the staging, when the nut is liberated and the material allowed to fall through the flaps at the bottom of the bucket into a chute, and over the side of the vessel into an ordinary punt.

The bucket is revolved by means of a chain passing from the winch to a pulley, and bevel wheels, connected to the upper end of the hollow shaft.

In order that my invention may be most easily understood, I will now proceed to describe the same in detail, and shall for that purpose refer to the accompanying drawings, whereon Figure 1 is a side-elevation of my dredge showing the bucket lowered. Figure 2 is a plan of the same. Figure 3 is a vertical section of the bucket with its bracket. Figure 4 is a vertical elevation of the same. Figure 5 is a plan of the same. Figure 6 is a side-view of the bevel gearing, and bracket. Figure 7 is a plan of the same. Figure 8 is a side-view of the nut and attachments. Figure 9 is a plan of the same. Figure 10 is a side-view of the same. Figure 11 is a side-view of a square driving-shaft and spur gearing. Figure 12 is a view of a spliced shaft.

Referring to these views, a is the hull, having a well a^1 , and a staging a^2 , which supports the guide-rods b ; ordinary railway rails are admirably suitable for making these rods b . Guys b^1 steady and support the guide-rods above and below the hull. The weight of the rods is taken upon chain b^2 , one of which is provided on each side, and being secured to the bottom of the rods, pass over pulleys b^3 , which are secured to the staging a^2 , and thence to the winch c by means of pulleys b^4 . When being raised by means of these pulleys and ropes, the rods b slide within brackets a^3 , Figure 5, fixed to the staging. The bucket d is secured to shaft d^1 , and revolves with the same, within brackets d^2 , and J^6 provided with friction-wheels d^3 , which roll upon guide-rods b . The shape of the bucket is cylindrical, but its bottom is formed as shown in Figures 1, 3, and 4, and is provided with hinged flaps d^4 , which, when let down and revolving in the direction shown by the arrow on Figure 5, cut into the material to be lifted and raise it into the bucket. As the material rises upon the flaps it is guided by guard plate d^5 on to the fixed portion d^6 of the bottom of the bucket, and into the interior of the same. When the bucket is loaded, the flaps are closed by turning the crank-handle d^5 , which will revolve shaft f , and draw up nut f^1 and links f^2 , which are connected to the flaps. Nut f^1 is of special construction, as may be seen by reference to Figures 8, 9, and 10, where it is shown on a large scale. The nut proper is made in two halves f^1 , screw-threaded on the inside, and having a wedge shape on the outside. The nut fits freely within a framing f^{10} , and springs f^3 tend to separate the two halves of the nut and disengage them from the screw-thread of the shaft f . A strap f^4 passes around the nut, and when forced up the wedge-shaped faces force the halves of the nut into position upon the shaft. The strap is held in place by an eye-bolt f^9 , which is hinged to the strap by pin f^5 . Nuts f^6 rest upon a bracket f^7 secured to frame f^{10} , and a pin f^8 prevents the eye-bolt from disengaging. As the various parts wear, the nuts f^6 may be correspondingly adjusted.

Flaps d^4 being closed, the bucket is raised by means of wire-rope or chain g attached to bucket bracket d^2 , and passing over pulley g to winch c . Strap f^4 is then released to liberate the two halves of the nut f^1 and allow the flaps d^4 to fall. The material will fall through chute h into an ordinary punt.

The bucket is revolved by means of a chain J , passing from the winch by guide-pulleys J^1 to pulley J^2 . A bevel-wheel J^3 is secured to pulley J^2 , and gears with a large bevel-wheel J^4 , which is secured to the upper end of hollow shaft d^1 . Pulley J^2 and wheel J^3 are carried upon a bracket J^5 , built up upon bracket J^6 , which carries the upper end of hollow shaft d^1 .

To raise the bucket, chain J is lifted off pulley J^2 , when the bucket, shafts, d^1 and f , and brackets d^2 and J^6 , will be free to rise bodily.

On Figure 11 I have shown a spur-wheel K in place of the large bevel-wheel J^4 , and a pinion K^1 in place of the small bevel-wheel J^3 , and a square vertical shaft K^2 in place of chain J . By this arrangement the necessity of removing the chain J in order to lift the bucket is obviated, as the shaft is driven by any suitable motor, gearing with spur-wheel K^3 , which being secured to the shaft near the deck, may revolve within a bracket K^4 , and pinion K^1 may slide upon the shaft K^2 whilst it is free to revolve within its bracket K^5 carried upon bracket J^6 .

The upper end of the shaft may be pivoted at K^6 to revolve in any suitable bearing K^7 bolted to the staging a^2 . It is obvious that I may use a circular shaft in place of the square one, and groove the same to engage with a feather secured in the pinion K^1 .

Shafts d^1 and f may be spliced to suit the depth to be dredged, and for this purpose I provide couplings I , consisting of flanges secured to sections of the shaft d^1 , and bolted together by bolts