

XLIII. Description of an improved crane for wharfs

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XLIII. Description of an improved Crane for Wharfs. By Mr. ROBERT HALL junior, of Basford, near Nottingham.

FORTY guineas were voted to Mr. Hall, by the Society for the Encouragement of Arts, &c., for his ingenious invention of a method to *expand a set of bars parallel to the axis of a crane*, by which means the velocity of the rope in raising weights may be increased or diminished in proportion to the load to be raised.

A description and engraving of this crane are given in the twelfth volume of the Society's Transactions, from which we have drawn up the following account of it:

The ends of the reel (fig. 1 and 5, Plate IV.) consist each of two flat plates or circular pieces, shown separately in fig. 2 and 3. These circular plates form the two ends of the reel, and are held fast on the spindle or axis by pins passed through its ends, of which one may be seen at *a*, fig. 2, and another in the end shown in fig. 5. The outer circular plate (fig. 3.) of each end of the reel has a spiral groove cut in it, as shown at *b*, and the inner circles have each eight mortices cut quite through them, as shown at *c*, fig. 2. (seen partly also in fig. 1 and 5.) The outer plates have also an iron tube, *d*, made fast to them by means of a flange or collar, and the screws, *ee*, fig. 2.

When the parts are all joined, (as shown in fig. 1.) the axis *f* passes through the tube *d*, and thus the ends are connected. In fixing the cross bars, two of which are shown detached in fig. 4, the parts *g, g* slide in the mortices *c* of the inner circular plates, and the small ends or tenons *h, h* go fairly through the inner and enter the spiral grooves of the outer plates.

The inner and outer circular plates are locked together by a catch (*i*, fig. 1, 2, and 6.) the stationary part of which is made fast to the inner plate (see fig. 2), while the catch itself, by means of a spring, is kept in a notch on the edge of the outer plate. When the diameter of the reel is to be enlarged or diminished, it is effected by bringing the reel round to the position shown in fig. 6, when a hook, *k*, is put into a hole, *l*, which keeps the inner circular plate in that position till the adjustment is made by lifting the catch from the notch of the outer end-plate far enough to be kept disengaged by the hook *k*, before mentioned, being thrust quite through the hole *l*: the handle *m* being then turned, the outer plate only is carried round, and the tenons or small ends of the cross bars (being prevented from being carried

Fig. 3.

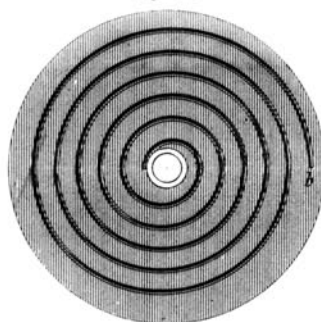


Fig. 2.

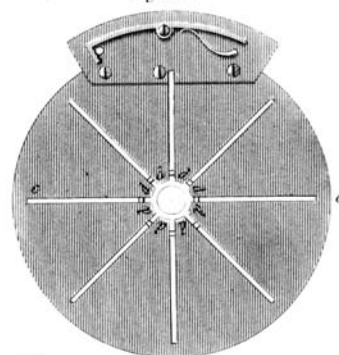


Fig. 1.

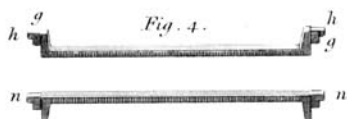
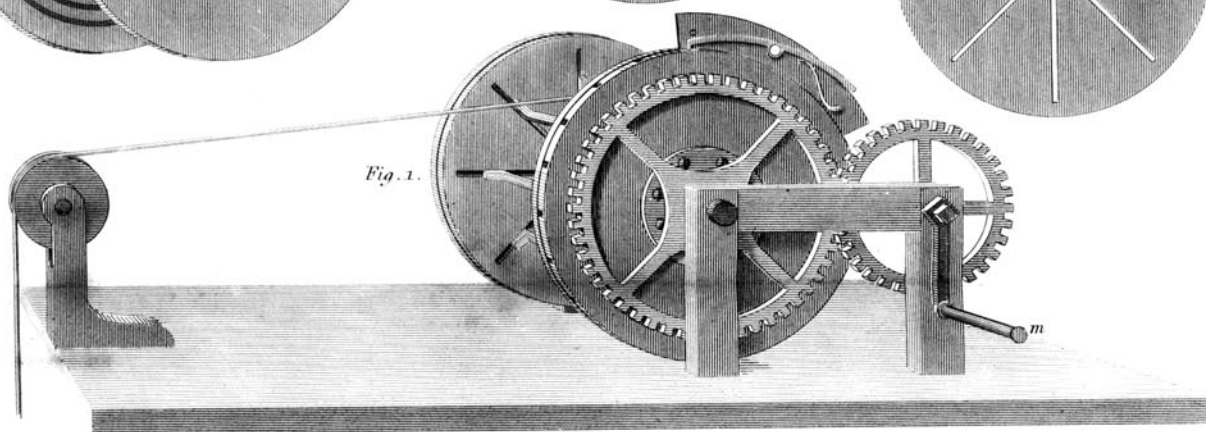
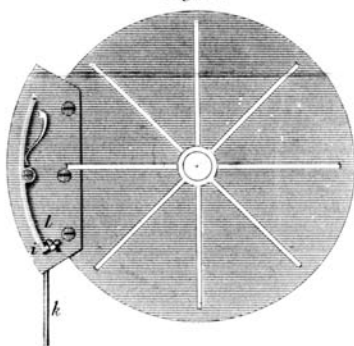
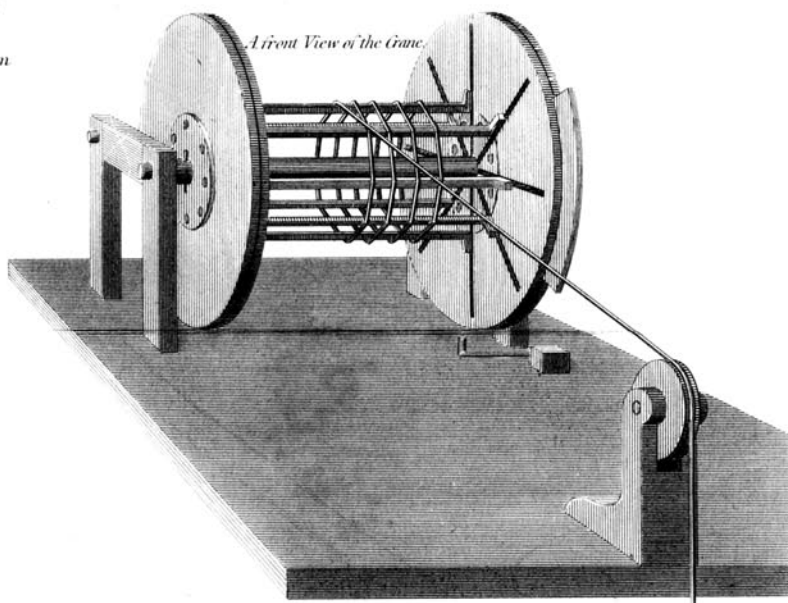


Fig. 6.



A front View of the Grane.



carried round with it, by the mortices of the inner plates through which they pass being stationary) are obliged to change their distance from the axis by the spiral groove sliding over them, while they are able to move nearer or further from the axis by sliding in the radial mortices of the inner end-plate.

The handle *m* being turned till the reel is of the size required, the hook *h* is withdrawn or pushed out, and the crane is then ready for work.

It is necessary to observe that the tenons *h, h* must be cut, so that the outside of all the bars next the rope shall be at an equal distance from the centre. If the tenon of the first bar that is placed in the reel be cut like the tenons *h, h*, fig. 4, the last of them must be cut the same as the tenons *n, n*, fig. 4; and all the other tenons, at the extremities of the several bars, must be at proper distances between these extremes, as is shown by the dots *P* in the mortices fig. 2.

The other parts of the crane may be so easily understood from an inspection of the engraving, that any further description is unnecessary.

XLIV. *Description of an improved Bucket for drawing Water out of deep Wells.* By Mr. GEORGE RUSSEL*.

THE silver medal of the Society for the Encouragement of Arts, &c., was voted to Mr. Butler for this invention, of which a model is reserved in the society's repository for the use of the public. The following is Mr. Butler's account of the improvement:

"My well at Downe, in Kent, is about 360 feet deep, and is worked by two buckets and a horse-wheel, each bucket holding little less than a barrel; and are the same sort of buckets, with the same mode of emptying, as at Dorking, Dover, Hasted, and all the deep wells I have met with.

"The great weight of iron on those buckets, to make them sink immediately on descending to the water, being observed, together with the heavy flat iron chain by which they are hung to the rope; and which, passing over a flat-grooved wheel above, brings the face of the buckets properly to the cistern-catch, suggested the following idea:

"A valve of five inches diameter was put into the lower

* From the *Transactions of the Society for the Encouragement of Arts, Manufactures, and Commerce*, vol. xii.