

(No Model.)

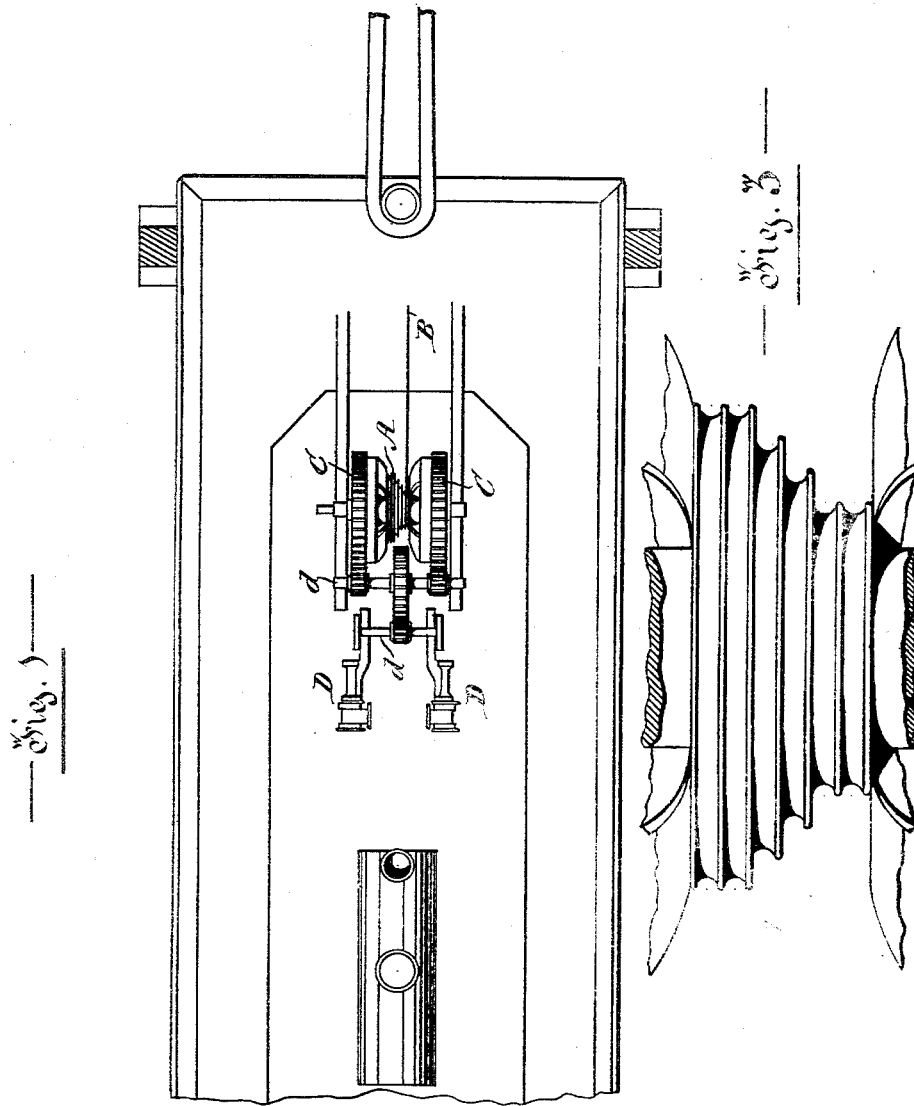
3 Sheets—Sheet 1.

J. KENNEDY.

MECHANISM FOR OPERATING BOOM DIPPER DREDGES.

No. 453,724.

Patented June 9, 1891.



Witnesses

*Wm. P. McFeat.*  
*Fred. Sears*

Inventor

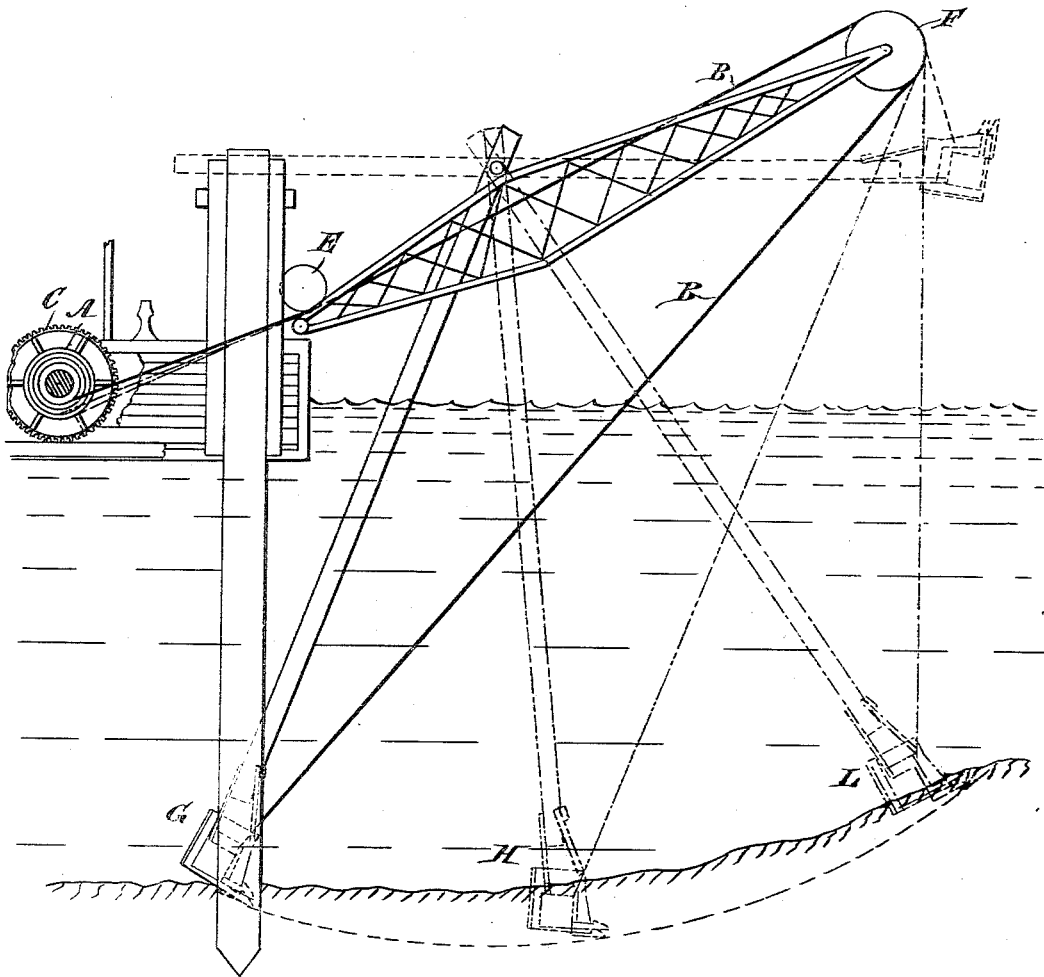
*John Kennedy*  
By *his* Attorney  
*Wm. H. Perdue*

(No Model.)

3 Sheets—Sheet 2.

J. KENNEDY.  
MECHANISM FOR OPERATING BOOM DIPPER DREDGES.  
No. 453,724.  
Patented June 9, 1891.

— Fig. 2 —



Witnesses  
Will. P. McFeat.  
Fred. Sears.

Inventor  
John Kennedy  
By his Attorney  
Hart & Keister

(No Model.)

3 Sheets—Sheet 3.

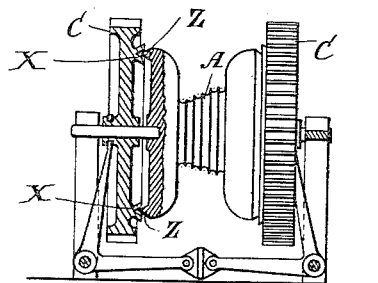
J. KENNEDY.

MECHANISM FOR OPERATING BOOM DIPPER DREDGES.

No. 453,724.

Patented June 9, 1891.

Fig. 4.



Witnesses

*W. H. P. Felt*  
*Fred. Sears*

Inventor

*John Kennedy*  
By *his* Attorney  
*David F. Taylor*

# UNITED STATES PATENT OFFICE.

JOHN KENNEDY, OF MONTREAL, CANADA.

## MECHANISM FOR OPERATING BOOM-DIPPER DREDGES.

SPECIFICATION forming part of Letters Patent No. 453,724, dated June 9, 1891.

Application filed August 8, 1890. Serial No. 361,427. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN KENNEDY, of the city of Montreal, in the district of Montreal and Province of Quebec, Canada, have invented certain new and useful Improvements in the Machinery of Boom-Dipper Dredges; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention has reference to the mechanism for lowering, holding, and raising the buckets of dredges, and is specially adapted to dredges working at great depth; but it is also applicable to excavators working on land. It may be briefly described as consisting in making the main drum conical for the whole or a considerable portion of its length, the wire rope or chain (by which the dipper is suspended) being secured thereto at any point of the least diameter. This drum will be connected by friction-clutches with double operating-gearing driven from suitable engines.

For full comprehension, however, of the invention reference must be had to the accompanying diagrams, forming part of this specification, in which—

Figure 1 is a part view of the deck of a dredge, showing the main engines, &c.; Fig. 2, a side diagrammatic view of boom, &c., showing bucket at lowest point; Fig. 3, a detail view of drum, and Fig. 4 a diagram of frictional clutch connection.

Like symbols indicate the same parts.

A is the main drum, conical or partly conical in shape, as shown, grooved to receive the wire rope B, secured to it at some part of its least diameter.

C C are double gear-wheels arranged at the ends of the barrel, and connected therewith by friction-clutches, preferably worked by steam-cylinders operated by levers under the control of the engineer. These friction-clutches may be of any type ordinarily employed in dredges; but I prefer the "cone-clutches" shown in Fig. 4, in which the double gear-wheels can be moved along the axle (on which they, together with the conical drum A, are loosely mounted) by means of levers, so as to bring the conical surface X, projecting from the side of the spur-wheel, in contact with the corresponding return-surface Z of the

drum. The wheels are driven from cylinders D D, acting through transverse shafts *d d* and suitable spur-and-pinion gearing, to give the speed desired. The wire rope B, by preference, passes at the dredge end of the boom or crane under a sheave E and at the outer end over a sheave F.

The construction of the boom or crane, dipper or bucket and arm, and of the swinging mechanism differ in no way from the now existing approved types and form no part of the invention.

The drum A may be entirely conical; but it is preferably made with only the central part conical and with the two ends parallel, or nearly so, in order to act as follows: The parallel part of the small end winds in the rope or chain while the bucket is moving from the point G to the point H, (what may be termed the "entering cut,") during which the angle at which the rope acts upon the bucket is increasing, and the digging power of the bucket is therefore increasing, until the full power which the dredge is designed to have is attained at H. The next part of the drum is made conical and of rapidly-increasing diameter, the effect of this being that while the bucket is drawn from H to I and the angle at which the rope draws the bucket is still further increased the digging power of the bucket is kept approximately uniform, instead of being dangerously increased, as in ordinary dredges. The last part of the drum is made parallel and of large diameter, so that after the bucket has finished digging it may be rapidly raised to the full height desired without increasing the speed of the hoisting-engine.

In order to drive the drum, which is thus larger than usual, it is preferably provided with a friction-clutch at each end, which clutches are separately driven by one of the gear-wheels C C. For large dredges and where great power is required the drum is also driven with double-powered gearing by the introduction of the intermediate shaft *d* and the gear-wheels thereon, as shown. It will thus be seen that by the operation of the apparatus above described the working strains on the machinery and dredge are equalized and the

bucket moved rapidly when it is so desired and that thus the rate of speed of dredging is increased and the wear and tear reduced.

What I claim is as follows:

- 5 1. In a dredging or excavating machine, the combination of a graduated hoisting-drum operated by an engine, intermediate connecting mechanism, a boom or crane supporting a dipper-handle carrying a dipper, and a hoisting-cable connected to and wound upon said drum and passing over a sheave carried at upper end of boom and attached to dipper, all as herein set forth.

2. In a dredging or excavating machine, the

combination of a graduated hoisting-drum operated directly from a double engine, intermediate connecting mechanism, friction-clutches for throwing same in and out of gear, a boom or crane supporting a dipper-handle carrying a dipper, and a hoisting-cable connected to and wound upon said drum and passing respectively under and over drums E and F at inner and outer ends of boom and attached to dipper, all as herein set forth. 15 20

JOHN KENNEDY.

Witnesses:

W. DE M. MARLER,  
MATTIE S. DIRKHAM.