(No Model.)

A. L. GRINNELL.

CAPSTAN AND APPARATUS FOR PLOWING.

No. 509,028. Patented Nov. 21, 1893.

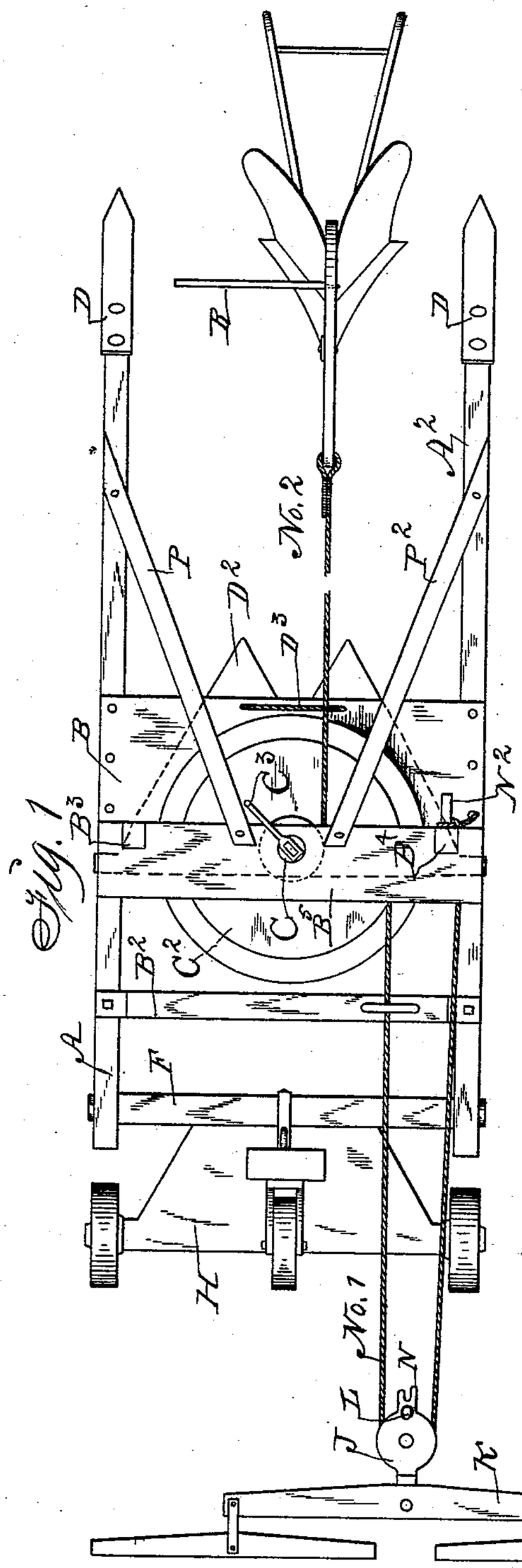

Fig. 1

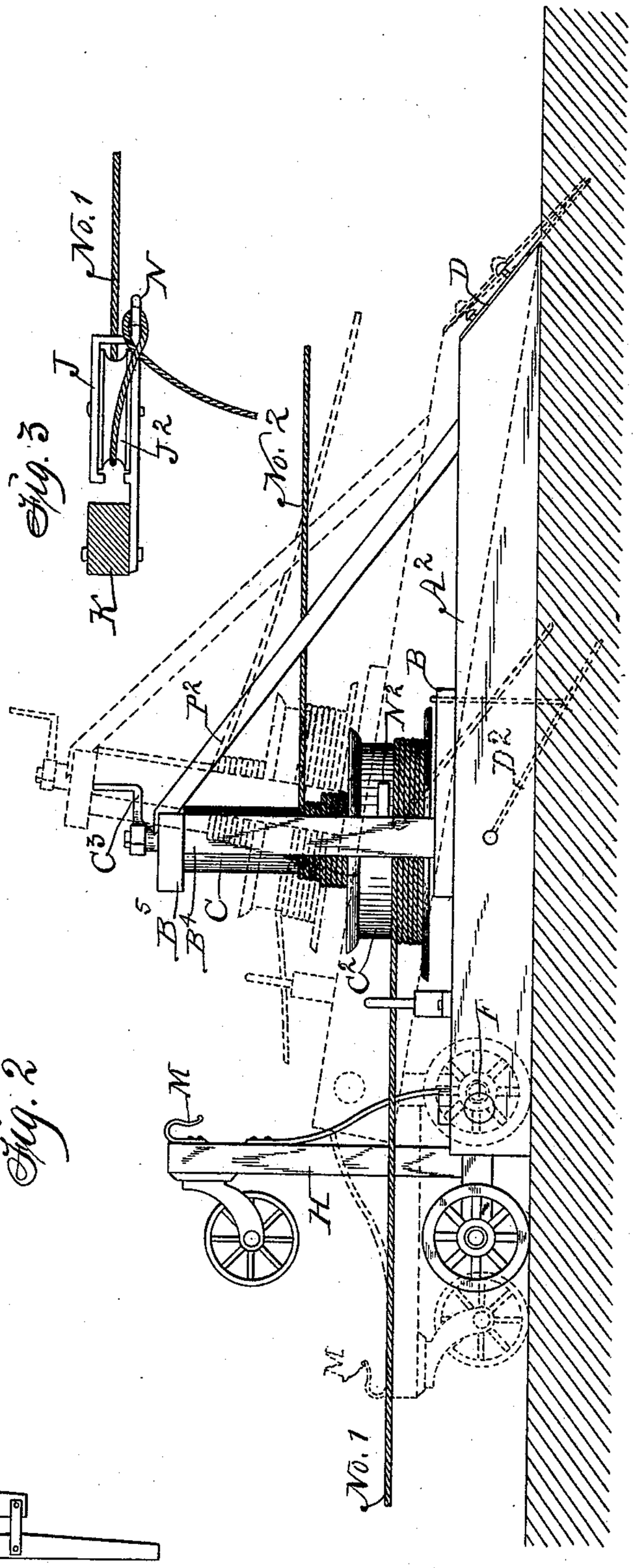

Fig. 3

Fig. 2

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CAPSTAN AND APPARATUS FOR PLOWING.

SPECIFICATION forming part of Letters Patent No. 509,028, dated November 21, 1893.

Application filed December 8, 1892. Serial No. 454,435. (No model.)

To all whom it may concern:

Be it known that I, AMOS L. GRINNELL, a citizen of the United States of America, residing at Campbell, in the county of Polk and State of Iowa, have invented a new and useful Capstan and Apparatus for Plowing, of which the following is a specification.

My object is to facilitate the operation of a plow as required to cut the roots of shrubbery and break up hard ground and prepare it for farming purposes.

My invention consists in the construction, arrangement, combination and operation of a capstan, a truck, tackling, a plow and means for hitching horses to the truck and also to the tackling, as hereinafter set forth, pointed out in my claims and illustrated in the accompanying drawings, in which—

Figure 1 is a top view of my complete apparatus in position as required to operate a plow. Fig. 2 is a side view in which dotted lines indicate the position of the truck and the capstan when the capstan is elevated as required to be moved about by means of the truck. Fig. 3 is an enlarged detail view of a hitching device for a rope as required to advance the plow in ground where less power is required to move the plow.

A and A^2 are the parallel side pieces of the oblong frame and base of a capstan. They are rigidly connected by means of cross-pieces B and B^2.

B^3 and B^4 are the parallel posts of an auxiliary frame fixed on top of the base to support a spindle and drum. The spindle C has a bearing formed in or fixed to the cross piece B^5 at the tops of the parts B^3 and B^4 and rests in a step formed in or fixed to the deck or cross piece B fixed on top of the side pieces A and A^2.

C^2 is a drum fixed to the lower portion of the spindle C.

C^3 is a crank handle at the top of the spindle for manually operating the spindle and drum as required for winding ropes thereon.

The rear ends of the side pieces A and A^2 are inclined and pointed metal plates D attached thereto in such a manner that a rearward motion of the capstan will cause them to enter the ground and to serve as a means of anchoring and holding the capstan stationary. These plates are also self-adjusting so that in a forward movement of the capstan they will slide over the top of the ground.

D^2 is an auxiliary anchor device in the form of a metal plate that is pivotally connected with the side pieces of the base in such a manner that the points at its free end will enter the ground when the capstan moves rearward and slide on top of the ground when it moves forward.

D^3 represents a rope or chain connected with the anchor D^2 and the cross piece B in such a manner that it will restrict the descent and inclination of the anchor D^2.

F is a cross bar that has journals on its ends that engage bearings formed in or fixed to the front ends of the side pieces A and A^2 of the capstan.

H represents a three-wheeled truck that is pivotally connected at its rear end with the cross bar F in such a manner that its three wheels can rest upon and advance upon the ground and at the same time support the front end of the capstan elevated, as indicated by dotted lines in Fig. 2, and also in such a manner that the front end of the truck can project upward as required to allow the base of the capstan to rest its entire length upon the ground. The front wheel of the truck has a swiveled connection with the frame and is adapted to serve as a caster wheel in moving the truck and capstan.

J is a pulley bearer and a part of the tackling and K is a double tree pivoted to the front end of the bearer. An opening L in the rear end of the pulley bearer J is adapted to admit a hook M on the front end of the truck to connect the bearer and double tree direct with the truck as required to move the truck and capstan forward and from place to place.

N is the bifurcated rear extremity of the bearer J adapted to serve as a cleat for attaching a rope thereto as shown in Fig. 3.

N^2 represents a cleat at the side and central portion of the capstan for attaching the end of a rope thereto as shown in Fig. 1.

No. 1 is a rope attached to the drum C^2 and coiled thereon and its free end extended forward and over a pulley, J^2, in the bearer J and then attached to the cleat N, as shown in Fig. 1, when a plow is to be advanced slowly in hard ground or through roots.

No. 2 is a rope attached to the spindle C and coiled thereon and its free end portion extended rearward and attached to a plow as required to operate the plow by means of the capstan.

In the practical use of my invention, when the apparatus is in position as shown in Fig. 1, I hitch horses or oxen to the double tree and advance them so that their power will be applied by means of the pulley J^2, and rope No. 1 to rotate the drum and spindle and wind the rope No. 2 upon the spindle as required to draw the plow toward the capstan through the ground that is to be broken up by the advance of the plow. The rope being double the joint motion of the drum and spindle is increased relative to the motion of the force applied to the rope and that power applied to the drum also increased in accordance with the diminished speed of the animals: or in other words when the animals advance one foot two feet of the rope No. 1 will be unwound from the drum and the length of the rope No. 2 wound upon the spindle will be governed by the difference between the diameter of the spindle and the diameter of the drum and the power applied to the plow increased and the speed of its forward motion diminished accordingly. By detaching the rope No. 1 from the cleat N^2 and fastening it to the cleat N and pulley bearer J the speed of the animals hitched thereto will be increased but the draft force will be diminished.

P and P^2 are braces fixed to the side pieces A and A^2 and the cross piece on the top of the posts B^3 and B^4.

R is a lever detachably connected with the plow as a means for steadying the plow as it is advanced.

I claim as my invention—

1. A portable capstan comprising an oblong frame and base adapted to rest upon and to be fastened to the surface of the ground as required to prevent a rearward motion, an auxiliary frame fixed to the said base to project vertically, a spindle supported in a vertical position in the auxiliary frame, a drum fixed to the spindle, a cross-bar journaled to the front end portion of the base, a truck pivotally connected with the said cross bar and adapted to elevate the front end of the capstan; all arranged and combined to operate in the manner set forth for the purposes stated.

2. An apparatus for operating a plow, comprising a capstan having a spindle and a drum, means for fastening the base of the capstan to the ground to prevent rearward motion, a truck pivotally connected with the front portion of the capstan and adapted to elevate the front end of the capstan in the manner set forth, a pulley bearer having a double tree pivoted to its front end, a rope fixed to the drum and connected with said pulley bearer, and a rope connected with the spindle and adapted to be attached to a plow; all arranged and combined to operate in the manner set forth for the purposes stated.

3. The capstan frame carrying the drum C^2 and having the fixed cleat N^2, the truck H pivotally connected with the capstan frame and provided with a hook M at its front end, the pulley bearer J having a bifurcated and perforated rear extension N, a doubletree pivoted to the front end of the said bearer, a rope fixed to the drum C^2 and extended over a pulley in the bearer J, arranged and combined to operate in the manner set forth for the purposes stated.

AMOS L. GRINNELL.

Witnesses:
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