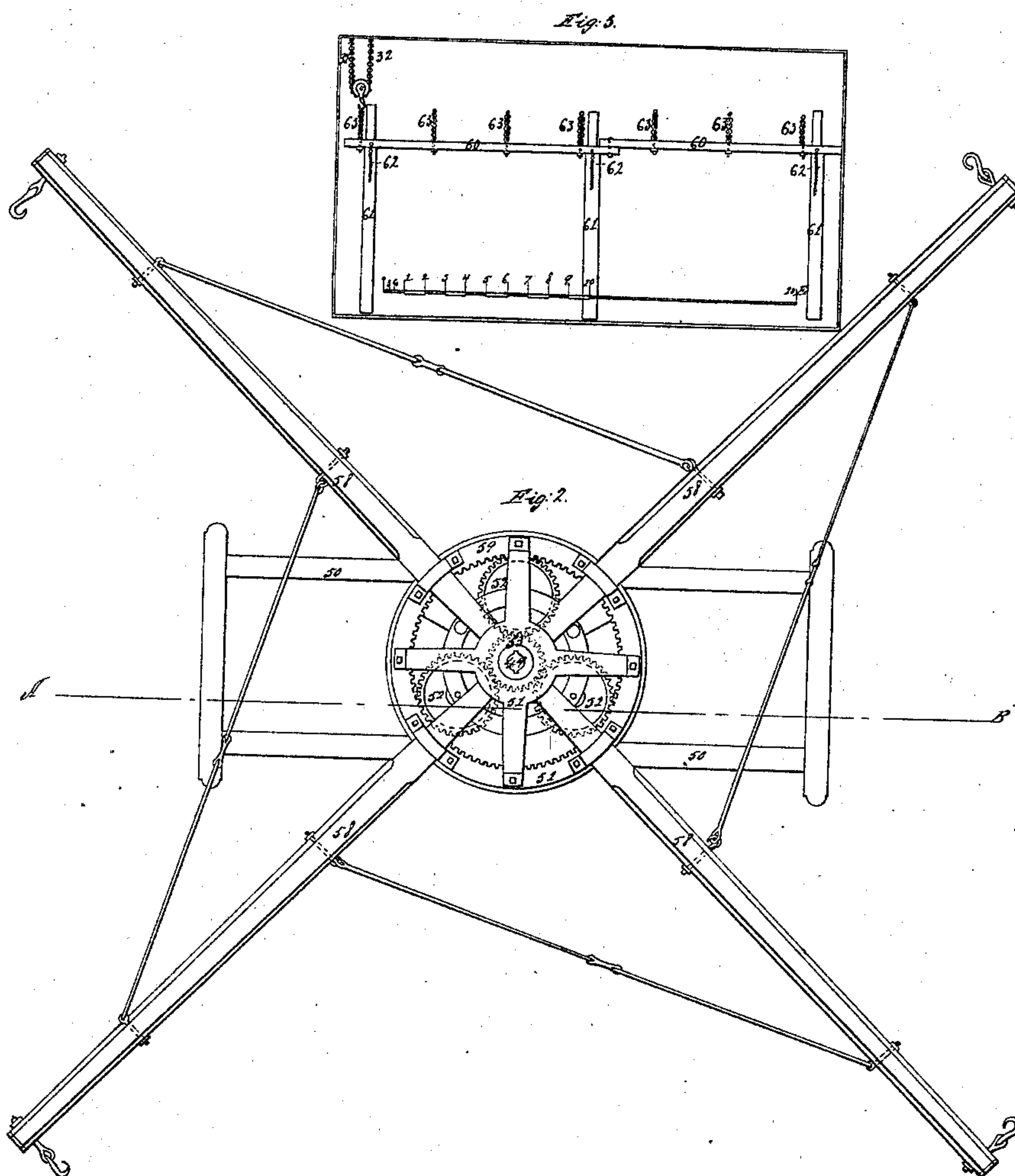
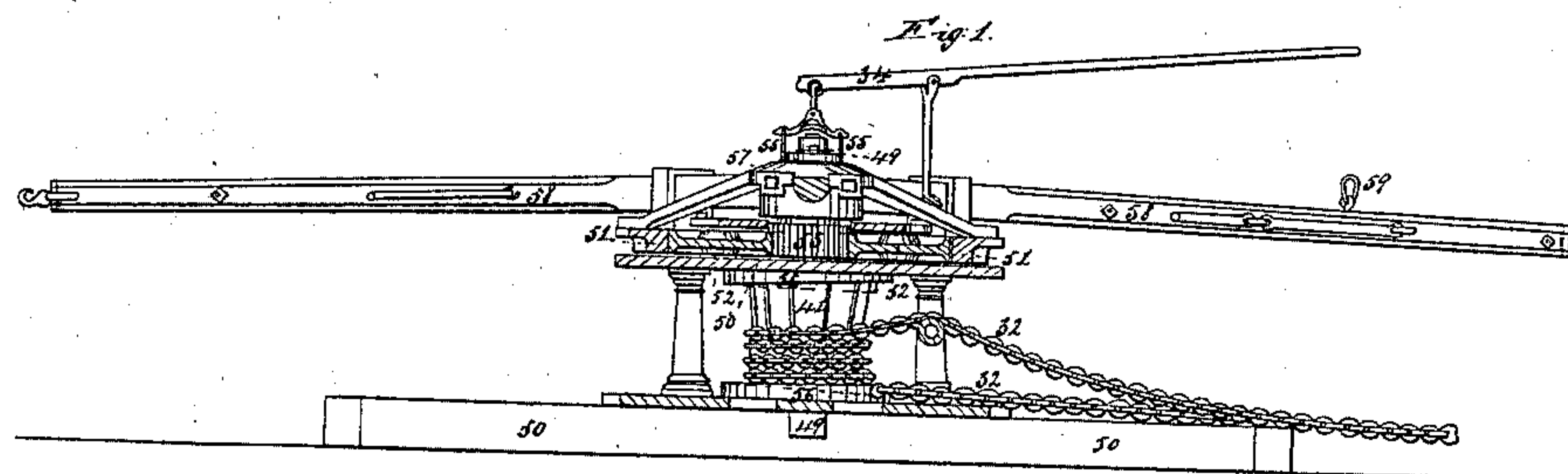


Ellis & Gordon,

Capstan.

N^o 11,156.

Patented June 27, 1854.



UNITED STATES PATENT OFFICE.

J. A. H. ELLIS AND ALEX. GORDON, OF ROCHESTER, NEW YORK.

REVERSIBLE CAPSTAN.

Specification of Letters Patent No. 11,156, dated June 27, 1854.

To all whom it may concern:

Be it known that we, JOEL A. H. ELLIS and ALEXANDER GORDON, both of the city of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Reversible Capstans; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part thereof, in which—

Figure 1, represents a side elevation, and Fig. 2, represents a top plan.

Similar characters in both the figures denote corresponding parts.

The nature of our invention consists in combining with the capstan, a shifting spur wheel connected to the shaft of the capstan by feathers, and operated by a lever or its equivalent, for the purpose of reversing the direction of the barrel of the capstan, without reversing the direction of the sweeps, and giving said capstan an increased backward motion over that of its forward motion.

To enable others skilled in the art to make and use our invention, we will proceed to describe the same with reference to the drawings.

The capstan is made similar to those in common use, and operated by any power, though herein represented as operated by horses, it being so arranged as to let off the chain from one end of the drum as fast as it winds on at the other, and capable of having its motion reversed by means of gearing, so as to run in an opposite direction while the horses travel constantly in the same direction, and thus draw in on the opposite end of the chain and discharge slack chain from the opposite end of the capstan drum, thus drawing the machine or thing to which the chain is attached either backward or forward, though at different velocities and with power in accordance with the velocities.

The main shaft 49 of the capstan, is properly supported in the frame 50, 50, and on said shaft the drum or barrel of the capstan is firmly keyed; 51, 51, is a large internal gear wheel, the center of which revolves loosely around the main shaft, except when held by a clutch, and 52, 52, 52, are three gear wheels, placed at equal distances from each other inside of the internal gear wheel 51, and meshing into it; they also all mesh with the pinion 53, which is connected with

the main shaft, by means of feathers projecting from the shaft, which causes the shaft to revolve with said pinion. This pinion 53, is drawn up and down on the shaft by means of the lever 54, (Fig. 1,) which is attached to the pinion by the connecting rods 55, 55. When this pinion is drawn up on the shaft it slides into a suitable recess cast on the underside of the hub of the internal gear wheel 51. This recess has cogs on its inside surface, corresponding in size and shape with the spaces between the cogs of the pinion, so that when the pinion is in the recess it is turned in the same direction that the sweep wheel is turning, and with the same number of revolutions, and drives the main shaft and capstan drum with it. When the pinion is dropped down into gear with the three intermediate gear wheels 52, 52, 52, the direction in which it turns is then reversed, and its speed increased to four revolutions, to one of the sweep wheel. Thus, an excavator or large plow (for which the capstan is at present used) may be drawn forward and operated on a slow motion with the full power of the capstan, and drawn back without resistance, at a considerably increased speed by merely shifting the lever 54. The machine may be usefully employed in raising heavy bodies from quarries, coal drifts, or for any purpose where the power is required in one direction, and the speed in the opposite direction.

Two spiral wedges 56, 56, are permanently attached to the frame of the capstan—one at each end of the capstan barrel, and placed in such a manner as to completely encircle it. The draft chain commences winding upon this barrel, at or near the place where the point or edge of the wedge is fixed—the chain being carried around by the barrel as it revolves, slides on the surface of the cam wedge, and is continually crowded in toward the center of the barrel, by the action of the wedge upon it. The throw of the wedge is just sufficient to crowd the second coil of chain entirely out of the way of the first.

A roller 57 passes horizontally across the frame of the capstan, near the upper end of the barrel, in such manner as to support the upper part of the chain, so that the slack chain which is continually being discharged from the upper end of the capstan barrel when the machine is being drawn forward, will be drawn out over the roller

by its own weight, and thus prevent the upper coils of chain on the capstan barrel from getting loose so as to fall down and become entangled with those below, and thus prevent the chain from unwinding freely. The motion of the capstan barrel is reversed to draw the thing, operated by it, back, and the chain winds upon the upper end of the capstan barrel. The roller 57, supports the upper chain, and keeps it up, so that it commences winding upon the barrel at or near the point of the upper wedge 56, and prevents it from winding down over the coils below.

58, 58, are the sweeps to which the team is hitched, but when other power is applied, of course other suitable means of applying it, may be used. An eye and ring 59, is fastened to one of the sweeps in such a position that the ring can be slipped over the end of the lever 54, when it is brought down, and retain it in that position.

When this capstan is used for working an excavator we use an anchor such as is represented at Fig. 3, which should extend entirely across the bed of earth to be excavated. It should be sunk below the surface of the ground, to give it the necessary

firmness, and allow the carts or wagons which receive the earth from the excavator to move around over it. It should be further provided with chains 63, 63, &c., to which the pulley, over which the main chain runs, can be fastened, as the machine is moved across the bed of earth, to remove it by longitudinal sections—the front part of the machine being guided by snatching the main chain to one side or the other of its direct movement.

Having thus fully described the nature of our invention, what we claim therein as new and desire to secure by Letters Patent is,

The shifting spur wheel 53, connected to the shaft of the capstan by feathers, and operated by a lever 54, or its equivalent, for the purpose of reversing the direction of the barrel of the capstan, without reversing the direction of the sweeps, and giving said capstan an increased backward motion, substantially as described.

J. A. H. ELLIS.
A. GORDON.

Witnesses:

A. B. STOUGHTON,
SAM'L GRUBB.