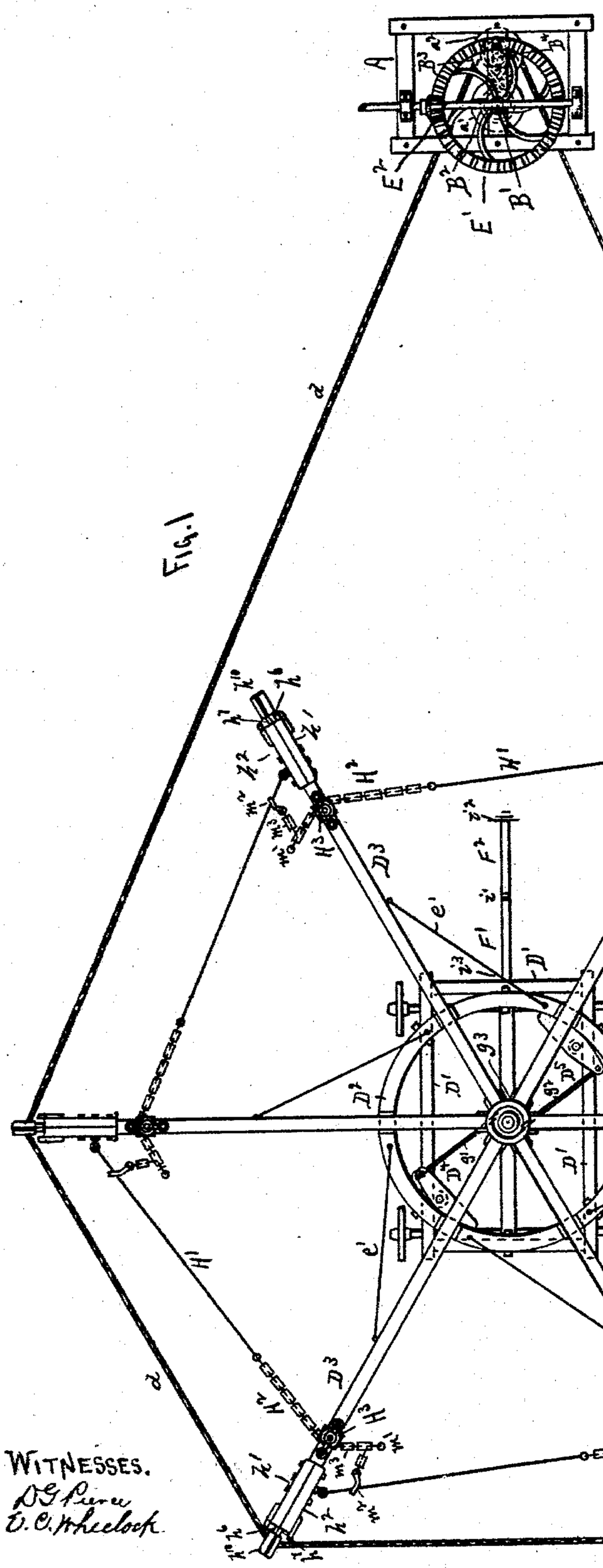
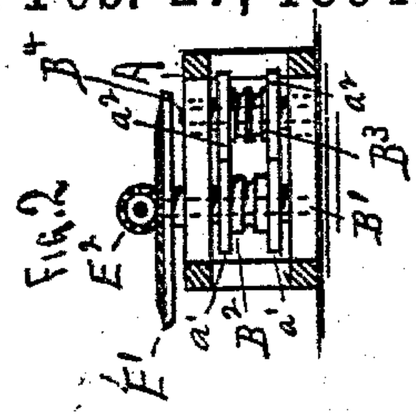
(No Model.) 2 Sheets—Sheet 1.

# J. H. WATTS.

## ROPE OR CABLE SYSTEM FOR OPERATING MACHINERY.

No. 515,416. Patented Feb. 27, 1894.





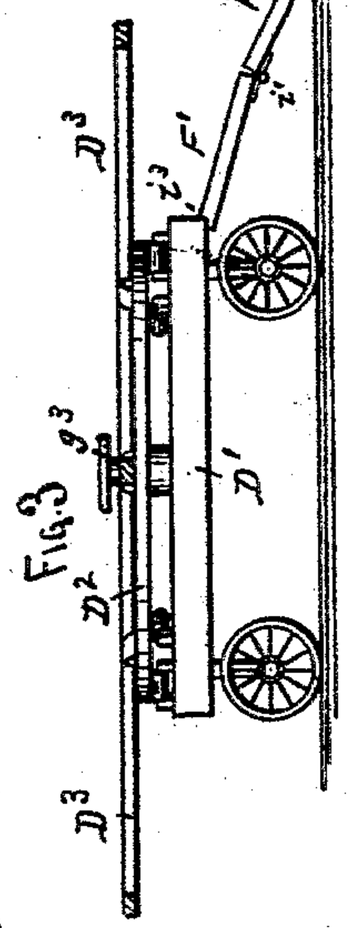


FIG. 1.

FIG. 2.

FIG. 3.

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(No Model.) 2 Sheets—Sheet 2.

# J. H. WATTS.

## ROPE OR CABLE SYSTEM FOR OPERATING MACHINERY.

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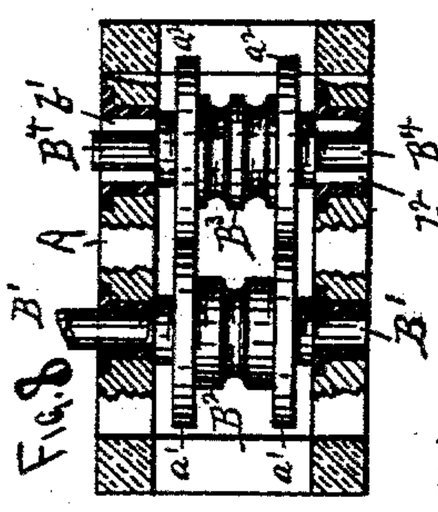


Fig. 8.

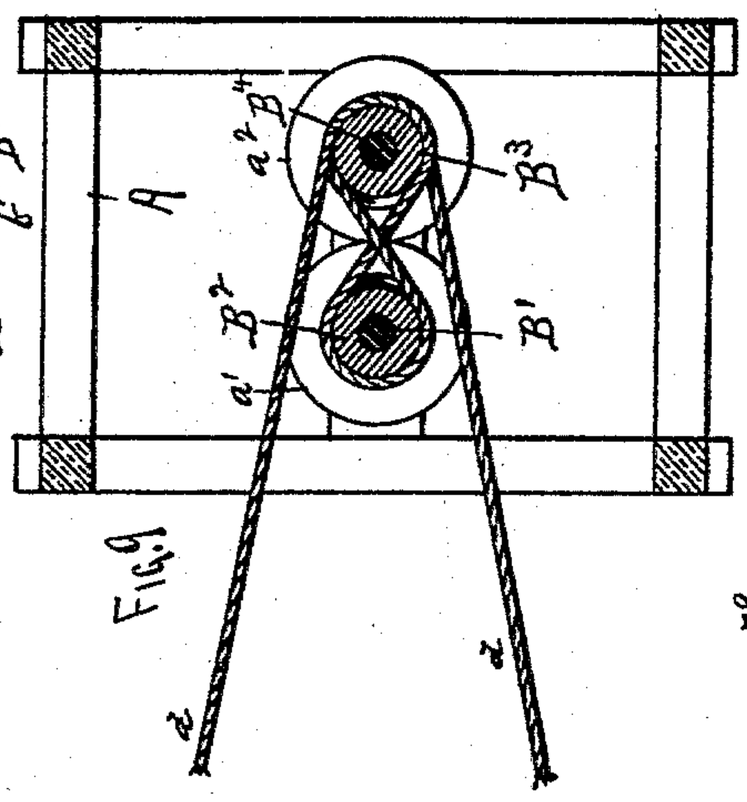


Fig. 9.

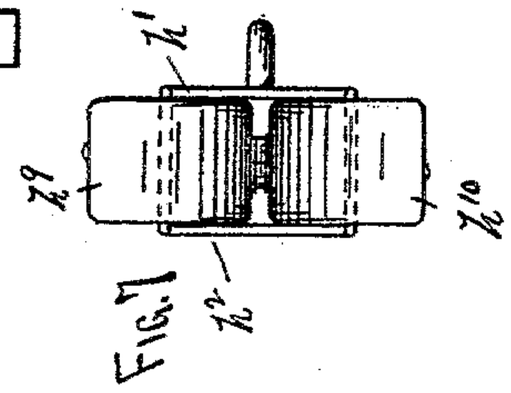


Fig. 7.

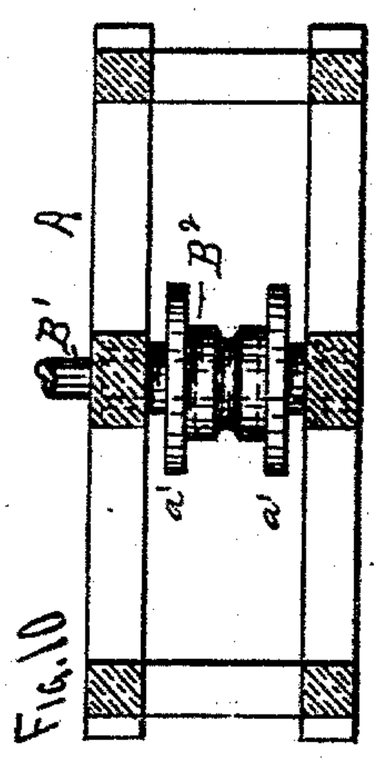


Fig. 10.

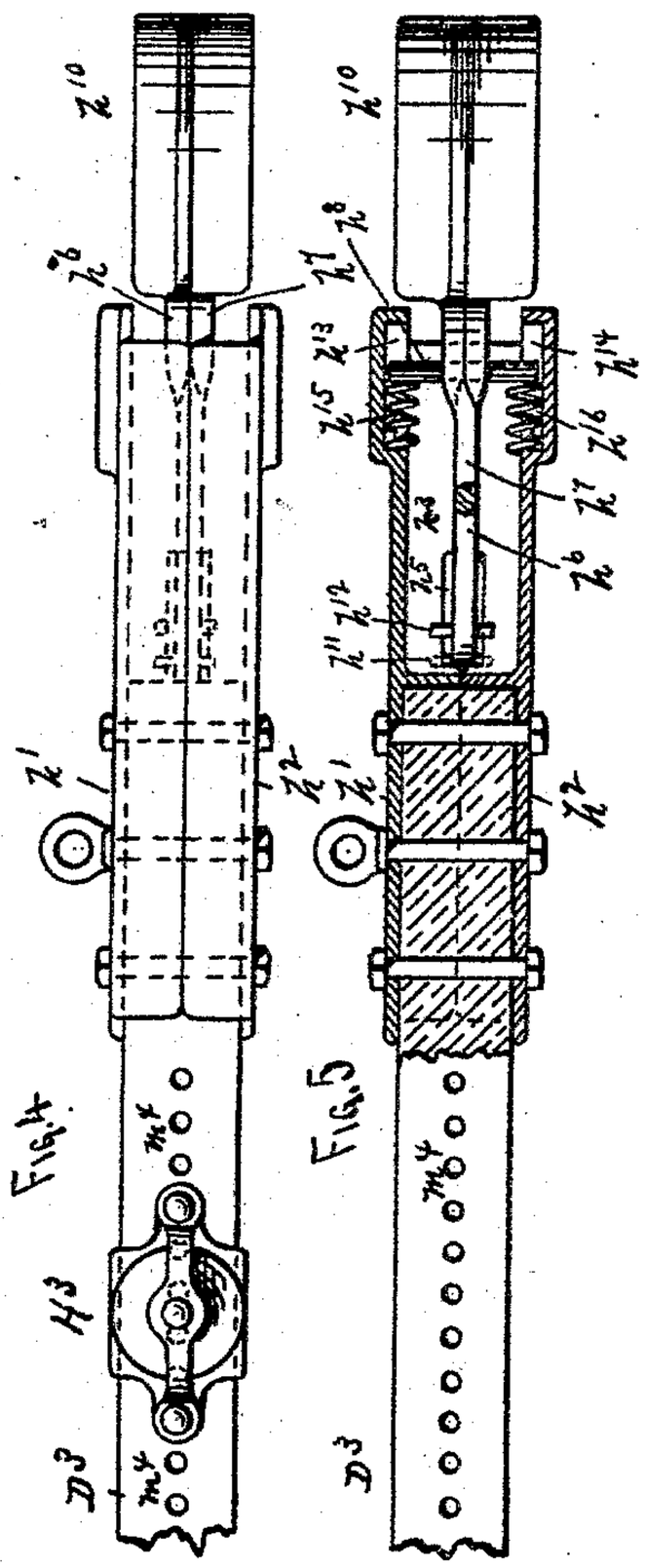


Fig. 4. Fig. 5.

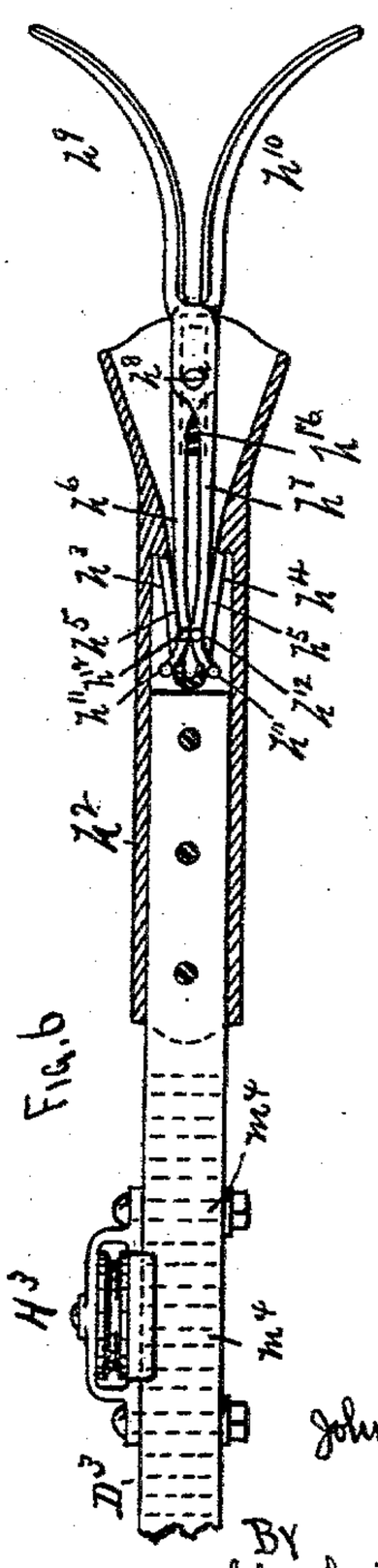


Fig. 6.

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# UNITED STATES PATENT OFFICE.

JOHN H. WATTS, OF AUBURN, NORTH DAKOTA.

## ROPE OR CABLE SYSTEM FOR OPERATING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 515,416, dated February 27, 1894.

Application filed May 20, 1893. Serial No. 474,889. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN H. WATTS, a subject of the Queen of Great Britain and Ireland, who have declared my intention of becoming a citizen of the United States, residing at Auburn, in the county of Walsh and State of North Dakota, have invented certain new and useful Improvements in Rope or Cable Systems for Operating Machinery, of which the following is a specification.

This invention relates to rope or cable mechanism for operating machinery, and consists in the construction, combination, and arrangement of parts, as hereinafter shown and described, and more specifically pointed out in the claims.

In the drawings, Figure 1 is a plan view of the apparatus complete. Fig. 2 is a cross sectional view on the line "*x x*" of Fig. 1. Fig. 3 is a side view of a portion of Fig. 1. Fig. 4 is a side elevation. Fig. 5 is a sectional side elevation. Fig. 6 is a plan view, and Fig. 7 is a front elevation, enlarged, of the cable gripping mechanism. Fig. 8 is a cross sectional elevation. Fig. 9 is a plan view in section, and Fig. 10 is a longitudinal sectional elevation, enlarged of the cable driving mechanism.

A′ represents a frame work placed at any convenient point and to which the machinery to be operated is connected in any suitable manner. Within this framework A′ is journaled a main shaft B′ and carrying a grooved drum $B^2$, with friction rims $a'$, and adapted to engage with corresponding friction rims $a^2$ on a corresponding grooved drum $B^3$ on a counter shaft $B^4$, journaled in the frame A, as shown. The shaft $B^4$ is mounted in slotted bearings $b'$ $b^2$, (see Fig. 8,) so that it will have a certain degree of movement to and from the shaft B′, so that the friction rims $a'$ $a^2$ will have the requisite surface contact, when drawn together. The drum $B^3$ is provided with two of the cable grooves, while the drum $B^2$ has but one groove, the groove in the drum $B^2$ coming opposite the space between the two grooves in the drum $B^3$, as shown more clearly in Figs. 2 and 8. The cable *d* passes first from the driving mechanism around the drum $B^3$ in one of its grooves, and is then crossed over and passed around the drum $B^2$ in its groove, and thence crossed over and around the drum $B^3$ again in the opposite direction and in the other groove, and thence back to the driving mechanism. The tension being toward the drum $B^2$, and the drum $B^3$ being movable laterally in its bearings $b'$, $b^2$ will be drawn tightly against the friction surfaces $a'$, so that the "grip" will be increased by any increase of tension, so that the greater the tension, the greater will be the friction, and consequently the less danger of loss of motion by the slipping of the surfaces. The manner of wrapping the cable also greatly increases the power, and lessens the danger of slipping, as so large a percentage of the cables are in contact with the surfaces of the drums.

The driving mechanism consists of a framework D′ suitably anchored to the ground at any convenient point, and either mounted upon wheels or otherwise arranged to be transported. Upon this framework is mounted a circular frame or "bull-wheel" $D^2$ from which a series of arms $D^3$ radiate, as shown. Any required number of these arms $D^3$ may be employed, but for the purpose of illustration I have shown in the drawings six of the arms. Each arm is suitably braced at *e*′, and connected by brackets or otherwise to the "bull-wheel," as shown. Pivoted at suitable points to the frame D′ are two brakes $D^4$ $D^5$ having chains or cables $g'$ $g^2$ leading to a drum $g^3$ on the shaft of the "bull-wheel," and adapted to be "set" against the inner surface of the "bull-wheel," to check or stop its motion by merely turning the drum $g^3$.

Upon the outer end of each of the arms D′ is a metal casing formed of two parts $h'$ $h^2$ and bolted to the sides of the arms, as shown. Formed in the outer end of each part of the casing $h'$ $h^2$ are two reversed angular partitions $h^3$ $h^4$, each partition having a recess $h^5$ therein adapted to receive the legs $h^6$ $h^7$ of a pair of clamps, the latter jointed by a pin $h^8$ and with oppositely curved jaws $h^9$ $h^{10}$ outside the casing, as shown. The legs $h^6$ $h^7$ are each provided with pins $h^{11}$ $h^{12}$, adapted to project on opposite sides of the partitions $h^3$ $h^4$, as shown. The pin $h^8$ projects by its ends into blind slots $h^{13}$ $h^{14}$ in the casing $h'$ $h^2$, and with springs $h^{15}$ $h^{16}$ normally pressing them outward. When thus pressed outward the pins $h^{11}$ $h^{12}$ running outward on the inclined

partitions $h^3$ $h^4$ will distend the legs $h^6$ $h^7$, and correspondingly distend the jaws $h^9$ $h^{10}$.

The cable $d$ is threaded around in the flaring jaws $h^9$ $h^{10}$, as shown, and when the arms are revolved, the jaws as they come around to the cable inclasp it one after the other, the tension causing the jaws and legs to be pressed inward into the casing $h'$ $h^2$ and causing the legs $h^6$ $h^7$ to run inward along the converging partitions and thus compress the legs and likewise compress the jaws upon the cable, causing the arms D′ to therefore be tightly and automatically coupled to the cable, the force of the "grip" being increased by the increase of the tension. The cable is therefore positively drawn around by the revolving arms, and no danger exists of its slipping no matter how much work may be required of it.

The apparatus is shown arranged with bevel gearing E′ $E^2$ by which the power may be transmitted to the machinery to be driven, but any other required arrangement of gearing may be employed to accomplish the same results. A "shore" or tightener will be employed by which the proper tension may be applied to the cable. This consists of two pieces F′ $F^2$ united at the ends centrally by a hinge $i'$, so that when placed as shown in Figs. 1 and 3 with one end $i^2$ resting upon the ground and the other end $i^3$ resting against the frame D′, and partially doubled up, as shown in Fig. 3, by straightening out the two parts F′ $F^2$ a very strong force may be exerted upon the frame D′ to move it along and thus take up the slack of the cable and keep it "taut." Attached to each of the arms $D^3$ near its outer end is a rod H′ extending toward the next arm, and provided with a section of chain $H^2$ which passes over a chain sheave $H^3$ on each of the arms $D^3$ just inside the casings $h'$ $h^2$. The horses are connected to the ends of these chain sections $H^2$ at $m'$, so that each team draws not upon the arm next in the rear but upon the second arm, as shown. Upon each rod H′ near the arm $D^3$ to which it is connected, is a small angular bar $m^2$ connected by a short chain $m^3$ to the next adjacent chain $H^2$ near its end $m'$, as shown. This acts as a compensating coupling between the parts H′ $H^2$ to equalize the draft, and prevent undue strains upon any one arm or draft rods or chains, caused by unequal sizes of teams, or the failure of any one team to do its proportion of the work. By setting the bars $m^2$ along the rods H′ the draft may be regulated and adapted to the teams or the work being performed. The chain sheaves $H^3$ are adjustable along the arms $D^3$ by holes $m^4$, as shown.

The apparatus will be found especially applicable to actuating thrashing machines and similar machinery, but may be also applied to any other kind of machinery.

The jaws $h^9$ $h^{10}$ are formed wider than the legs $h^6$ $h^7$, so as to secure a more extended grip upon the cable and thereby lessen the chance for slipping.

While I have shown the drum $B^3$ with two of the cable grooves, and the drum $B^2$ with only one groove, the drums may be provided with any desired number of the grooves, the more grooves there are in the drums, the greater will be the adhesion of the cable.

Having thus described my invention, what I claim as new is—

1. A series of arms radiating from a common center, and adapted to be revolved, a gripping mechanism upon the outer end of each arm, a cable encircling the gripping mechanism of said arms and also the mechanism to be driven, a base frame for supporting said radiating arms, a chain sheave $H^3$ upon the outer end of each arm, a draft chain or cable connected to the outer end of each of said arms and passing around the chain sheave of the arm next in advance, in combination with adjustable connections $m^2$ $m^3$ between the chains or cables of each adjacent pair of arms, substantially as and for the purpose set forth.

2. In a cable system for operating machinery, a series of arms radiating from a common center and adapted to be revolved, each of said arms being provided on its outer end with a casing $h'$ $h^2$ having reversely diagonal slotted partitions $h^3$ $h^4$ jointed clamps consisting of legs $h^6$ $h^7$ and jaws $h^9$ $h^{10}$ held normally outward by springs and adapted to be distended and extended by the co-action of said legs and diagonal partitions, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN H. WATTS.

Witnesses:
M. L. KING,
CLÉOPHAS SICARD.