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Patented Aug. 14, 1900.

J. A. MOORE.

CLUTCH.

(Application filed Apr. 19, 1900.)

(No Model.)

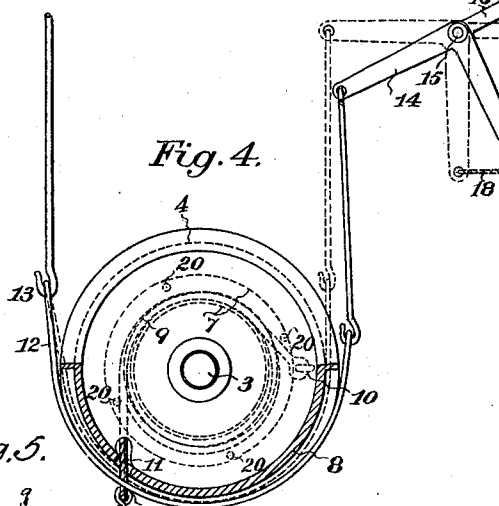
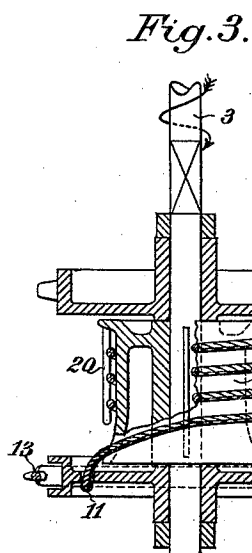
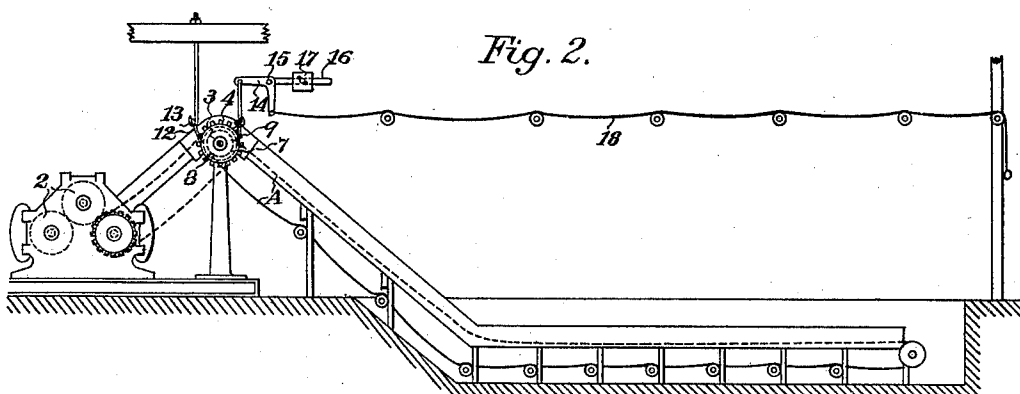
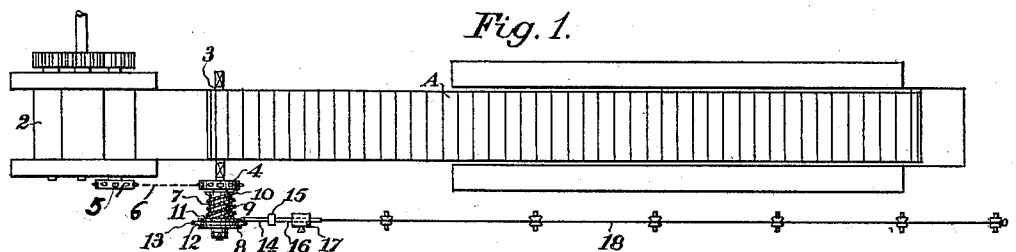
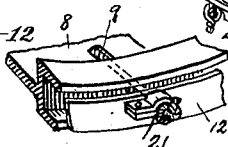


Fig. 5.



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UNITED STATES PATENT OFFICE.

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CLUTCH.

SPECIFICATION forming part of Letters Patent No. 655,906, dated August 14, 1900.

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To all whom it may concern:

Be it known that I, JOSEPH A. MOORE, a citizen of the United States, residing at Paa-u-hau, Hawaii, have invented an Improvement
5 in Frictional Driving Devices; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a device for driving and interrupting the movement of apparatus
10 requiring such intermittent movements.

I have illustrated my invention as applied to apparatus which is designed for the transportation of sugar-cane and the like from
15 points where it is collected to the crushing-rollers; but it will manifestly be useful in any connection where similar conditions occur and in which it is at times desirable to temporarily interrupt the travel of the apparatus.

20 It consists of a sprocket loosely mounted upon the driving-shaft of the carrier and receiving power from some moving portion of the apparatus, a rope-drum keyed to the shaft, a rope having one end fixed to the
25 sprocket, and a number of turns about the drum, and the other end fixed to a band or friction wheel, which is also loosely turnable upon the shaft at the opposite end of the drum from the driving-sprocket. By means
30 of a brake and suitable connecting mechanism sufficient friction is brought upon the friction-wheel to tighten the rope around the drum, so that motion will be transmitted through the sprocket-wheel to the drum to
35 drive the shaft and carry any designated load. By relieving the frictional pressure upon the friction-wheel the rope will be loosened about the drum to allow the pulley A to turn without transmitting power to the shaft,
40 and the apparatus will stop. This effect may also be produced by so adjusting the tension that an increase of weight upon the carrier will act to stop it.

Referring to the accompanying drawings,
45 Figure 1 is a plan showing the application of my device. Fig. 2 is a longitudinal elevation. Fig. 3 is a sectional plan of the frictional driving device. Fig. 4 is an end elevation of the same. Fig. 5 is a detail of the
50 clamping device 21.

In the transporting of cane from points

where it is collected to the crushing-rolls long endless belts or carriers are employed, as shown at A, and the cane being deposited
55 upon these carriers is transmitted from the point of deposit to the crushing-rolls, which are illustrated at 2. It is desirable to control the movement of this carrying-belt, so as to stop it in case of accident, or by overloading or carrying the cane faster than the rolls can
60 take care of it, or for other like or similar reasons; and it is the object of my invention to provide a means for controlling this device.

As shown in the drawings, the cane-carrier A passes around a drum mounted upon a
65 shaft 3, through which power is to be transmitted to rotate the drum and advance the carrying-belt. Upon this shaft is a sprocket-wheel 4, which is driven, as here shown, from a similar sprocket-wheel 5 upon the shaft of
70 the first roll by means of a driving-chain 6. The sprocket-wheel 4 turns loosely upon the shaft 3 and will not advance the latter until it is in some manner locked to the shaft, so that the latter will rotate with the sprocket.
75 This is the object of my invention.

7 is a rope drum or barrel which is keyed to the shaft 3, so as to be revoluble with it. This drum lies close to the sprocket-wheel 4,
80 and upon the opposite side of the drum is a friction-wheel 8, which also turns loosely upon the shaft.

9 is a rope or other flexible medium, one end of which is fixed to the sprocket-wheel 4. As illustrated at 10, the rope winds around
85 the drum 7, forming a number of coils, and the opposite end is attached to the friction-wheel 8, as shown at 11. As long as the rope is not drawn tightly about the drum 7 the revolution of the sprocket-wheel 4 carries the
90 rope, and with it the friction-wheel 8, revolving loosely upon the shaft 3, without rotating the latter; but when the rope 9 has been tightened about the drum until its friction is sufficient to impel the latter the shaft will
95 also be turned and the carrying-belt will be advanced. In order to effect this, I have shown a flexible strap 12, one end of which may be fixed at any suitable or desired point,
100 as at 13, and the other end is connected with a tilting lever 14. As here shown, this lever is in the form of a bell-crank having its an-

gle fulcrumed as shown at 15, and an arm projecting as shown at 16 serves to carry an adjustable weight 17. By moving this weight nearer to or farther from the fulcrum-point 15 of the lever the tension of the band 12 upon the friction-wheel 8 is decreased or increased. This weight is first adjusted to such a point that the friction of the band upon the friction-wheel will draw the rope 9 tightly enough about the drum to drive the shaft and carrying-belt with a certain load which has been predetermined. So long as this load is not unduly increased the friction will be sufficient to drive the carrier; but if the load is greatly increased, as by a person accidentally falling upon the belt, the increased weight will overcome the frictional driving power of the rope and the carrier will stop.

In order to stop the carrier under any condition of load where it is desirable, I have shown a rope 18 connected with one arm of the lever 14 and extending along the line of the carrier to its outer end. This rope is supported at suitable points along its line and is so disposed that any one within reach may pull upon the rope. Any pull upon the rope will turn the lever 14 about its fulcrum-point, raising the weight 17 and depressing the end of the lever with which the friction-band 12 is connected, so as to slacken this band and reduce its frictional contact with the friction-wheel 8. This immediately loosens the rope 9 about the drum and so reduces the friction that no power will be communicated from the sprocket-wheel 4 to drive the drum, and the carrier will stop. I am thus enabled to control very accurately the movement of the carrier or like moving device and also to stop it automatically by an increase of load beyond what is desirable.

In order to prevent the rope 9 from slipping down about the drum 7 and overriding or otherwise becoming misplaced, I have shown rods 20 fixed to the drum 7 and extending down parallel to the drum, so that the rope is retained between these rods and the drum. The length of the rope is adjusted in case of stretching or to suit conditions by any well-known form of clamping device at 21, by which it is fixed to the friction or driving pulley.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A frictional driving apparatus consisting of a shaft a drum fixed to the shaft through which power is to be transmitted, a driving-wheel loosely turnable upon the shaft contiguous to one end of the drum, a friction-wheel loosely turnable upon the shaft contiguous to the opposite end of the drum, a flexible rope or the like having one end fixed to the driving-wheel and the other to the friction-wheel, and the intermediate portion coiled around the drum, and normally movable without communicating motion to the drum, and means for tightening the rope about the

drum and increasing its friction so that the movement of the driving-wheel will be communicated to the drum and the shaft.

2. A frictional driving device, consisting of a journaled shaft, and a drum fixed thereto, a driving-wheel loosely turnable upon the shaft contiguous to one end of the drum, a friction-wheel loosely turnable contiguous to the opposite end of the drum, a rope having its ends connected respectively with the driving-wheel and the friction-wheel and the intermediate portion loosely coiled about the drum, a frictional band and means by which it is tightened about the friction-wheel whereby the rope is tightened upon the drum and motion transmitted to it and the shaft.

3. A frictional driving apparatus consisting of a journaled shaft, a drum fixed thereto, a driving-wheel loosely turnable upon the shaft contiguous to one end of the drum, a loose friction-wheel upon the shaft contiguous to the opposite end of the drum, a rope having a number of turns about the drum, and its ends fixed respectively to the drive and friction wheel so that the wheels are normally turnable without communicating motion to the drum and shaft, a band fitted to the friction-wheel and connected with a weighted lever whereby the band is pressed upon the wheel and its movement retarded so as to tighten the rope and transmit motion to rotate it and the shaft.

4. A frictional driving mechanism, consisting of a drum fixed upon the shaft, a driving-wheel and a frictional wheel loosely turnable upon the shaft, contiguous to the ends of the drum, a rope loosely coiled about the drum having its ends fixed respectively to the driving and friction wheel, a fulcrumed lever, a band passing around a friction-wheel having one end fixed and the other connected with the lever, and a weight adjustable upon the lever whereby the friction of the band upon the wheel is regulated and the wheel retarded so as to compress the rope upon the drum and transmit movement to it and the shaft.

5. A frictional driving apparatus consisting of a drum fixed to the shaft to be driven, driving and frictional wheels loosely turnable upon the shaft contiguous to the ends of the drum, a rope coiled about the drum having its ends connected respectively with the driving and friction wheel and normally loosely slidable without communicating motion to the drum, a fulcrumed weighted lever, a band passing around the friction-wheel having one end fixed and the other connected with the weighted lever whereby the wheel is retarded and the rope caused to bind about the drum with sufficient pressure to drive the shaft, a connection between the weighted lever and a distant point whereby the lever may be turned and the friction of the band upon the wheel reduced to stop the movement of the shaft.

6. A frictional driving apparatus and carrier consisting of a shaft, a drum fixed thereto through which power is communicated to ro-

tate the shaft and drive the carrier, a driving
and a friction wheel loosely turnable upon the
shaft contiguous to the ends of the drum, a
rope having its ends connected respectively
5 with the drive and friction wheel and the in-
termediate portion coiled about the drum, a
fulcrumed bell-crank lever, a band passing
around the friction-wheel having one end fixed
and the other connected with the lever, an
10 adjustable weight by which the tension of the
band is adjusted so as to tighten the rope about
the drum and drive the carrier and its load,
a rope connecting with an arm of the lever
extending parallel with the carrier whereby
15 the lever may be turned about its fulcrum,
and the friction of the band and the rope re-
duced so as to allow the drum and shaft to stop.
7. A frictional driving apparatus consisting
of a drum fixed upon the shaft to be driven,

a driving-wheel and a friction-wheel loosely 20
turnable upon the shaft contiguous to the
ends of the drum, a rope having its ends con-
nected respectively with the driving-wheel
and the friction-wheel, and the intermediate
portion loosely coiled about the drum, a fric- 25
tional band and means by which it is tight-
ened about the wheel whereby the rope is
tightened upon the drum and motion trans-
mitted to it and the shaft, and guides extend-
ing from the driving-wheel parallel to and in 30
proximity with the surface of the drum where-
by the rope is retained in position.

In witness whereof I have hereunto set my
hand.

JOSEPH A. MOORE.

Witnesses:

E. L. ESTEY,

A. M. LINDSAY.