

(No Model.)

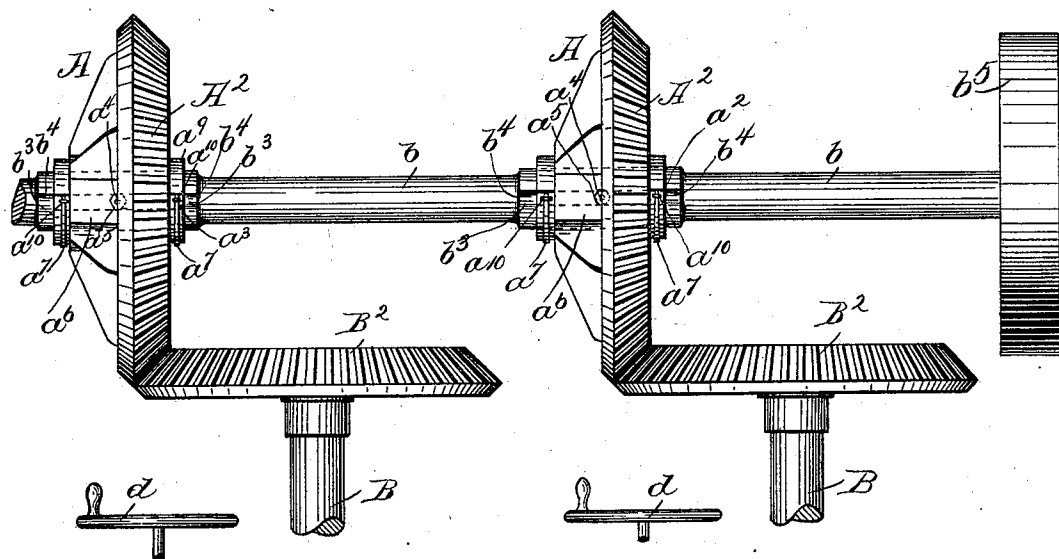
2 Sheets—Sheet 1.

J. P. FRIZELL.
POWER TRANSMITTING MECHANISM.

No. 581,547.

Patented Apr. 27, 1897.

Fig. 1.



Witnesses.

Jas. J. Maloney.
J. P. Frizell.

Inventor.
Joseph P. Frizell.
by J. P. Frizell
Atty.

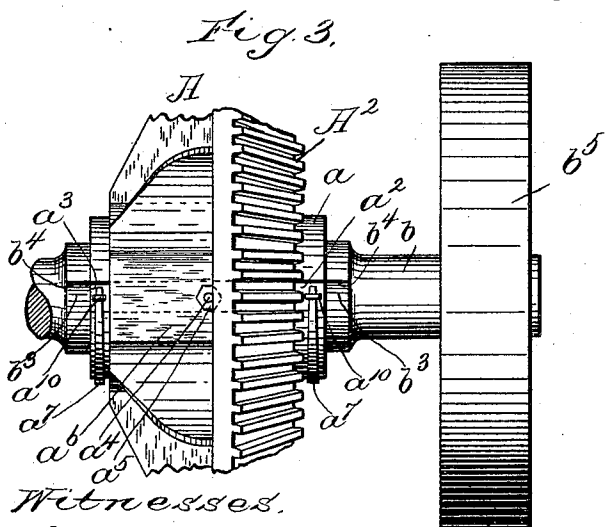
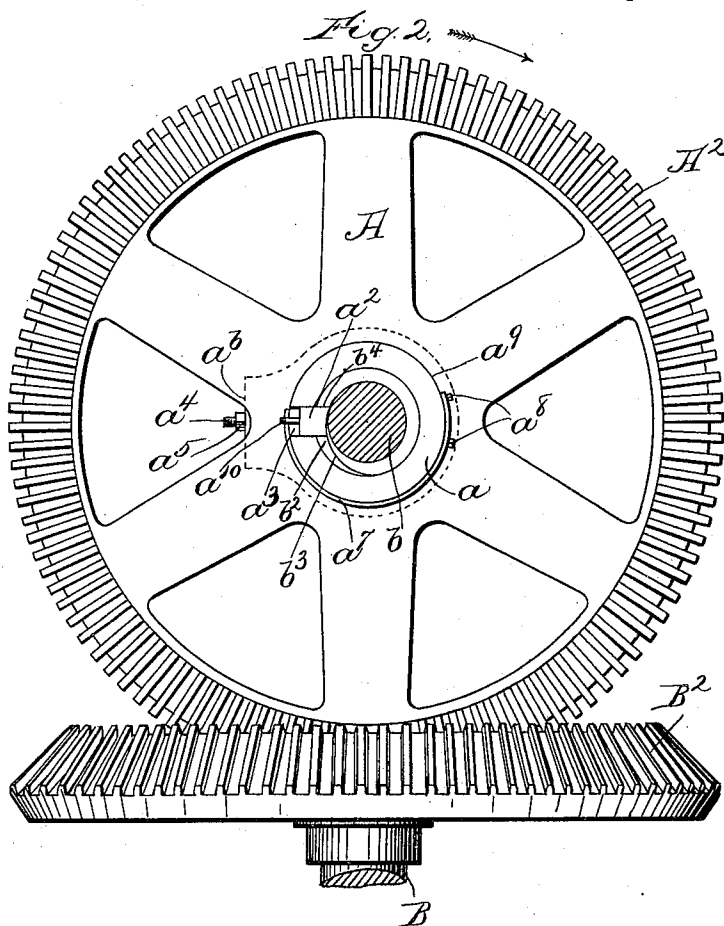
(No Model.)

2 Sheets—Sheet 2.

J. P. FRIZELL.
POWER TRANSMITTING MECHANISM.

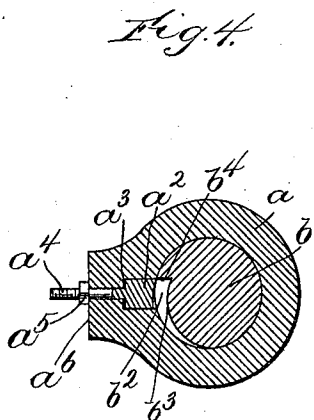
No. 581,547.

Patented Apr. 27, 1897.



Witnesses.

Joseph Maloney.
H. Livmore.



Inventor,
Joseph P. Frizell,
by J. P. Livmore
Att'y.

UNITED STATES PATENT OFFICE.

JOSEPH P. FRIZELL, OF BOSTON, MASSACHUSETTS.

POWER-TRANSMITTING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 581,547, dated April 27, 1897.

Application filed July 30, 1896. Serial No. 601,082. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH P. FRIZELL, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Power-Transmitting Mechanism, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to a power-transmitting mechanism and is embodied in a single shaft having two or more independently-operated driving-wheels and means whereby any of said wheels can be independently stopped and when started can be brought up to speed and the power thereof applied without affecting the independent operation of the shaft and without any shock or strain.

The object of the invention is to provide such a connection between each of a number of driving-wheels and a shaft common to all that the latter, although adapted to be driven by any or all of the said wheels, is capable of rotation independently thereof, so that if it is desirable to shut down the power applied to any one of the driving-wheels the consequent slowing down and stopping thereof will not affect the rotation of the shaft, which will go on independently thereof, and, conversely, when any one of said driving-wheels is idle and power is applied thereto it can be controlled so as to gradually increase in speed until it finally reaches a speed equal to that of the shaft, upon which it will take up its work without any shock or disturbance, the device being preferably so arranged that the relative speeds of the driven and driving members are within the observation of the attendant who is manipulating the controlling device through which the force is applied. To accomplish this, the driving-wheels—for example, two or more wheels operated by separate motors, as steam-engines, turbine water-wheels, or electric motors—are mounted on a single shaft, so that the said wheels and shaft are normally capable of independent rotation, and the hub of each wheel is provided with a key extending inward therefrom toward the shaft, the said key being yieldingly pressed inward, as by a spring, and the shaft is provided with a groove extending lon-

gitudinally along the same, one side of said groove terminating in an abrupt shoulder, while the other side slopes gradually outward toward the periphery of the shaft. The direction of rotation of each driving-wheel is such that the key will enter the groove along the sloping side thereof and will bring up against the shoulder, so that as the shaft and the wheel rotate in the same direction the said shaft will be positively driven by said wheel when the key is in engagement with the shoulder.

Figure 1 is a longitudinal elevation of a portion of a shaft having drive-wheels applied thereto in accordance with the invention, there being for convenience only two drive-wheels shown. Fig. 2 is a cross-section of a portion of the shaft and one of the drive-wheels connected thereto. Fig. 3 is a longitudinal elevation of a portion of the shaft and one of the wheels, a portion of the latter being broken away; and Fig. 4 is a sectional view of the hub and shaft, showing the key withdrawn and locked in its withdrawn position.

The drive-wheels A, each of which is herein shown as provided with a beveled gear A², meshing with a corresponding beveled gear B² on a vertical shaft B, driven by a suitable motor—as, for example, a turbine water-wheel or steam-engine—are each mounted on the shaft b, which is adapted to be driven thereby and which is shown as provided with a pulley b⁵, from which power may be taken, said shaft b being represented as the main shaft in a shop or factory. Each of said wheels A is provided with a hub a, having a key a² radially movable in a recess a³, the said key preferably extending completely across from one side of the hub to the other and being provided with a stem a⁴, having a nut a⁵ screwed onto the outer end thereof and adapted to bear against the flattened surface a⁶ of said hub. The said key is normally pressed inward toward the center of the hub by means of springs a⁷ of any suitable construction, the said springs being preferably bow-springs, secured at one end by screws or bolts a⁸ to the surface of the shoulder a⁹ at each end of the said hub, the said springs extending around the hub and engaging at their opposite ends with projections a¹⁰, extending upward from

the top of the key through the slot a^3 , which, as shown in Figs. 1 and 2, extends completely through the shoulder portion of the hub. The hub a of each of the said drive-wheels 5 forms a bearing therefor on the shaft b , which is common to all, and said hub is capable of rotation independently of said shaft, which is provided with a longitudinal groove b^2 , having a long inclined surface b^3 and terminating in 10 an abrupt shoulder b^4 , as shown in Figs. 2 and 4. Assuming, therefore, that the wheel A is driven in the direction of the arrow, Fig. 2, and the key a^2 pressed inward by its springs a^1 , it is obvious that the said key will reach 15 the position shown in Fig. 2 and engage the shoulder b^4 , thus tending to rotate the shaft b in the same direction. If, however, the power applied to any wheel is shut down, the shaft b , which, as shown in Fig. 1, is also driven 20 by one or more similar wheels, each having an independent motor, will continue to be rotated independently of the drive-wheel A , the shoulder b^4 traveling away from the key a^2 , which will ride up the incline and around 25 the shaft, dropping over the shoulder at each revolution.

The invention, as has been stated, is especially applicable to cases where water-power is used in conjunction with steam, it 30 being obvious that when the water-supply is somewhat low it is advantageous to employ steam alone, while either the steam-motor or one or more water-motors, all operating on the same shaft, can be independently applied or 35 shut down at any time. Further than this, it is obviously of advantage in many cases to provide a number of similar motors, any of which can be operated or shut down to compensate for variations in load. As soon 40 therefore as it is apparent that the power applied to any one of the drive-wheels is unnecessary or inefficient the said power can be shut down, and when the wheel has ceased to turn the key a^2 may be withdrawn and main- 45 tained withdrawn, as shown in Fig. 4, by turning up the nut a^3 , so that the clicking or pounding of the key is prevented. Then when it is desired to again turn on the power the key is released and the dropping thereof 50 over the shoulder at each revolution will be apparent by the clicking sound, so that the attendant as he manipulates the controlling

device d , which is conventionally shown in Fig. 1, is enabled, by observing the clicks, the frequency of which will obviously diminish 55 as the motor speeds up, to so control the motor that the power thereof is at last applied to the shaft without any shock.

It is to be understood that the invention is not limited to the specific construction herein 60 shown, nor to any particular application thereof, since it is obvious that the construction shown may readily be modified, while the invention may be usefully applied in any case 65 where two or more motors of any kind are applied to a single shaft if it is desirable to use any motor or group of motors independently of the others.

I claim—

1. The combination with a driven shaft, of 70 two or more independent motors therefor, a power-transmitting device connected with each motor and adapted to coöperate with said shaft, the said shaft and power-transmitting devices constituting members of clutches 75 or couplings, and engaging portions of said members adapted to engage and remain in engagement during the movement of one member relative to the other in one direction but not in the other, whereby any motor or 80 group of motors may be shut down or started up independently of the rest, while the said shaft is being driven, substantially as described.

2. The combination with a shaft provided 85 with a groove on its surface terminating in an abrupt shoulder, of two or more independently-operated driving-wheels mounted on said shaft and capable of rotation thereon, a key mounted in a radial groove in the hub 90 of each of said wheels, springs connected to said hubs and said keys respectively to produce an inward movement of said keys, and means for maintaining said keys out of engagement with said shoulder, substantially 95 as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH P. FRIZELL.

Witnesses:

H. J. LIVERMORE,
N. P. FORD.