

(No Model.)

2 Sheets—Sheet 1.

J. RIDDELL.

VARIABLE TRANSMITTING MECHANISM.

No. 464,895.

Patented Dec. 8, 1891.

Fig-I-

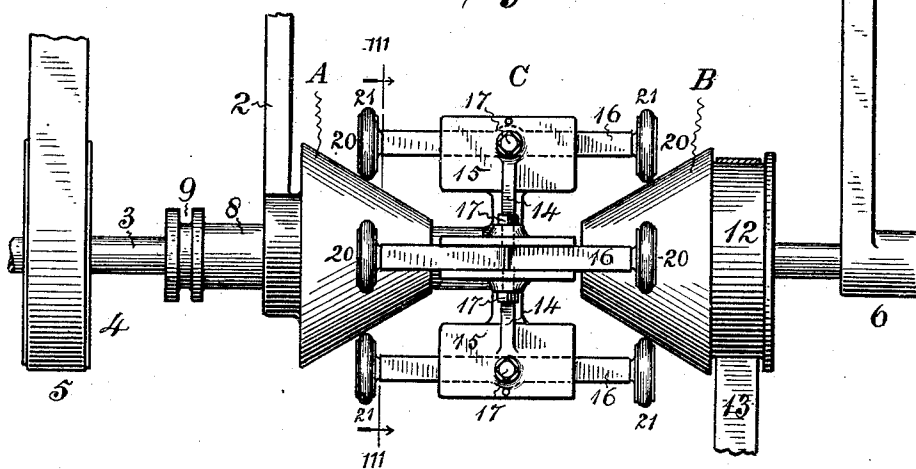


Fig. II.

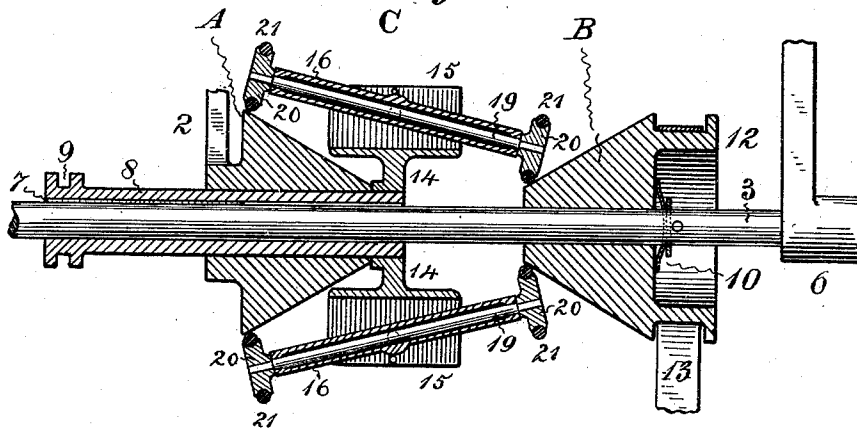
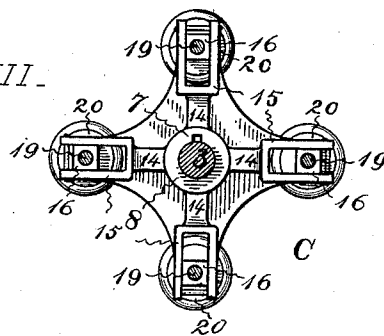


Fig-III-



Witnesses

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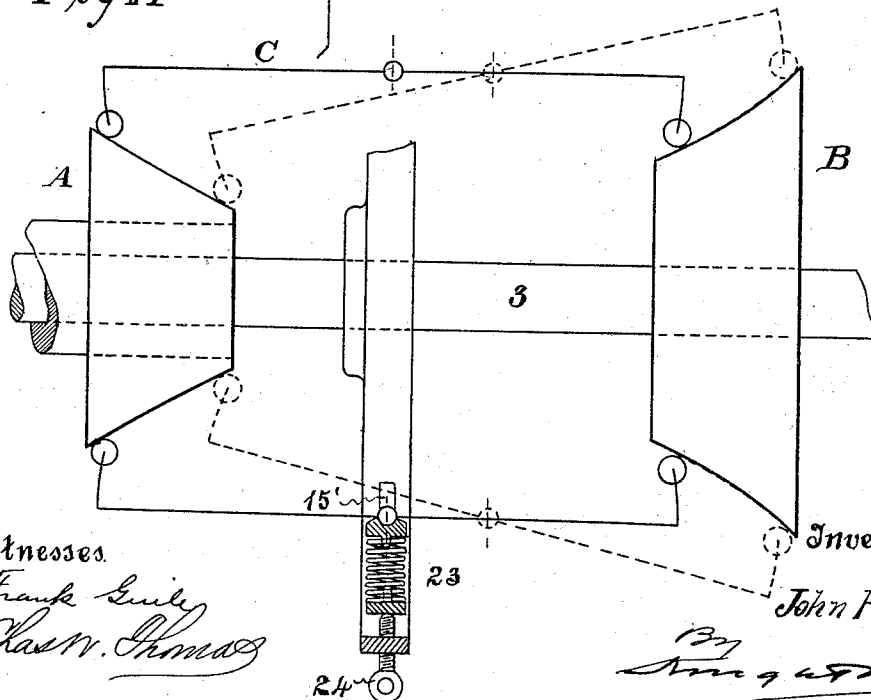
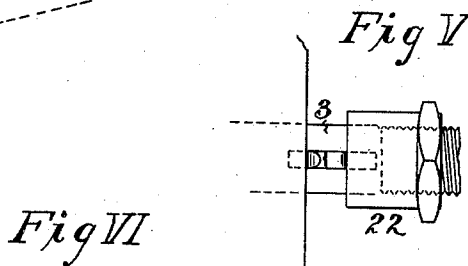
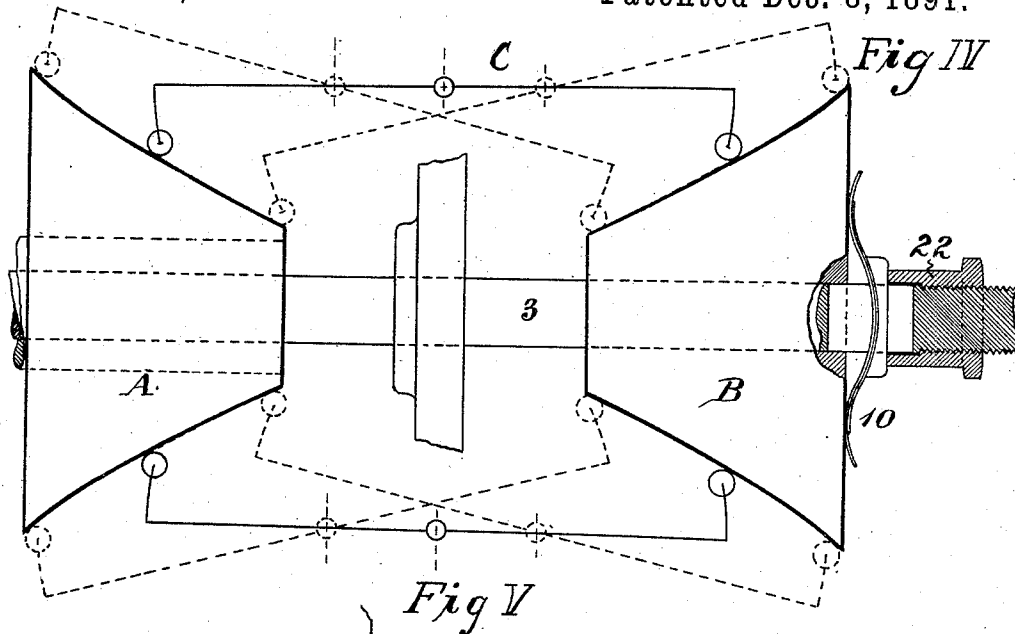
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UNITED STATES PATENT OFFICE.

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VARIABLE TRANSMITTING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 464,895, dated December 8, 1891.

Application filed March 20, 1891. Serial No. 385,776. (No model.)

To all whom it may concern:

Be it known that I, JOHN RIDDELL, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Variable Transmitting Mechanism, of which the following is a specification.

My invention relates to a device whereby a normally-quiescent member—say a shaft, wheel, or pulley—may at will of the operator be so connected with a constantly-revolved member—say a driving-shaft—as to be propelled therefrom at any desired speed and in either the same direction as such driving member or in a direction reversely thereto.

My device is applicable to a great diversity of uses—for example, as a speed and power transmitter and regulator for various devices, such as dental-engines, jewelers' drills and burnishers, electric motors, &c. As a governor for electric motors and dynamos and for steam, water, and other engines, it may be made to produce a variable speed in either a forward or the reverse direction.

The form of my invention herein illustrated is well adapted to such machines as those lathes, circular saws, drills, &c., which require a slow speed with great power in the direction of effective rotation followed by a quick return or retractile rotation.

The device combines the functions of a clutch and a variable transmitter without change or disruption of impact and without sudden jar.

Referring to the accompanying drawings, which form a part of this specification, Figure I shows in its normal or inactive condition a form of my device whereby the person in charge can cause the driven shaft or member to be rotated at any desired speed relatively to the driver, said rotation, when slow, being in the same direction as that of the driver and when fast in the contrary direction thereto. Fig. II is an axial section which represents the transmitter so shifted as to communicate to the driven member a rotation at higher velocity than and in reverse direction to the driver. Fig. III is a section on the line III-III. Fig. IV is a diagram which represents certain modifications of my invention. Fig. V is a top view of the spring-regulator. Fig.

VI is a diagram which represents a form of my invention in which the driven member is rotated in the same direction as the driving member, but at any desired slower speed.

A represents a conical boss, which consists of a rigid and removable projection from a hanger or other fixture 2.

3 is my driving-shaft, having a pulley 4 for a driving-belt 5 from any suitable source of power. At the end remote from the said pulley 4 the driving-shaft is journaled in a rigid bearing 6, and near the said pulley is journaled in and feathered, as at 7, to a sleeve 8, whose normal position is shown in Fig. I, but which is capable of being shifted to either the right or left. For this purpose said sleeve has a circumferential groove 9 for reception of a shifting ring or yoke, (not here shown,) which may be of any customary or suitable construction. Fig. II shows the said sleeve shifted to its extreme left position. The cone A is perforated in the line of its geometrical axis, so as to constitute a journal-bearing both for the rotating and longitudinally-shiftable sleeve 8 and the included driving-shaft 3. Sleeved upon the driving-shaft 3 and pressed toward the cone A by a spring 10 is my driven cone B, which carries a pulley 12, from which proceeds a belt 13 to the machinery to be driven.

Extending radially and at equal circumferential distances from the sleeve 8 are two, three, four, or more arms 14, having bifurcated extremities or cheeks 15 for oscillating tubes or boxes 16, from which at their mid-length extend fulcrums 17, that occupy and rock within orifices in said cheeks. Each of said tubes constitutes the journal-bearing of a shaft 19, armed at each extremity with a wheel 20, which has a tire 21 of india-rubber or other suitable material so as to constitute a friction-wheel.

The parts 8 and 14 to 21, inclusive, compose a rotative and shiftable member, which constitutes the transmitter proper C, and the proportions of the parts are such that whatever be the position of said member the friction-wheels at the left extremities of the said shafts 19 bear constantly on the periphery of the stationary cone A and those at their right extremities on the periphery of the rotated

cone or member B. At their normal position (see Fig. I) the wheels 20 simply roll around both cones without producing rotation of the member B. Shift of the transmitter C either to right or to left operates to rotate the member B. A right shift of the transmitter operates to set up in the member B a rotation in the same direction as the transmitter, but at a reduced speed. A left shift, on the contrary, (see Fig. II,) operates to rotate the member B at a higher speed than and in the reverse direction to the rotation of the transmitter. Associated with spring 10 may be a nut 22, which, being screwed leftward or rightward on the driving-shaft, serves to regulate the pressure of said spring.

The fulcrum of the oscillating bearing 16 may be confined in a radial slot 15' in the arm 15 and the transmitter may be held with yielding pressure upon the cones by a spring 23, which may have its stress regulated by a temper-screw 24. With such a yielding fulcrum one of the "cones" may be of cylindrical or approximately cylindrical form and may operate by cogs instead of friction connection.

The second cone or member B, instead of the shaft 3, may be the driving member, pulley 5 being then the driven instead of the driving-pulley.

It is manifest that of the three members A, B, and C either one may be the non-rotative member, and of the other two either may be employed as the driving with the other as the driven member.

It is obvious that any suitable mechanism—such as a train of cog-wheels—may be used for transmitting the motion of the member B to the machinery to be driven, or the said

member may itself constitute the driven object.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a variable transmitting mechanism, the combination of three members, of which two are aligned and reversely-presented cones, and of which the other member is armed at each end with rolling contacts whose journal-bearing is fulcrumed in a head slidable longitudinally of said cones, means for preventing one member from rotation, and means for communicating rotation to one of the other members, substantially as and for the purpose set forth.

2. In a variable transmitting mechanism, the combination of a fixed cone, an aligned reversely-directed rotatable cone, a shaft coaxial with and revolving freely within said cones, a sleeve feathered to and slidable upon said shaft, two or more equidistant arms of said sleeve, each arm affording fulcrum-bearing for an oscillating bearing, and a shaft journaled in said bearing, which shaft carries at its extremities two rolling contacts or transmitting-wheels, substantially as and for the purpose set forth.

3. The combination of the shaft 3, the stationary cone A, the transmitter proper C, the cone B, revolving and sliding freely on said shaft, the spring 10, and the regulating-nut 22, substantially as set forth.

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Witnesses:

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