

G. M. RHOADES.

Belt Gearing.

No. 98,632.

Patented Jan. 4, 1870.

Fig. 1

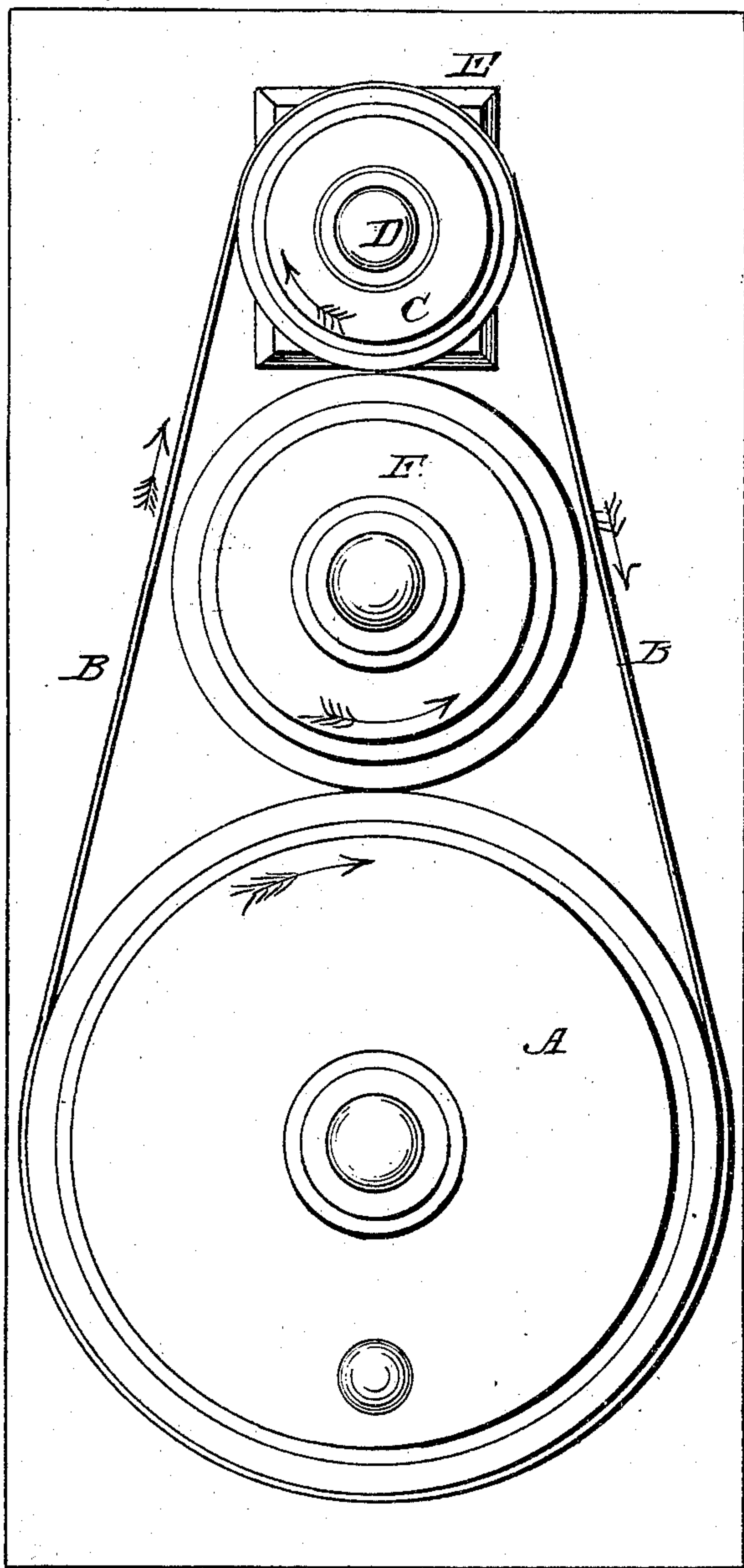
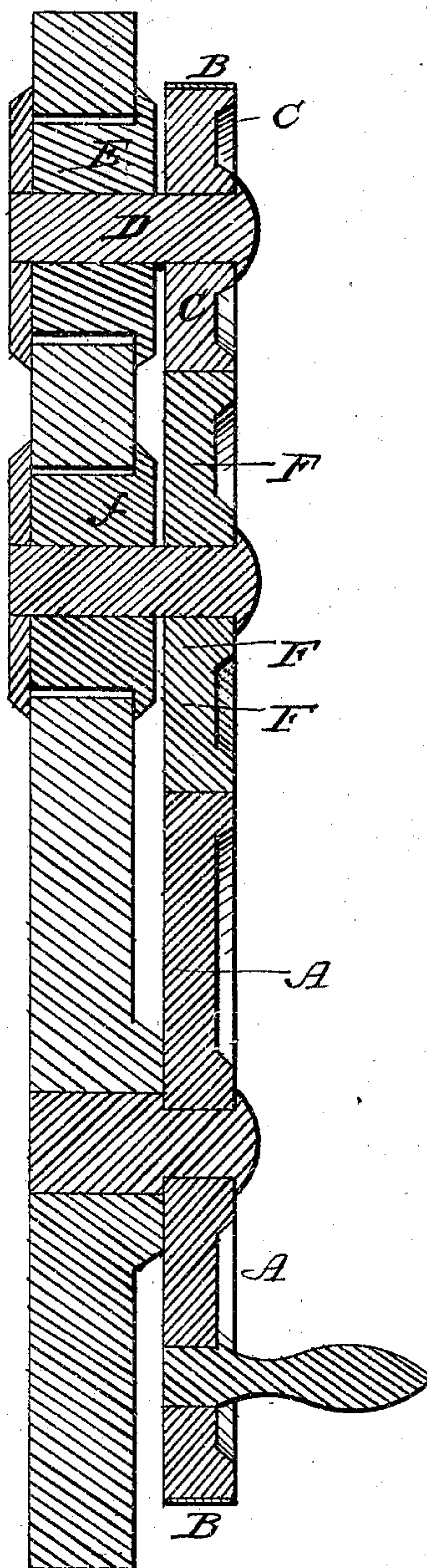


Fig. 2



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GEORGE M. RHOADES, OF HAMILTON, NEW YORK.

Letters Patent No. 98,632, dated January 4, 1870.

IMPROVEMENT IN MECHANICAL MOVEMENT.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, GEORGE M. RHOADES, of Hamilton, Madison county, in the State of New York, have invented certain new and useful Improvements in Mechanical Movement; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this application.

Previous to my invention, various combinations of mechanical devices have been suggested to constitute driving-mechanisms, or means for economically applying the driving or motive-power to the machine to be driven; but most or all of the contrivances heretofore known, have been either too complicated, or have induced in their use the generation of too much friction, to become generally useful. The most useful and practical arrangement of driving-mechanism known, and in which the most economical application of the driving-power may be made, is that in which the power is applied through the medium of friction-pulleys, and in which the shafts are so hung as to run with but little friction. But there are many instances, in some classes of machinery, where the friction-surfaces (or friction-pulleys) for drivers are not desirable or reliable.

My invention has for its main object to provide a simple and efficient means, by which the motive-power may be applied in any kind of machinery, (with either fast or slow speed,) through the medium of a driving-belt, and in such manner that the shafting shall run with little or no friction, and, consequently, without any waste of the power; and to these ends,

My invention consists in forming a driving-mechanism, by the employment, in combination with an ordinary driving-pulley (having a fixed axis) and belt, of a pulley, banded by said belt to the driving-pulley, but having its shaft or centre supported or maintained (in the direction of the the main shaft) by the contact of its face with an anti-friction pulley or pulleys, arranged between said pulley-face and the face of the driving-pulley, and bearing against both their faces, as will be more fully explained hereinafter.

To enable those skilled in the art to more fully understand my invention, I will proceed to describe it, referring by letters to the accompanying drawings, in which—

Figure 1 is an elevation, and

Figure 2, a vertical section of a train of pulleys, with a driving-belt, anti-friction wheels, and moving journals, such as I propose to use in carrying out my invention.

I have illustrated the shafts and their boxes as merely arranged in connection with a table or plane, but they may of course be located to form the working-parts of any machine or mechanical apparatus.

A is the main driving or motive-wheel, as arranged on an ordinary shaft or journal, mounted in a suitable stationary box or bearing.

B is the driving-belt or band, made and arranged in the usual way, and extending around or over the pulley C to be driven.

This pulley C may be termed the main wheel of the machine or apparatus, to which motion and power are to be imparted from the main motor or driving-pulley A, and has its shaft or journal D, being in a box E, which is free to move toward and from the axis of pulley A, and this pulley C, and its box and journal, are supported or kept from moving in the direction of the pulley A by an anti-friction roll or pulley, F, which is arranged between and runs in contact with the faces of pulleys A and C.

The box *f*, in which is hung the journal of roll F, is arranged to slide freely in the directions of the other two journals, so that it merely plays between the faces of the two pulleys A and C, rotating with them, and serving merely as a bearing, in the direction of the strain, for the pulley C.

By this arrangement of pulleys and driving-belt, it will be seen that the power is applied directly to the shaft of wheel C, from the main driver A, through the medium of the usual belt B, and, that in lieu of the loss of power generally occasioned by the friction of the shaft D in its bearings, all such friction and consequent loss of power are avoided, by reason of the said shaft and its pulley or wheel C being supported by and turning on the rotating face of wheel F.

The direction of motions of the belt and the several pulleys, I have illustrated in the drawings by arrows, from which it will be seen, that since the loose pulley F runs in contact with both the faces of the driving-wheel A and that of the pulley C, it serves not only to enable the latter to run without friction, but also constitutes a medium for the transmission of motion and power from the driver A to the wheel C, so that the transmission of motion and power by the belt is augmented by a transmission-effected through the medium of the friction-pulley F.

It will be understood that by such an arrangement of devices as I have shown and described, or the equivalent thereof, a most economical driving-mechanism, or mechanism for the transmission of motion and power is produced, and it will be understood that this arrangement of devices, under various modifications, may be applied in all cases where the economical application of a motive-power is a desideratum. Of course the detail arrangements and proportions may be varied at the pleasure of the mechanic or engineer, without departing from the spirit of my invention. Where greater leverage and less speed are desired, or, so to speak, less speed and more power, the proportions

of the driving-wheel A and driven wheel C may be transposed or reversed, A being made small in diameter and C large. The proportions of all the wheels may be varied to suit surrounding circumstances, and more than one intermediate, anti-friction, and auxiliary driving-wheel may be employed, though I deem one, as shown at F, sufficient.

It will be seen that it is only necessary to always keep the driving-belt taut to insure a perfect contact of the pulleys, and a proper and certain transmission of motion and power, and that this is effected irrespective of the projection of the bearings, and after the main shaft-bearing may have, since the belt confines the whole system within itself.

Where the motion is slow and great power required, the function of the intermediate wheel, as an auxiliary driver, is important, since it partially relieves the belt, and prevents any slip that might otherwise occur, the

two (the belt and friction-pulley) working together with nearly the same certainty as gearing.

Having so described my invention that the skilful mechanic can readily understand and practise it in all its modifications, and understand the great advantages to be gained by it,

What I claim as new, and desire to secure by Letters Patent, is—

The employment, in combination with the usual main driving-wheel and belt, and a secondary or driven pulley, hung on a movable axis, of an intermediate pulley or pulleys, the whole arranged to operate in the manner and for the purposes set forth.

In testimony whereof, I have hereunto set my hand and seal, this 29th day of October, 1869.

Witnesses: GEORGE M. RHOADES. [L. S.]

J. MCINTIRE,

E. S. MCCULLY.