(No Model.)

W. W. GRISCOM.

MECHANICAL MOVEMENT.

No. 409,193. Patented Aug. 20, 1889.

Fig. 1

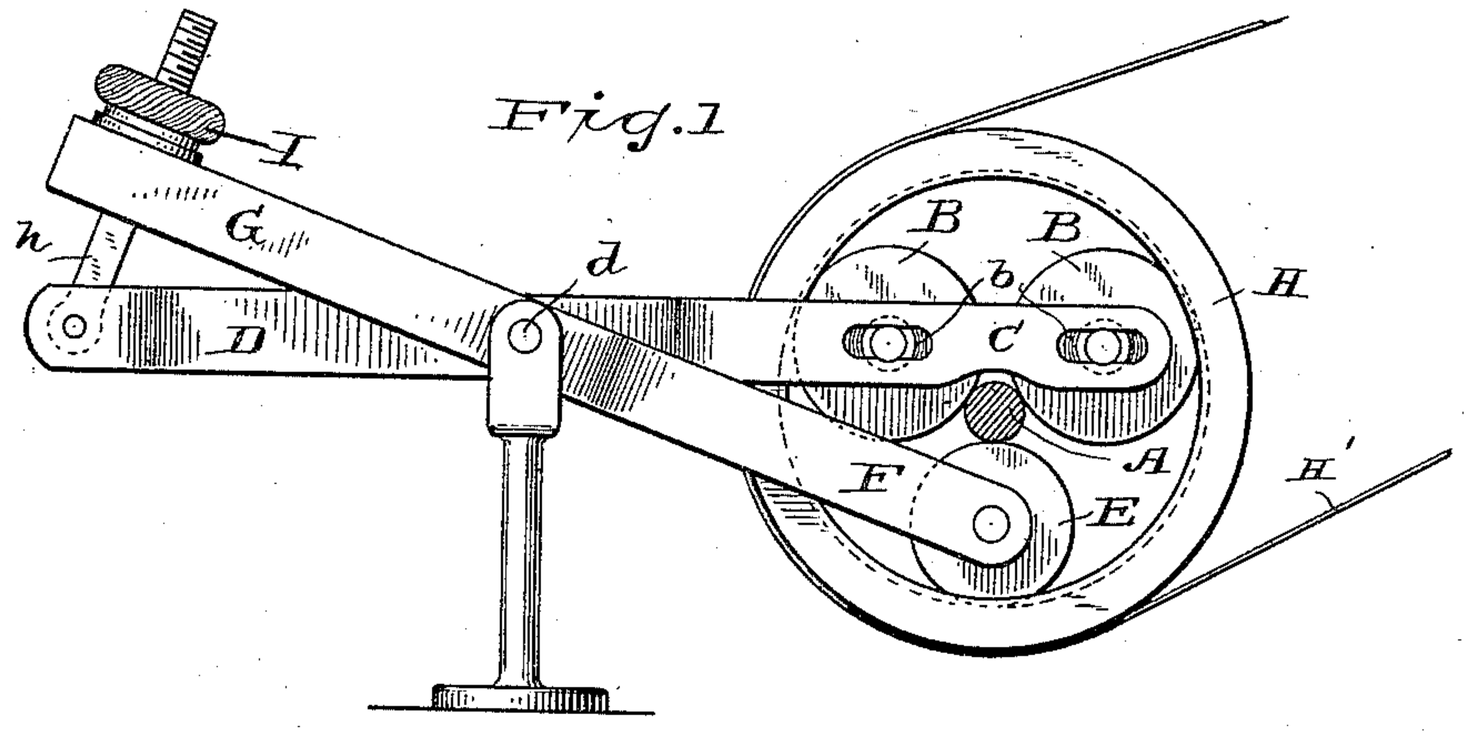


Fig. 2.

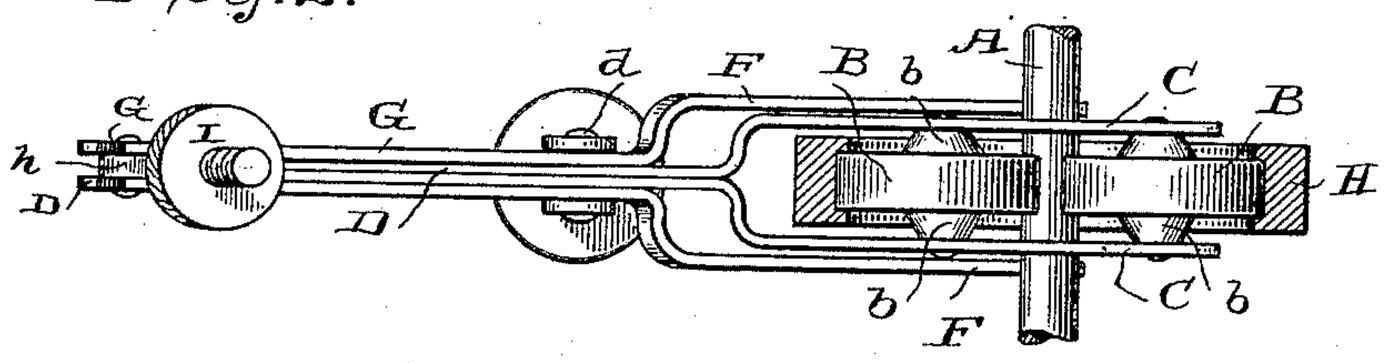


Fig. 3.

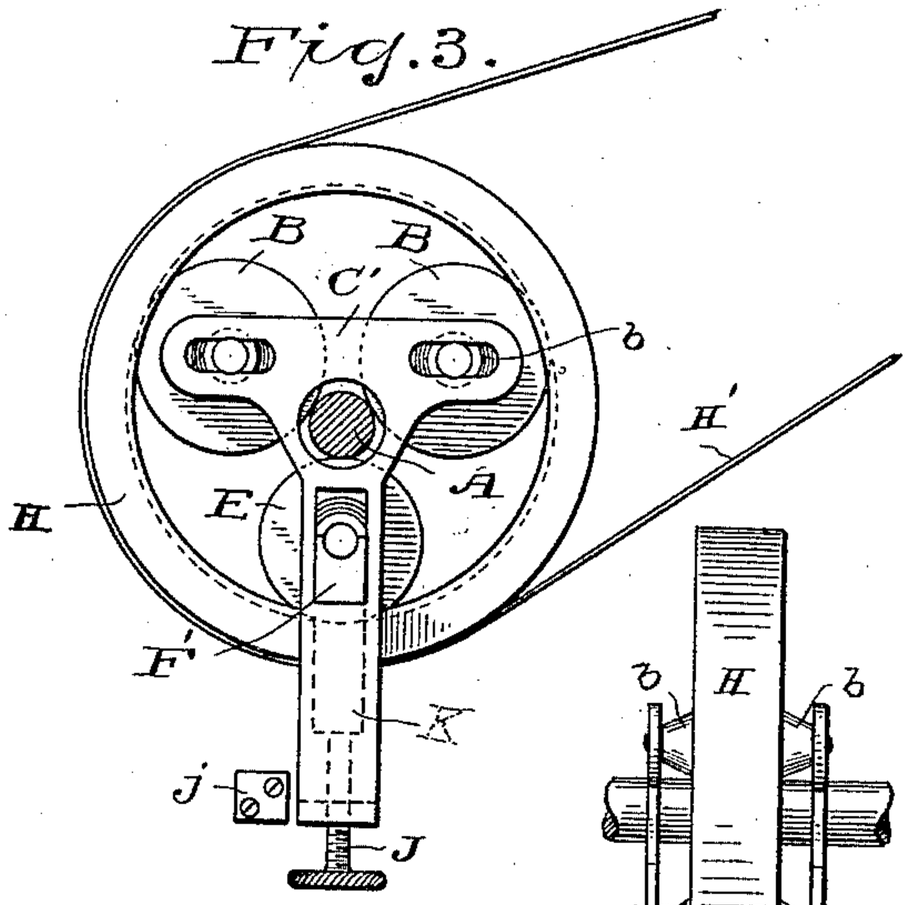
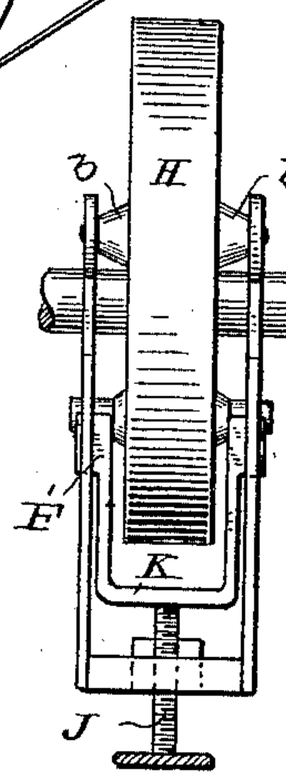


Fig. 4.



Witnesses

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WILLIAM WOODWORTH GRISCOM, OF HAVERFORD COLLEGE, PENNSYLVANIA.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 409,193, dated August 20, 1889.

Application filed December 10, 1887. Serial No. 257,513. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WOODWORTH GRISCOM, a citizen of the United States, residing at Haverford College, in the county of Montgomery, State of Pennsylvania, have invented certain new and useful Improvements in Mechanical Movements, of which the following is a description.

My invention relates to a new and improved device for converting the high speed of a rapidly-rotating driving shaft or pulley to a slower speed without the interposition of counter-shaft and belting or similar power-absorbing mechanism.

By means of my improved apparatus I am enabled to utilize to advantage the highest power capable of being developed by small high-speed motors for various purposes where the power delivered to the apparatus being driven could not be advantageously used at such high speed. Instead of being compelled to use a larger motor running at less than its normal speed or waste a large proportion of the power in complicated gearing, I may utilize a small motor running at its best and most economical rate, and with the minimum loss by friction.

The details of the construction, arrangement, and operation of my improved speed-reducing device will be hereinafter fully described, and referred to in the appended claims.

In the drawings illustrating my invention, Figure 1 is a view in elevation showing a speed-reducing apparatus embodying my invention. Fig. 2 is a top plan view thereof, partly in section. Fig. 3 is a view in elevation showing a slightly-different form of the adjusting devices. Fig. 4 is plan view of the devices illustrated in Fig. 3.

Similar letters denote like parts throughout.

As shown in the drawings, A is the driving-shaft of the prime motor, and, so far as my invention is concerned, may receive its motion from any desired source of power, as a water-wheel, steam-engine, or electric motor.

B B are a pair of friction-pulleys engaging opposing sides of the driving-shaft. The friction-pulleys B B are mounted in sliding bearings *b b* in a suitable support, in the present instance shown as a pivoted lever or frame C, extending on both sides of the friction-wheels B B and continued in the form of a lever D, pivotally supported at *d*. A third friction-wheel E is pivoted in a similar frame F, which is also continued in the form of a lever G, and likewise supported upon the pivot *d*. The friction-pulley E is made somewhat smaller than the pulleys B B, and is arranged to engage the side of the main shaft equidistant from said pulleys B, the bearing-points of the three pulleys forming a triangle.

A driving-wheel or belt-pulley in the form of a floating rim H incloses the three pulleys, the exterior bearing-surfaces of which engage the interior surface of the said floating rim. The size of the laterally moving or spreading pulleys B B and the internal diameter of the floating rim are so proportioned that the points of contact of said pulleys B B will be above the transverse center thereof, while the smaller pulley E is at the lowest point of its internal diameter. The extremities of the levers D G are connected by a pivoted screw-threaded link *h*, provided with adjusting-nut I. Rotation of the nut I in one direction will bring the pulley-carrying frames C F toward each other and force the three pulleys against the driving-axle A.

It will be obvious that a very high degree of frictional tension or adhesion may be secured between the parts by the use of levers D G of any desired length; also, that when the friction-pulleys B B are so proportioned that they engage the interior of the floating rim above its transverse center by pressing them downward upon the axle A, thus tending to separate them laterally, their tendency will be to raise the floating rim H. This being prevented by the presence of the pulley E directly in a vertical line between the said pulleys B, they will act in harmony to increase or diminish the tension, as may be desired. By making the pulley E of less diameter than the pulleys B B the device may be operated with a very small driving-axis and the friction-pulleys B B E revolve without interference, and coact to transmit the movement of the axis to the inner circumference of the floating rim, on the exterior of which a driving-belt H′ may be placed for the transmission of power; or the exterior of said rim

may be provided with cog or other known gearing to suit the purposes to which it is applied.

It may in some instances be necessary, in order to transmit great power, to obtain more frictional adhesion than that capable of being afforded by the three friction-pulleys B B E shown, since they represent the simplest form of my device, and in such cases a greater number of wheels are to be employed, it being evident that it would not require invention to increase the number of friction-wheels or connections interposed between the driving-axle and rim.

It will be readily understood that the mechanical relationship between the three driving-pulleys such as just described may be established and maintained by different forms of connection than that above referred to. For example, as shown in Figs. 3 and 4, the wheels B B are supported in a T-shaped frame C′, which is provided with downwardly-extending slots for the reception of sliding bearings F′, carrying the axis of the friction-pulley E, which is adjusted to and from the opposing pulleys B B by means of a set-screw J, passing through the outer end of the frame C′ and acting against a yoke K, connecting the sliding bearings F′.

Instead of a pivotal support for the frame C′, I provide a stop *j* at any convenient point. The stop *j* preventing rotation of the frame, the motion of the axis A is transmitted to the wheels, and through them to the floating rim, as and in the manner just described.

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

1. In the described device, a main driving-shaft, wheels B B in engagement therewith, adjustably mounted in suitable bearings, a wheel, as E, also engaging the shaft, but from a direction opposing the wheels B B, a floating rim encircling said wheels, said wheels E being mounted in a movable frame, a suitable screw device acting upon the said frame for forcing upward the wheel E, whereby the wheels B B are spread to increase the friction against the floating rim, substantially as described.

2. In the described device, a main driving-shaft, wheels B B in engagement therewith, adjustably mounted in suitable bearings, a wheel, as E, mounted in the end of a pivoted lever, also engaging the shaft, but from a direction opposing the wheels B B, a floating rim encircling said wheels, and a suitable screw and nut acting on the said lever for giving the wheel E a vertical movement, whereby the wheels B B are spread to increase the friction against the floating rim, substantially as described.

3. In the described device, a main driving-shaft, wheels B B in engagement therewith, having their axes movable in suitable bearings upon a frame, a wheel E, supported on a suitable frame, said wheel engaging the main shaft, but from a direction opposing the wheels B B, and a floating rim encircling said wheels, the frame supporting the wheel E being pivoted to the frame supporting the wheels B B, and connected therewith by a suitable nut and screw at one end, whereby upon the adjustment of said nut the wheels B B may be spread, substantially as described.

In testimony whereof I hereto affix my signature in presence of two witnesses.

WILLIAM WOODWORTH GRISCOM.

Witnesses:
JOHN RODGERS,
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