3 Sheets--Sheet 1.

A. M. DAMON.

Improvement in Gear or Pulley Mechanism.

No. 123,618. Patented Feb. 13, 1872.

Fig. 2.

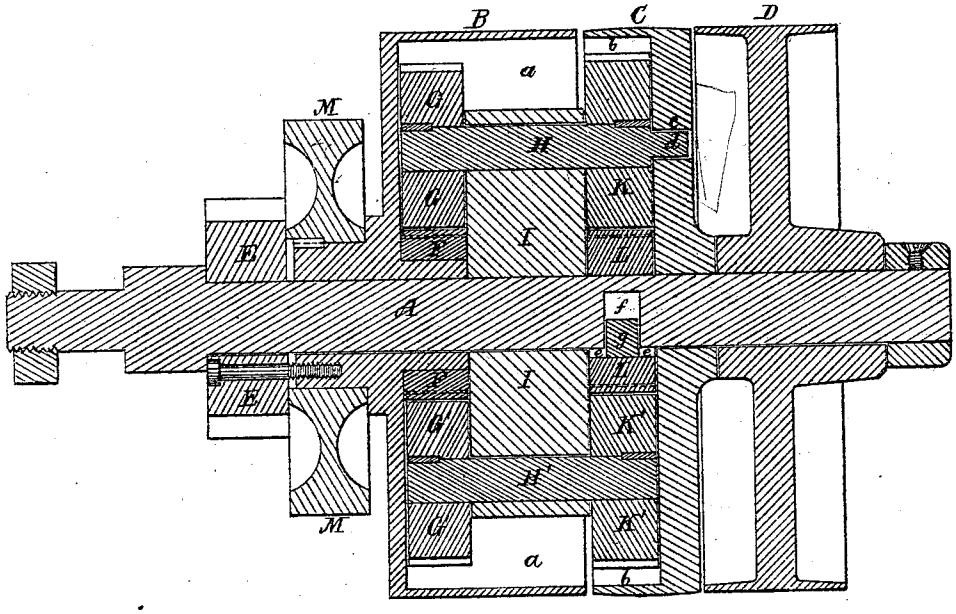
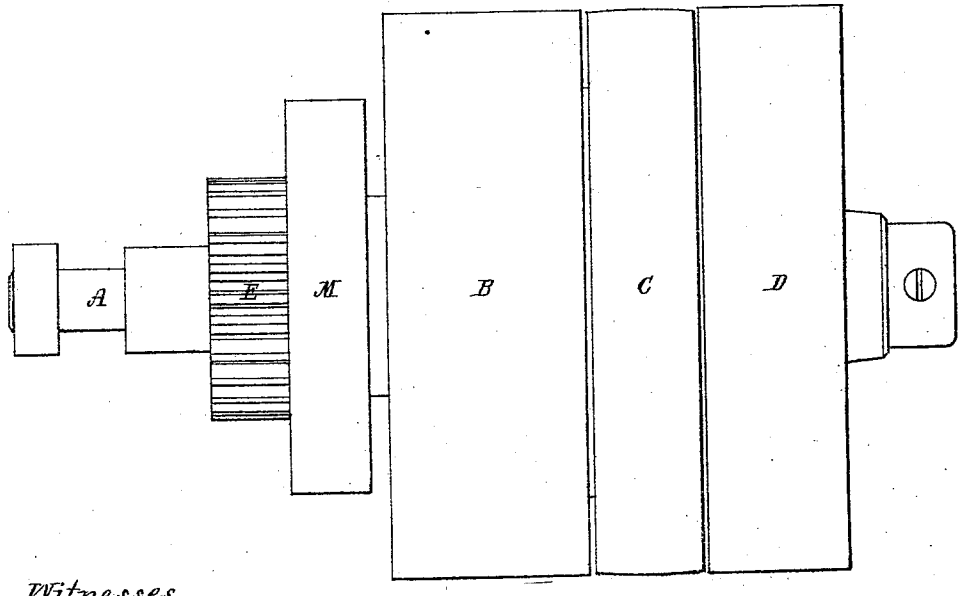


Fig. 1.



Witnesses
S. N. Piper
L. N. Miller

Alex. M. Damon.
by his attorney.
R. F. Lindsey

3 Sheets--Sheet 2.

A. M. DAMON.

Improvement in Gear or Pulley Mechanism.

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Fig. 3.

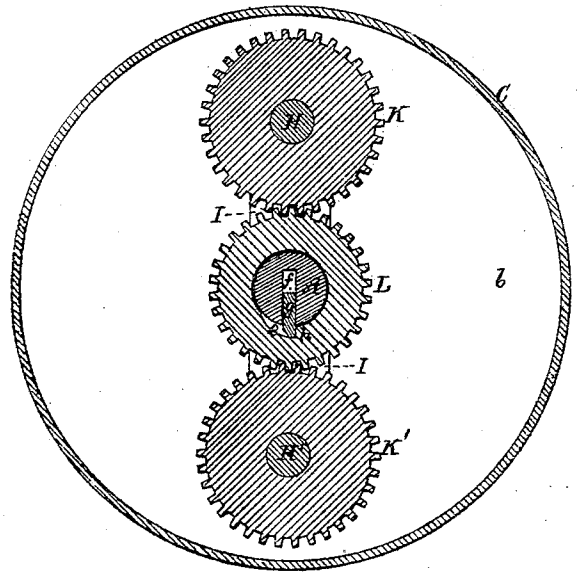


Fig. 5.

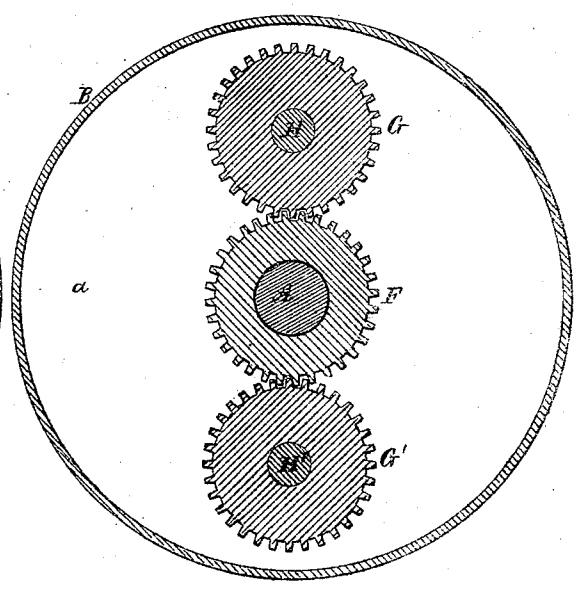
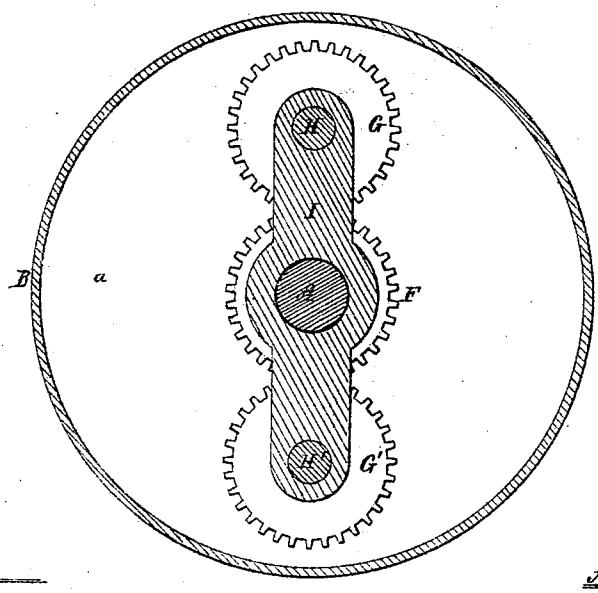


Fig. 4.



Witnesses
S. N. Piper
L. N. Moller

Alex. M. Damon.
by his attorney
R. H. Eddy

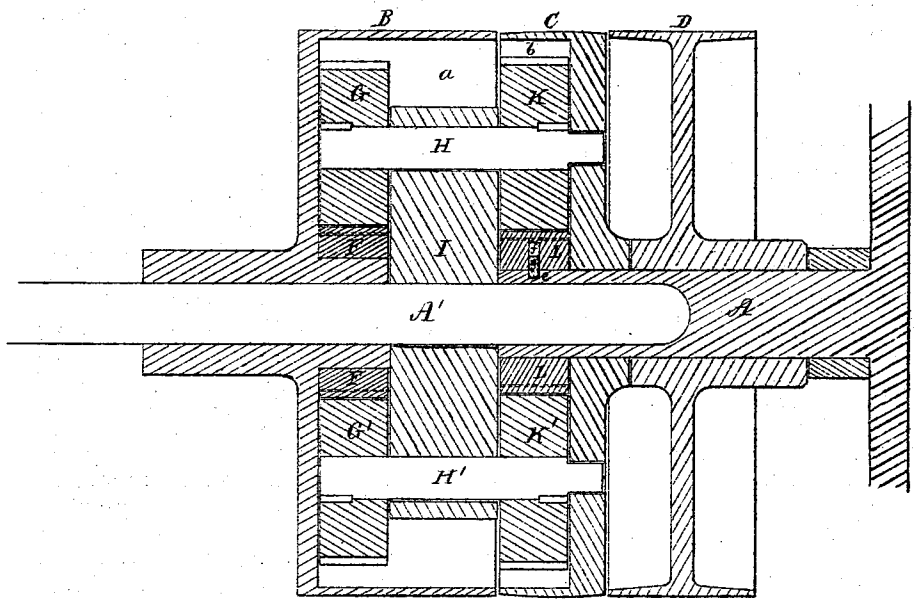
3 Sheets--Sheet 3.

A. M. DAMON.

Improvement in Gear or Pulley Mechanism.

No. 123,618. Patented Feb. 13, 1872.

Fig. 6.



Witnesses.
S. N. Piper.
L. N. Miller

Alex. M. Damon.
by his attorney.
R. Mundy

UNITED STATES PATENT OFFICE.

ALEXANDER M. DAMON, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND OLIVER H. MOULTON, OF SAME PLACE.

IMPROVEMENT IN GEAR OR PULLEY MECHANISMS.

Specification forming part of Letters Patent No. 123,618, dated February 13, 1872.

To all persons to whom these presents may come:

Be it known that I, ALEXANDER M. DAMON, of Lowell, in the county of Middlesex and State of Massachusetts, have invented new and useful Mechanism for Revolving a Gear or Pulley at different velocities by a belt running at one speed and on either of two pulleys; and I do hereby declare the same to be fully described as follows, and to be represented in the accompanying drawing, of which—

Figure 1 is a top view, Fig. 2 a longitudinal section, and Figs. 3, 4, and 5 transverse sections of the said mechanism.

It is intended for use on warpers, slashers, or various other machines where two different speeds of their driving-gear may be required to be produced from a driving-belt running at a uniform speed.

In the said drawing, A denotes a stationary shaft—that is, one which, when in use is not to revolve, but be absolutely stationary. On this shaft, concentrically, there are arranged three pulleys, B C D, in manner as represented, each being to revolve freely on the shaft. The wheel D is what is termed a "loose pulley." Each of the wheels or pulleys B C is provided with a cylindrical chamber, shown at *a* in the one end, at *b* in the other. Furthermore, a gear, E, is fixed to the wheel B, and revolves with it about the shaft A, and there is also arranged within the pulley B, and fixed to it so as to revolve with it, a gear, F. This gear F engages with two gears, G G′, all three gears, F G G′, being equal in diameter, and each having a like number of teeth, as thirty-two, for instance. The gears G G′ are fixed to two arbors, H H′, which extend through and revolve freely within a rotary carrier, I, which turns freely on the shaft A, and extends in opposite directions therefrom, as shown. The arbors H H′ support and have fixed to them two other gears, K K′, arranged as represented, each of the said gears having a diameter larger than that of its fellow gear, G or G′, on the same arbor, and, of course, a greater number of teeth, as, for instance, thirty-four. The two gears K K′ engage with another gear, L, arranged between them on the shaft A, so as to freely revolve thereon. The gear L has thirty teeth. One of the arbors H is provided with a cylindrical journal, *d*, extended into a corresponding hole, *c*, made in the side of the pulley C, the same serving to so engage the carrier I with the pulley C as to cause the former to be revolved by and with the latter while it may be in revolution. The gear L has a locking-notch formed in it, as shown at *e*, there being arranged vertically within the shaft A, or in a chamber, *f*, made therein, a slide-bolt, *g*, to act with such notch; the whole being so that the gear L will be estopped from revolving in one direction, and be allowed to revolve in the opposite direction. If the driving-belt be slipped from the loose pulley D upon the pulley C, and be running in a direction to cause the belt *g* to be borne against the shoulder *h* of the notch *e*, the gear L will be stopped from being revolved with the said pulley C. Now, as the carrier I will be revolved with the pulley C and at the same velocity, the gears K K′ will be revolved in an orbital path about the gear L. As a consequence the gear K K′ will, in turn, be revolved by the gear L, each gear K or K′ making thirty thirty-fourths of a revolution on its own axis while making an entire orbital revolution. The gears G G′ will revolve with the gears K K′ and their arbors, and, as a consequence, will revolve about and revolve the gear F, which will revolve the pulley B and the gear E, the latter turning once to each revolution, orbital or otherwise, of either gear G G′. From the above it will be seen that, while the pulley C may make thirty-four revolutions, the gear F will make but thirty. If, now, we shift the belt from the pulley C to the pulley B, the gear L will be immediately unclutched from the shaft A, in consequence of such gear being revolved, as it will be, in a direction to carry the bolt *g* away from the shoulder of the notch, and cause the bolt to slide upon the inclined part of the notch and upward into the shaft. The gear L, being thus unclutched from the shaft, will continue to revolve about it, the clutch-bolt falling into and being raised out of the notch during each revolution of the gear, without estopping the rotary motion of the gear as it did when the belt was on the pulley C. Consequently, as the pulley B is revolved by the driving-belt, a like speed will be communicated to the gears E and F; and the carrier

I and the pulley C will be at rest, while the gears G G′, K K′, and L and the arbors H H′ will be revolved. Thus it will be seen that by means of the mechanism, as hereinbefore described, the gear E will be driven at the slower speed when the belt is upon the pulley C. I remark that one gear, G, its arbor H′, and gear K′ of such arbor may be dispensed with, they being used to counterbalance the fellow arbor and its gears, and thereby cause the mechanism to run with less jar. It is better to use such auxiliary shaft and gears, as will be readily seen. M is a pulley, which may be used with the pulley B, instead of or with the gear E. In the above-described mechanism, the shaft A is stationary, the gear revolving on it. Should it, however, be desirable to have the shaft A revolve at either of two different speeds, such may be effected by connecting it with the wheel B, and employing in place of said shaft a stationary tubular shaft or sleeve, arranged concentrically with the shaft, and extended through the pulleys D and C, and provided with a catch-notch like that of the gear L, the catch-bolt being arranged in the said gear. Under these circumstances the tubular shaft is the equivalent of the shaft A, which, when combined with the tubular shaft, will be moved by and with the wheel B, and, of course, may be moved at either of the two different speeds, as the belt may be on one or the other of the pulleys B C. Fig. 6 is a section of such a modification or construction of my invention, the tubular shaft being exhibited at A, and the shaft to revolve being shown at A′.

What I claim as my invention is—

1. The stationary shaft A, the pulleys B and C, the gear F, the carrier I, the arbor H, the gears G K, the gear L, the journal *d*, hole or bearing *c*, the slide-bolt *g*, and the locking-notch *e*, combined and arranged substantially in the manner as set forth, and for use with a gear, F, or its equivalent, or with such and a loose pulley, D, all being essentially as specified.

2. I also claim, in combination with the subject above claimed, the auxiliary counterbalancing-gears G′ K′ and the arbor H′, arranged therewith, substantially as represented.

ALEXANDER M. DAMON.

Witnesses:

GEORGE DRAPER,

JOHN B. HUNT.