

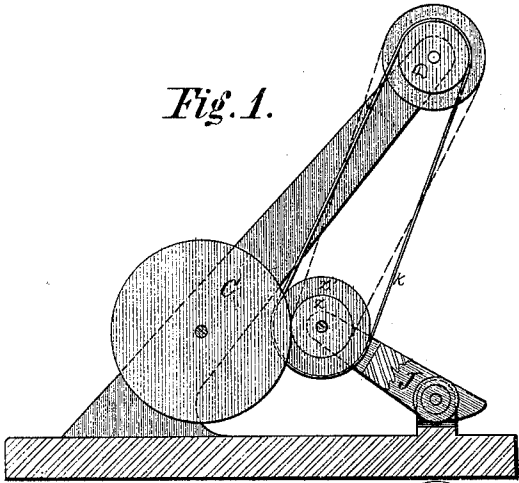
*G. C. Howard,*

*Belt Gearing.*

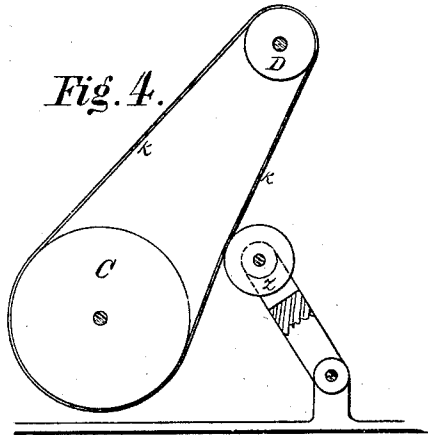
*No. 112,145.*

*Patented Feb. 23, 1871.*

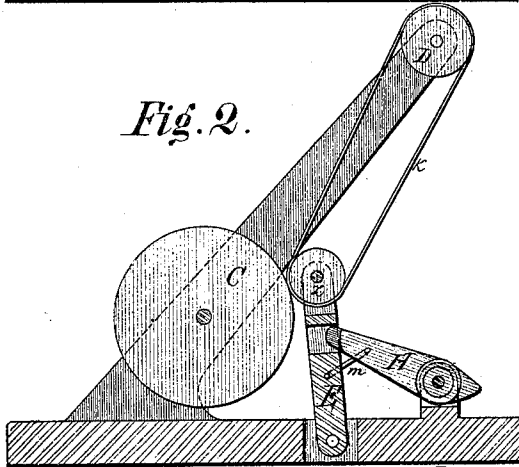
*Fig. 1.*



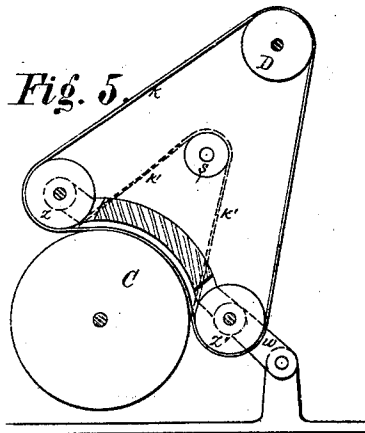
*Fig. 4.*



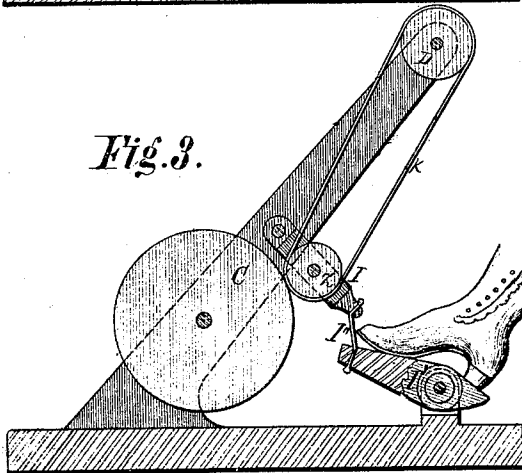
*Fig. 2.*



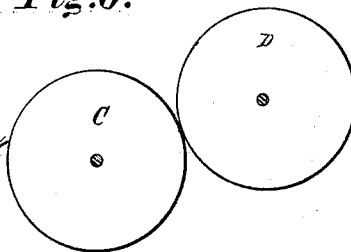
*Fig. 5.*



*Fig. 3.*



*Fig. 6.*



*H. Daniels*

*Witnesses.*

*Geo. Howard*  
*Inventor.*

# United States Patent Office.

GEORGE C. HOWARD, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 112,145, dated February 28, 1871.

## IMPROVEMENT IN BELT-GEARINGS.

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 C. HOWARD, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Belt-Gearing; and do hereby declare that the following description, taken in connection with the accompanying drawing, hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvement by which my invention may be distinguished from others of a similar class, together with such parts as I claim and desire to secure by Letters Patent.

My invention relates to an improvement in belt-gearing, the object being to be able to leave the driving-pulley entirely free when no power is used, (figs. 1, 2, 3, and 6,) and to be able to regulate the speed of the mechanism quickly.

Figures 1, 2, 3, and 5 represent modifications of my arrangement, and

Figures 4 and 6 show devices already known.

To show clearly the novel and useful points in my invention I will first describe the well-known devices shown in figs. 4 and 6.

Fig. 4 represents the common device for tightening belts;

C is the driving-pulley; and

D the receiving-pulley.

K, the belt, which communicates the motion from C to D.

This belt K incloses the pulleys C and D so loosely that no power is transmitted through it as long as the "tightening"-pulley Z does not press against it.

When the pulley Z is forced against the belt K the latter tightens around the pulley C and transmits its motion to D.

The objections to this arrangement are:

First, that nearly as much power is consumed by the friction, created by the belt K hanging loosely upon the pulley C, as it takes to drive the machinery;

Second, that as the belt tightens and slackens gradually upon the pulley C the machinery cannot be started quickly; and

Third, that, owing to the elasticity of the belt, the speed cannot be closely regulated by varying the pressure upon the tightening-levers.

The device shown in fig. 6, in which the pulley D, which is to receive the motion, is forced against the pulley C, without the medium of any belt, is free from the objections peculiar to fig. 4; but, in order to convey the power to any considerable distance, a large number of wheels would be required, or else they would have to be enormously and impracticably large in diameter, in order to fill up the space between the driving and receiving-shaft.

The object of this invention is to produce an apparatus which shall possess the advantages of fig. 6, of being capable of immediate stoppage, of running the receiving-pulley any speed less than that of the pulley C by merely varying the pressure upon the tightening-levers, and of leaving the driving-pulley C entirely free when no power is used; and also those of figs. 4 and 5; namely, the use of the belt K, but which shall not be liable to the disadvantages of fig. 4.

My improved apparatus is shown in various forms in figs. 1, 2, 3, and 5, and its essential features are to connect the pulley Z, having a movable center, with the receiving-pulley D, by a common belt, K, and then to force the pulley Z against the pulley C. By this operation the belt K is pinched so tightly between the peripheries of the pulleys Z and C that it must move with the same velocity as the periphery of the pulley C does, and thus it communicates motion to the pulley D.

If it is desired to cause the belt to move faster or slower than the periphery of the pulley C the pulley Z must run directly in contact with C, and the belt K is put around a second pulley, Z', fig. 1, which is larger than Z, if the speed is to be increased, and smaller if it is to diminish.

The arrangement shown in fig. 5, where the belt K does not inclose the pulley C, but is forced in contact with part of the periphery of C until the pulleys Z Z' on the moving lever w impinge upon the pulley C, embodies the principle of my invention, but is still liable to the same objection as fig. 4, namely, of the belt K being still in contact with C after the pulleys Z and Z' have left the periphery of C.

If it should be, therefore, desired to keep the driving-belt K away from the driving-pulley C, and only to let it touch it when the pulleys Z and Z' impinge upon C, a pulley, s, on a fixed stud, may be provided, and the belt passed over it, as shown by dotted lines K' K'.

It will be easily seen that the peculiar mechanical devices that may be adopted for bringing the pulleys Z, Z Z', or Z and Z', in contact with C are quite numerous, as they may be made to suit the foot, as in figs. 1, 2, and 3, or the hand, or they require to be made to suit the peculiar relative position of the pulleys Z, C, and D.

In fig. 1 the pulley Z Z' is hung to the end of the lever or treadle J, which has its fulcrum at J', and by applying the foot, as shown in fig. 3, the pulley Z Z' may be forced toward the pulley C.

In fig. 3 two levers, I and I' are used, connected by a flexible band, I'' or by a link.

In fig. 2 two levers, H and E, are used, so that a depression of the left arm of H will cause the lever E to move toward the pulley C, either by reason of

the lever H pushing directly against E or by means of the link in connecting the two.

In this improved apparatus there are no additional contrivances required to bring the pulleys Z, Z', or Z'' away from O when the pressure upon the levers is released, as the elasticity of the belt is sufficient for that purpose.

Having thus described the construction, operation, and relative arrangement of the component parts of my invention, together with modifications of the same, I will indicate what I claim, and desire to secure by

Letters Patent of the United States, in the following clause:

The improvements in belt-gearing described in the foregoing specification, and illustrated in the drawing accompanying the same and forming a part thereof, consisting substantially of the combination of the driving-pulley C, belt K; tightening-pulley Z, pulley D, and levers J, as and for the purposes set forth.

Witnesses:

GEO. C. HOWARD.

SAMUEL C. OGLE,

L. M. BLANTON.