C. DE L. RICE.

BELT GEARING.

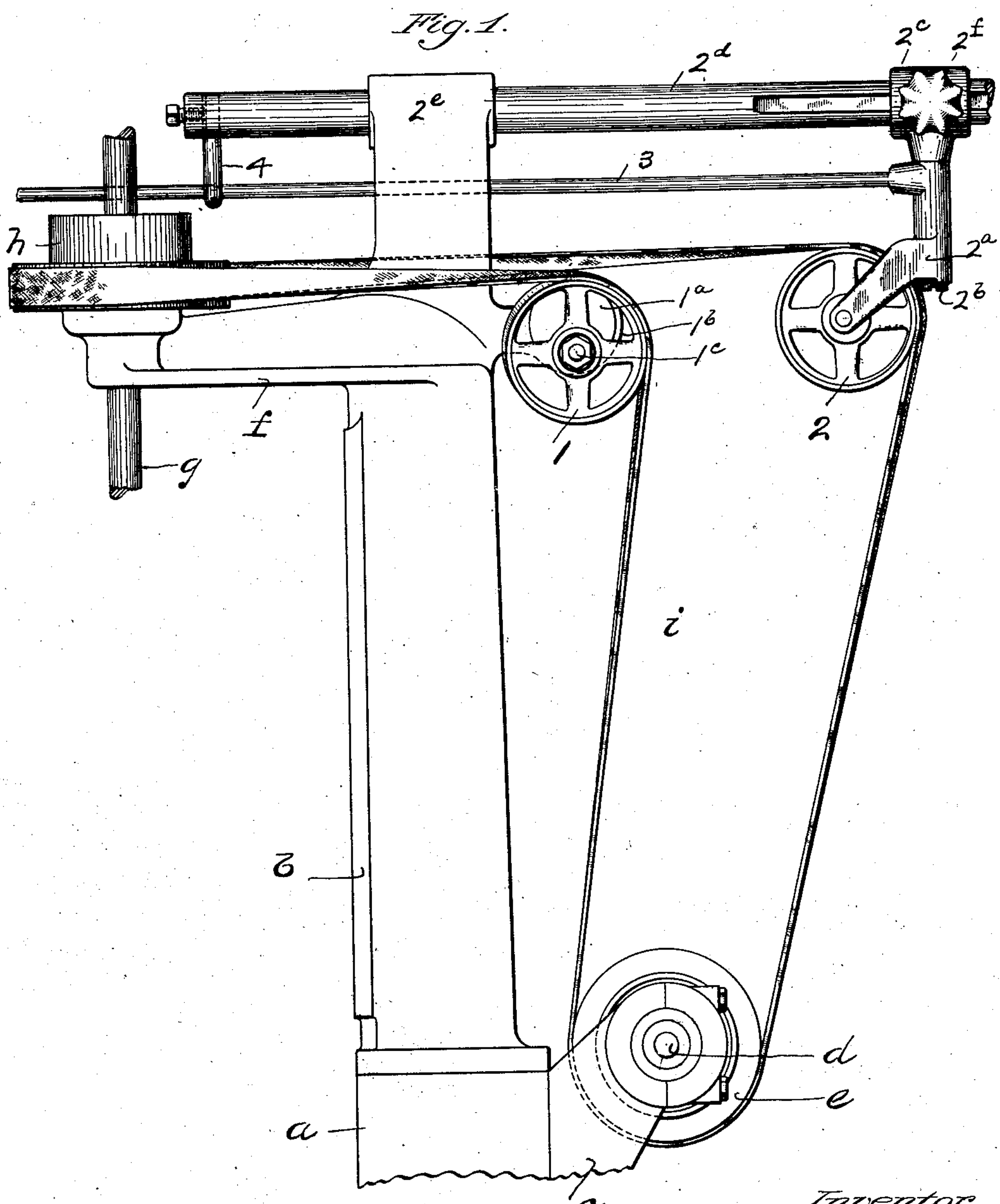
APPLICATION FILED MAR. 2, 1906.

1,022,756.

Patented Apr. 9, 1912.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

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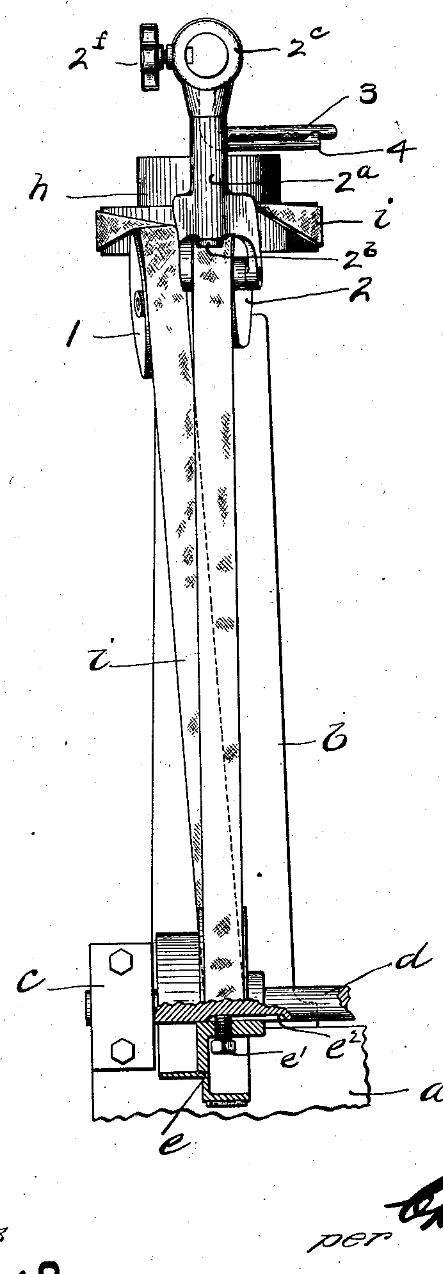
4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 3.

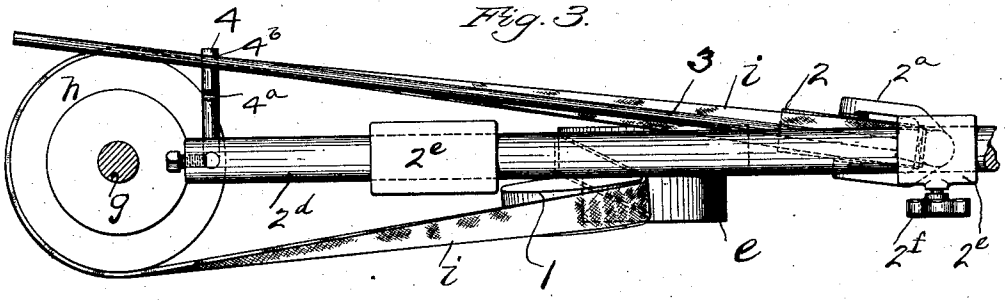


Fig. 4.

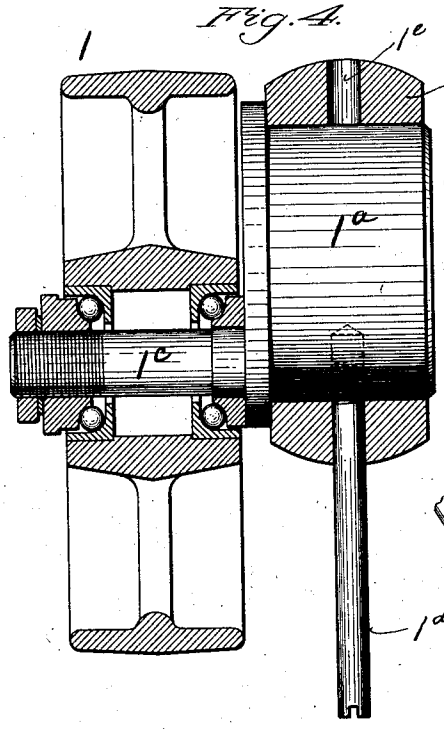
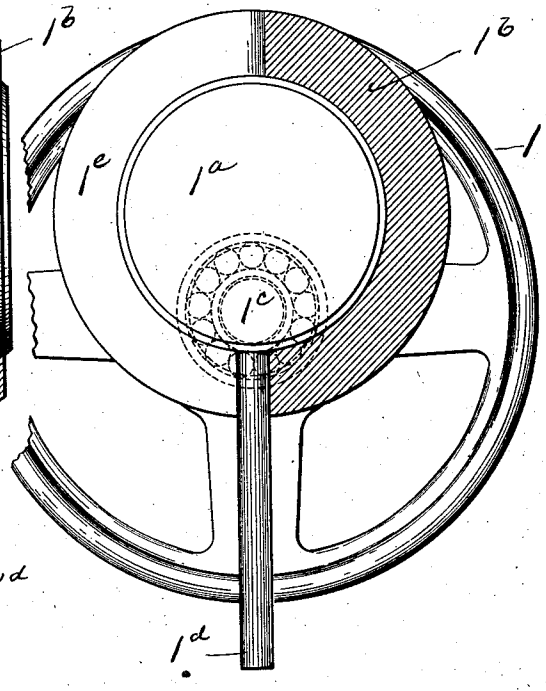


Fig. 5.



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4 SHEETS—SHEET 4.

Fig. 6.

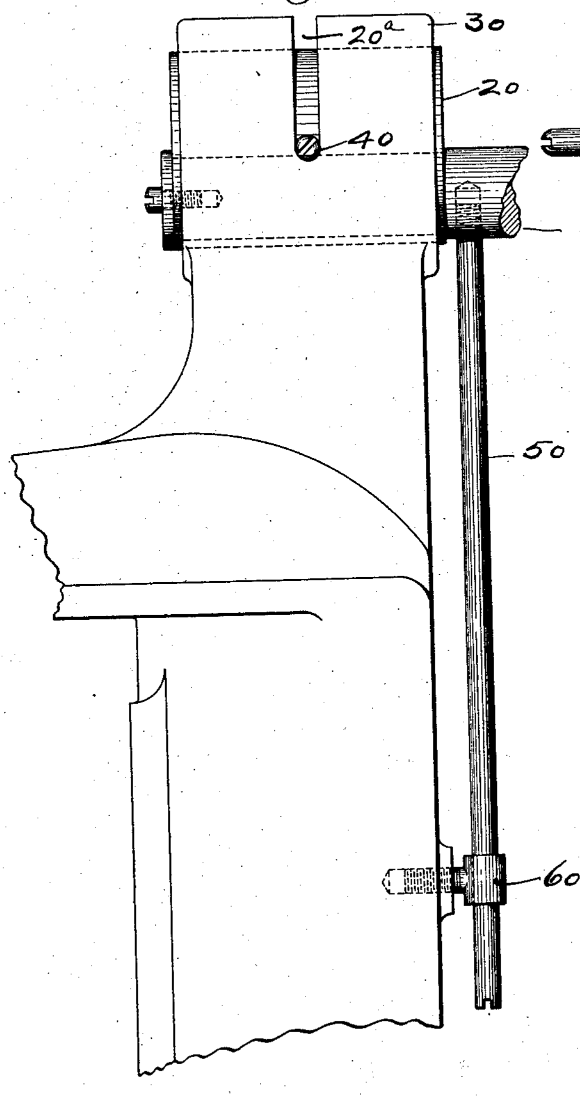
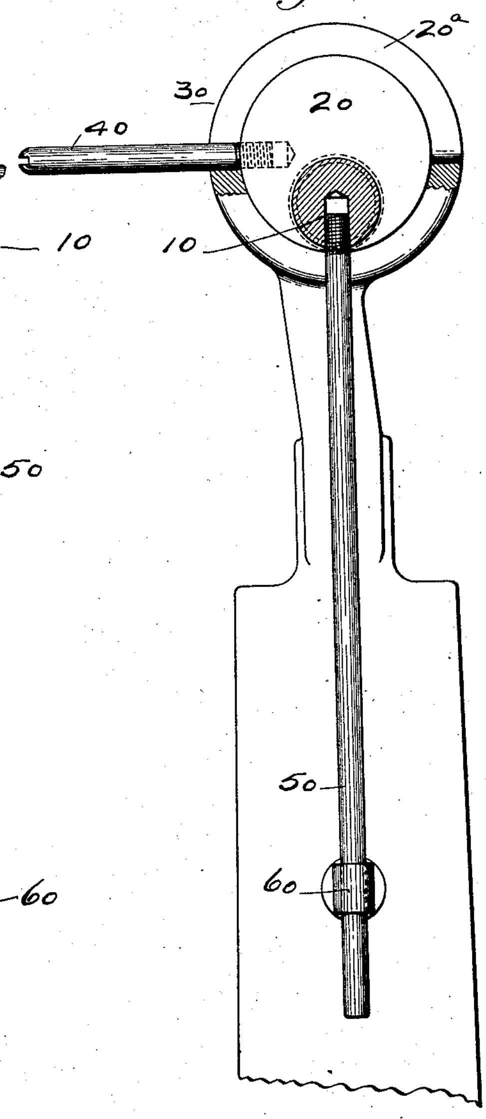


Fig. 7.



Witnesses.

C. W. Storrs

[signature]

Inventor

Charles D. Rice

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UNITED STATES PATENT OFFICE.

CHARLES DE LOS RICE, OF HARTFORD, CONNECTICUT.

BELT-GEARING.

1,022,756. Specification of Letters Patent. Patented Apr. 9, 1912.

Application filed March 2, 1906. Serial No. 303,907.

To all whom it may concern:

Be it known that I, CHARLES D. RICE, citizen of the United States of America, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Belt-Gearing, of which the following is a specification.

The object of the invention is to provide a belt gearing having features of novelty and advantage.

It is particularly well adapted for use on metal working machines, such as drill presses, and is illustrated as applied to such a machine.

In the drawings—Figure 1 is a general side elevation of a portion of a drill press showing the application of my belt gearing thereto. Fig. 2 is a rear view of the part of the machine shown in Fig. 1. Fig. 3 is a top view of the same. Fig. 4 is a detail in section on enlarged scale of the eccentric mounting of one of the idler pulleys. Fig. 5 is a side view of the device shown in Fig. 4. Figs. 6 and 7 are side and rear views of a modification in which the members supporting the idlers may be adjusted vertically.

Referring to the drawings *a* is a part of the pedestal of the machine, *b* the upright, *c* the brackets supporting the counter shaft *d* on which is mounted the two-step counter shaft pulley *e*.

f is an overhanging arm at the top of the upright supporting the spindle *g* on which is mounted the two-step spindle pulley *h*.

i is the belt passing around the spindle and counter shaft pulleys and over idler pulleys 1 2. The delivery idler 1 is provided with means for raising and lowering it so that it will track with either step of the spindle pulley, this means comprising an eccentric bushing 1^a mounted in a suitable housing 1^b and having a pin 1^c on which the pulley is mounted. A pin 1^d is attached to the bushing and serves as a handle by which to turn the bushing to either position, the handle moving in a slot 1^e in the housing 1^b. The return idler 2 is mounted in a yoke 2^a which is pivotally supported on a pin 2^b which is carried by a carrier 2^c carried by a rod 2^d which is mounted in the sleeve 2^e supported at the top of the upright. The carrier 2^c is adjustable lengthwise of the rod 2^d in order to take up the slack in the belt and keep it at its desired tension, it being provided with a set-screw 2^f for securing it in its position of adjustment. The counter shaft pulley *e* is mounted to slide on its shaft in order to bring either of its steps into line with the return idler; it is provided with a set-screw *e'* which takes into a slot e^2 in the shaft to hold it in position. By this arrangement it is seen that I am able to operate either step on one pulley with either step on the other pulley, and in consequence am able to drive the spindle at four different speeds.

In order that this belting arrangement shall work to the best advantage it is advisable to have the face of the return idler square to a line tangent to whichever step of the spindle pulley the belt is operating on. For instance, when the driving conditions are as shown in Figs. 1, 2 and 3 the face of the pulley should square to a tangent of the larger step of the spindle pulley, as illustrated in Fig. 3. In order to insure such an arrangement of the parts I provide a tiller rod 3 which at one end is attached to the yoke 2^a. At the forward end of the rod 2^d is secured the bracket 4 having two notches 4^a 4^b, one of which is in a vertical plane tangent to the larger and the other to the smaller step of the counter shaft pulleys. In one of these notches the tiller rod rests, according to whether the larger of smaller step of the pulley is being used. It is secured to the yoke directly over the center of the return idler and the arrangement insures that the idler will be turned to proper position to receive the belt from the pulley no matter what its position is along the rod 2^d. This provides what might be termed a fixed adjustment for the return idler.

In the modification of Figs. 6 and 7 a rod 10 is mounted eccentrically in a bushing 20 which is supported in a sleeve 30 upstanding from the top of the column. On this rod both the delivery and return idlers are supported. The bushing is provided with the handle pin 40 by means of which it may be turned from one position to another, the pin working in the slot 20^a in order to raise or lower the idlers. To prevent the rod 10 from rolling over during this raising and lowering operation a stem 50 projects downwardly from the rod and passes through an eye 60 which is permitted of such turning motion as is necessary to ac-

commodate the travel of the stem with the rod from high to lower position. The detail arrangement of the idlers and pulleys is the same as shown in Figs. 1, 2 and 3 except that both the idlers are adjustable vertically. Pairs of pulleys of different diameters on each shaft may be used in place of the two-step pulleys shown.

I claim as my invention:

1. In a belt gearing for drill presses and similar machines a counter-shaft extending lengthwise of the machine, a spindle parallel to a vertical plane passing through the axis of said counter-shaft, and pulleys of different diameters mounted on said spindle and said shaft, an endless belt, idler pulleys for the delivery and return sides of said belt, said delivery idler being vertically adjustable, and said return idler being adjustable back and forth horizontally to take up slack, a swiveled support therefor to permit of its adjustment in a horizontal plane, and positive means for causing said return idler to track with either one of the spindle pulleys.

2. In a belt gearing for drill presses and similar machines, a counter-shaft extending lengthwise of the machine, a spindle parallel to a vertical plane passing through the axis of said counter-shaft, pulleys of different diameters on said spindle and said counter-shaft, an endless belt, idler pulleys for the delivery and return sides of said belt, said delivery idler being vertically adjustable, and said return idler being adjustable back and forth horizontally to take up slack, and devices for alining said return idler with either of said spindle pulleys comprising a swiveled support for said idler and means for holding said idler with its face squared to a vertical plane tangent to either of the spindle pulleys.

3. In a belt gearing for drill presses and similar machines the combination with the spindle, the counter shaft, a pair of pulleys of different diameters mounted on each, an endless belt, idler pulleys for the delivery and return sides of said belt, said delivery idler being vertically adjustable and said return idler being adjustable back and forth horizontally to take up slack, the relative position of said return idler and the pulleys on the countershaft being adjustable in the direction transverse to the planes of rotation of the latter to cause said belt to track with either of the pulleys on said countershaft of devices for alining said return idler with either of said spindle pulleys including a swivel support for said idler, and means for holding said idler with its face squared to a vertical plane tangent to either of the spindle pulleys, said means comprising a tiller rod having one end secured to the swiveling support of the idler and its free end held against sidewise movement.

4. In a belt gearing for drill presses and like machines the combination with the counter shaft and spindle, a pair of pulleys of different diameters on each, the belt and idler pulleys for said belt, a common support for said idlers, said support comprising a rod, a bushing in which said rod is eccentrically mounted, and a sleeve in which said bushing moves.

5. In a belt gearing for drill presses and like machines the combination with the counter shaft and spindle, a pair of pulleys of different diameters on each, the belt and idler pulleys for said belt, a common support for said idlers, said support comprising a rod, a bushing in which said rod is eccentrically mounted but free to turn therein, a sleeve in which said bushing moves, means for turning said bushing, and means for preventing the rolling of said rod during the turning of the bushing.

6. In a belt gearing for drill presses and like machines the combination with the counter shaft and spindle, a pair of pulleys of different diameters on each, the belt and idlers for said belt, a common support for said idlers, said support including a rod, a bushing in which said rod is eccentrically mounted, but free to turn therein, a sleeve in which said bushing moves, means for turning said bushing, and means for preventing the rolling of said rod during the turning of the bushing comprising a guide stem and a rotatable support therefor.

7. In a belt gearing for drill presses and similar machines the spindle, the counter shaft, a pair of pulleys of different diameters on each, an endless belt, a vertically adjustable idler pulley for the delivery side of said belt, an idler pulley for the return side of said belt adjustable back and forth horizontally to take up slack, a swivel support for said return idler permitting it to swing in a horizontal plane to track with either spindle pulley, a tiller rod secured to said swivel support over the center of said idler pulley and extending toward the spindle pulleys, and a bracket to support the free end of said tiller rod, said bracket having notches, corresponding to each spindle pulley, in which said rod rests.

8. In a belt gearing for drill presses and similar machines, the combination with a machine frame, a driving shaft extending lengthwise thereof, a driven shaft parallel to a vertical plane passing through the axis of said driving shaft, pulleys of different diameters on said driving and said driven shaft, an endless belt, idler pulleys for the delivery and return sides of said belt, and mechanism for shifting said return idler to effect the tracking relation of it with either spindle pulley.

9. In a belt gearing for drill presses and similar machines, a driving shaft extending lengthwise of the machine, a driven

shaft parallel to a vertical plane passing through the axis of said driving shaft, a pulley on one shaft and pulleys of different diameters on the other shaft and a flat belt connecting them, of a revoluble eccentrically mounted arm, and a belt engaging element supported thereby.

10. In a belt gearing for drill presses and similar machines, a driving shaft extending lengthwise of the machine, a driven shaft parallel to a vertical plane passing through the axis of said driving shaft, a pulley on one shaft, pulleys of different diameters on the other shaft, and a flat belt, of a rotatable supporting member, an arm carried thereby but arranged eccentrically with respect thereto whereby rotation of said supporting member will cause said arm to move in a circular path, means for holding said supporting member and arm in different positions, and a belt-engaging element carried by said arm.

11. In a belt gearing for drill presses and similar machines, the combination with a driving shaft extending lengthwise of the machine, a driven shaft parallel to a vertical plane passing through the axis of said driving shaft, and pulleys of different diameters on each shaft, of a power transmitting belt connecting the same, a rotatable crank member, means for rotating and holding the crank member in different positions, and a belt engaging element mounted on the crank member.

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

CHARLES DE LOS RICE.

Witnesses:

W. M. BYORKMAN,

ED. S. MCALL.