F. KLEINVOGEL.

DRIVING MECHANISM FOR MACHINES AND VEHICLES.

APPLICATION FILED APR. 17, 1912.

1,036,264.

Patented Aug. 20, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

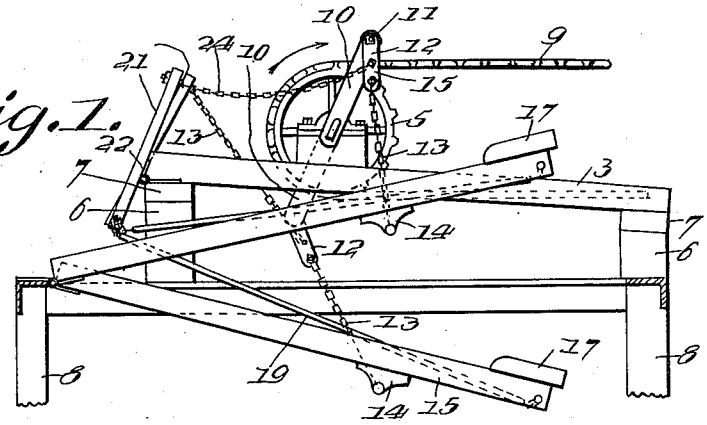


Fig. 2.

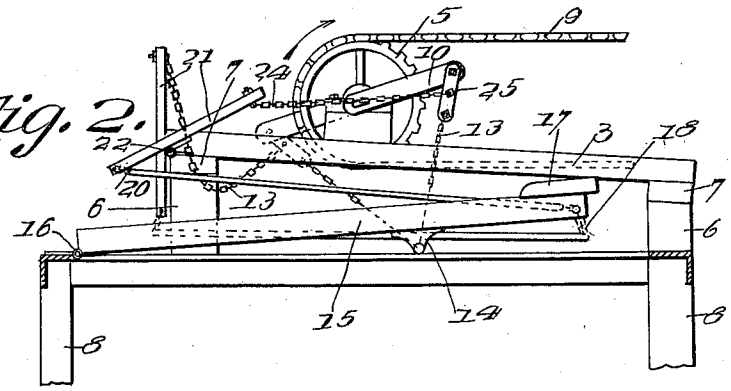
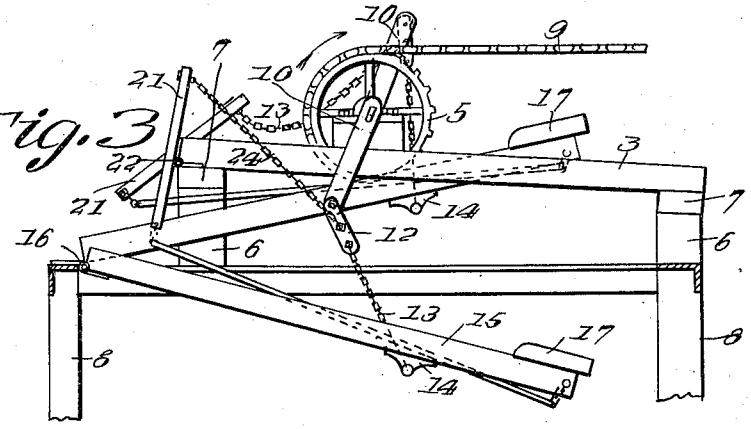


Fig. 3



Witnesses

E. W. Brown.

M. A. Bond.

Inventor

Friedrich Kleinvogel,

E. W. Bond

Attorney

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Fig. 4.

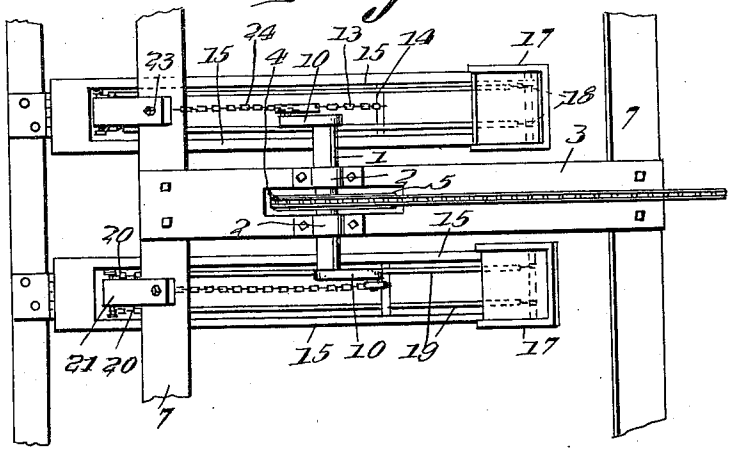
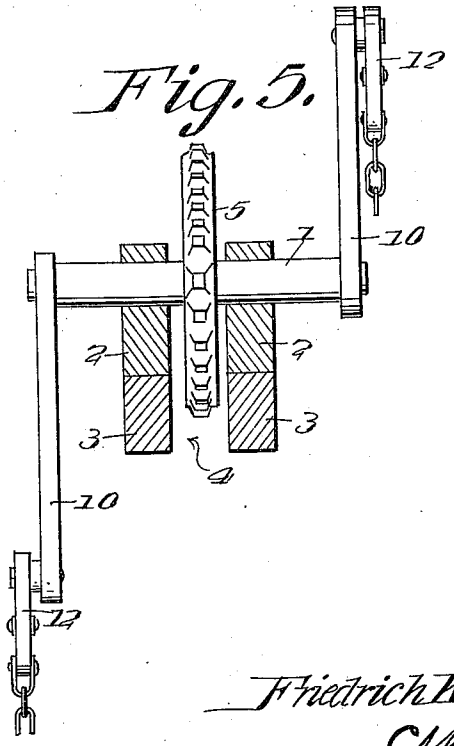


Fig. 5.



Witnesses

E. D. F. Brown.

M. A. Bond.

Inventor

Friedrich Kleinvogel,

E. A. Bond

Attorney

UNITED STATES PATENT OFFICE.

FRIEDRICH KLEINVOGEL, OF NEWPORT, KENTUCKY.

DRIVING MECHANISM FOR MACHINES AND VEHICLES.

1,036,264. Specification of Letters Patent. Patented Aug. 20, 1912.

Application filed April 17, 1912. Serial No. 691,309.

To all whom it may concern:

Be it known that I, FRIEDRICH KLEINVOGEL, a citizen of the United States of America, and a resident of Newport, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Driving Mechanism for Machines and Vehicles, of which the following is a specification.

This invention relates to certain new and useful improvements in driving mechanism designed for driving machinery, vehicles and the like and it has for its objects among others to provide a simplified and improved construction, easily operated, and in which all dead centers are overcome.

I aim at improvements in the details of construction whereby the parts are reduced to a minimum and the levers so mounted and connected that through the same a pressure or power is produced through the medium of the crank shaft without interruption, the pedals or analogous members being designed to be given more than a half revolution at each depression of the pedal or analogous device. The opposite pedals and their connecting mechanism are so disposed that when the connecting chains or ligaments of the one pedal are taut, the others are loose and vice versa.

Other objects and advantages of the invention will hereinafter appear and the novel features thereof will be particularly pointed out in the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the numerals of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a side elevation with one treadle up and the other down. Fig. 2 is a similar view with both pedals in their neutral position. Fig. 3 is a similar view with the pedals in a reverse position from that in which they are shown in Fig. 1. Fig. 4 is a top plan. Fig. 5 is a vertical section through the shaft supporting member, with the shaft, its sprocket and the cranks and portions of the connections shown in elevation.

Like numerals of reference indicate like parts throughout the different views.

Referring to the drawings, 1 designates the crank shaft mounted in suitable bearings 2 on any suitable support, in this instance being shown as a bar or the like 3 provided with a vertical slot 4 through which moves the sprocket wheel 5 fast upon the shaft 1, as will be seen best upon reference to Figs. 4 and 5. The supporting member 3 may be supported in any suitable manner and position according to the existing circumstances. In the present instance I have chosen to show it as upon the standards or the like 6, said supporting member resting upon the transverse supports 7 secured to the tops of said standards in any suitable way. These standards may, in turn, be supported as may be found most convenient, as, for instance, upon the legs or other supports 8. This, however, is but one of the many ways in which the crank shaft may be supported and the invention is in no wise restricted to such manner of support.

9 is a sprocket chain passed around the sprocket wheel 5 and designed to transmit power to any desired point or member.

10 are crank arms fast upon opposite ends of the shaft 1 and extending in opposite directions from the center thereof. These crank arms are so disposed that normally they extend in opposite directions but in a plane out of a vertical plane through the shaft, as indicated best in Fig. 1, so as to normally lie off the dead center. These crank arms may be secured to the end of the shaft in any suitable manner. Pivotally mounted upon the outer end of each of these crank arms, as at 11, is a short arm 12 arranged to normally lie at an angle to the crank arm 10, as seen best in Fig. 1. The free end of each arm 12 is connected by a chain or the like 13 with a bracket or the like 14 attached to the underside of the pedal or treadle 15, which latter is pivotally mounted at one end, as at 16, to some fixed part, this treadle or pedal being formed as shown best in Fig. 4, that is, with a longitudinal slot between its side bars for the movement of the said chain and the connecting members soon to be described. The free ends of the treadles or pedals 15 are provided with suitable portions 17 forming supports for the feet of the operator, as seen clearly in Figs. 1 to 4. To the free end of each pedal there is connected in any suitable manner the flexible

ligaments or chains 18 to which are connected one end of the rods 19, which rods work in the slot or space between the side bars of the pedals 15, the other ends of said rods being connected by chains or the like 20 with one end of a bar 21, which bar is hinged, as at 22, intermediate its ends to some fixed part as the support 7 and its other end connected, as at 23, with a chain or the like 24, the other end of which is connected to the arm 12 intermediate its ends, as shown at 25 in Figs. 1 and 2.

As seen in Fig. 1, the connections above described are such that when one pedal is down and the other up, as seen in Fig. 1, the arms 10 extend in line with each other in a plane out of the vertical. It is to be understood that these arms 10, 10 are so fixed upon the shaft as to at all times maintain such a position that they extend in line with each other. The arms 12 being pivotally connected with the arms 10 change their positions relatively to the arms 10 as the treadles are operated, but whenever the treadles, or either one of them, are in their lowermost position, the arms 12 will extend at an angle from the arms 10, as will be clearly understood upon reference to Figs. 1, 2 and 3 in which the treadles are shown in three different positions.

The operation will be readily understood. Downward pressure alternately upon the treadles causes the shaft to rotate in the direction of the arrow seen in Figs. 1, 2 and 3, the crank arms 10 and 12 and their connections being so disposed that the dead centers or points will be passed whenever the treadles are in either position, the mechanism moves smoothly and with but little friction and great power can be readily obtained. The connections are such that the chains connecting the pedals with the crank arms and the chains connecting the pivoted members 21 with the crank arms are not all taut at the same time. When one set is taut, the other is loose, or at least one member thereof is loose so that no matter in whatever position the treadles may be stopped, they can be readily started with but little power. The pivoted members 21 serve to render it impossible for the parts to stop on a dead center. When one of these members is up, the other is down or partially down and when the treadles are operated, these pivoted members also operate.

Modifications in details may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

What is claimed as new is:—

1. In a driving mechanism, a crank shaft, crank arms fast upon opposite ends of said crank shaft and extending in opposite directions and normally disposed in a plane out of the vertical plane through the crank shaft, short arms pivotally mounted upon the outer ends of said crank arms, pedals, a connection between the free end of each of said short arms and the under side of said pedals, hinged bars and means connecting the lower ends thereof with the pedals and the upper ends with said short arms between their ends.

2. In a driving mechanism, a crank shaft, crank arms fast upon opposite ends of said crank shaft and extending in opposite directions and normally disposed in a plane out of the vertical plane through the crank shaft, short arms pivotally mounted upon the outer ends of said crank arms, pedals, a connection between the free end of each of said short arms and the under side of said pedals, hinged bars and means connecting the lower ends thereof with the pedals and the upper ends with said short arms between their ends, said hinged bars being mounted on independent pivots.

3. In a driving mechanism, a crank shaft, crank arms fast upon opposite ends of said crank shaft and extending in opposite directions and normally disposed in a plane out of the vertical plane through the crank shaft, short arms pivotally mounted upon the outer ends of said crank arms, pedals, a connection between the free end of each of said short arms and the under side of said pedals, hinged bars, means connecting the lower ends thereof with the pedals and the upper ends with said short arms between their ends, and flexible means interposed between the connections of the said bars with the pedals.

4. In a driving mechanism, a suitable support, a crank shaft, crank arms secured thereto and arranged to normally stand at an angle to the vertical, arms pivotally connected with the free ends of said crank arms and normally extending at an angle thereto, pivotally mounted treadles, connections between the free ends of said arms and the treadles between their ends, pivotally mounted members mounted on said support upon independent pivots, connections between one end thereof and said arms intermediate their ends, and connections between the other ends of said pivoted members and the free ends of the treadles.

5. In a driving mechanism, a crank shaft, crank arms thereon, arms pivoted to the crank arms, pivotally mounted treadles, chains connecting the free ends of said arms with the treadles, pivotally mounted members, chains connecting one end thereof with said arms intermediate their ends, rods, and chains connecting the opposite ends of said rods with the other ends of said pivoted members and with the free ends of the treadles respectively.

6. In a driving mechanism, a crank shaft, crank arms thereon, arms pivoted to the

crank arms, pivotally mounted treadles, chains connecting the free ends of said arms with the treadles, pivotally mounted members, chains connecting one end thereof with said arms intermediate their ends, rods, and chains connecting the opposite ends of said rods with the other ends of said pivoted members and with the free ends of the treadles respectively, said treadles being slotted for the passage of said rods.

Signed by me at Washington, D. C., this 17th day of April, 1912.

FRIEDRICH KLEINVOGEL.

Witnesses:

E. H. BOND,

IRA M. BOND.