

UNITED STATES PATENT OFFICE.

ERNST F. AUTENRIETH, OF NEW YORK, ASSIGNOR TO THE GLEN COVE MACHINE COMPANY, (LIMITED,) OF GREEN POINT, BROOKLYN, NEW YORK.

VARIABLE DRIVING MECHANISM FOR MACHINERY.

SPECIFICATION forming part of Letters Patent No. 395,471, dated January 1, 1889.

Application filed July 21, 1888. Serial No. 280,620. (No model.)

To all whom it may concern:

Be it known that I, ERNST F. AUTENRIETH, of the city and county of New York, in the State of New York, have invented a new and useful Improvement in Variable Driving Mechanism for Machinery, of which the following is a specification, reference being had to the accompanying drawings.

This improvement relates to pulleys for variable speeds described in Letters Patent No. 377,281, dated January 31, 1888.

The invention consists of means, hereinafter described, for shifting the pulleys to produce the changes of speed required.

I will proceed to describe the improvement with reference to the accompanying drawings, and afterward point out the novel features in the claim.

In the drawings, Figure 1 represents a longitudinal sectional elevation of part of a wood-planing machine provided with a variable driving mechanism embodying my improvement. Figs. 2, 3, and 4 represent transverse vertical sectional views corresponding with Fig. 1. Fig. 5 represents a plan view, partly in section, corresponding to Fig. 2; Fig. 6, a plan view corresponding to Fig. 3, and Fig. 7 a plan view corresponding to Fig. 4.

Like letters of reference indicate corresponding parts in all the figures.

A designates the frame of the machine; B, the driving-shaft, upon which pulleys for variable speeds are placed. The shaft B is supported in this example in adjustable bearings *a a*, and when the machine is in operation is driven at a uniform speed by a belt, for which the fast and loose pulleys *b* and *c* are provided.

d, *d'*, and *d²* designate the pulleys of a series for variable speeds, of which *d²* is arranged to slide over *d'*, and *d'* is arranged to slide over *d*, which is fixed on the shaft, the whole forming a nest of pulleys. These pulleys are connected together and with the shaft B, so as to turn therewith. The sliding pulleys *d'* *d²* of the said series have inclined edges to pass easily under and lift a belt, F, which is common to all of them, and they also have concentric sleeves *e'* and *e²*, in which are grooves *f'* and *f²*, for engaging the shifting devices by which the sleeves *e'* and *e²* and pulleys *d'* and

d² are moved or shifted longitudinally along the shaft B to engage or disengage a belt, F.

In all the particulars above mentioned the said pulleys *d*, *d'*, and *d²* are like those described in Letters Patent No. 377,281, before referred to.

According to the patent above referred to a separate hand-lever is required for each of two sliding pulleys similar to the series *d'* and *d²*. By my improvement I am enabled to shift all the sliding pulleys of that or a similar series for variable speeds by manipulating or operating a single handle or other convenient operating device actuating a number of shifting devices, one for each of the sliding pulleys of the series—as, for example, a multiple cam, E, engaging with the several shifting devices for actuating said devices may be operated by the hand applied directly to it, or by the hand applied to an intervening hand-lever, D, connected with the cam for actuating the same. In the example represented in the drawings the multiple cam E is a sliding plate-cam moving in guides *l l* in or attached to the frame A.

The working-faces of the cam E are in this example so formed, constructed, and arranged with relation to the position of the several parts that when the lever D is at its extreme position in one direction, as represented in Fig. 1, pulleys *d'* and *d²* will have been withdrawn from belt F, which will then be upon pulley *d*, as represented in Figs. 1, 2, and 5. When the lever D is in a position half-way between the extremes, the belt F will be upon the pulley *d'*, as represented in Figs. 3 and 6, and when the lever D is at its extreme position opposite to that represented in Fig. 1 the belt F will be upon the pulley *d²*, as represented in Figs. 4 and 7. In the same example shifter-arms *g'* and *g²* are attached severally and rigidly to parallel shifter guide-bars *i'* and *i²*, constructed to move side by side in guides *j* in frame A. Upon the upper edges of guide-bars *i'* and *i²* are formed projections *h*, fitted to move against and be moved by the bearing-faces of the flat cam-plate or multiple cam E in grooves or slots *k* of that flat cam-plate. The cam-plate may be moved to and fro in the guides by hand to shift the pulleys, but is represented as actuated by the hand-

lever D, pivotally connected thereto by a rod, *m*, the said lever D being pivotally attached to frame A by a bolt, *n*. The form and direction of the slots or grooves *k* are such that
 5 by moving the cam-plate back and forth the required movement will be imparted to the projections *h*, guide-bars *i'* and *i''*, and shifter-arms *g'* and *g''*, and thence to the sliding pulleys.
 10 The multiple cam represented in the drawings has certain portions, *o*, of the grooves or slots *k* formed substantially at right angles to the sliding shifting guide-bars *i'* and *i''*, in order that when the projections *h* are in said
 15 portions of the grooves or slots *k* the said bars will be held and locked stationary, the other portions, *p*, of the said grooves or slots being oblique to the said guide-bars for shifting said bars, as hereinbefore specified.
 20 The belt F is in this example employed to drive the shaft G, which is parallel with the driving-shaft B, at variable speeds corresponding to the diameter of the several pulleys *d*, *d'*, and *d''*.
 25 H designates a tightening-pulley, which is

pivotally attached to the frame at *o*, and by its weight maintains a uniform tension on the belt F, by whichever pulley the belt may be driven.

What I claim as new, and desire to secure 30 by Letters Patent, is—

The combination, with a driving-shaft and a series of pulleys thereon of different diameters sliding one over another and connected together and with the shaft, so as to turn with 35 the shaft, of arms loosely connected with said pulleys, slider-bars to which said arms are rigidly connected near one of their ends, and a plate provided with cam-grooves engaging said slider-bars, adapted when moved to move 40 said slider-bars in opposite directions, said cam-grooves being so constructed that they will lock the slider-bars against longitudinal movement when the latter are shifted to their farthest positions, substantially as specified. 45

ERNST F. AUTENRIETH.

Witnesses:

FREDK. HAYNES,
 JOSEPH W. ROE.