W. RICKS.

MACHINE TOOL.

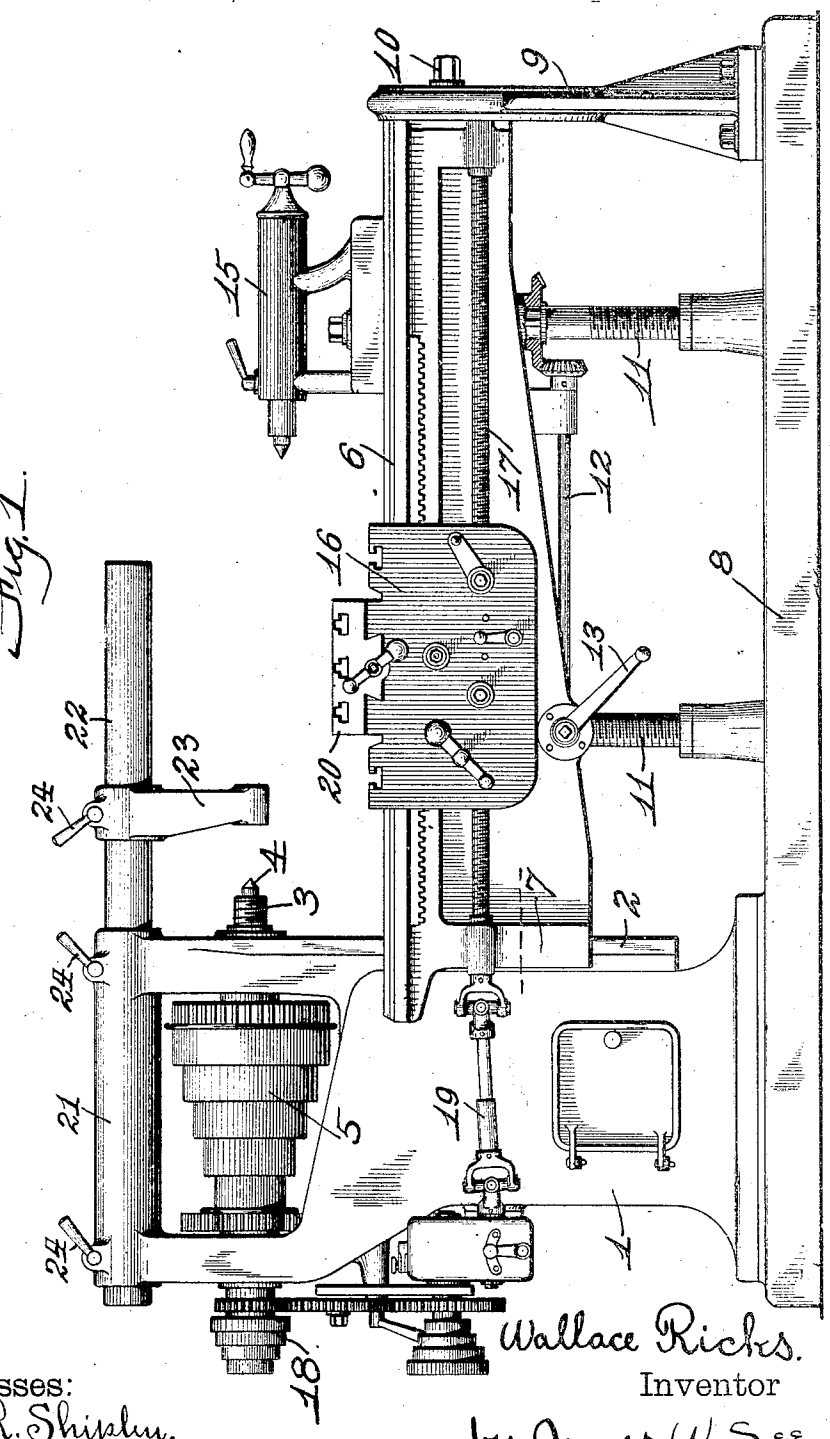
APPLICATION FILED JULY 31, 1912.

1,041,874.

Patented Oct. 22, 1912.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
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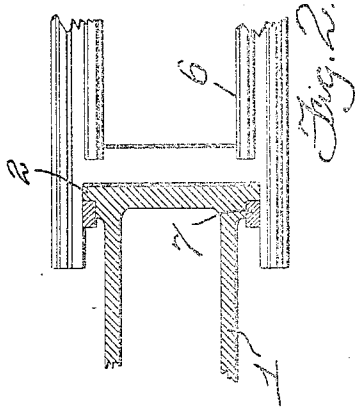

Fig. 2.

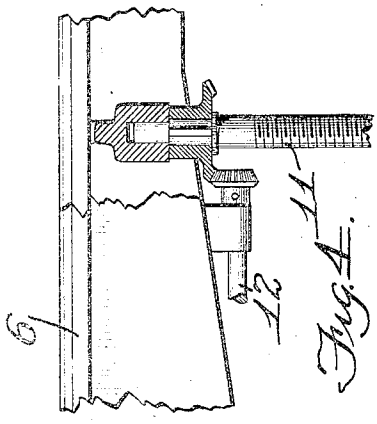

Fig. 4.

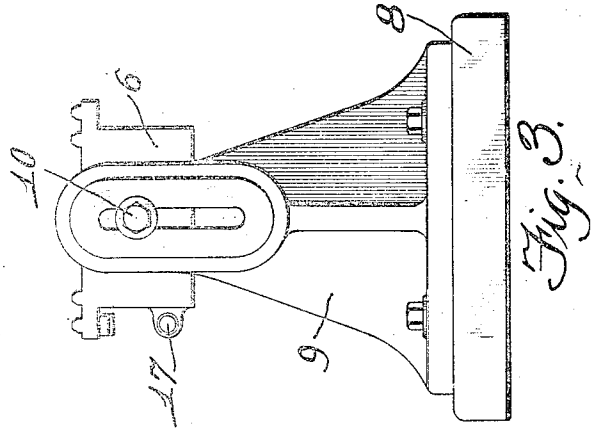

Fig. 3.

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UNITED STATES PATENT OFFICE.

WALLACE RICKS, OF SANTA ANA, CALIFORNIA.

MACHINE-TOOL.

1,041,874. Specification of Letters Patent. Patented Oct. 22, 1912.

Application filed July 31, 1912. Serial No. 712,475.

To all whom it may concern:

Be it known that I, WALLACE RICKS, a citizen of the United States, residing at Santa Ana, Orange county, California, have invented certain new and useful Improvements in Machine-Tools, of which the following is a specification.

This invention pertains to an improved machine tool of combination character adapting it for the peculiarities of use called for about small repair shops, garages, etc.

The invention will be readily understood from the following description taken in connection with the accompanying drawings in which:—

Figure 1 is a front elevation of a machine tool exemplifying my invention: Fig. 2 a plan of a portion of the horizontal bed thereof, shown in conjunction with a portion of the vertical column of the machine: Fig. 3 an end elevation of the horizontal bed and its supporting standard: and Fig. 4 a side elevation of a portion of the horizontal bed, partly broken away, to expose one of the cross-girts in vertical section.

In the drawings:—1, indicates a column forming the main fixed frame of the machine: 2, vertical guide-ribs formed at one side thereof: 3, an arbor, which need not be dissimilar from an ordinary lathe arbor, this arbor being mounted in the upper portion of the column with its nose projecting from that side of the column which is provided with the vertical guide-ribs 2: 4, the live center carried thereby: 5, the cone and gearing for giving motion to the arbor, this particular form of mechanism for imparting motion to the arbor being based upon the presumption that the arbor is to be driven by belt: 6, a horizontal bed having guide-ways like a lathe-bed, this bed engaging and projecting out from the guide ribbed side of the column: 7, gib-work on the end of the bed, the same engaging the guide-ribs 2 whereby the bed may rise and fall upon the column, relative to the level of the arbor: 8, a sole-plate supporting the column: 9, a standard rigidly bolted to the sole-plate and engaging the free end of the bed and being vertically slotted where it engages the bed: 10, a clamping device uniting the slotted standard with the end of the bed whereby, after the bed has been vertically adjusted upon the standard, it may be made secure: 11, vertical elevating screws mounted under the bed, at points along the length thereof and having their upper ends journaled in bearings formed in the bed, as indicated in Fig. 4, the lower threaded portions of these screws engaging nuts supported by the sole-plate: 12, a horizontal shaft carried by the bed and having its opposite ends geared to the elevating screws: 13, a crank carried by the bed and serving as a means by which the shaft 12 and both the elevating screws may be simultaneously turned: 15, a tailstock, of usual lathe construction, adapted to slide on the bed to and from the column: 16, a carriage, which may follow the construction of lathe carriages, and adapted to slide upon the bed between the tailstock and the column: 17, a feed screw mounted in the bed and adapted to coöperate with mechanism in the apron of the carriage, after the manner of lathes: 18, feed gearing and pulleys carried by the column and receiving motion from the arbor, of the form not unusual in ordinary lathe construction, it being preferred that this feed mechanism include a speed and reverse box, this entire feed mechanism terminating in a shaft which, in ordinary lathe construction, might be in line with or be a part of the feed screw: 19, a tumbling shaft connecting this terminal shaft flexibly with the feed screw: 20, a slotted rest arranged for sliding motion in carriage 16 transversely of the bed, and provided with a cross feed-screw such as is usual with the tool rests of lathes: 21, a clamp-socket carried by the column above the arbor and parallel with the arbor and having, preferably, a circular bore: 22, a steady-bar adapted for sliding motion in the clamp socket, and adapted to project a considerable distance therefrom toward the tailstock: 23, an arm clamped to the steady-bar and adapted for adjustment along the same, the lower end of this arm being adapted to support bushings, centers, or the like, as is usual in the steady-arm of milling machines: and 24, clamps for securing the steady-bar and arm in adjusted position.

By properly manipulating the handle 13 the bed may be elevated to such position that the tail center is in line with the live center. Assume steady-arm 23 to be turned up out of the way or that the steady-bar

with the arm is reversed endwise in the clamp-socket, and assume that the cross-slide rest has secured to it any of the tool-holding devices usual in lathes, and assume that clamp-bolt 10 has been tightened to secure the bed in its adjusted position. Under these conditions it is manifest that the apparatus lends itself for use as a lathe to operate on work between the centers and of such diameter as is within the limit of the swing of the lathe thus adjusted. The vertical adjustment of the bed without disconnection from the feed-gearing on the column is rendered permissible by means of the tumbling rod 19. It will be understood, of course, that, the nose of the arbor 3 being adapted to receive a chuck, as is usual in lathes, after the bed has been adjusted, in the manner which has been indicated, chucking-work may be done as in an ordinary lathe, up to the swing-capacity of the lathe as thus adjusted.

By lowering the bed upon the column, the swing may be much increased and the lathe then lends itself for chucking work on diameters much greater than that corresponding with the height of the tail center.

It has thus far been assumed that the machine was to be used as a lathe and it is seen that it may be used as an ordinary lathe to operate on work between centers or as a chucking lathe for work of greater diameter than would be permissible at normal height of centers, and in thus operating as a lathe it has been assumed that cross-slide 20 was provided with the usual tool-carrying accessories of lathes. Assume, now, that cross-slide 20, instead of being provided with tool-carrying facilities such as are employed in lathes, be provided with a work-holding vise, such as is usually employed in milling machines, or assume that the work to be operated upon is bolted to cross-slide rest 20. Assume, further, that, by usual means for mounting a milling tool in connection with the arbor of a milling machine, arbor 3 carries a milling tool. This milling tool may then operate upon the work carried by cross-slide rest 20, and the vertical distance between the cross-slide rest and the arbor may be adjusted by means of screws 11 to regulate the depth of cut. The machine may thus operate as a milling machine for all cutting suitable for a milling cutter supported entirely from the arbor. Assume, now, that the steady-bar and steady-arm be placed in the position indicated in the drawing and that the milling cutter or cutters, instead of being supported entirely from the arbor, be on a mandrel having one end supported and driven by the arbor and the other end carried by the steady-arm as is usual in milling machines provided with steady-arms. The steady-arm may be adjusted to and from the arbor to suit the length of the mandrel employed for the milling cutters and the mandrel may carry a single cutter or gangs of cutters as is usual in milling machine practice. Under these conditions the machine is adapted to operate as a milling machine doing heavy work.

In the above referred to operations of the machine as a milling machine, the tailstock has been out of service, though present. When the machine was used as a lathe operating on work between centers, one of which was carried by the tailstock, the diameter of the work which could be operated upon was necessarily limited to the height of centers as controlled by the height of the tailstock. But by providing the steady-arm with a tail center, as is usual in milling machine work, a tail center support may be given to work being done between centers and under these conditions the bed may be lowered so as to operate as a lathe having much greater swing than that due to the normal height of centers as controlled by the height of the tail stock.

I claim:—

1. A machine tool comprising, a column, a vertical guide carried by the column, a horizontal bed having one end fitted to rise and fall on said guide, a vertically slotted support for the outer end of the bed, elevating screws disposed below the bed to serve in raising and lowering it, a hand-crank and gearing connected with the elevating screws to serve in turning them simultaneously, a tailstock carried by the bed, a carriage mounted for longitudinal movement upon the bed, a cross-slide rest mounted on the carriage, a feed screw mounted on the bed for giving motion to the carriage along the bed, an arbor mounted in the column above the level of the bed, means for imparting rotary motion to the arbor, feed gearing carried by the column and adapted to have motion imparted to it from the arbor, and a flexible connection between said feed gearing and said feed screw, combined substantially as set forth.

2. A machine tool comprising, a column, a vertical guide carried by the column, a horizontal bed having one end fitted to rise and fall on said guide, a vertically slotted support for the outer end of the bed, elevating screws disposed below the bed to serve in raising and lowering it, a hand-crank and gearing connected with the elevating screws to serve in turning them simultaneously, a tailstock carried by the bed, a carriage mounted for longitudinal movement upon the bed, a cross-slide rest mounted on the carriage, a feed screw mounted on the bed for giving motion to the carriage along the bed, an arbor mounted in the column above the level of the bed, means for imparting rotary motion to the arbor, feed gearing carried by the column and adapted to have

motion imparted to it from the arbor, a flexible connection between said feed gearing and said feed screw, a clamp-socket carried by the column above the arbor and parallel therewith, a steady-bar carried by the clamp-socket to project beyond the inner end of the arbor, and a steady-arm carried by the steady-bar, combined substantially as set forth.

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Witnesses:
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