Dec. 2, 1924. 1,517,431

F. S. JONES

METAL WORKING MACHINE

Filed Feb. 13, 1923 5 Sheets-Sheet 1

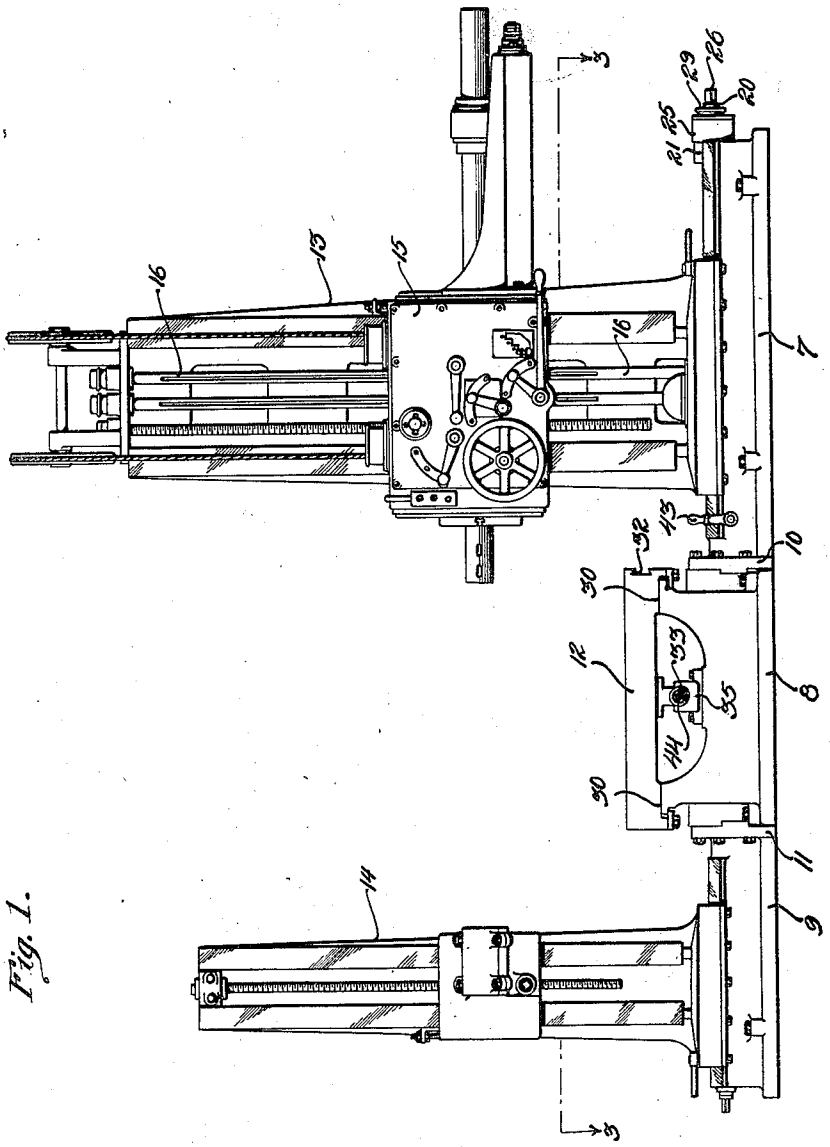


Fig. 1.

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John E. Burch.

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Dec. 2, 1924. 1,517,431

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METAL WORKING MACHINE

Filed Feb. 13 1923 5 Sheets-Sheet 2

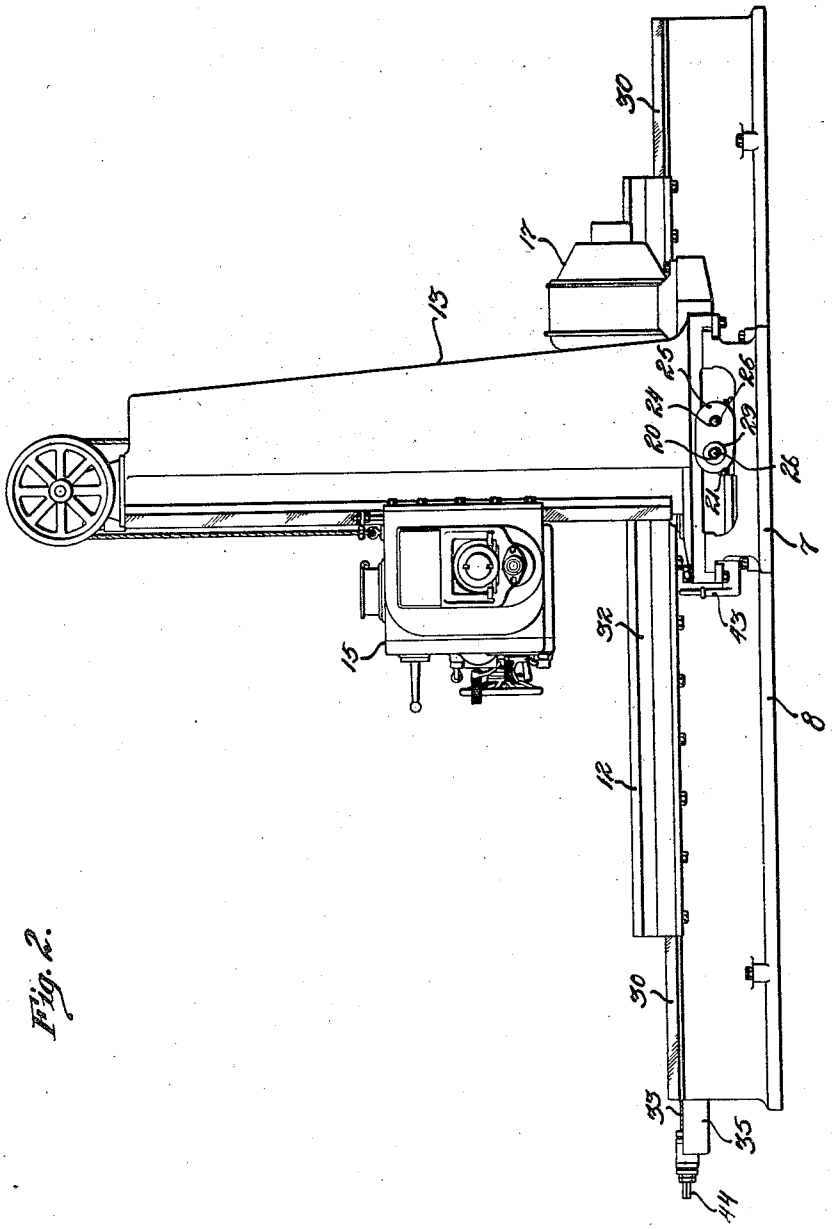


Fig. 2.

Witnesses
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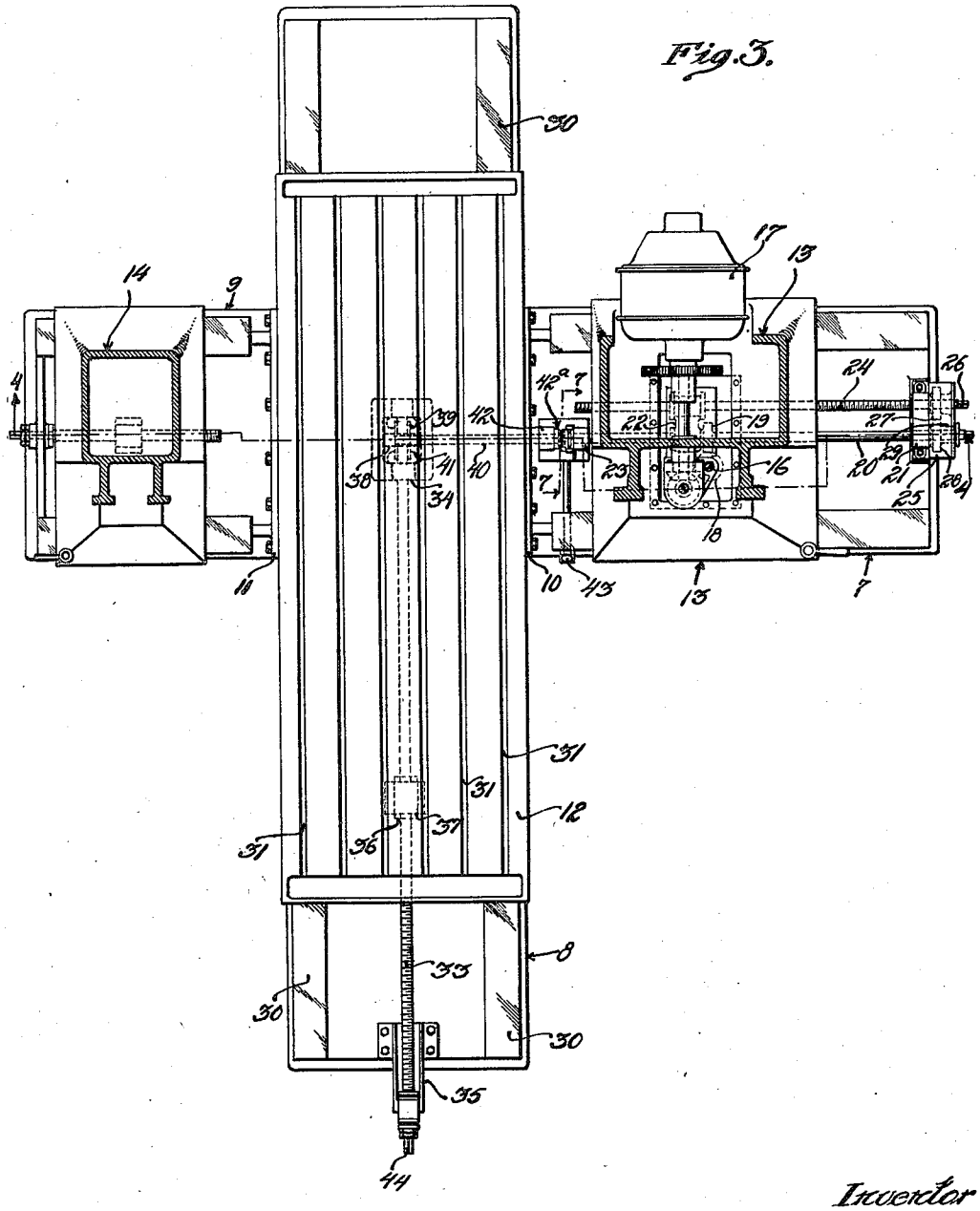
Dec. 2, 1924. 1,517,431

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METAL WORKING MACHINE

Filed Feb. 13, 1923 5 Sheets-Sheet 3

Fig. 3.



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Dec. 2, 1924. 1,517,431

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METAL WORKING MACHINE

Filed Feb. 13 . 1923 5 Sheets-Sheet 4

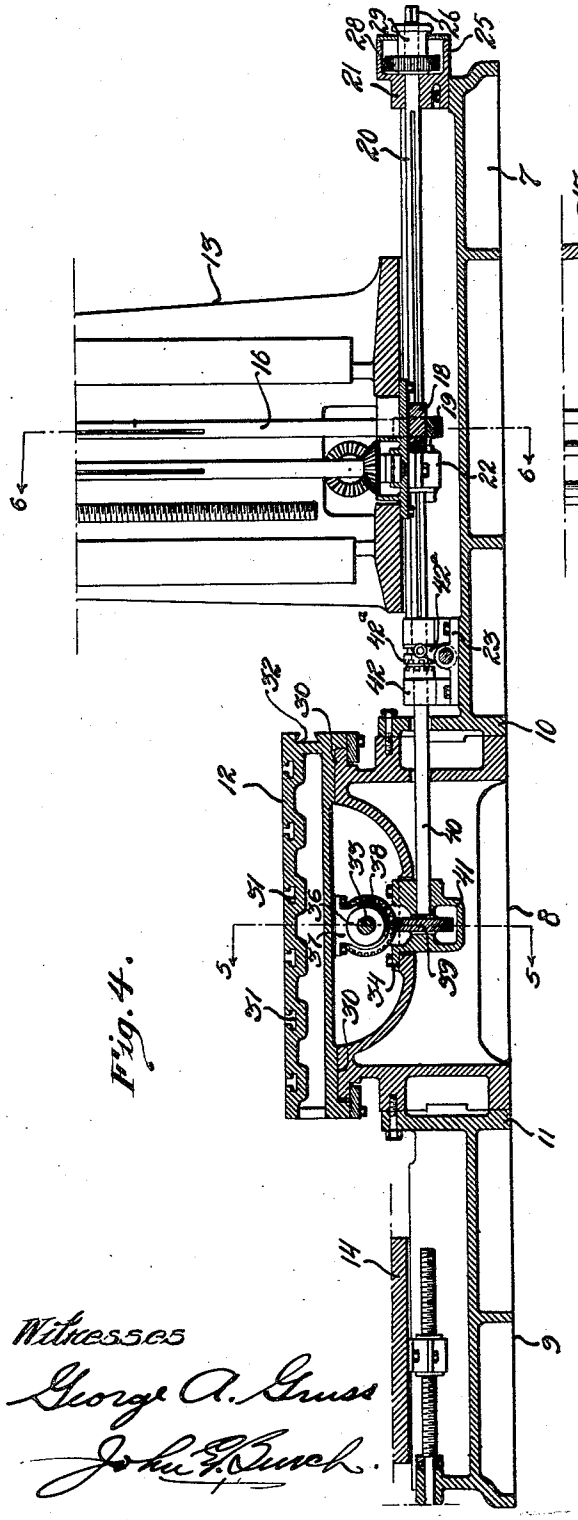


Fig. 4.

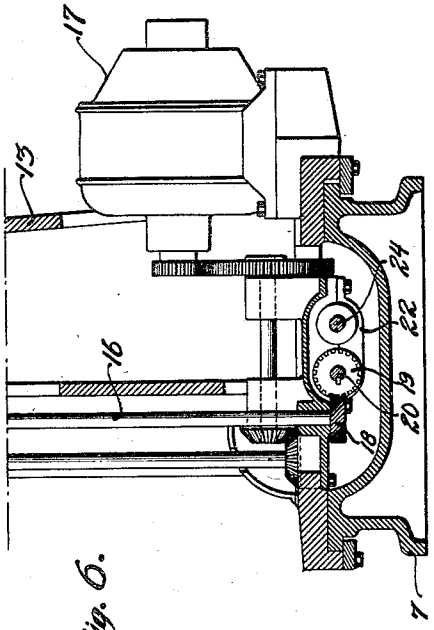


Fig. 6.

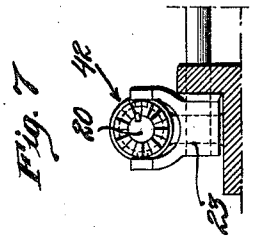


Fig. 7

Witnesses
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Inventor
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By Joshua R. H. Scott
His Attorney

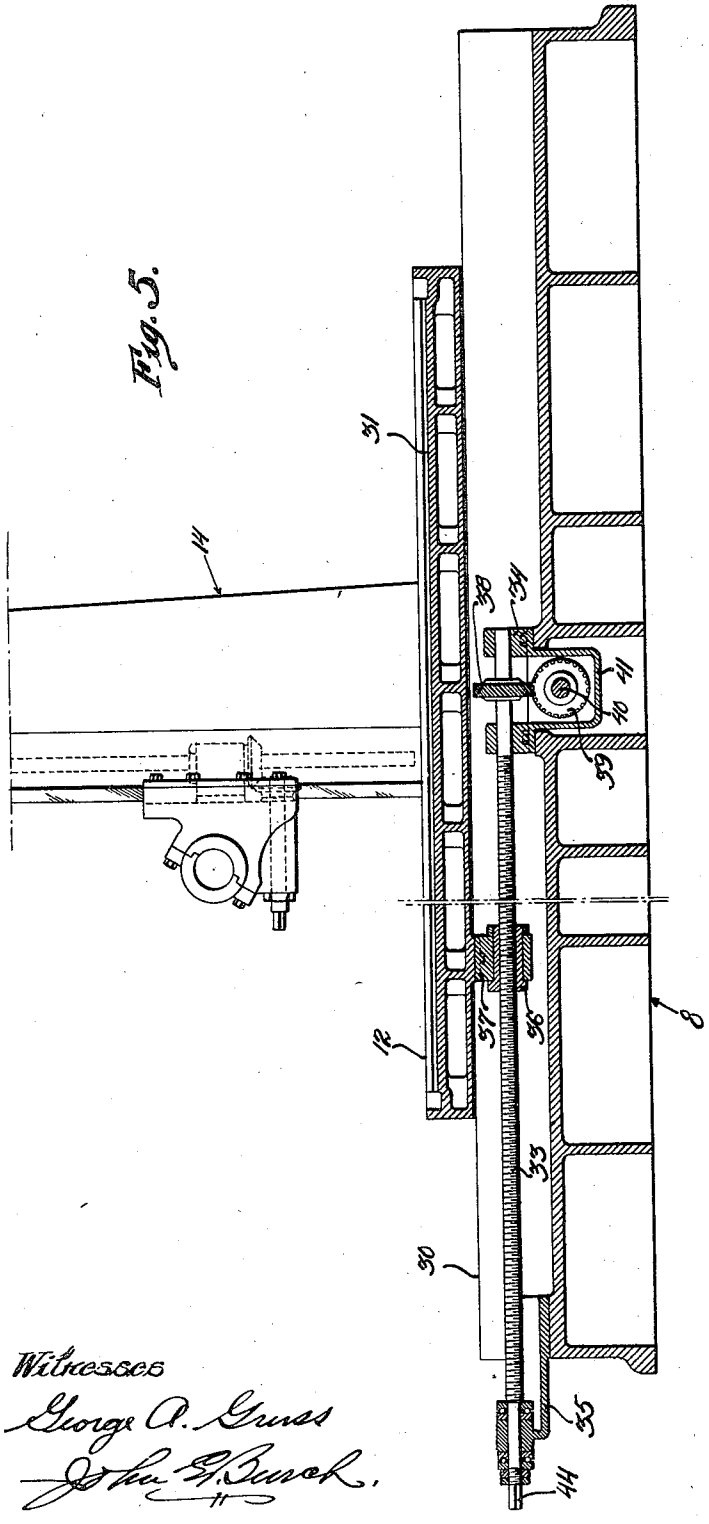
Dec. 2, 1924. 1,517,431

F. S. JONES

METAL WORKING MACHINE

Filed Feb. 13, 1923 5 Sheets-Sheet 5

Fig. 5.



Witnesses
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Patented Dec. 2, 1924. 1,517,431

UNITED STATES PATENT OFFICE.

FRANK S. JONES, OF PHILADELPHIA, PENNSYLVANIA.

METAL-WORKING MACHINE.

Application filed February 13, 1923. Serial No. 618,787.

To all whom it may concern:

Be it known that I, FRANK S. JONES, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Metal-Working Machines, of which the following is a specification.

My invention relates to metal working machines, and more particularly to the general use machine adapted for heavy duty work such as boring, drilling, milling, splining and tapping, oil grooving, rotary planing, slotting and the like.

The object of the invention is to provide a machine of the above character which is lighter, more compact, and occupies less floor space, which may be assembled more conveniently and in which the work is more conveniently supported.

These objects, and other advantageous ends which will be described hereinafter, I attain in the following manner, reference being had to the accompanying drawings in which—

Figure 1 is a front elevation of my improved machine,

Figure 2 is an end elevation,

Figure 3 is a sectional plan on line 3—3 of Figure 1,

Figure 4 is an enlarged vertical sectional view taken on the line 4—4 of Figure 3,

Figure 5 is a vertical sectional view taken on the line 5—5 of Figure 4,

Figure 6 is a vertical sectional view taken on the line 6—6 of Figure 4, and

Figure 7 is a fragmentary detail sectional view taken on the line 7—7 of Figure 3.

Briefly my invention includes a bed made in sections adapted to be detachably connected, a work table slidably mounted on one section, a column carrying the spindle and saddle mounted on another section and adapted to slide at right angles to the table, a tail column mounted on another section at the side of the table opposite the spindle column and adapted to slide at right angles to the table, and means for imparting sliding movement to the table and columns.

In the drawings, 7, 8 and 9 are bed sections. Sections 7 and 9 are narrow as compared with the length of section 8. Section 7 is provided with a flange 10 adapted to be bolted or otherwise detachably secured to one side of section 8 and section 9 is provided with a flange 11 by which it may be likewise secured to the opposite side of section 8, the point of attachment preferably being nearer the rear than the front end of section 8. The middle section 8 supports the work table 12 which is longitudinally slidable thereon, section 7 supports the spindle column 13 which is slidable thereon in a direction at right angles to the path of the table, and section 9 supports the tail column 14 which is slidable thereon at right angles to the path of the table, the columns being so positioned that they will slide in alignment with each other.

The tail column may be of any usual construction. The main column 13 carries a saddle 15 which may be of the usual type and which encloses the usual gearing. It also supports, in suitable bearings, the usual vertical shaft 16 driven, through suitable gearing, by a motor 17 and serving to drive the power operated mechanism. Shaft 16, for the purposes of this invention, is extended through the base of column 13 and a spiral gear 18 is fixed to its lower end. This gear meshes with a spiral gear 19 splined on a horizontal shaft 20 journaled longitudinally of bed section 7 in brackets 21, 22 and 23. A feed screw 24 is also journaled in these brackets parallel to shaft 20. Bracket 21 is provided with a gear box 25 through which the outer ends of shaft 20 and feed screw 24 extend, the projecting ends being squared as indicated at 26 to permit their operation by a crank. A gear 27 is fixed to feed screw 24. A gear 28 is splined on shaft 20, within gear box 25, and is provided with a flanged sleeve 29, projecting outside the box, whereby said gear may be thrown in or out of mesh with gear 27. Inasmuch as feed screw 24 is in threaded engagement with bracket 22 rotation of the screw will cause movement of column 13 longitudinally of bed section 7 and such movement may be effected by manual rotation of the feed screw by means of a crank or by power transmitted from vertical shaft 16, through spiral gear 18, worm gear 19, horizontal shaft 20 and gears 27 and 28.

The work table 12 is mounted to slide longitudinally upon tracks 30 on bed section 8, is provided in its upper surface with T-slots 31 for bolting down the work and, in one side, with a dovetail slot 32 for holding index plates or fixtures. A feed screw 33, extending longitudinally of the table is carried in suitable bearings 34 and 35 on bed section 8 and takes through a threaded sleeve 36 carried by a bracket 37 fixed to the table. A spiral gear 38 is fixed to the end of feed

screw 33 and is adapted to mesh with a spiral gear 39 fixed to the end of a shaft 40 journaled in a bearing 41 detachably hung from bed section 8 and a bearing 42 mounted on bed section 7, the shaft being in alignment with shaft 20. Shafts 20 and 40 are adapted to be connected by a clutch 42ª, the movable member of the clutch being provided with a lever 43 by which tht shafts may be connected or disconnected. The outer end of feed screw 33 preferably has a squared end 44 adapted to receive a crank by means of which the feed screw may be manually actuated. With the members of clutch 42 connected and gears 27 and 28 out of mesh, feed screws 33 may be driven, and the table shifted longitudinally, by power transmitted from shaft 16, spiral gear 18, spiral gear 19, horizontal shafts 20 and 40 and spiral gears 38 and 39.

By making the work carrying section comparatively long and disposing the other sections with their length transverse to the work-supporting section, I am enabled to provide a sufficient base for the most powerful machines and to leave available space which has heretofore been occupied by the beds. By making the bed in sections, each section carrying one of the essential elements, I am enabled to dispense with such machining while being able to assemble the parts in accurate alignment and the machine as a whole is much more readily handled and much better adapted to shipment.

While I have described my invention as taking a particular form, it will be understood that the various parts of my invention may be changed without departing from the spirit thereof, and hence I do not limit myself to the precise construction set forth, but consider that I am at liberty to make such changes and alterations as fairly come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A general use machine including a bed; a spindle-carrying column movable in the direction of the length of the spindle; a work table movable on the bed transversely to the column; a feed screw adapted to move the column; a feed screw adapted to move the table; a driven shaft, and gearing connecting the shaft and the feed screws.

2. A general use machine including a bed; a spindle-carrying column movable in the direction of the length of the spindle; a feed screw adapted to move the column; a gear at the end of the feed screw; a power-driven shaft; a spiral gear thereon; a shaft extending parallel to the feed screw; a worm gear splined thereon adapted to mesh with the spiral gear, and a gear splined on said shaft and adapted to be engaged with or disengaged from the gear on the feed screw.

3. A general use machine including a bed; a work table movable on the bed; a feed screw adapted to move the table; a spiral gear fixed on one end of the screw; a spindle-carrying column; a power-driven shaft journaled in the column; a spiral gear thereon; a horizontal shaft; a worm gear thereon adapted to mesh with the spiral gear; a shaft in alignment with said horizontal shaft, having a clutch connection therewith and carrying a spiral gear adapted to mesh with and drive the spiral gear on the feed screw.

4. A general use machine including a bed made in sections, one section carrying a work table; a second section carrying the spindle-column, and a third section carrying the tail column, the sections being detachably connected.

5. A general use machine including a bed made in sections, one section carrying a work table movable longitudinally thereon; a second section carrying a spindle column movable transversely to the path of movement of the table, and a third section carrying a tail column, the sections being detachably connected.

6. A general use machine including a bed made in sections, one section being adapted to support the work, the other sections carrying, respectively the spindle column and the tail column, the column-supporting sections being narrow compared with the length of the table supporting section and disposed with their length transverse to that of the work supporting section.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK S. JONES.

Witnesses:
DAVID A. HAMMOND,
FELIX O. UNGLAUB.