

No. 691,199.

Patented Jan. 14, 1902.

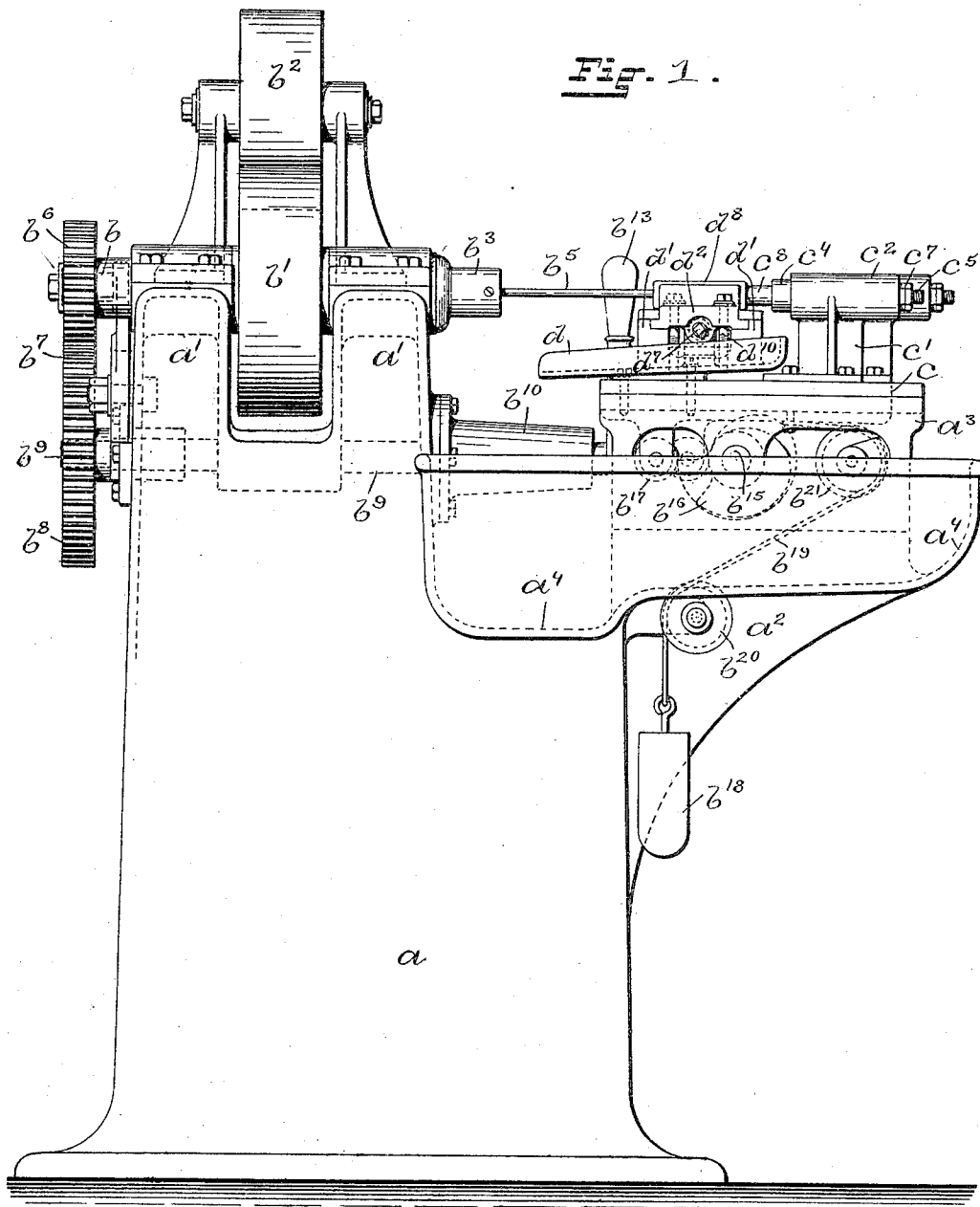
J. STEPHANS.
NUT TAPPING MACHINE.

(Application filed May 9, 1900.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.



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INVENTOR:

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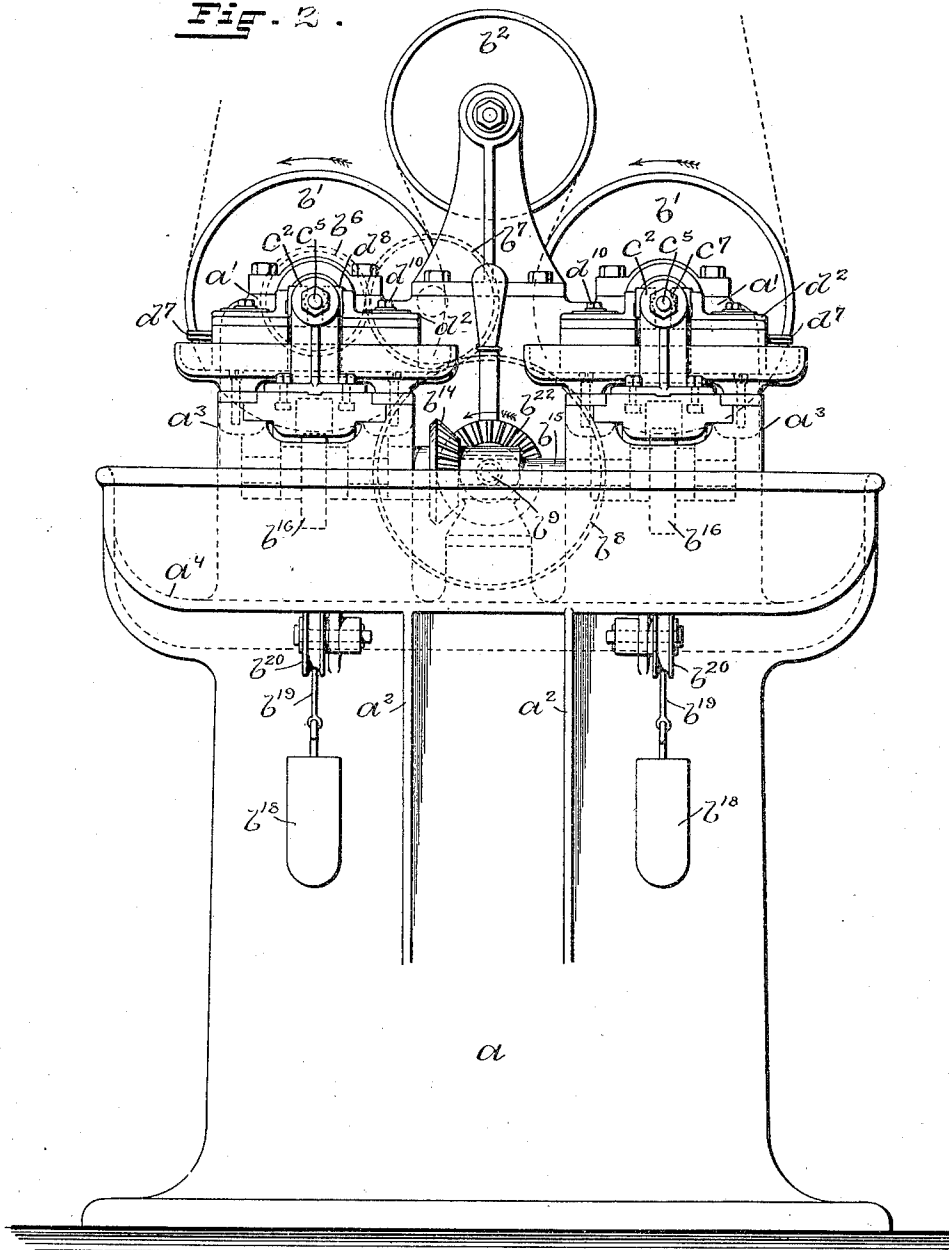
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Fig. 2.



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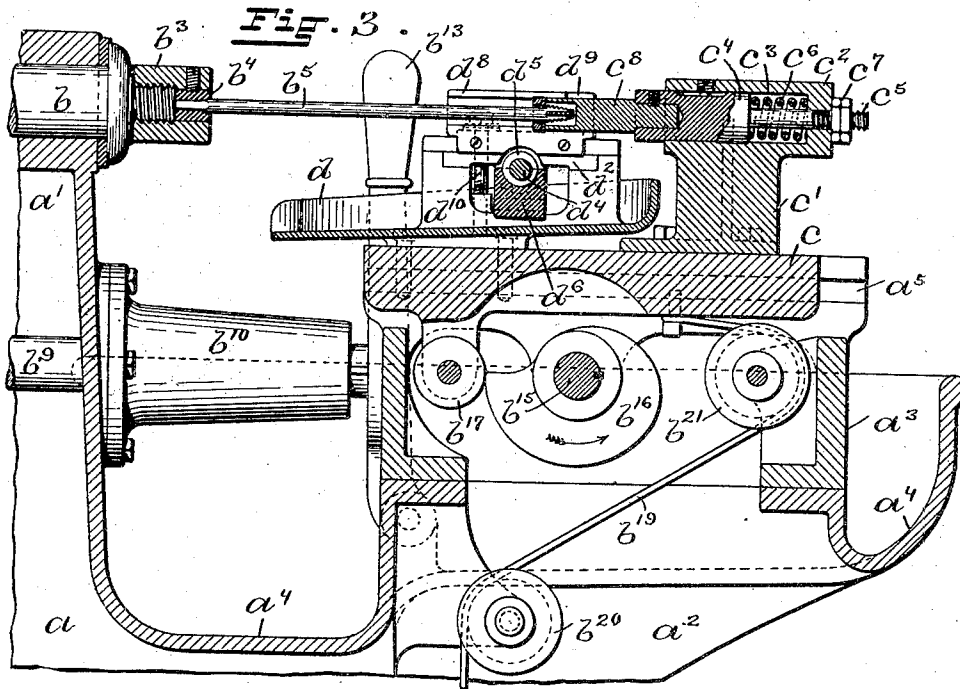
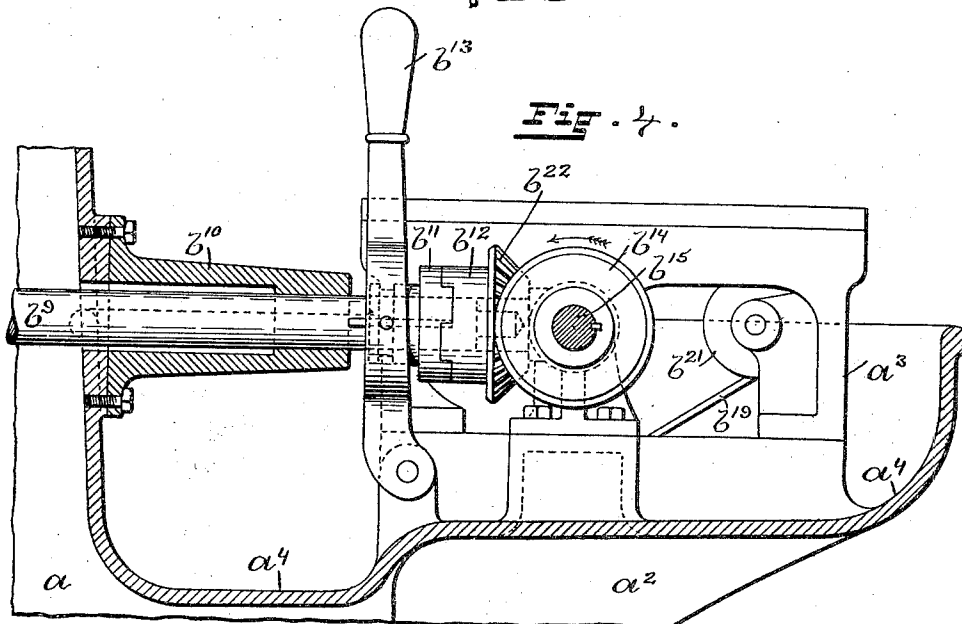
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Fig. 5.

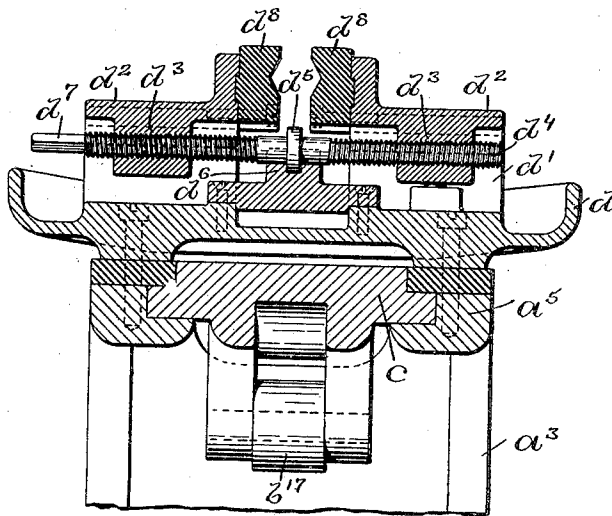


Fig. 6.

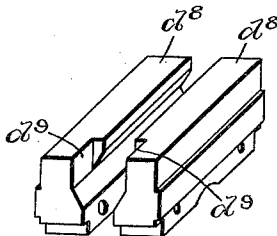
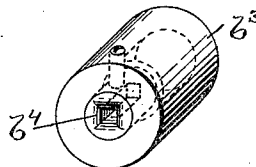


Fig. 7.



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UNITED STATES PATENT OFFICE.

JACOB STEPHANS, OF PAWTUCKET, RHODE ISLAND.

NUT-TAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 691,199, dated January 14, 1902.

Application filed May 9, 1900. Serial No. 16,015. (No model.)

To all whom it may concern:

Be it known that I, JACOB STEPHANS, a citizen of the United States, residing at Pawtucket, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Nut-Tapping Machines, of which the following is a specification.

This invention has reference to an improvement in machines for tapping nuts; and it consists in the peculiar and novel construction and combination of parts whereby two or more tapping-spindles are operated by one belt and the nut-feeding devices are operated by cams simultaneously or consecutively, as will be more fully set forth hereinafter.

The object of this invention is to so construct and arrange a nut-tapping machine that two or more tapping-spindles may be readily supplied by one attendant, and also so that in the one machine nuts may be internally threaded with threads of different pitch while using the same cam for operating the feeding devices.

Figure 1 is a side view of my improved nut-tapping machine. Fig. 2 is a front elevation of the same, showing two tapping-spindles operated by one belt. Fig. 3 is a vertical longitudinal section through the center of one of the nut-tapping and nut-feeding devices. Fig. 4 is a longitudinal sectional view showing the connection of the cam-shaft with the driving-shaft. Fig. 5 is a transverse sectional view of the adjustable nut-holding jaws. Fig. 6 is a perspective view of the nut-holding jaws. Fig. 7 is a perspective view of the socket for the tapping-spindle.

In the drawings, *a* indicates a hollow cast-metal standard of practically rectangular cross-section. The rear portion of the standard extends above the front portion and forms the transversely-extending pillow-blocks *a' a'*. In front the brackets *a² a²* extend from the standard outward and form an overhanging support for the beds *a³ a³*. The forward part of the standard has the troughs *a⁴ a⁴* extending along each side and the front to form a convenient receptacle for nut-blanks within easy reach of the attendant.

On the pillow-blocks *a' a'* journal-bearings for the spindles *b b* are supported. On each

spindle *b* a pulley *b'* is secured. Between the pulleys *b' b'* the idle pulley *b²* is supported in bearings formed in brackets which are secured to the two pillow-blocks *a' a'*. A belt (indicated in broken lines in Fig. 2) extends under the pulleys *b' b'* and over the pulley *b²* and drives the same in the direction indicated by the arrows.

The beds *a³ a³* have the grooved ways *a⁵ a⁵*, on which the reciprocating carriages *c c* are supported. The stocks *c' c'* are secured to each of the carriages *c c*. The heads *c²* of the stocks *c'* have the cylinder *c³*, in which the piston *c⁴* is supported. The piston *c⁴* has a stem *c⁵*, which extends through a hole in the closed end of the cylinder *c³*. A spiral spring *c⁶* surrounds the stem, one end bearing on the closed end of the cylinder and the other against the piston *c⁴*. The nuts *c⁷* on the threaded portion of the stem *c⁵* serve to adjust the spring *c⁶* and limit the forward movement of the piston *c⁴*. The piston is held against rotation by a stop in the wall of the cylinder *c³*, which enters a longitudinal groove in the piston *c⁴*. The pusher *c⁸* is secured to and projects from the piston *c⁴*. The front end of the pusher is bored out to allow the thread-cutting die to enter the pusher, as is shown in Fig. 3.

The tray *d* forms the support for the nut-guide. It is rigidly secured to and supported on the ways *a⁵*, as is shown in Fig. 3 and on an enlarged scale in Fig. 5. From the tray *d* extend upward the transversely-extending ways *d' d'*, on which the carriages *d² d²* slide. The nuts *d³ d³* form parts of the carriages *d² d²*. The right and left handed screw *d⁴* extends through the nuts *d³* on the carriages. The central disk *d⁵* rotates in a groove in the block *d⁶*, so that when a wrench is placed on the end *d⁷* and the screw turned both the carriages are adjusted toward or from the center. The jaws *d⁸ d⁸* are longitudinally grooved to conform to the shapes of the nuts to be tapped, the front ends *d⁹ d⁹* being formed to permit the insertion of nuts. The jaws *d⁸* are secured to the carriages *d² d²* and are adjusted to hold the nuts against rotation while permitting the nuts to slide with a loose sliding fit along the grooves in the jaws.

When properly adjusted, the carriages are

preferably firmly secured to the tray by suitable bolts, as is shown in Fig. 1 and indicated by the screw d^{10} in Fig. 3.

To the screw-threaded front end of the spindle b the socket-piece b^3 is secured, and in the end of this piece a preferably hardened-steel socket b^4 is secured, in which the end of the tap-rod b^5 is supported. To the rear of one of the spindles b the pinion-gear b^6 is secured, engaging with the intermediate gear b^7 , which engages with the gear b^8 on the shaft b^9 . The intermediate gear b^7 is journaled on an adjustable post, so that it may be moved and a smaller or larger gear substituted for the intermediate gear, such construction being of any one of the usual construction of speed-change gearing. The shaft b^9 is supported near the front end by a bearing in the tubular sleeve b^{10} . The sliding part b^{11} of the clutch b^{12} is connected with the clutch-lever b^{13} , the lower end of which is pivoted to a fixed part of the standard. The bevel-gear b^{22} on the clutch b^{12} engages with the bevel-gear b^{14} on the transversely-extending cam-shaft b^{15} . Underneath each one of the carriages c a cam b^{16} is secured to the cam-shaft b^{15} . These cams may be set so as to actuate the carriages together or one after the other, and if more than two spindles are used in one machine the cam-shaft b^{15} may be lengthened and cams secured to actuate any desired number of carriages.

The cam b^{16} bears against the roller b^{17} , journaled in an arm extending from the carriage c . The carriage is held against the cam by the weight b^{18} , suspended from the strap b^{19} , which, extending over the pulleys b^{20} and b^{21} , is secured to the carriage c . By this construction a positive forward motion is imparted to the carriages by the cam and a quick return by the force of gravity exerted by the weight b^{18} . For tapping a variety of nuts differing in diameter and pitch of the internal screw-thread the cam b^{16} is formed to feed nuts of the highest pitch. When nuts are to be tapped at less pitch, the spring-pressed piston c^4 yields sufficiently to compensate for the difference in the pitch and recovers its normal position. As each nut is tapped it remains on the tap-rod b^5 and is pushed farther and farther onto the tap-rod. When the tap-rod is full, it may be removed and the nuts taken off the rod.

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

1. The combination of a standard provided with an overhanging support at the front thereof and a trough extending around three sides of the said overhanging front, a set of rotary tool-carrying spindles mounted side by side parallel to each other upon the standard and provided with means for driving the spindles in the same direction, a set of horizontally-reciprocating tables provided with guide-ways located upon said overhanging front

and means for reciprocating said tables, a nut holder and guide arranged in stationary position over each of said tables, and a nut-pusher mounted upon each of said tables at the forward end thereof and adapted to enter said holder and guide to push the nut through the same in the direction of the tool-spindles, substantially as and for the purpose set forth.

2. In a nut-tapping machine, a horizontal rotatable tap-rod held against longitudinal movement, a horizontally-reciprocating carriage, a stock on the carriage, a spring-pressed piston mounted in the stock, a nut-pusher detachably secured in the piston, a separate nut-support detachably secured to the machine and having longitudinal grooves in which the nut and pusher may slide, means for rotating the tap-rod, and means for reciprocating the carriage, substantially as described.

3. In a bolt-tapping machine, the combination with the standard, a head-stock on one end of the standard, a plurality of spindles placed parallel to each other journaled in the head-stock, tapping-rods on the spindles and a plurality of stationary nut-guides, of a plurality of reciprocating carriages, ways for the reciprocating carriages placed parallel to each other, spring-pressed pushers on the carriages, means for rotating the spindles, a central shaft, and a cam-shaft for operating the reciprocating carriages, whereby a number of nuts may be tapped simultaneously with screw-threads differing in pitch, as described.

4. In a nut-tapping machine, in combination, two or more spindles, tap-rods in the ends of the spindles, means, comprising a belt, for rotating all the spindles in the same direction, two or more carriages, a cam-shaft extending transversely under the carriages, actuating-cams on the cam-shaft, one for each carriage, mechanism intermediate the cam-shaft and one of the spindles, stocks on the carriages, cylinders in the stocks, and spring-pressed pistons in the cylinders, nut-pushers yieldingly supported by the pistons, and adjustable jaws for guiding the nut-blanks, as described.

5. In a nut-tapping machine, a combined holder and guide consisting of two carriages detachably mounted on the machine and adjustable toward and away from each other, a jaw adjustably mounted in each carriage, a longitudinal groove in each jaw into which a portion of the nut may enter and be held thereby against rotation, and an enlargement of the grooves at one end to permit insertion of the nut, substantially as described.

6. The combination of a rotary horizontal tool-carrying spindle and means for driving it, a horizontally-reciprocating table moving in a plane parallel with the axis of the spindle and means for actuating it, a tray fixed above and across the end of the reciprocating table nearest to the spindle and independently of the table, an adjustable work-holder

and guide mounted upon said tray and in
axial alinement with said spindle, and a
spring-mounted work-pusher located upon
the far end of said reciprocating table and
5 adapted to project into said work-holder and
guide to push upon the work, substantially
as and for the purpose set forth.

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

JACOB STEPHANS.

Witnesses:

B. M. SIMMS,

J. A. MILLER, Jr.