No. 610,208. Patented Sept. 6, 1898.

H. A. TUTTLE.

TAPPING MACHINE.

(Application filed Sept. 29, 1897.)

(No Model.)

Fig. 1.

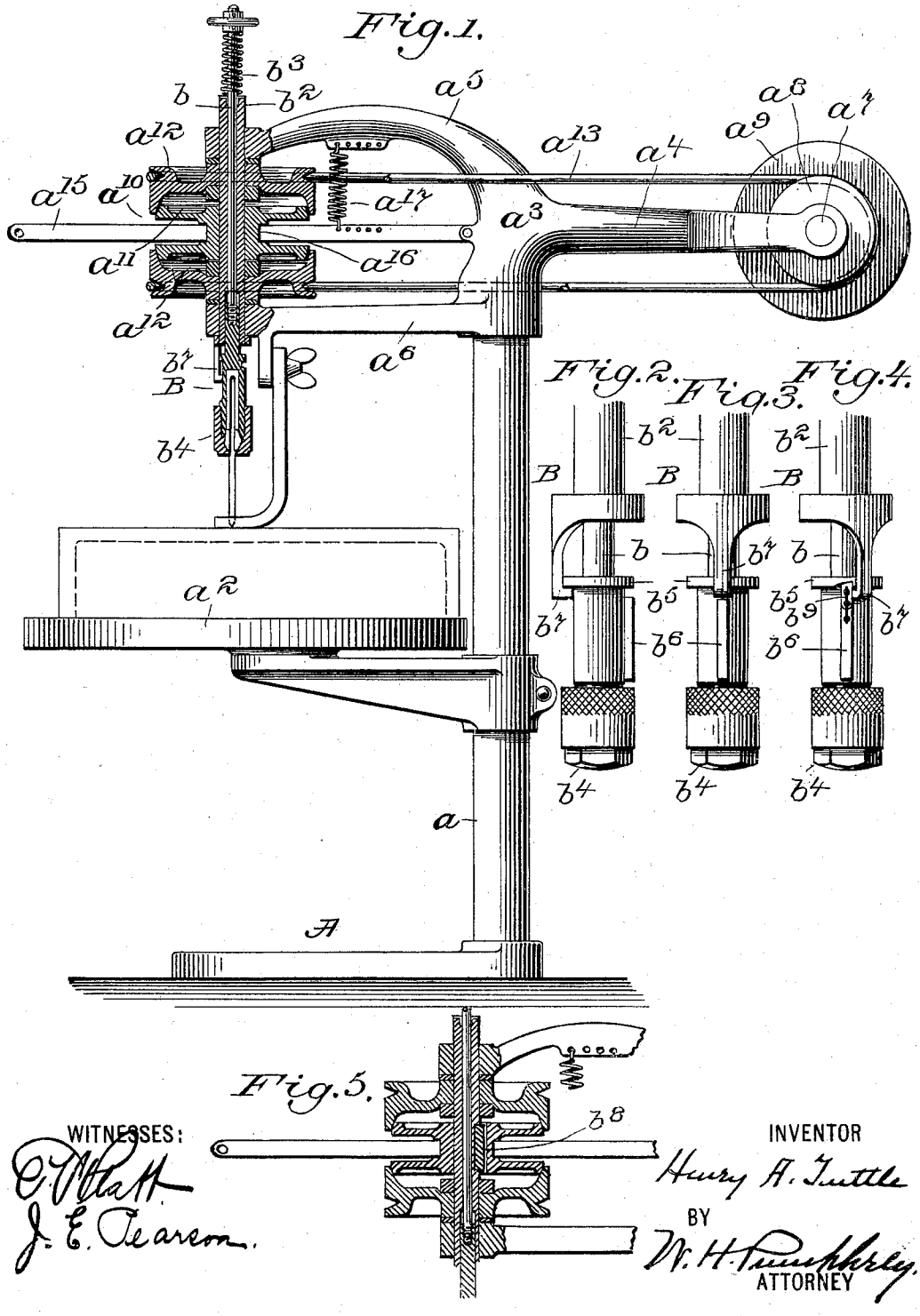


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

WITNESSES:

C. Hall

J. E. Pearson.

INVENTOR

Henry A. Tuttle

BY

W. H. Pinckney.

ATTORNEY

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HENRY AUGUSTUS TUTTLE, OF STAMFORD, CONNECTICUT.

TAPPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 610,208, dated September 6, 1898.

Application filed September 29, 1897. Serial No. 653,439. (No model.)

To all whom it may concern:

Be it known that I, HENRY AUGUSTUS TUTTLE, residing at Stamford, in the county of Fairfield and State of Connecticut, have invented an Improved Tapping-Machine, of which the following is a specification.

My invention relates to machines of a class particularly adapted for tapping, drilling, and reaming.

The invention consists of an adjustably-mounted table upon which the work is sustained, a revoluble tool-holding chuck adjacently journaled and having endwise movement to and from the table, which may be varied and automatically limited according to the requirements of the work, and suitable gearing for driving the chuck.

The points of invention lie in rotatably mounting a chuck in a manner to render it movable to and from the work, and in automatically limiting such movement to vary the depth of the cut as desired, and, finally, in various minor features to be hereinafter fully described and claimed.

In the accompanying drawings similar letters indicate corresponding parts in the several views, in which—

Figure 1 is a view in elevation of one embodiment of the invention applied, parts being shown in section to more clearly illustrate the construction of the chuck-spindle and its driving mechanism. Fig. 2 is an enlarged detail view of the chuck and a portion of its spindle, the parts forming the spindle being shown in their normal relative position. Fig. 3 is a similar view of the same, illustrating the operation of the driving-dog. Fig. 4 is a view of a modified form of spindle, and Fig. 5 is a sectional view of the driving mechanism thereof.

In the drawings, A represents a base, from which a standard a, preferably tubular, extends and serves as a support for a table a^2, the latter being adjustably clamped thereon in any suitable manner. Upon the upper end of the standard a casting a^3 is mounted and provided with three arms a^4 a^5 a^6. One of these arms extends rearwardly and is bifurcated to provide bearings, in which a shaft a^7 is journaled, carrying a series of pulleys a^8 a^9. The arms a^5 a^6 project forwardly and terminate in heads, in which the driving member of the chuck-spindle is rotatably mounted. Centrally between these heads a friction-clutch a^{10} is arranged, which comprises a double-cone clutch-pulley a^{11}, keyed or feathered upon the driving part of the chuck-spindle and adapted to engage either of the adjacently-mounted pulleys a^{12} a^{12}, which are loose but belted up to run in opposite directions. The desired direction of rotation is obtained through the employment of an endless belt a^{13}, which passes around these pulleys and is looped over a fast pulley and a loose pulley carried by the driving-shaft in the rear. The clutch is operated by means of a hand or foot lever a^{15}, pivoted to the upper casting and extending outwardly, it being looped to engage a circumferential groove a^{16} formed in the clutch-cone. A spring a^{17} is adjustably attached to this lever and, acting upwardly, tends to effect continuous engagement between the cone and upper clutch-pulley.

B represents the chuck-spindle, which comprises two parts or members b b^2, telescopically arranged one within the other in a manner to permit independent endwise movement of the inner member or spindle proper, which latter is sustained normally elevated by an encircling spring b^3, acting against an annular shoulder formed by the upper end of the outer member.

The chuck b^4 may be of any suitable or well-known form, it being essential, however, in the application of the present invention that the casing thereof be peculiarly formed to provide two stops b^5 b^6, one of which is circumferentially and the other axially disposed with respect to the casing, they being separated sufficiently to permit the free passing of a dog or pawl b^7 carried by the outer or driving member. The upper end of the casing is tapped to receive the threaded extremity of the spindle, whereby they are rendered practically continuous. The outer or driving member is journaled to rotate freely and may be keyed to the double-cone pulley to partake of both its rotary and vertical motion, as illustrated in Fig. 1, or of only its rotary motion, as shown in Fig. 5, in which latter case a feather-and-spline connection b^8 would be employed to permit the independent adjustment of the clutch-cone necessary for its engagement with the pulleys.

The operation of the construction just described involves a modification of the stops, as illustrated in Fig. 4, which consists in interposing a spring-dog b^9 in the path of travel of the main or driving dog, so that it will yield in one direction and be sustained by a shoulder against movement in the opposite direction.

In setting or adjusting the machine the inner member or chuck-spindle proper is depressed against the action of its spring until the annular stop-shoulder engages the driving-dog, and the work-carrying table is then elevated to bring the work into contact with the tool while the latter is in its lowered position. Continued movement of the table carries the tool upward until the driving-dog and stop-shoulder become separated a distance approximating the depth of cut required, at which point the table is secured. The spindle on being released is elevated by the action of its spring and the machine is then in operative condition. Power from the main driving-pulley is transmitted by belt to the clutch-pulleys to drive them in opposite directions, and under the control of the clutch proper the chuck may be rotated as desired. As above stated, however, under the influence of the upward-acting spring the clutch-cone lies in engagement with the upper pulley, and thereby drives the tool in a right-hand direction through the medium of the driving-pawl acting against the axially-disposed stop or key. The tap or tool is entered by depressing the spindle and is self-feeding in the well-known manner, the depth of cut being limited by bringing the tool to a state of rest. This is effected automatically by the escape of the stop or key from the dog, and the latter then runs freely under the annular shoulder. To withdraw the tool, the clutch-lever is depressed to close the cone with the lower pulley and thereby reverse the direction of rotation. This movement of the cone carries the outer member of the spindle downward (see Fig. 1) until the driving-dog thereof engages the stop-key, upon which it acts, as above described. When the cone is feathered upon the spindle, the pivoted pawl will yield and permit the dog to rotate beneath the stop-shoulder, and it is only necessary to reverse the direction of rotation, as the driving-dog will temporarily lock the pivoted pawl (see Fig. 4) in the notch forming its stop.

It will be understood that various changes may be made in the construction and arrangement without departing from the spirit of my invention.

Having therefore described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. A chuck, comprising a spindle proper movable in the direction of its length and provided with an engaging projection, and a suitably-controlled driving-sleeve engaging either side of said projection to rotate the spindle and being adapted to successively engage opposite sides thereof to effect the advance and withdrawal of the tool, as specified.

2. A chuck, comprising a spindle proper movable in the direction of its length and provided with an engaging projection, and a suitably-controlled driving-sleeve having a dog engaging said projection to rotate the spindle and being adapted to successively engage opposite sides thereof, to effect the advance and withdrawal of the tool, as specified.

3. A chuck, comprising a spindle movable in the direction of its length and provided with an engaging projection, a suitably-controlled driving-sleeve having a dog engaging said projection to rotate the spindle and being adapted to successively engage opposite sides thereof to effect the advance or withdrawal of the tool, and a spring sustaining said parts normally in engagement, as specified.

4. The combination with reversible driving mechanism, of a chuck, comprising a spindle proper movable in the direction of its length and provided with an engaging projection, and a suitably-controlled driving-sleeve engaging either side of said projection to rotate the spindle and being adapted to successively engage opposite sides thereof to effect the advance and withdrawal of the tool, as specified.

5. The combination with reversible driving mechanism, of a chuck, comprising a spindle movable in the direction of its length and provided with an engaging projection, a suitably-controlled driving-sleeve having a dog engaging said projection to rotate the spindle and being adapted to successively engage opposite sides thereof to effect the advance or withdrawal of the tool, and a spring sustaining said parts normally in engagement, as specified.

6. The combination with reversible driving mechanism, of a chuck, comprising a driven member independently movable in the direction of its length, and provided with a circumferential flange, and an axially-disposed projection terminating adjacent to said flange, and a driving member adapted to engage either side of said projection for the purpose described.

In testimony whereof I affix my signature in the presence of two witnesses.

HENRY AUGUSTUS TUTTLE. [L. S.]

Witnesses:
GEO. H. RENAUD,
GRAHAM R. HOLLY.