No. 763,235. PATENTED JUNE 21, 1904.

H. M. WILSON.

THREAD TAPPING MACHINE.

APPLICATION FILED OCT. 13, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 9.

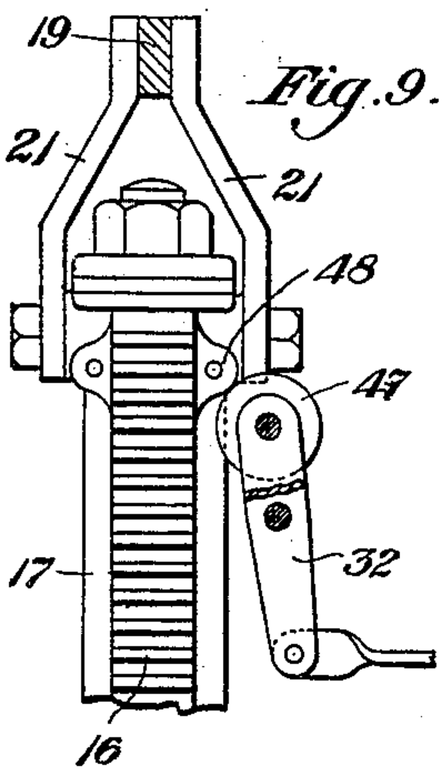

Fig. 1.

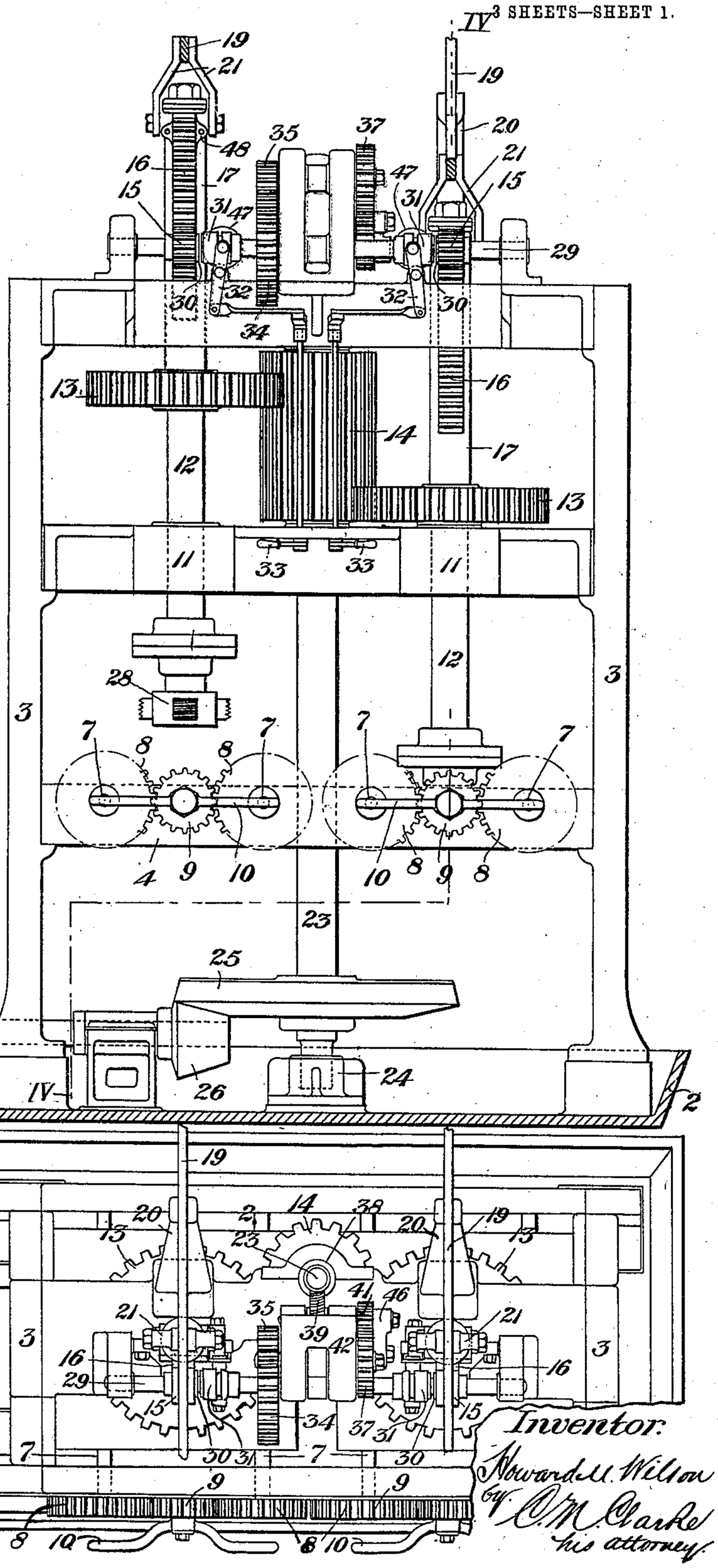

Fig. 2.

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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 3.

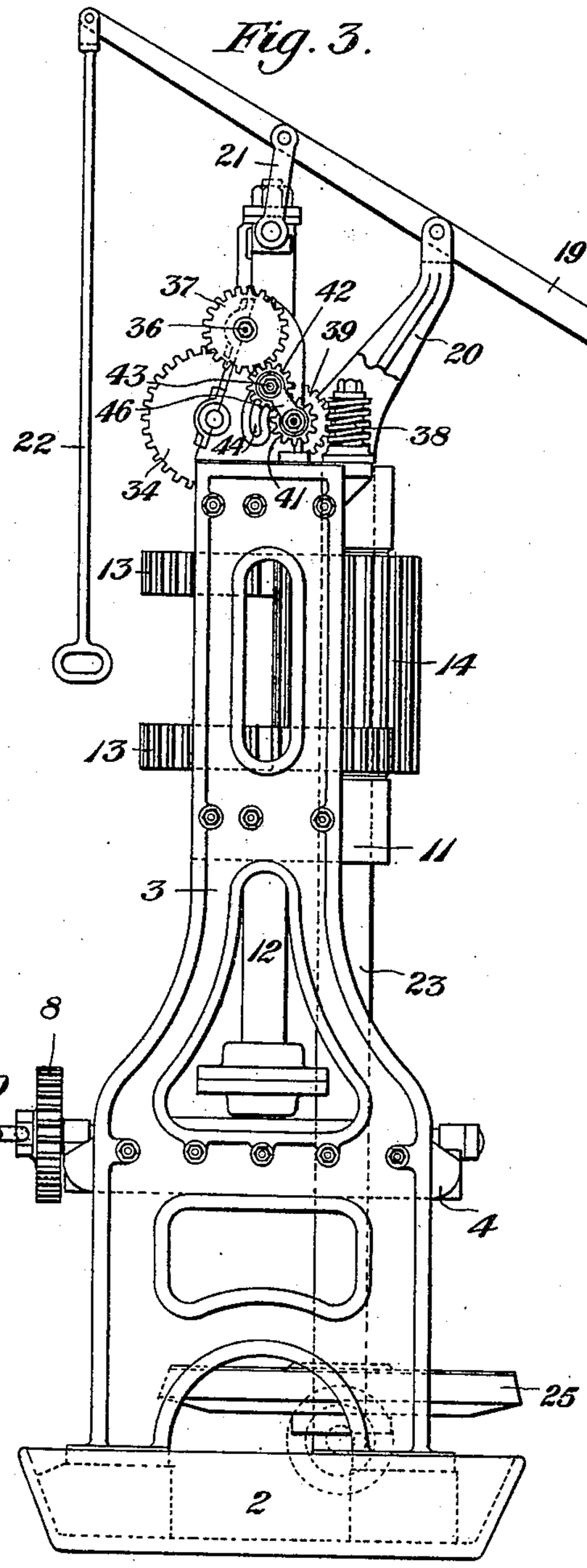
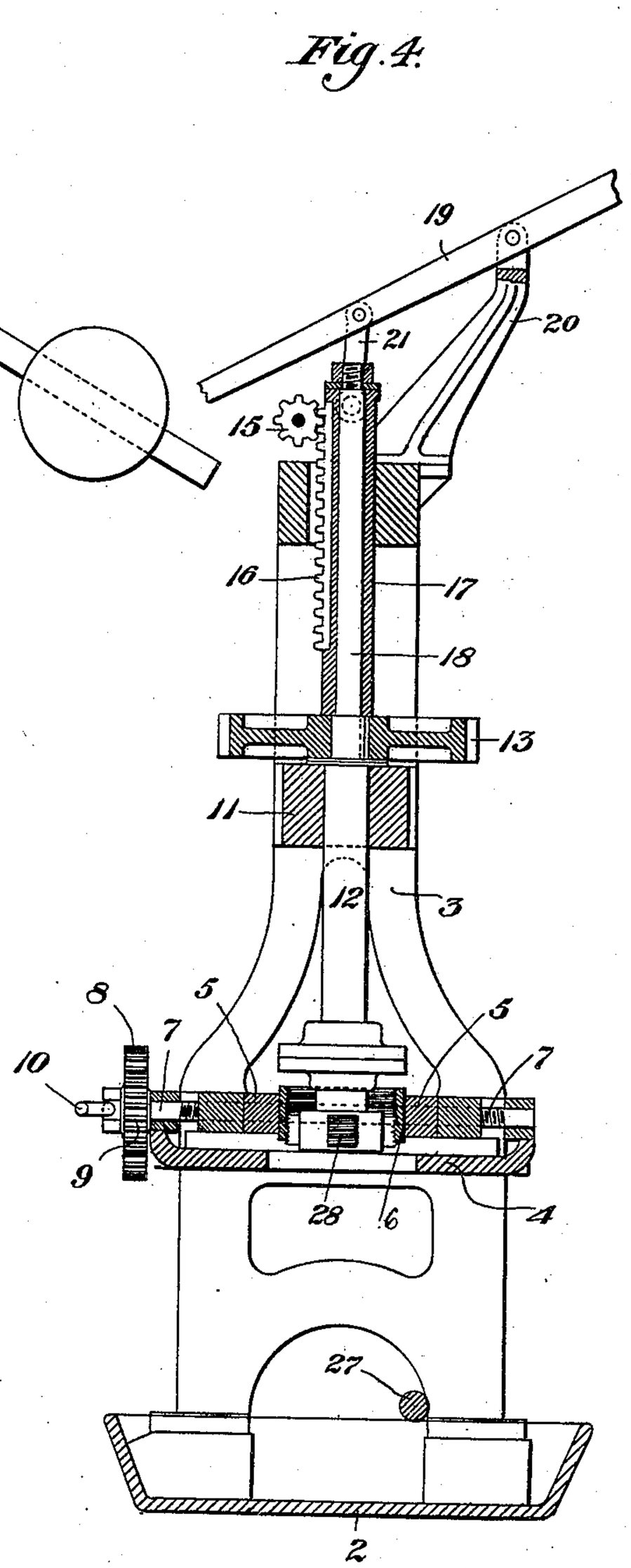


Fig. 4.



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APPLICATION FILED OCT. 13, 1902.

NO MODEL.

3 SHEETS—SHEET 3.

Fig. 5.

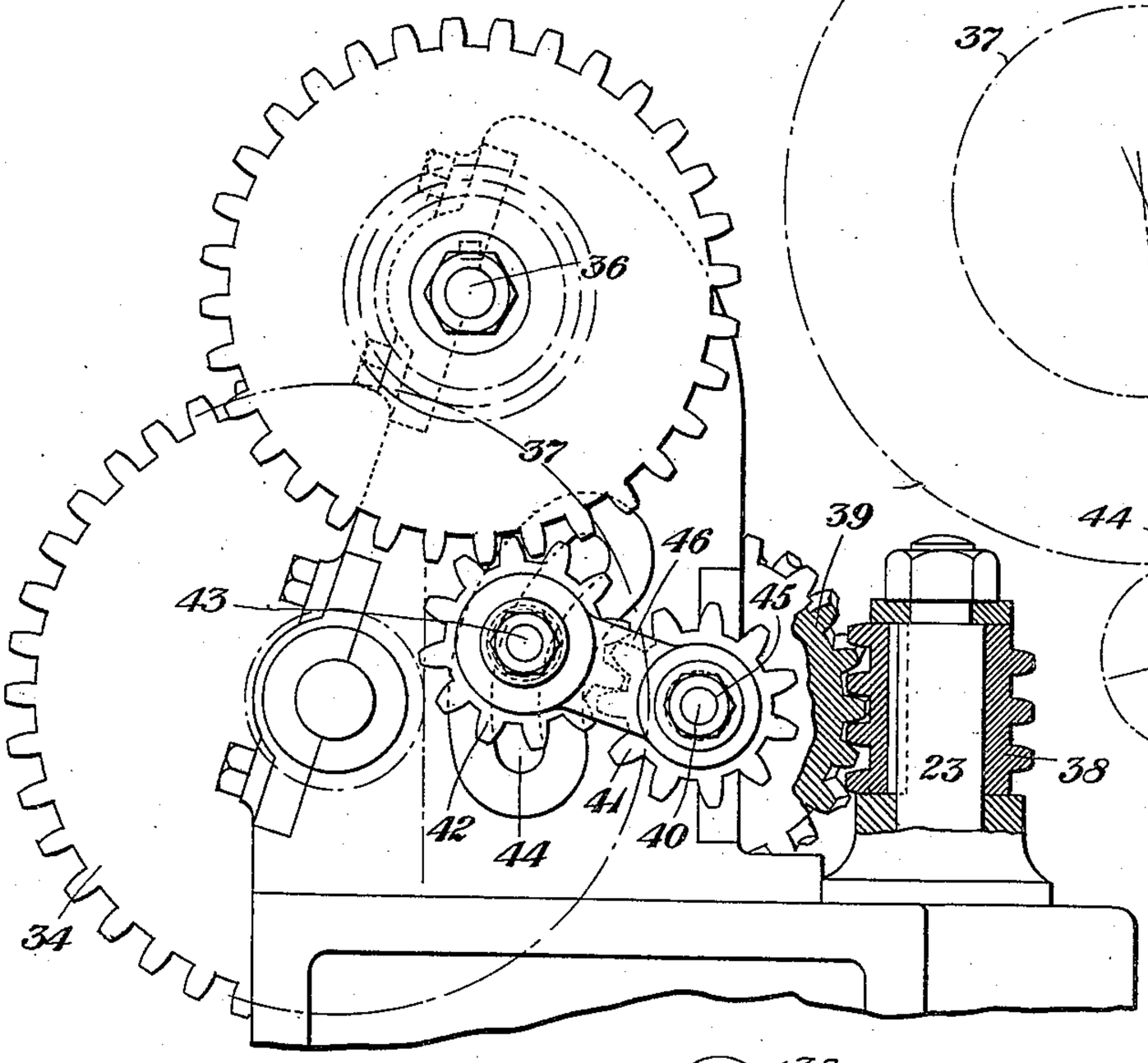


Fig. 6.

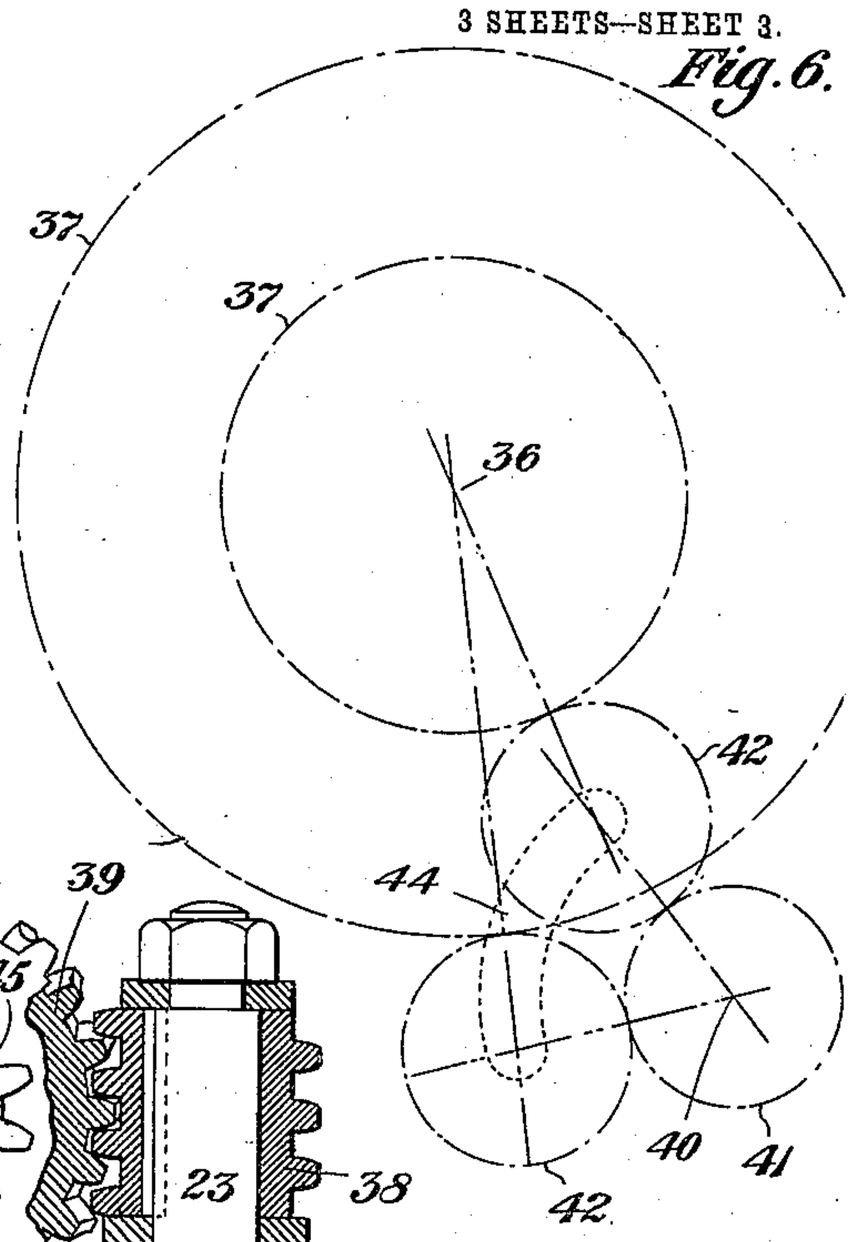
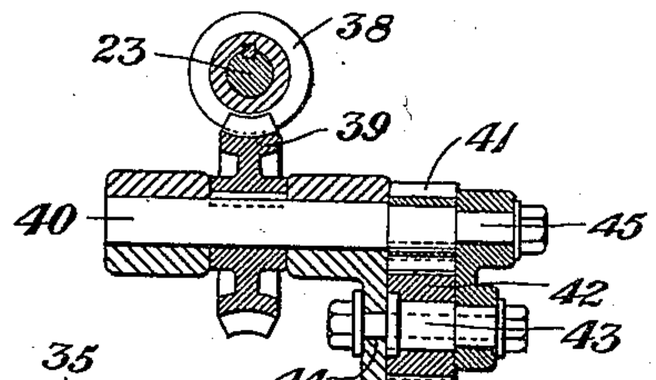


Fig. 7.



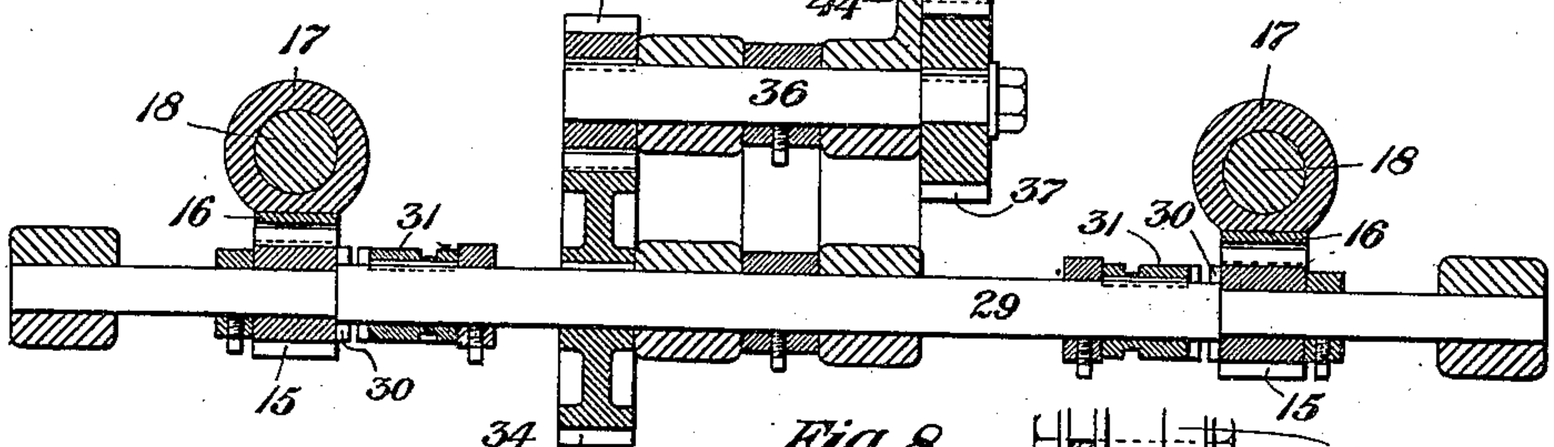
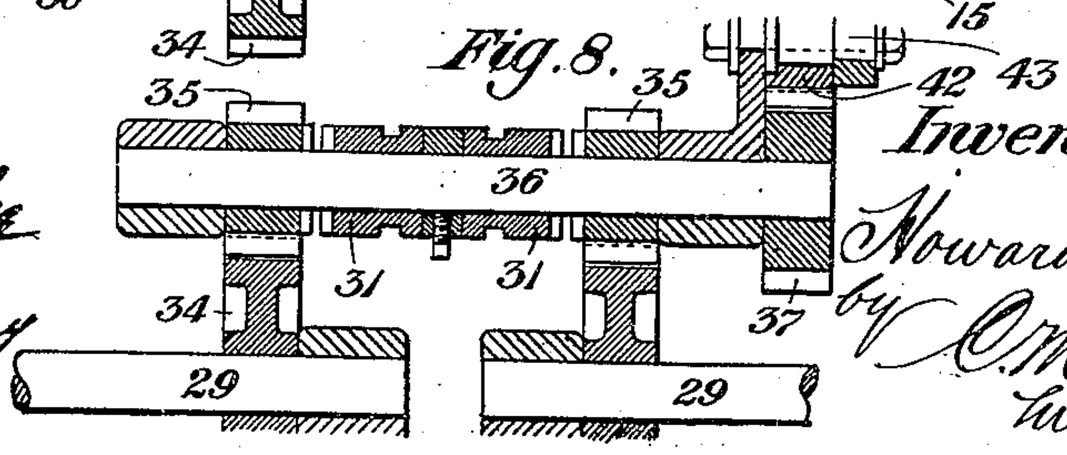


Fig. 8.



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UNITED STATES PATENT OFFICE.

HOWARD M. WILSON, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO TAYLOR, WILSON & COMPANY, LIMITED, OF ALLEGHENY, PENNSYLVANIA, A LIMITED PARTNERSHIP.

THREAD-TAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 763,235, dated June 21, 1904.

Application filed October 13, 1902. Serial No. 127,133. (No model.)

To all whom it may concern:

Be it known that I, HOWARD M. WILSON, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Thread-Tapping Machines, of which the following is a specification, reference being had therein to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a view in front elevation, partly in section, of my improved thread-tapping machine. Fig. 2 is a plan view thereof, partly broken away. Fig. 3 is an end view. Fig. 4 is a vertical section indicated by the line IV IV of Fig. 1. Fig. 5 is a detail view of the gearing, partly in section, on an enlarged scale. Fig. 6 is a diagrammatic view of the change-gear arrangement, indicating the minimum and maximum sizes. Fig. 7 is a sectional development of the gearing, shafting, and other operative elements, the section representing the relation of the different parts graphically. Fig. 8 is a partial similar view showing a modified arrangement of clutch-gearing. Fig. 9 is a detail view illustrating the automatic disengagement of the clutch.

My invention relates to apparatus or machines for tapping threads of couplings, sleeves, or other similar devices; and it has for its object the construction of a machine adapted to a wide variety of changes as to the pitch of the threads, diameter of the couplings, and the speed of operation, together with compactness of construction, ease of manipulation, and other advantages, as shall be more fully hereinafter set forth.

The primary object of the invention is to render the machine capable of different feeds by changing one gear, thereby obviating the necessity of separate spindles or other complicated and cumbersome feed devices which have been heretofore employed.

Referring now to the drawings, 2 is the bed-plate of the machine, preferably made in the form of a pan, upon which are mounted the end frames 3 3, by which the upper structure of the machine and the various operative parts are supported. Horizontally mounted between these end supports is a supporting-platform 4, upon which are slidingly mounted the chucks 5, which chucks are closed or opened to grip or release the blank by right and left hand threaded screws 7 7, provided with gear-wheels 8 in engagement with an intervening driving-pinion 9, adapted to be rotated in either direction by handle 10. In the construction shown two such gripping-supports are provided, one at each side, and vertically arranged above each and mounted in cross-bearings 11 are the tap-spindles 12, each of which is provided with a gear-wheel 13, in engagement with an elongated driving-pinion 14.

Each of the spindles 12 is adapted to rotate by means of gearing 14 13 and to be lowered by means of the pinion 15 in engagement with rack 16, secured to the outer portion of a cylindrical sleeve 17, within which a reduced extension 18 of spindle 12 is rotatably mounted, being supported at the top by a nut and bearing-washers, as clearly shown in Fig. 4. A counterweighted lever 19, pivoted in bracket 20 and connected to the upper end of sleeve 17 by links 21, serves to counterbalance the weight of the spindle and its connected parts, the front extension of the lever being provided with a pull-rod 22 for manual vertical manipulation independent of the rack and pinion.

23 is the main driving-shaft, vertically mounted in suitable bearings, resting in a step-box 24 in the base-plate and driven by bevel-wheels 25 26 from main counter-shaft 27, driven in any suitable manner. At the upper portion of the shaft 23 the elongated pinion 14 is mounted, of sufficient length to insure the constant engagement of gears 13 for the full range of the vertical travel of the spindles 12, provided at their lower ends with the usual taps 28. These taps, as will be readily understood, are removable, so as to provide for varying diameters of couplings as well as different sizes of threads, and for the purpose of positively feeding the spindles and forcing the taps into the blanks, as well as of varying their rate of speed so as to correspond with each standard pitch of thread, I have provided a construction of gearing

shown in the upper portion of the machine. (More particularly illustrated in Figs. 5, 6, and 7.)

The pinions 15, which engage the racks 16, by which the spindles are lowered and their downward feed controlled, are loosely mounted on a horizontal shaft 29 and provided with clutch-faces 30. Movable clutches 31, in spline engagement with shaft 29, are adapted to be thrown into or out of gear with the clutch-faces 30 by means of levers 32, operated by handles 33, within easy range of the operator. The spindles 12 are fed downwardly at varying speed, according to the speed of the shaft 29, the speed of which may be varied with relation to the fixed speed of rotation of the spindles. By throwing the clutch 31 at either or both sides into gear downward movement is imparted to one or both spindles, and upon releasing the clutches the spindles are raised by the counterweighted lever under control of the operator by rod 22 for commencing the operation or for insertion or removal of the taps.

Shaft 29 is mounted in suitable bearings in the upper framework of the machine and is provided with a gear-wheel 34, in driving engagement with the pinion 35, mounted on one end of counter-shaft 36, to the other end of which is secured the change-gear wheel 37 in such a manner as to permit of its removal or insertion.

On the upper end of shaft 23 is a worm 38, in engagement with worm-wheel 39, mounted on shaft 40, located in bearings in the framework and provided at one end with pinion 41.

Motion from shaft 40 is transmitted to counter-shaft 36 through said pinion 41 and an idler-wheel 42, mounted on an adjustable stud-bearing 43, carried in a curved slot 44 and connected with an extension 45 of shaft 44 by a swinging link 46. By this construction the idler-wheel may be thrown up or down and its bearing secured in slot 44 by a central bolt at varying positions to intermesh with the change-gear wheel 37, of whatever diameter such wheel may be.

As indicated in Fig. 6, I have provided for a wide range of sizes, so that the vertical feed of the spindles may be changed to any required feed, and an especial advantage of the invention, in addition to such wide range of adjustment, is the ease and facility with which such change may be made by merely taking out wheel 37, substituting one of a different diameter, and adjusting the power-transmitting idler-wheel 42 to intermesh with it.

For the purpose of preventing excessive downward travel of the spindles in case the clutches should not be thrown out by hand I have provided means for automatically disengaging the clutch. (More clearly shown in Fig. 9.) Each clutch-lever 32 is provided with a roller 47 on one of its arms, with which a lug or boss 48 on the vertically-moving sleeve 17 comes into contact before the limit of downward movement of the spindle is reached, thus throwing the lever and clutch out of gear, and consequently stopping the feed.

The machine is very simple and compact and not liable to get out of order and in operation has given most satisfactory results, and its advantages will be appreciated by all those familiar with this class of machinery.

It will be understood that the number of spindles 12 may be varied to suit different requirements of use and that several may be arranged in alinement by extending shaft 29 to one or both sides of gear 34 and duplicating the construction shown. A machine having a single spindle may also be used to advantage, although the clutch mechanism enables the operator to use each spindle independently of the other. It will be understood that the location of the clutches may be varied and that they are not necessarily located on shaft 29.

If it is desired, the clutches 31 may be inserted at a point nearer to the driving-worm, as shown in Fig. 8, thus insuring quicker engagement due to the higher speed of the shafting, or elsewhere. In such arrangement shaft 29 is made in two pieces, each side being independent of the other.

Changes and variations may be made by the skilled mechanic in the construction, design, proportions, or other details; but all such changes are to be considered as within the scope of the following claim.

What I claim is—

In a thread-tapping machine, a tapping-spindle, a rack for raising and lowering the same, a vertically-disposed driving-shaft having a worm-gear at its upper end and rotating at a fixed speed, a horizontal counter-shaft carrying a pinion for engaging with and driving the rack, gearing mounted on said counter-shaft for driving the same, a second horizontal counter-shaft carrying gearing for engaging with and driving the gearing on said first counter-shaft, a third horizontal counter-shaft carrying gearing for engaging with and driving the driving-gearing on said second counter-shaft and also having worm-gearing intermeshing with and driven by the worm-gear on the vertical driving-shaft, and changeable gearing intermediate said second and third counter-shafts, whereby the speed transmitted from the driving-shaft to the rack for moving the tapping-spindle vertically may be varied or altered without change of speed of the driving-shaft; substantially as described.

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

HOWARD M. WILSON.

Witnesses:
JAS. J. MCAFEE,
C. M. CLARKE.