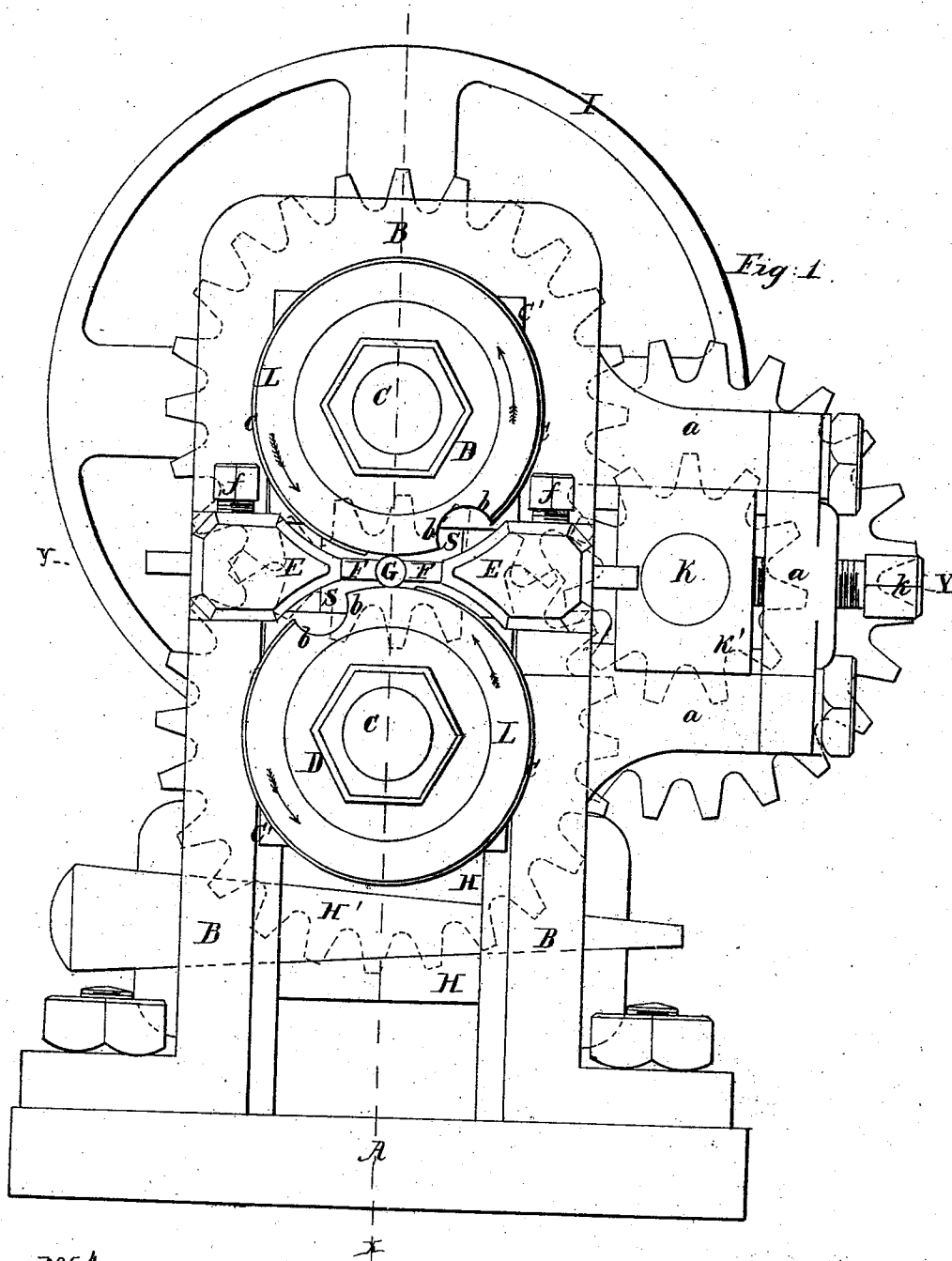


No. 96,372.

PATENTED NOV. 3, 1869.

J. B. WIGGENHORN.
MACHINE FOR THREADING BOLTS, &c.

3 SHEETS—SHEET 1.



Witnesses,
R. H. Phelps
for Comptroller

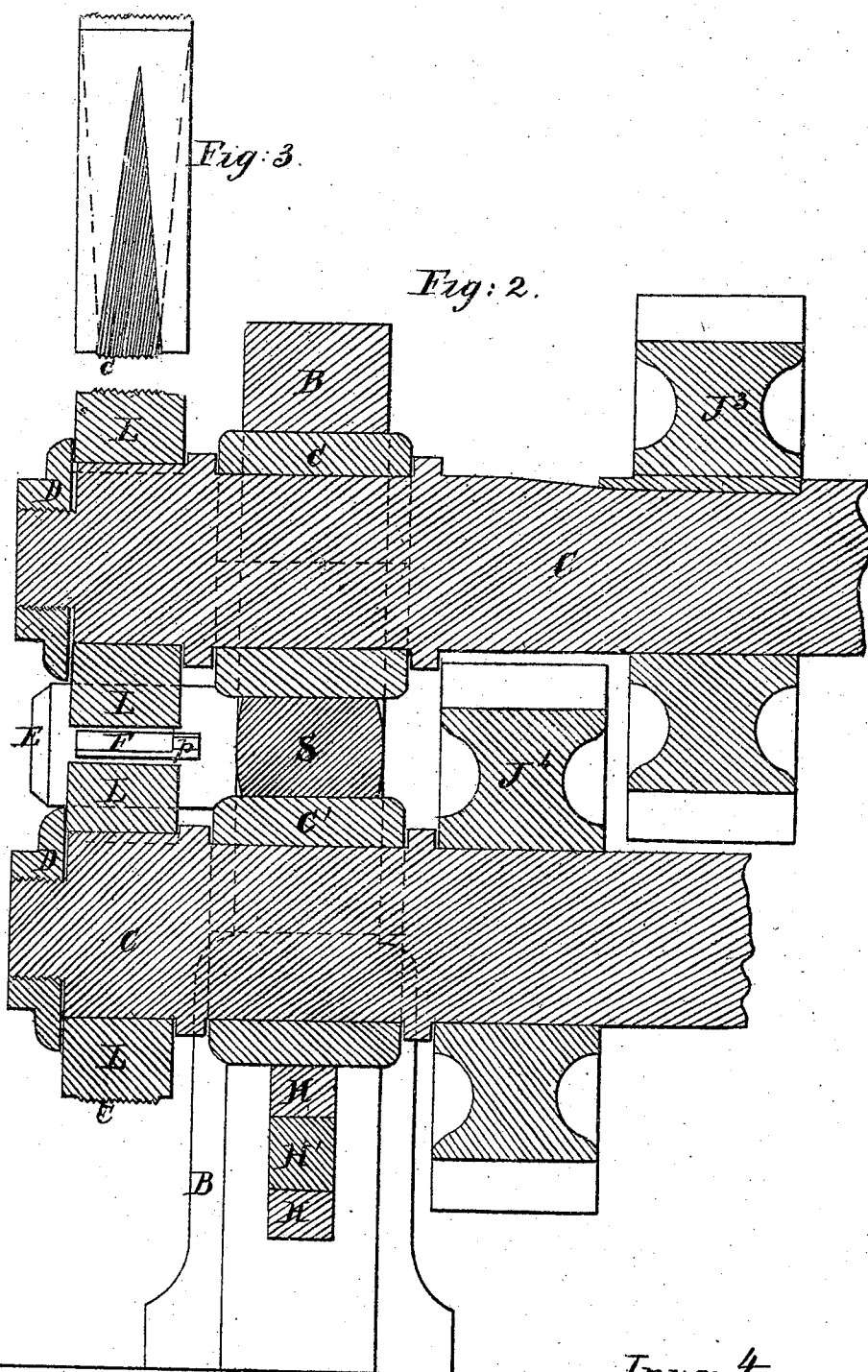
Inventor,
J. B. Wiggernhorn
by
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3 SHEETS—SHEET 2.



Witnesses
R. T. Humphreys
C. A. Humphreys

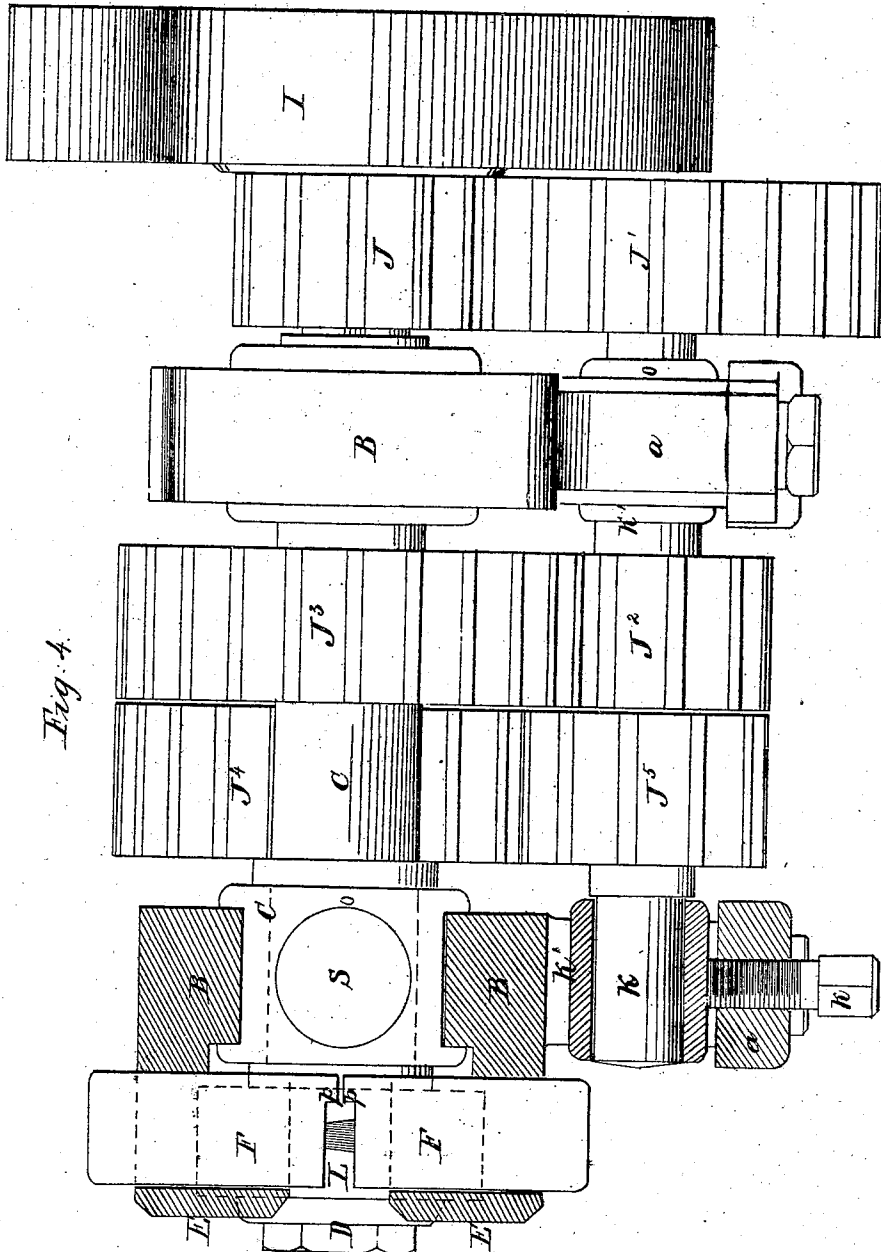
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4
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3 SHEETS—SHEET 3.



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United States Patent Office.

JOSEPH B. WIGGENHORN, OF ST. LOUIS, MISSOURI.

Letters Patent No. 96,372, dated November 2, 1869.

IMPROVED MACHINE FOR THREADING BOLTS, &c.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOSEPH B. WIGGENHORN, of St. Louis, in the county of St. Louis, and State of Missouri, have invented a new and improved Machine for Swaging Screw-Threads upon Bolts; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, sheet 1, is a front elevation of the improved machine.

Figure 2, sheet 2, is a section through part of the machine, taken in the vertical plane indicated by red line *x x* in fig. 1.

Figure 3, sheet 2, is a view of one of the circular threading-dies.

Figure 4, sheet 3, is a plan view of one part of the machine, and a sectional view taken in the horizontal plane indicated by red line *y y* in fig. 1, through the front part of the machine.

Similar letters of reference indicate corresponding parts in the several figures.

The object of this invention is to obtain a machine which will practically produce metal screws by swaging the threads upon the round bars or bolts, and thus condensing the metal instead of cutting out the grooves; and removing the metal to leave the threads.

I am aware that Letters Patent of the United States, numbered 66,568, were granted to E. Croft on the 9th day of July, 1867, wherein a single circular swaging-die, having helical threads formed on its periphery, was employed in conjunction with fixed segments, which latter, it was alleged, would hold the blanks up to the work of forming the threads. I do not, therefore, claim, as my invention, the devices shown in Croft's patent.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings—

A represents the foundation or bed of the machine, from which rise perpendicularly two standards B B, of an inverted U-shape.

These standards receive four journal-boxes C' C' O' C', which are vertically adjustable, and which afford bearings for two horizontal shafts O O that are arranged in the same vertical plane.

On the right-hand sides of the two standards B B, brackets *a a* are formed, for receiving journal-boxes K' K', which afford bearings for a horizontal shaft, K, that is horizontally adjustable.

The journal-boxes C' C' of the upper shaft O abut against the upper ends of their respective standards, and are sustained upon strong elastic cushions S, which rest upon the upper ends of the boxes C' C' of the lower shaft O.

The lower boxes C' C' are supported upon gibs H, and secured in the required position by keys H' driver transversely through the legs of standards B.

The journal-boxes K' K', which are supported in brackets *a a*, are laterally adjustable, and are provided with screw-abutments *k k*, for keeping said boxes in their shaft, in the required position, with relation to the two shafts O O.

On the rear end of the upper shaft O, a belt-wheel, I, is keyed, for receiving rotary motion from a driving-shaft through the medium of a belt.

On this shaft O, a pinion spur-wheel, J, and a larger spur-wheel, J', are also keyed. Wheel J engages with a spur-wheel, J', corresponding in diameter to J' on the side shaft K.

On this shaft K, spur-wheels J' J' are also keyed, one of which, J', engages with wheel J', and the other, J'', engages with the spur wheel J', which is keyed on the lowermost shaft O.

By this arrangement of gearing, the shafts O O are rotated in the same direction, and at an equal speed.

On the front ends of the two shafts O O, two circular screw-thread swaging-dies L L are firmly keyed, and confined by means of the nuts D D. These dies are of equal diameter, and are in all respects exactly alike.

Each die has a score or groove, *b*, cut transversely into its periphery, and each die has formed upon its periphery helical screw-threads *c*, which have the same angle or rake as it is required to have the threads upon the screw-bolts which are threaded by these dies.

The shape of these threads *c* should also correspond reversely with the threads of the proposed screw-bolts, and these threads should be of different lengths, so that during the operation of the threading, the longest thread will first operate, then the succeeding shorter one, and so on, through the entire number of threads *c*, until the dies have each made a complete revolution. This arrangement of the threads *c* is shown clearly in fig. 3, sheet 2, and is considered important, for the reason that if the full number of threads were caused to operate upon a blank at the commencement of swaging, the pressure would be so great that the blanks would be injured by the crushing of the metal.

The dies L L are arranged on their respective shafts, so as to insure a constant return to each other of the corresponding points on them, and the swaging-threads on both dies are so arranged as to co-operate with each other in producing the threads upon the bolts.

The threads commence at points near the scores *b b*, and terminate at the opposite sides of these scores, as shown in fig. 1.

The dies L L are adjusted, so that the space between their peripheries, at the point where the swaging is done, is exactly equal to the diameter of the bolts which it is desired to operate upon.

E E are two brackets, which are arranged in the same horizontal plane, and are permanently applied to the front sides of the front standard B.

Through these brackets slots are made for receiving removable guides F F, which can be secured at any required distance apart, by means of vertical set-screws f f. The inner ends of these two guides F may be slightly concave, as shown in fig. 1, and should present smooth surfaces to the bolts which impinge against them, and which they serve as guides for.

These guides F not only serve as guides for keeping the axis of a bolt, which is introduced between the dies, parallel to the axis of these two dies, but they also serve as gauges, for readily determining the length of the bolt which it is required to introduce into the machine before the operation of forming the threads commences. For this purpose the lips or abutments p p are formed on the inner end of the guides F, as shown in fig. 4, sheet 3.

The said guides F are removable, and they are also adjustable endwise. They are removable for the purpose of substituting others of different sizes, to correspond with the requirements of different blanks G of different sizes; and they are adjustable endwise, to adapt them to blanks of different diameters.

This mode of guiding and holding a blank positively in line with the axes of the dies is very important to the successful operation of the machine, for should a blank become slightly oblique to the axes of the dies during the swaging-operation, screw-threads would not be produced upon it.

The operation is as follows:

The shafts O O are provided with dies L L of the required diameter, and having the required number

and pitch of threads upon their perimeters. These dies being securely fastened to their respective shafts, they are adjusted the required distance apart by means of key H.

The guide and gauge-plates F F are then adjusted, so that their inner ends will just receive between them a blank, G, which is equal or slightly less in diameter to the space between the perimeters of the dies.

Motion being imparted to the belt-wheel I, or its equivalent, the dies L L will rotate in the direction indicated by the arrows in fig. 1, sheet 1.

A blank is now introduced between the guides F and between the smooth surfaces of the perimeters of the dies, as shown in fig. 1, and as these dies slowly rotate, the threads c will successively be brought in operation, and by condensing the metal of the blank G, produce screw-threads thereon, after which, and at the moment the scores b b come opposite each other, the screw-bolt will drop out, when another blank may be introduced between the dies, as before stated.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. Laterally-adjustable guides F F, in combination with screw-thread swaging-dies L, substantially as described.

2. The stops p p, in combination with guides and screw-threading swaging-dies, substantially as described.

JOSEPH B. WIGGENHORN

Witnesses:

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