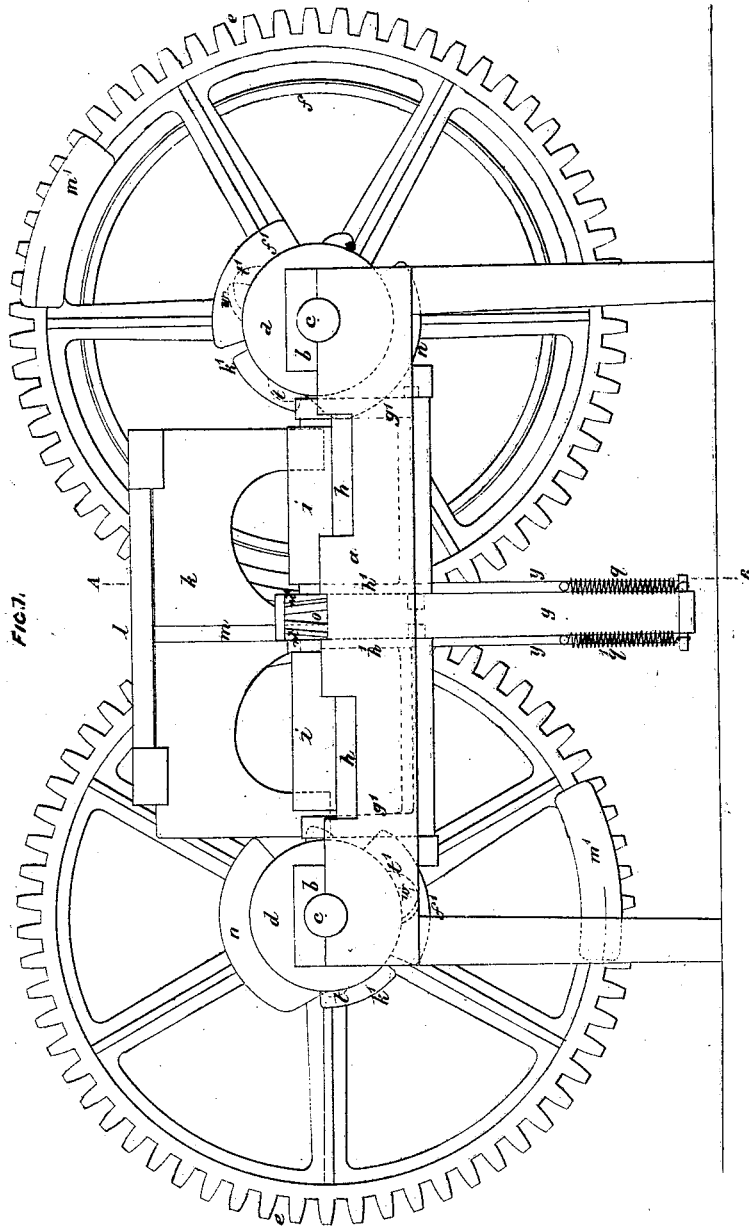


P. KOCH.

Improvement in Nut-Machines.

No. 114,691.

Patented May 9, 1871.



Inventor,

Philippe Koch
by *Kieversheim & Co.*
his Attys.

Witnesses.

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Dr. J. Fingel

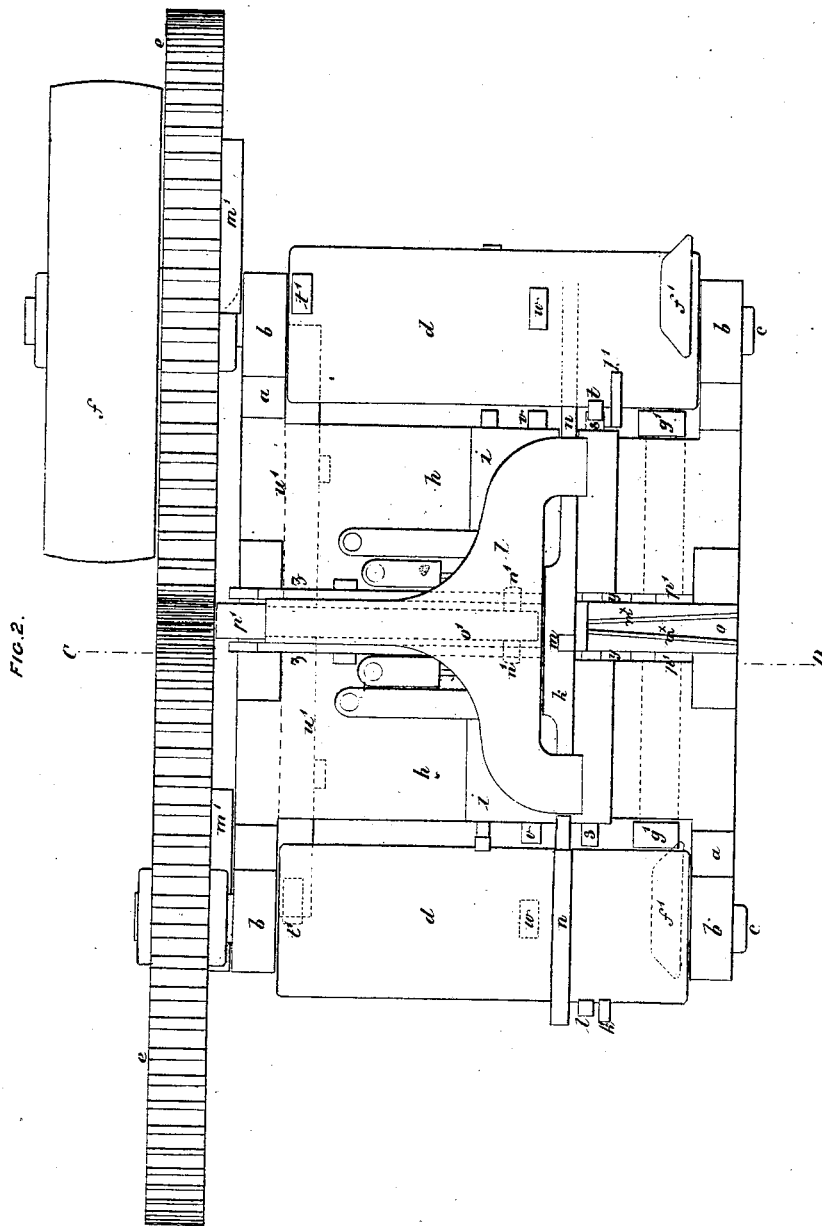
P. KOCH.

4 Sheets--Sheet 2.

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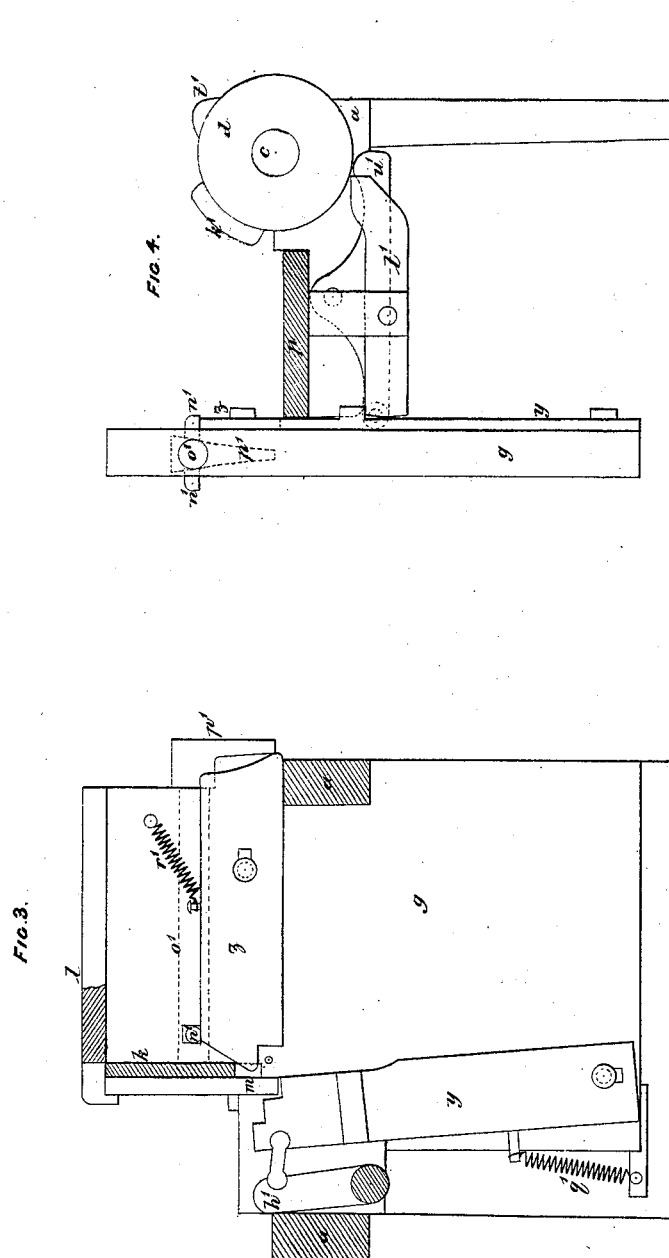
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Improvement in Nut-Machines.

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UNITED STATES PATENT OFFICE.

PHILIPPE KOCH, OF MANCHESTER, ASSIGNOR TO JAMES BUCKINGHAM
OF LONDON, ENGLAND.

IMPROVEMENT IN NUT-MACHINES.

Specification forming part of Letters Patent No. 114,691, dated May 9, 1871.

To all whom it may concern :

Be it known that I, PHILIPPE KOCH, of Manchester, England, have invented certain new and useful Improvements in Machinery for Manufacturing Untapped Nuts for Screw-Bolts, reference being had to the accompanying drawings, forming a part of this specification.

The object of this invention is to make smooth and well-shaped untapped nuts much more expeditiously than has hitherto been effected, and for this purpose I employ improved duplex mechanism with movements working horizontally, there being a double cutter, two angular-edged cups, two punches, and two flatteners moving to and fro successively, and two sets of hammers having compound up-and-down and to-and-fro motions, acting on a bar of heated metal moved forward on one edge, the whole of the movements being operated at the required times by two sets of similar cams working two sets of levers and corresponding parts.

Figure 1 is a front elevation, and Fig. 2 a plan of my improved machinery for making square untapped nuts. Fig. 3 is a transverse section of Fig. 1 on the line A B. Fig. 4 is a vertical section of part of one side of the machine. Fig. 5 is a transverse section of Fig. 2 on the line C D. Fig. 6 is a plan showing some of the working parts of one side of the machine. Fig. 7 is a plan, partly in section, of some of the working parts of both sides.

The two sides of the machine, with their points of resistance, their working parts, and modes of operation, are precisely similar, and, therefore, if, after a general description of some of the parts, one side is minutely explained, the whole of the machine will be clearly understood; and I may here remark that when the word "nuts" is used, I mean the untapped nuts referred to in the title.

On the cross-bars *a* of the main frame-work there are two pairs of bearings or pedestals *b*, carrying the pivots or shafts *c* of two cylinders *d*, to which are fixed a number of cams, and to the pivots or shafts at one end are fixed toothed wheels *e*, of equal size, gearing into each other, and on one pivot or at the end of one shaft there is a driving-pulley, *f*. To the cross-bars *a* are fixed an upright frame,

g, and two tables *h*, there being fixed to each table a block, *i*, having slots or guides, in which are placed slides for working an angular-edged cup, a punch, and a flattener; and in the blocks there are slots or guides in which the lower ends of the traveling frame *k* are placed, the upper ends fitting slots or guides in the small frame *l* fixed to the top of the upright frame *g*; and to the middle of the traveling frame is fixed the double cutter *m*, there being to-and-fro horizontal motion given to the traveling frame and cutter by the cams *n* on the cylinders *d*. In front of the upright frame *g* there is a horizontal passage, *o*, between two fixed cutters *m**, for leading the heated bar *p*, from which the nuts are to be made, in front of the cutter *m*, the end of each side of the passage near the cutter being made at an angle converging upward, as seen in Fig. 1, or downward for enabling the cutter to act on the metal by degrees, instead of at one absolute thrust, and the iron bar is pushed forward on its edge without any turning over from one side to the other.

In each block *i*, directly opposite each cutting side of the cutter, there is a stationary pin, *q*, Figs. 5 and 7. In the middle of the angular-edged cup *r*, at the end of the slide *s*, which is moved forward by the cam *t* and backward by a spring, and near the cup, the punch *u* is fixed to the slide *v*, which is moved forward by the cam *w*, and returned by the spring *x* on the table *h*. At each side of the upright frame there are two hammers, *y z*, having slots working on studs fixed to the frame, each hammer being formed at its acting part of two sides of a square or other suitable shape; and in a groove in the table *h* there is a slide, *a'*, having at the front end a flattener, *b'*, and below the table a spring support, *c'*, Figs. 5 and 6. When the machine is set to work, and the heated bar *p* pushed through the passage *o*, the cutter *m*, as it advances, cuts off a blank and pushes it against the stationary pin *q*, Figs. 5 and 7, and then the cup *r* is pushed forward by the cam *t* to chamfer the blank, which is held by the pin *q*, when the action of the cam ceases, and the cup is pulled back by its spring. The hammer *y* is now moved forward by the cam *f'* and levers *g' h'*, so that its

squared ends shall move the blank opposite the punch *u* and against the square or other shaped recesses in the end of the hammer *z*, and the four sides of the blank are squeezed and finished by the hammers, and the blank immediately punched by the punch *u*, the hammer *y* having an upward movement by the action of the cam *k'* and lever *l'*, and the hammer *z* having a forward movement by the side action of the cam *m'* on the toothed wheel *e*, and a downward movement by the action of the projection *n'* on the rocking-shaft *o'*, having at the back a lever, *p'*, acted upon by the front surface of the cam *m'* on the toothed wheel *e*, the return movements of the hammers being effected by the springs *q' r'*. The cams now cease their action on the two hammers, and the spring *q'* pulls back the hammer *y*, and the hammer *z* descends, by the action of the cam *t'* and lever *u'* to place the nut on the spring-support *c'*, in front of the flattener *b'*, which now comes forward, by the action of the cam *v'*, slide *w'*, and lever *x'*, to flatten and finish the top and bottom of the nut; and when the hammer *z* is returned by the spring *r'*, the hammer *y*, in its next forward movement, forces back the spring-support *c'* to allow the nut to fall by its own gravity to any required place or receptacle. As before stated, both sides of the machine are alike, the movements of one side being followed by those of the other side, for when on one side the nut is flattened, the traveling frame *k*, with its double cutter *m*, is immediately acted upon by the cam *n* on its opposite side, and the operations before described take place on both sides successively, the cutter at each to-and-fro stroke forming straight and even edges as it leaves

the blank; and as the heated bar of metal has only to be pushed onward without turning, and the movements follow each other with great rapidity, an immense number of nuts are manufactured in a short time.

I claim—

1. The pair of fixed cutters and the double-acting cutter, combined and operating together in such a manner that without turning the heated iron bar the blanks are cut off with all their square edges on one side.

2. In a machine for making untapped nuts, the duplex fixed and movable cutters, constructed and arranged as herein described, in combination with the fixed pin and movable cup, and all arranged to operate successively in the formation of the nuts, substantially as set forth.

3. In a machine for making untapped nuts, the duplex fixed and movable cutters and the fixed pin and movable cup, in combination with the aforesaid two hammers, and all arranged to operate successively in the formation of the nuts, substantially as set forth.

4. In a machine for manufacturing untapped nuts, the duplex and double-acting mechanism consisting of the aforesaid fixed and moving cutters, the fixed pins, and movable cups, and the peculiarly-operating hammers, in combination with the cam-springs and other devices herein described, or their equivalents, for imparting the required motion to the moving parts of the mechanism, substantially as herein set forth.

PHILIPPE KOCH.

Witnesses:

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