

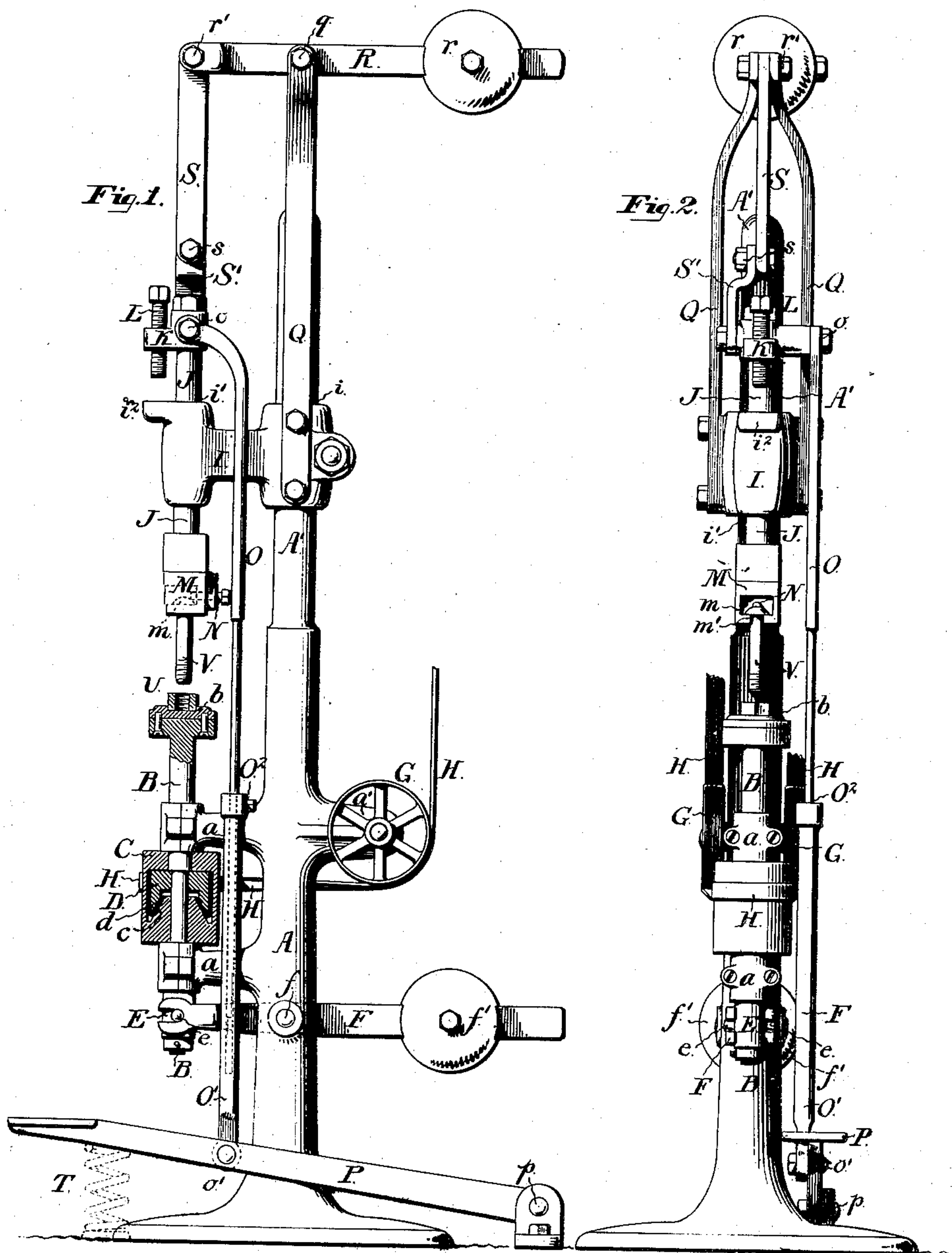
(No Model.)

F. PHILIPS.

MACHINE FOR FITTING NUTS ON BOLTS.

No. 396,597.

Patented Jan. 22, 1889.



Witnesses:

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# UNITED STATES PATENT OFFICE.

FERDINAND PHILIPS, OF PHILADELPHIA, PENNSYLVANIA.

## MACHINE FOR FITTING NUTS ON BOLTS.

SPECIFICATION forming part of Letters Patent No. 396,597, dated January 22, 1889.

Application filed November 5, 1888. Serial No. 289,977. (No model.)

*To all whom it may concern:*

Be it known that I, FERDINAND PHILIPS, a subject of the Emperor of Germany, residing in the United States, at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improved Machine for Fitting Nuts on Bolts, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to mechanism for fitting nuts onto the ends of bolts preparatory to shipping them to the consumers. This work is generally done in nut and bolt manufacturing establishments wholly or in part by hand, the distance to which the bolt is screwed into the nut being a matter of judgment with the workmen.

The object of my invention is to provide a simple machine by which the work can be done more rapidly and uniformly than has heretofore been the case.

Reference being now had to the drawings which illustrate my invention, Figure 1 is a side elevation, and Fig. 2 a front elevation, of a machine embodying my invention in what I consider its best form.

A is the main frame or stand of the machine, the upper part, A', of which serves as a support for a sliding block, hereinafter described.

a a are arms extending out from the front of the frame and serving to support bearings for a vertical shaft, B.

C is a drum surrounding the shaft B, and having a cone, c, formed in or attached to it.

D is a rim fastened securely to the shaft B, and provided with a conical face, d, adapted to fit over the cone c, the two conical faces serving as a friction-clutch in the ordinary way.

E is a sleeve fitting on the lower end of shaft B and provided with trunnions e.

F is a lever pivoted at f, one end engaging, as shown, with the trunnion of sleeve E, and a counter-balance, f', secured upon its other end, the effect of the lever and counter-balance being to thrust the shaft B upward and held the conical surfaces d and c apart.

b is a chuck secured on the upper end of shaft B, and adapted to hold the nut U in po-

sition concentric with the shaft, as shown. To accommodate the machine to nuts of different sizes, the chuck b is made removable, as shown.

G G are pulleys journaled on an arm, a', of the frame.

H is a driving-belt passing over the pulleys G G and around the drum D.

I is a sliding block arranged to move up and down on the upper part, A', of the frame, and adjustable in any position thereon by means of a clamp, i. In the end of the sliding block I a bearing, i', is formed, in which a shaft, J, is longitudinally adjustable.

On the upper end of the shaft J a head-block, K, is secured, and in this block the adjustable screw L is threaded so as to lie directly above the top of the bearing in block I, or a flange thereof, as shown at i<sup>2</sup>.

On the bottom of the shaft J is secured a device, M, for holding the head of a bolt. It is hollowed out in front, as shown at m, to receive the head of the bolt, and provided with a slot, m', in the bottom to permit the passage of the shank, the bolt being represented by the letter V.

N is an adjustable screw passing through the back of device M and serving the purpose of a stop, by which the bolt is held concentric with the shafts J and B. By moving the screw in or out the device can be made to accommodate itself to any size of bolt.

O O' are connecting-rods made in two pieces, as shown, and adjustably secured together, as at O<sup>2</sup>, so as to be adjustable in length. The rod O is attached to the head-block K at o, and the rod O' to a foot-lever, P, at o', the lever P being pivoted at p, as shown.

Q Q are straps or rods secured to the sliding block I, and serving as a support for a lever, R, pivoted to them at q.

S is a connecting-link pivoted to lever R at r', and at its other end to shaft J, or, preferably, as shown, to a link, S', pivoted to the head-block K.

r is a counter-balance, adjustable on the end of lever R opposite to that to which the link S is pivoted.

T, in Fig. 1, indicates a spring acting on the foot-lever P, and serving, like the lever R, its counter-balance and connections, as a device for holding the shaft J in its uppermost posi-



tion, the spring and lever being here shown as equivalents, the one for the other.

The operation of the machine is as follows: The operator places a nut, U, in the chuck b, and a bolt, V, in the hollow m of the device or box M, the adjusting-screw N being first set so that the bolt when its head rests against it will be concentric, or substantially so, with the shafts J and B and with the nut U. The belt H is connected with the driving-pulley (not shown) and the drum C is constantly rotated by it. When the nut and bolt have been placed in the machine as aforesaid, the operator places his foot on lever P, and, pressing down upon it, draws down the shaft J through the connecting-rods O O'. The end of bolt V is thus brought in contact with the edges of the hole in the nut U, and, the pressure being continued, the shaft B is thrust down until the cone surfaces d, secured to it, come in contact with the cone surfaces c, secured to drum C, and the motion of the drum is thus communicated to shaft B. The nut U of course turns with the shaft, and is screwed onto the end of the bolt V to a depth regulated by the position of the set-screw L with respect to the flange i'. When the screw L comes in contact with the flange, the downward motion of the shaft J ceases, and the bolt being now stationary a very slight additional movement of the nut upon it relieves the pressure on the shaft B, and the counter-weight f', acting through lever F and sleeve E, raises the shaft B, releasing the friction-clutch made up of cones c and d, and stopping the rotation of the shaft. The operator then removes his foot from the lever P, and the counter-weight r, acting through its described connections, draws the shaft J upward, and the machine is ready for the insertion of another bolt and nut.

The adjustment of the machine for bolts of different length is made by raising or lowering the supporting-block I on the upper part, A', of the frame. The connecting-rod O O' is of course adjusted in length to correspond with the position of support I.

Of course any convenient counterbalancing device can be used to hold the shaft J in its upper normal position. A spring—such as is indicated at T, for instance—may be used.

It is of course evident that the feeding of the nuts to the bolts is accomplished very rapidly in my apparatus, and also that the depth to which the bolt is screwed into the nut is automatically regulated.

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

1. In a machine for fitting bolts in nuts, the combination of a vertical longitudinally-movable shaft having a chuck for holding the nut at its upper end, a counter-balance arranged to hold it normally in its uppermost position, a driving-drum, a clutch arranged to connect the shaft and drum when the shaft is moved

downward, a longitudinally-movable shaft arranged above and concentric with the shaft holding the chuck, a counter-balance arranged to hold this shaft normally in its uppermost position, a device at the bottom of the shaft for holding a bolt by its head, and mechanism for drawing down the upper shaft, all substantially as and for the purpose specified.

2. In a machine for fitting bolts in nuts, the combination of a vertical longitudinally-movable shaft having a chuck for holding the nut at its upper end, a counter-balance arranged to hold it normally in its uppermost position, a driving-drum, a clutch arranged to connect the shaft and drum when the shaft is moved downward, a vertically-adjustable supporting-block, a longitudinally-adjustable shaft journaled in said block so as to be above and concentric with the shaft having the nut-holding chuck, a counter-balance arranged to hold the shaft normally in its uppermost position, a device at the bottom of the shaft for holding a bolt by its head, and mechanism for drawing down the upper shaft, all substantially as and for the purpose specified.

3. In a machine for fitting bolts in nuts, the combination of a vertical longitudinally-movable shaft having a chuck for holding the nut at its upper end, a counter-balance arranged to hold it normally in its uppermost position, a driving-drum, a clutch arranged to connect the shaft and drum when the shaft is moved downward, a longitudinally-movable shaft arranged above and concentric with the shaft holding the chuck, a counter-balance arranged to hold this shaft normally in its uppermost position, a device at the bottom of the shaft for holding a bolt by its head, an adjustable stop secured to the shaft for regulating the extent of its downward motion, and mechanism for drawing down the upper shaft, all substantially as and for the purpose specified.

4. In a machine for fitting bolts in nuts, the combination of a vertical longitudinally-movable shaft having a chuck for holding the nut at its upper end, a counter-balance arranged to hold it normally in its uppermost position, a driving-drum, a clutch arranged to connect the shaft and drum when the shaft is moved downward, a longitudinally-movable shaft arranged above and concentric with the shaft holding the chuck, a counter-balance arranged to hold this shaft normally in its uppermost position, a device at the bottom of the shaft for holding a bolt by its head, an adjustable stop secured in the bolt-holding device for regulating the position of the bolt therein, and mechanism for drawing down the upper shaft, all substantially as and for the purpose specified.

5. In a machine for fitting bolts in nuts, the combination of a vertical longitudinally-movable shaft having a chuck for holding the nut at its upper end, a counter-balance arranged to hold it normally in its uppermost position, a driving-drum, a clutch arranged to connect the shaft and drum when the shaft is moved



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