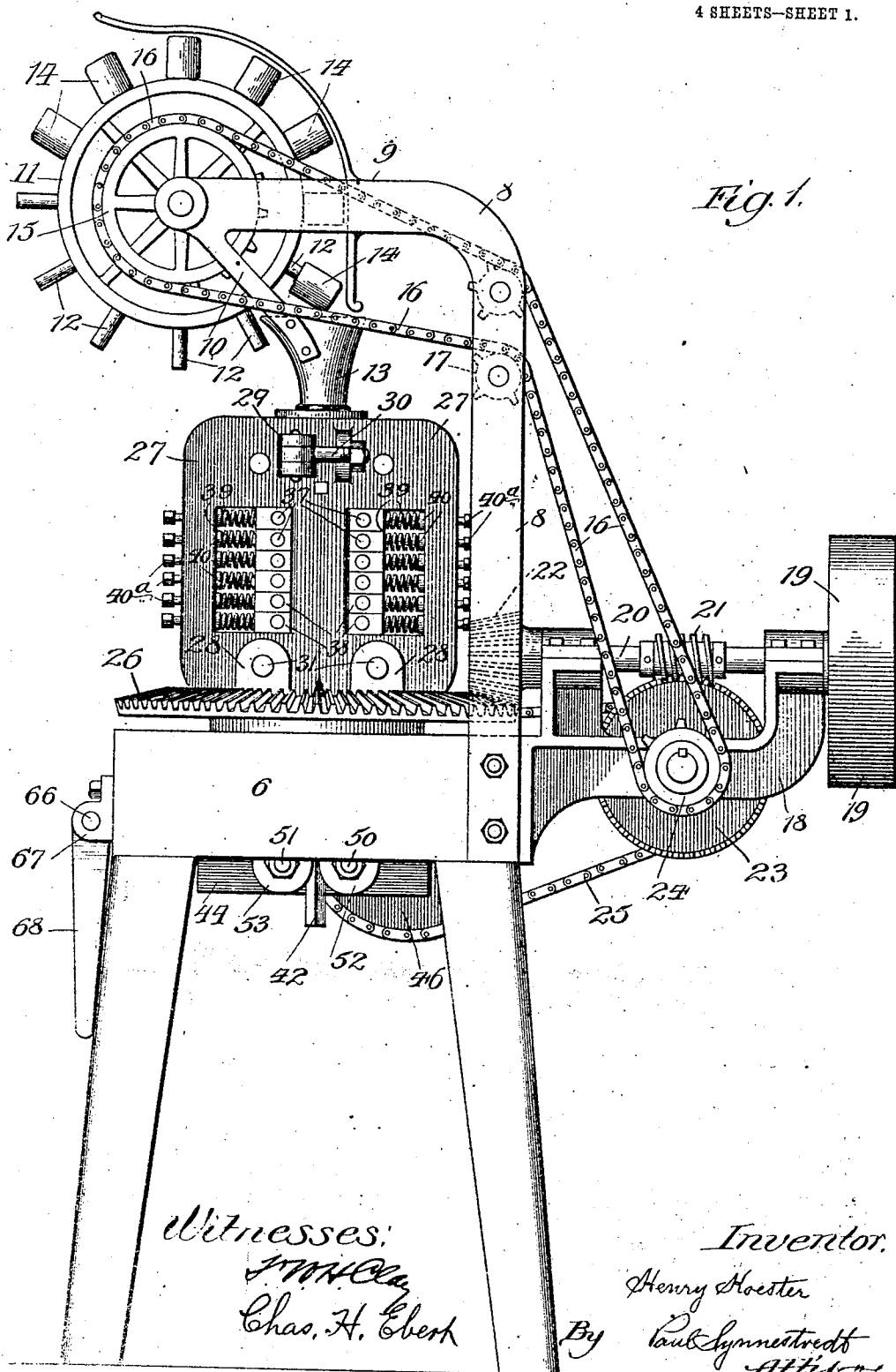


No. 813,559.

PATENTED FEB. 27, 1906.

H. KOESTER.
TAPPING MACHINE.
APPLICATION FILED MAR. 2, 1903.

4 SHEETS—SHEET 1.



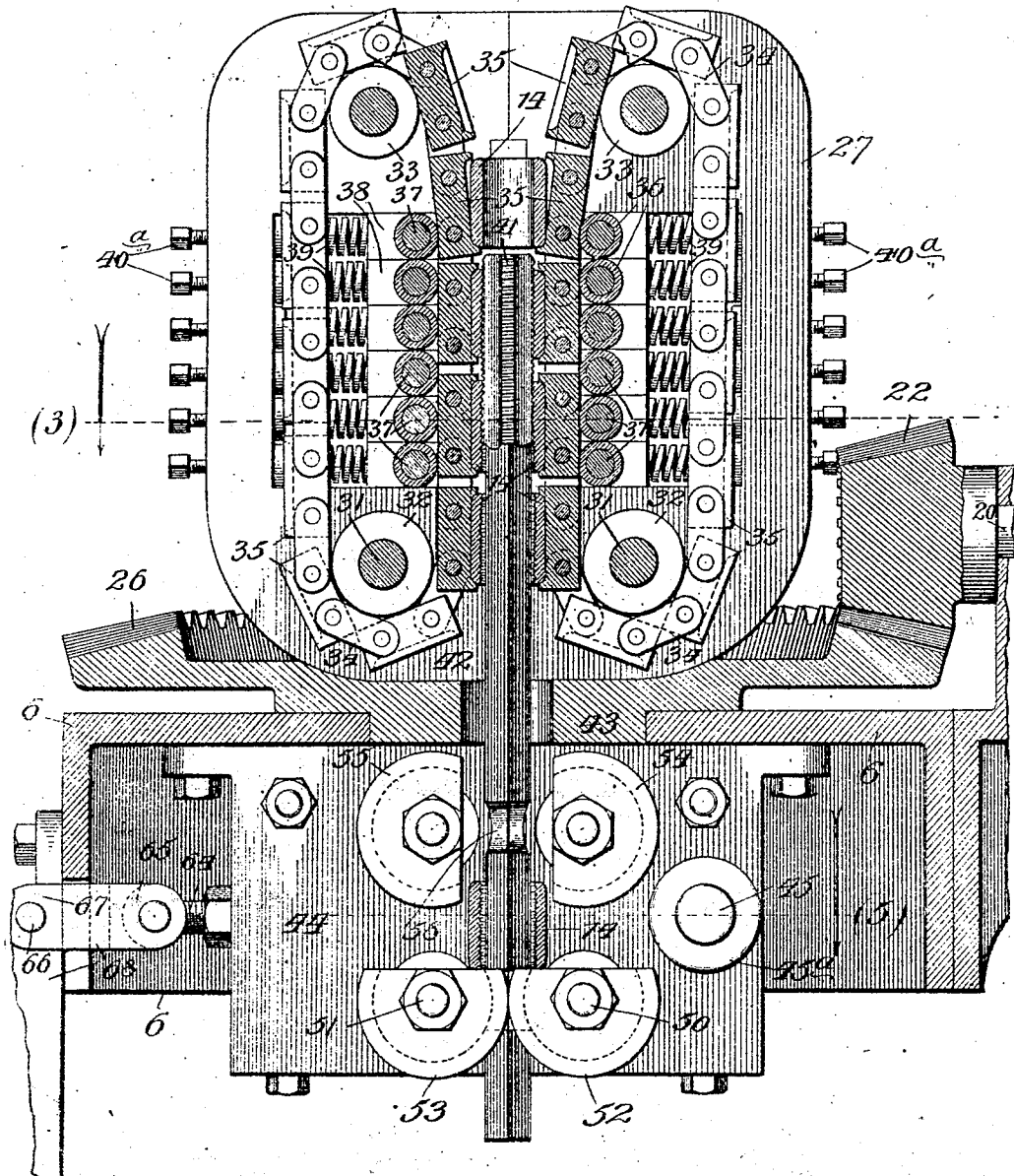
No. 813,559.

PATENTED FEB. 27, 1906.

H. KOESTER.
TAPPING MACHINE.
APPLICATION FILED MAR. 2, 1903.

4 SHEETS—SHEET 2.

Fig. 2.



Witnesses:

J. W. H. Clay
Chas. H. Clark

Inventor:

Henry Koester
Paul Synnestvedt
Attorneys

By

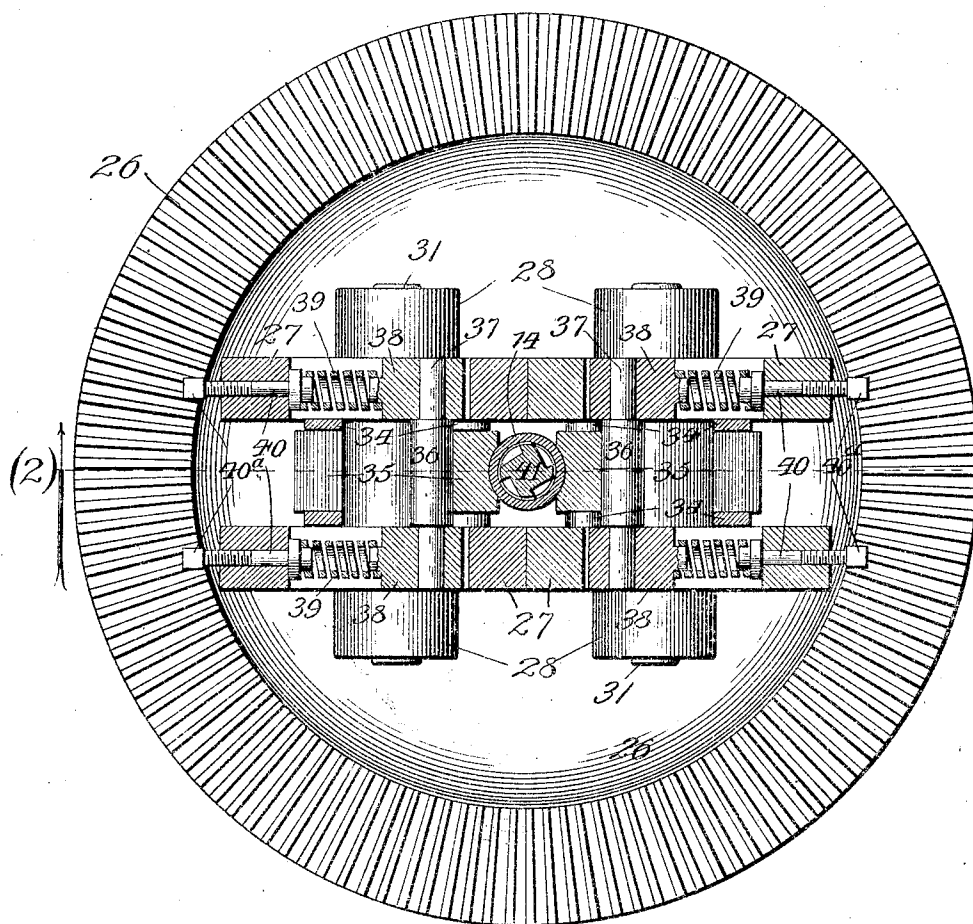
No. 813,559

PATENTED FEB 27 1906

H. KOESTER.
TAPPING MACHINE.
APPLICATION FILED MAR. 2, 1903.

4 SHEETS—SHEET 3

Fig. 3.



Witnesses:

J. W. H. Clay
Chas. H. Clark

By

Inventor:

Henry Koester
Paul Symmestrecht
Attorney

No. 813,559.

PATENTED FEB. 27, 1906.

H. KOESTER.
TAPPING MACHINE.
APPLICATION FILED MAR. 2, 1903.

4 SHEETS-SHEET 4.

Fig. 4.

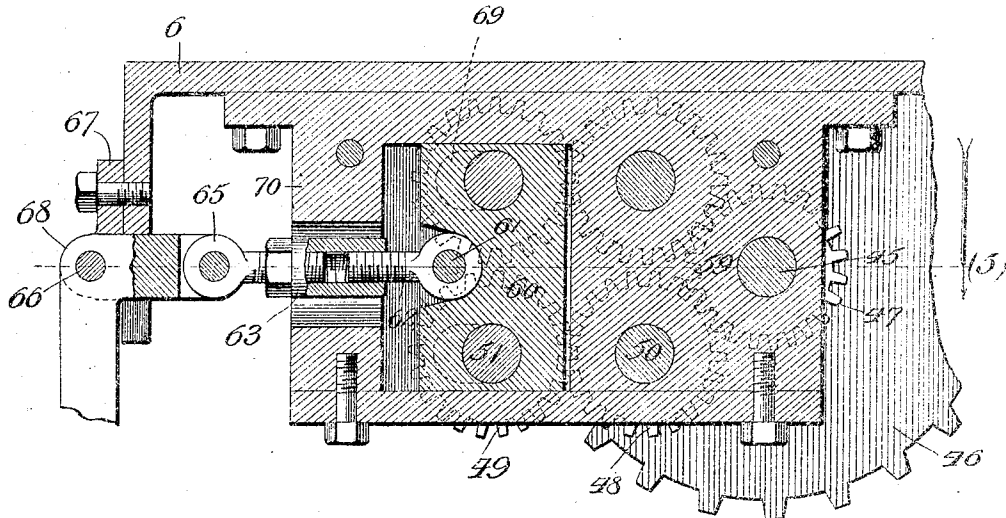
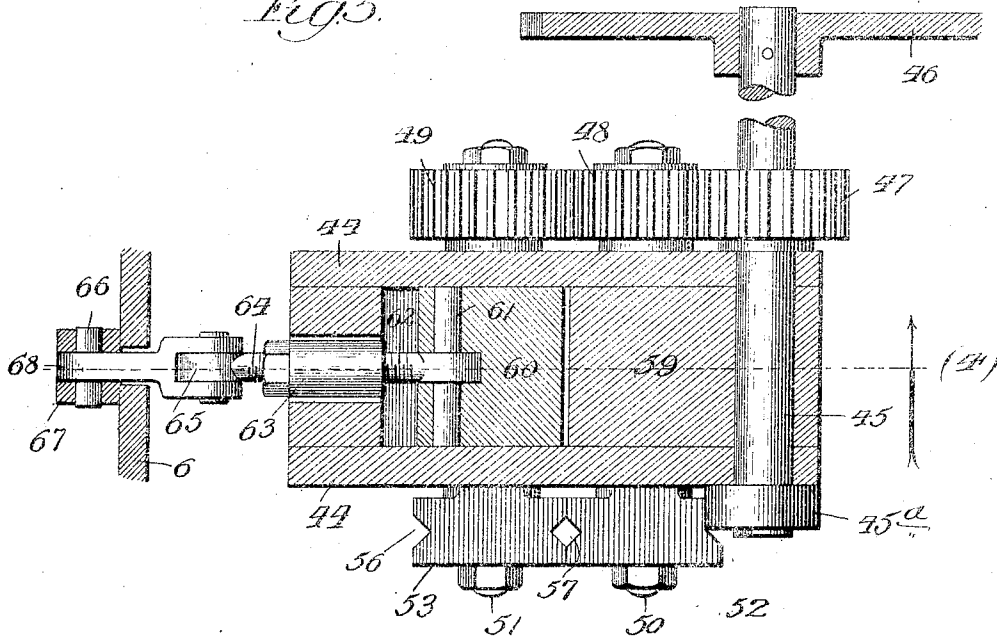


Fig. 5.



Witnesses:

F. W. H. Clay
Chas. F. Cherk

Inventor.

Henry Koester
Paul Synnestvedt
Att'y

By

UNITED STATES PATENT OFFICE.

HENRY KOESTER, OF CHICAGO, ILLINOIS, ASSIGNOR TO CRANE COMPANY,
OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

TAPPING-MACHINE.

No. 813,559.

Specification of Letters Patent.

Patented Feb. 27, 1906.

Application filed March 2, 1903. Serial No. 145,856.

To all whom it may concern:

Be it known that I, HENRY KOESTER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Tapping-Machines, of which the following is a specification.

My invention relates to apparatus for cutting the female threads in nuts, pipe couplings, and other like articles, and it is designed particularly to provide a machine for continuously cutting the threads in a series of such articles as they are fed continuously into the machine from a feeding device, and which automatically ejects the articles from the machine when the threads are finished. The objects of my invention are;

To construct a machine of the character described which is compact and accurate in its working parts, easy of manipulation and rapid in its action;

To provide for semi-automatic feeding of the articles into the machine and automatic holding and carrying of the same in position to be tapped;

To provide a machine with automatic resilient gripping devices and easily removable tapping tool;

To provide a machine in which a straight tapping tool is used, preferably held in vertical position by the alternate gripping of a series of supporting devices arranged to allow the finished article to pass through them and be discharged from the machine;

To provide a machine which allows of readily changing the tool, and of easy adjustment of the gripping devices to accord with the size of the tool and of the article to be tapped, and self adaptable to any irregularities in the size or form of the articles being operated upon;

To provide a machine in which the operation of the tapping tool upon the article will itself convey the latter through the machine and operate to introduce a fresh article to the action of the tool; and

To provide a machine of the kind which may be readily opened for inspection and is easily and accurately adjustable in all its parts.

The above objects, as well as other advantages which will hereinafter appear, I attain by means of the construction and operation

illustrated in preferred form in the accompanying drawings, wherein—

Figure 1 is a side elevation of the whole machine.

Figure 2 is a central vertical section through the upper part of the machine and showing a series of pipe couplings being tapped in the same, the section taken on line 2 of Figure 3.

Figure 3 is a horizontal section of the machine taken on line 3 of Figure 2.

Figure 4 is a vertical section through the shafts and the box supporting the holding devices for the tapping tool, taken on the line 4 in Figure 5.

Figure 5 is a plan and a horizontal section taken through the holding device for the tapping tool, along the line 5 in Figure 4.

The machine of my present invention is especially designed to cut the inside threads of pipe couplings or other articles which have a rounded outside surface; but it is equally adapted to the cutting of threads in square or hexagonal nuts, etc., by changing the contour of the recessed faces of the gripping devices. In cutting pipe coupling threads it is highly desirable to have a gripping device which will not only hold the same from turning during the operation, and carry the same through the machine, but also is at the same time capable of yielding to accommodate couplings of different sizes and couplings having irregularities on their outer surfaces. It is also desirable to have the article held yieldingly in the gripping devices so as to allow of some lateral play of the article in order that the tapping tool may accommodate itself to the true center of the tubular opening in the article. For these reasons I have provided a peculiar gripping and carrying device which is yieldingly held against the pipe couplings and which is itself actuated by the progress of the couplings downward over the tapping tool, as will be hereinafter explained.

The machine is mounted upon a frame, 6, supported by the legs 7, and having an upwardly extending standard 8, provided with a horizontal arm 9, which carries the shaft of the feeding wheel 11, designed to introduce the pipe couplings to the operation of the tapping tool. This feeding wheel has a series of projecting arms 12, upon which the coup-

lings 14, may be placed by hand, whereupon they are turned over and dropped off into the hopper 13, supported by a pair of downwardly extending arms 10, projecting from the arm 9 of the frame of the machine.

The frame 6 of the machine has also a laterally extending bracket 18, which carries the shaft 20, of the driving pulley 19, by which the whole machine is operated. The shaft 20 is provided with a worm screw 21, and also with a miter gear 22, which engages the large gear wheel 26, to turn the table and housing in which are mounted the gripping and carrying devices surrounding the tapping tool. Below the worm 21 and mounted upon a horizontal shaft in the frame 18, is a gear wheel 23, which on its outer end carries a sprocket wheel 24, driving the chain 16 to turn the feeding wheel 11, as before described. In order to operate the gears of the tap-holding devices and means for ejecting the finished articles, I mount another sprocket wheel upon the same shaft with the gear 23, which by means of the chain 25, drives the large sprocket wheel 46, as will be hereafter described.

On top of the frame 6 and resting upon a bearing for its hub 43, is the large gear wheel 26, upon which are four studs 28, supporting shafts 31, and on these shafts are pivoted the two halves of an upright frame or boxing 27, which surrounds the tapping tool and carries the gripping devices. In order to carry the couplings 14 downward over the tapping tool 41, I provide in the housing 27, two pairs of shafts carrying the rollers 32 and 33, over which operate a series of links 34, connecting the gripping blocks 35, which have recessed faces and which approach in pairs to the entering position of the coupling 14, and securely grip it against rotation. It will be seen from Figures 2 and 3 that this chain of gripping devices 35, is thus driven by means of the downward motion of the couplings 14, as they are being operated upon by the tapping tool 41.

In order to keep the gripping blocks 35 in close contact with the coupling between them I provide that they bear upon a series of rollers which are spring pressed inward toward the tapping tool. In an open slot in the sides of the housing 27 there is a series of loose blocks 38, each of which carries the spindle 37 of a roller 36, and the said blocks are pressed inward by means of spiral springs 39, which are adjusted in tension by means of the screws 40, set in the edges of the housing 27, as is clear from Figures 2 and 3. As shown in Figure 1, the two sides of the housing 27 are pivoted upon the shafts 31 and may be rocked apart when the fastening device 29, 30, shown at the top of the figure, is loosened, which readily allows of inspection of the inside of the carriers, or removal of the tapping tool.

It will be understood that the gear 26 upon which are pivoted the parts of the housing 27, revolve altogether and carries the gripping devices and the pressure rollers about the stationary tapping tool. It will however require no essential reorganization of the machine if this housing 27 be stationary and the tapping tool be revolved. The tapping head 41, is carried on top of the shank 42, which is made square or otherwise angular in cross-section and extends downward through an opening in the hub 43 of the gearing 26. It is supported alternately by the pair of clamping wheels 52, 53, and a pair 54, 55, which, as will be seen from Figure 5, project from the sides of the housing 44, below the large gear 26. These supporting wheels have their peripheries grooved and are so placed as to fit upon the reduced portion 58, of the rod 42, supporting the tapping head; and it will be seen from Figure 2 that each pair of clamping wheels is partially cut away so that, in the position shown for the upper pair in Figure 2, the wheels are out of contact with the supporting shank 42, and leave room for the article 14 to descend and fall upon the lower pair of wheels, which in the meanwhile are in contact with the shank 42.

When the wheels continue their motion so as to bring the lower pair in the present position of the upper pair, (Fig. 2), the article will be dropped out, and in the meanwhile the upper pair will be in engagement with the shank 42. The two pairs of holding wheels 52, 53, and 54, 55, are driven by the gears 48, 49, from the pinion 47, on the shaft 45, which carries the sprocket wheel 46, heretofore described. Thus the upper and lower pairs of holding wheels alternately engage the spindle 42 and retain it against both vertical movement and turning, while the alternation of the contact of the two pairs of wheels allows the article 14 to pass through the same and drop off of the shank of the tool and out of the machine.

In order to allow of ready removal of the tapping tool I provide that the spindles of the wheels 53 and 55 are carried in a block 60, and work through open slots 69, in the sides of the housing 40; this block also has a shaft 61, upon which is pivoted the link 62, connected by means of a turnbuckle 63, to the screw 64. The head 65, of the link is pivoted to the short arm of bell crank lever 68, the pivot 66 of which is carried in a bracket 67, on the outside of the frame 6. By this means the link may be withdrawn, and by moving back the block 60, will release the holding wheel from contact with the tool shank and allow the latter to be withdrawn, in order to repair or to replace with one of different size or shape, as may be desired.

From the above description the operation of the machine will be apparent. The articles to be tapped being placed upon the arms

of the feeding wheel 11 and carried thereby under the shield shown in Fig. 1, and dropped into the hopper 13, fall down in proper position between the approaching gripping blocks 35, and are thereby carried downward over the tapping tool 41 in regular order. They are held under compression and prevented from rotation by the force of the springs 39, as before described, and since these latter have a yielding hold upon each of the articles, they can make allowance for irregularities in the size or form of the different articles, as well as being readily adaptable to couplings or nuts of different sizes. The articles are continuously carried down between the gripping devices and over the tapping tool, and at the bottom of the carriers they are dropped upon the wheels 54, 55, are removed thereby to the lower set of wheels, and by these latter ejected from the machine. The entire operation is continuous and is automatic with the exception of the placing of the couplings in the machine. Though I have illustrated a form of feeding mechanism, it will be understood that this is not an essential part of the invention, and any other desired method may be used for introducing the articles to the gripping and carrying device. By opening the pair of jaws carrying these gripping devices it is easy to remove them for repairs or to inspect the interior of the machine, and by mere shifting of the bell crank lever 68, the tapping tool may be removed for grinding or repair, or exchange. Various other advantages of the machine will readily occur to those familiar with the art.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is the following:

1. A tapping machine having a stationary tapping tool, revolving means for gripping and carrying articles to be tapped along said tool, and rotary sectors adapted for alternately engaging and holding the tool and ejecting the finished article from the tool.

2. A tapping machine having a stationary tapping tool, continuous traveling mechanism for gripping and feeding the articles along the tool, and separate pairs of rotary sectors adapted for automatically holding the tool alternately at different points and for ejecting the finished article from the tool.

3. In a tapping machine in combination with a stationary tapping tool, a set of gripping and carrying blocks for engaging the articles operated upon, the same being pivoted together in a chain and being provided with means for pressing them resiliently against the article, and mounted to be driven by the motion of the article as it travels over the tapping tool, and means to revolve said carriers about the tool.

4. The combination of a resiliently mount-

ed chain of traveling gripping and carrying blocks, positive driving means for said chain, a stationary tapping tool and means for revolving the blocks about the tool and for automatically discharging the finished article from the tapping tool.

5. In a tapping machine the combination with mechanism for revolving the articles to be operated upon, a stationary tapping tool, a pair of revoluble partially cut out rollers for alternately gripping the tool at different points of its length, and adapted to positively eject between them the finished article from the tapping tool.

6. The combination with a tapping tool having a shank of angular cross section, of two pairs of wheels grooved and partially cut away to alternately hold the tool and release and eject articles being operated upon from the tool.

7. In a tapping machine in combination with a stationary tapping tool, two pairs of revolving sectors having grooved partial circumferences adapted to hold the same alternately at different points of the shank and to positively eject articles from the tool.

8. In a tapping machine the combination with a tapping tool of two pairs of sectional revolving rollers adapted to alternately grip and release the tapping tool at different points.

9. In a tapping machine in combination with a stationary tap, a pair of revolving pivoted jaws, two sets of gripping devices mounted respectively upon said pivoted jaws, a revolving table carrying the jaws, said jaws being adapted to open to release the articles in the gripping devices.

10. The combination of a feed wheel, a vertically translating gripping device for thrusting the articles against the tapping tool, means for revolving the grippers, spring pressed rollers for insuring contact of the gripping device, a stationary tapping tool and means for holding said tapping tool in position and allowing the ejection of the articles therefrom.

11. In a tapping machine the combination with a stationary tool, of two sets of gripping blocks movable along the same and provided with resilient supporting means for holding and carrying an article over its tool, and means to revolve the holding means.

12. A tapping machine comprising the combination with a tap, of a set of revolving gripping devices movable relative thereto and provided with spring pressed means for holding the gripping devices against the articles upon the tool.

13. In a tapping machine, in combination with a stationary tap, several pairs of gripping wheels to engage said tapping tool, the same being provided with peripheries adapted to prevent the tool from turning and

with open sections thereon whereby the tool is periodically released from the gripping wheels.

14. In a tapping machine the combination
5 with a stationary tap having a shank of angular section, of several pairs of wheels placed together with angular openings between their peripheries, and being provided with coöperating open sections on the wheels, whereby
10 the tool may be released and space allowed for discharge of the article from the tapping tool.

15. In a tapping machine the combination with a tapping tool and a stationarily
15 mounted pair of gripping rollers therefor, said gripping rollers being partially cut out on their peripheries and mounted in shift-

able bearings to engage the tool, and means for retracting the bearings together for the purpose of releasing the tool and removing it. 20

16. In a tapping machine the combination with a continuous chain of gripping devices, of a series of blocks provided with rollers and compression springs adapted to hold the rollers against the gripping devices and force
25 them in contact with the articles being operated upon by the machine.

In testimony whereof I have hereunto set my name in the presence of the subscribed witnesses.

HENRY KOESTER.

Witnesses:

PAUL SYNNESTVEDT,
EDWARD C. BURNS.