

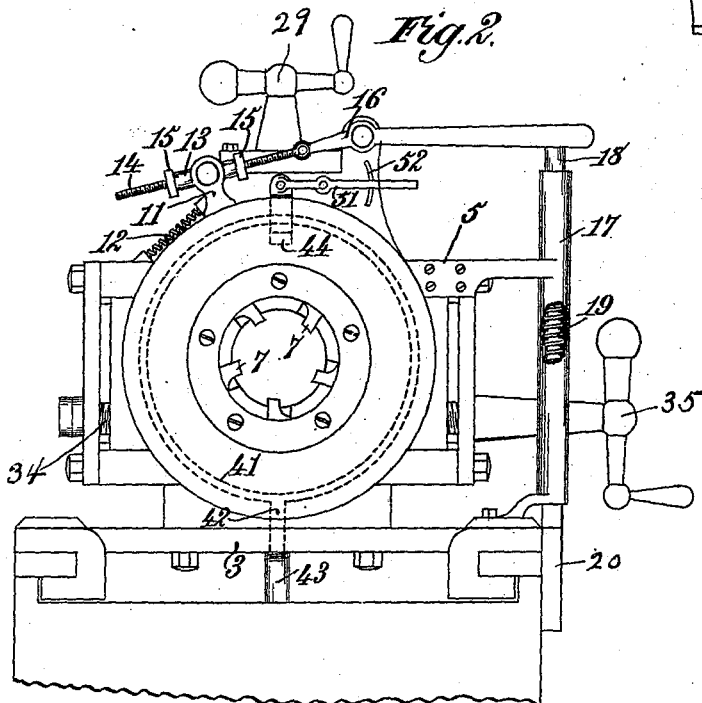
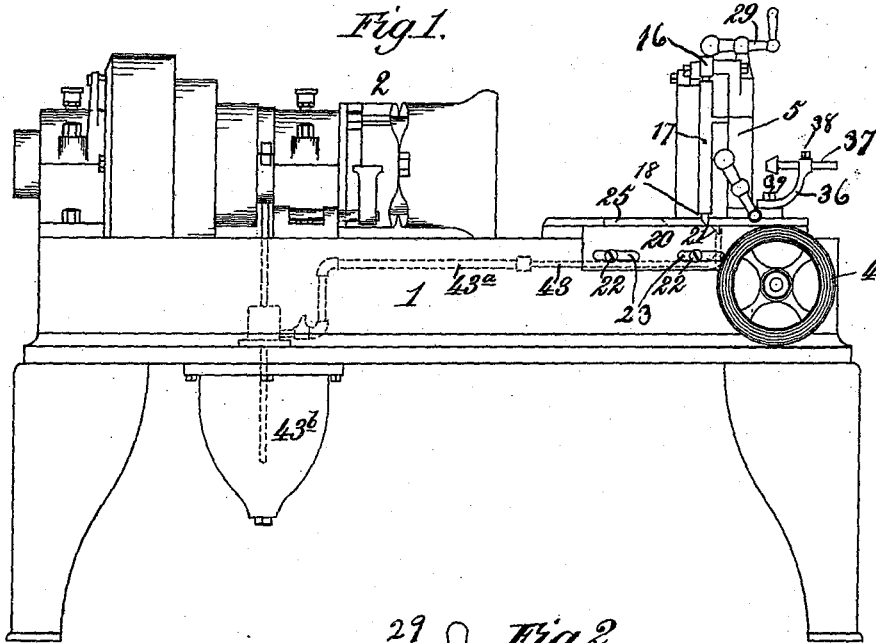
(No Model.)

2 Sheets—Sheet 1.

W. C. & F. E. WELLS.
MACHINE FOR MAKING NIPPLES.

No. 569,902.

Patented Oct. 20, 1896.



Witnesses:

Geo. W. Rea
Robert Everett.

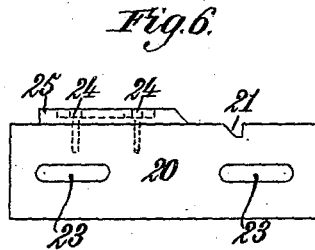
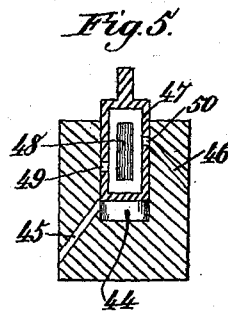
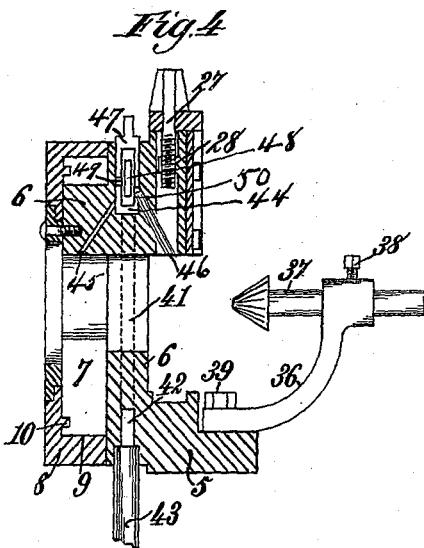
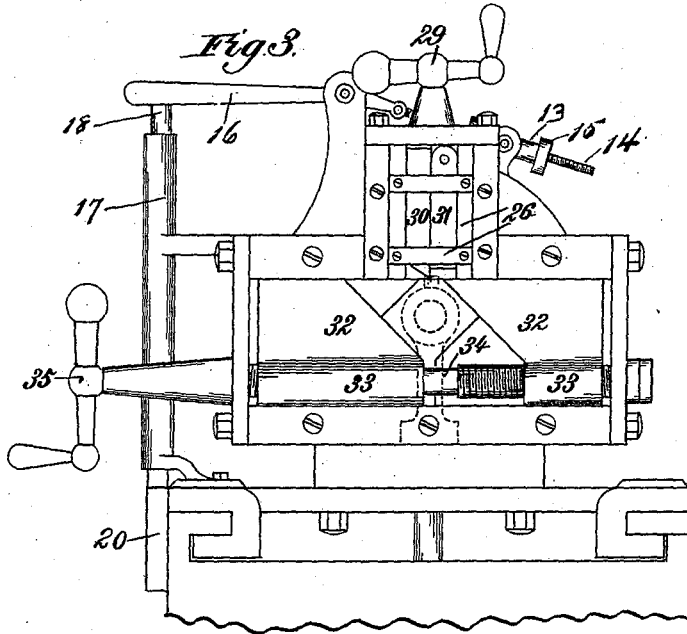
Inventors:

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By James L. Norris
Atty.

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Witnesses:
Geo. W. Rea,
Robert G. Smith,

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Willet C. Wells,
Frank E. Wells.
By James L. Norris,
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UNITED STATES PATENT OFFICE.

WILLET C. WELLS AND FRANK E. WELLS, OF FOSTORIA, OHIO.

MACHINE FOR MAKING NIPPLES.

SPECIFICATION forming part of Letters Patent No. 569,902, dated October 20, 1896.

Application filed January 31, 1896. Serial No. 577,617. (No model.)

To all whom it may concern:

Be it known that we, WILLET C. WELLS and FRANK E. WELLS, citizens of the United States, residing at Fostoria, in the county of Seneca and State of Ohio, have invented new and useful Improvements in Machines for Making Nipples, of which the following is a specification.

This invention relates to machines for making nipples, and has for its object to provide improved means for threading, reaming out, and cutting off the end of a pipe to form successive nipples, and has for its further object to provide improved means for furnishing lubricant to the threading-dies and to the cutters; and to these ends our invention consists in the novel features and the construction or combination of parts hereinafter described, and afterward pointed out in the claims following the description, reference being had to the drawings, forming part of this specification, wherein—

Figure 1 is a side elevation of our improved machine. Fig. 2 is a front elevation of the threading mechanism and its carriage. Fig. 3 is a rear elevation of said carriage and the pipe-cutting mechanism. Fig. 4 is a vertical central sectional view of the threading and cutting mechanism, and also illustrating the means for lubricating the dies and cutters. Fig. 5 is a similar detail view of the lubricating device, drawn to an enlarged scale; and Fig. 6 is a detail view illustrating the manner of adjusting the face-plate.

Referring to the drawings, the reference-numeral 1 indicates the bed or frame of the machine, resembling an ordinary lathe-bed. Upon one end of said bed is arranged the pipe-rotating mechanism 2, comprising means adapted to grasp and rotate the pipe. The construction of this part of the device forms a part of the subject-matter of a separate application for Letters Patent, filed on even date with the present application, and need not, therefore, be described herein.

Upon suitable ways formed in the opposite end of the bed 1 is arranged to travel a carriage 3, provided with a rack-and-pinion gear (not shown) actuated by a hand-wheel 4, by means of which the carriage may be caused to travel back and forth in its ways. Mounted on the carriage 3 is a frame 5, on the face of

which is formed or-fitted a die-ring 6. The die-ring is centrally apertured to pass over the end of a pipe and is provided with a series of radially-movable dies 7, arranged in suitable bearings in the die-ring. Arranged about the die-ring 6 is a cam-ring 8, having a cam-shaped inner periphery 9 and a correspondingly-shaped cam-rib 10, that engage the ends and sides of the dies and, when the cam-ring is turned in the proper direction, operate to exert a wedge-like action on said dies, force them radially inward to engage the pipe, and outward to release it.

The cam-ring is provided with a lug 11, and arranged between said lug and a lug 15, formed on the frame 5, is a coiled spring 12, that operates to turn the cam-ring toward the right. Journaled in the lug 11 is a sleeve 13, through which passes a threaded rod 14, and which is adjustably secured in said sleeve by jam-nuts 15. The other end of said rod is pivotally secured to the short arm of a lever 16, pivoted to the frame 5, forming in effect a toggle-joint and operating in such manner that when the lever 16 is turned in the proper direction to cause its short arm and the rod 14 to lie in the same right line the pivotal centers of the rod and lever and their pivotal point of connection will all lie in the same straight line, and hence the cam-ring will be held stationary against the action of the spring 12. When in this position, the cam-faces of the cam-ring operate to force the dies inward, or, in other words, close the same into engagement with the pipe. When the long arm of the lever 16 is raised, the pivotal point of connection between the pivotal centers of the lever and the rod 14 is thrown below a line taken through said pivotal centers, when the spring 12 will immediately expand and turn the cam-ring toward the right and release the dies from engagement with the pipe.

In order to cause the die to be automatically thrown out of action when the threading operation has been completed, we provide the following mechanism:

Fixed upon the carriage 3 is an upright sleeve 17, in which is arranged a bolt 18, that at its upper end is adapted to project above the top of the sleeve 17 and impinge against the under side of the long end of the lever 16, and at its lower end is beveled, as shown most

clearly in Fig. 1, and projects below the lower end of said sleeve. A coiled spring 19 is arranged within the said sleeve and operates to normally depress said bolt. Attached to the bed of the machine is a plate 20, over the upper edge of which the lower end of the bolt 18 is adapted to travel, and in the top of said plate is formed an inclined notch 21. The plate is attached to the bed of the machine by bolts 22, which pass through elongated slots 23 in the plate, by which means the plate may be adjusted longitudinally on the bed, for the purpose hereinafter made apparent. On the upper edge of the plate 20 is adjustably secured by bolts 24 a face-plate 25, having an inclined end, as shown, for engaging the beveled end of the bolt 18.

The operation of this portion of the machine is as follows: Let it be assumed that the carriage has been retracted until the spring-bolt 18 drops into the inclined notch 24, which arrests its farther rearward travel. In this position the long arm of the lever 16 is depressed and rests on the upper end of the bolt 18, which is in its lowermost position, when, as above described, the cam-ring will be thrust over to the left and force the dies inward into position for operation. The pipe to be operated upon being in position and rotated by its holder 2, the carriage is caused to advance by means of the rack-and-pinion gear until the dies engage the end of the pipe and commence to cut the thread, when the carriage will feed itself forward. The carriage will continue to advance and the dies to operate until the beveled end of the bolt 18 reaches the inclined end of the face-plate 25, when the bolt will be raised and ride upon said face-plate. As the bolt rises the long arm of the lever 16 is elevated, throwing the pivotal point of connection between the lever and the rod 14 below the center, upon which the spring 12 will throw the cam-ring to the right and open the dies in the manner before described. The threading operation is now complete and the carriage will cease to advance.

From the foregoing it will be evident that by adjusting the plate 20 the rearward movement of the carriage is determined, and also by adjusting the face-plate 25 the point at which the dies will be thrown out of operation is also determined.

Arranged in suitable bearings in the frame 5 is a movable cutter-head 26, made vertically adjustable by means of a screw 27, that is journaled in bearings in said frame and passes through a threaded boss 28, formed on said cutter-head, and capable of being rotated by means of a balanced crank-handle 29. Resting within a suitable recess in said cutter-head is a knife 30, which is held in place by means of a key 31, the knife and key being interchangeable, whereby the knife and key may be substituted one for the other for the purpose of reversing the cutting position of the knife. Arranged in transverse

ways in the frame 5 are two opposed vise-jaws 32, that are provided with internally-threaded sockets 33, that are engaged by a right and left screw-threaded shaft 34, that is journaled in fixed bearings in the frame and provided with a balanced crank-handle 35. By turning said shaft in the proper direction the jaws are caused to approach each other and center the pipe and cause the same to rotate truly while the pipe is being cut off.

On the rear face of the frame 5 is secured an arm 36, apertured for the reception of the shank of a reamer 37, which is adjustably held in the arm by means of a set-crew 38. The reamer 37 is provided with a conical rasping-head, as shown, and is axially in line with the center of the pipe operated on, but when not needed may be turned to one side about its attaching-bolt 39 as a center.

After the pipe has been threaded in the manner before described and the reamer having been first adjusted to correspond to the length of nipple to be cut the carriage is farther advanced by means of the rack-and-pinion gear until the reamer enters the end of the pipe, when it will operate to remove the bur from the end of the pipe occasioned by the action of the knife 30 in cutting off the preceding nipple. The vise-jaws are now closed upon the pipe to properly journal the same and the knife fed forward into engagement with the pipe, by means of the hand-screw 29, until the nipple has been cut off, after which the carriage is retracted until the bolt 18 drops into the notch 21 in the plate 20. The lever 16 is then returned to its former position, when the parts are in readiness to form the thread upon the next nipple.

In order that lubricant may be supplied in proper quantities to facilitate the threading and cutting operations, we have devised the following-described means: Formed in the periphery of the die-ring is a groove 41, which forms a duct that communicates, by means of a port 42, with an oil-supply pipe 43, that telescopes in a pipe 43^a, which leads from a reservoir 43^b or other suitable source of supply. An aperture 44 is formed in the periphery of the die-ring which is in communication with the groove 41, and opening into said aperture are two ducts 45 and 46, which lead, respectively, to the threading-dies and the knife for cutting off the nipple. The ducts 45 and 46 enter the aperture 44 at different levels, in the present instance the duct 45 being shown as entering the aperture below the duct 46. A hollow plunger 47 is introduced into said aperture and is provided with a vertically-elongated slot 48, that registers with the groove 41 as the plunger is raised and lowered. The plunger is also provided with two ports 49 and 50, so arranged that as the plunger is raised and lowered the said ports are caused to alternately register with the ducts 45 and 46. To the upper end of the plunger is secured one end of a pivoted lever 51, that at its other end engages a seg-

ment 52, by means of which said lever may be held in either of its adjusted positions.

We have described the groove 41 as being formed in the periphery of the die-ring, but it will be evident that it may be formed in the frame in which the die-ring is seated, and it will also be manifest that a rotary valve may be substituted for the reciprocating plunger.

From the foregoing the complete operation of our improved machine will be readily understood.

Before advancing the carriage to cause the threading-dies to engage the pipe the lever 51 is raised to cause the port 49 to register with the duct 45, leading to the dies. The carriage is advanced and the dies proceed to thread the end of the pipe in the manner before described, during which operation oil is fed to the dies through the duct 45. After the thread has been cut the dies are automatically thrown out of operation, the lever is moved to its central position to stop the flow of oil, and the carriage is advanced by hand and the reamer operates to remove the bur. At the end of the reaming operation the lever 51 is depressed to cause the port 50 to register with the duct 46, leading to the knife, which then cuts the nipple, upon which the carriage is retracted and is in readiness for forming the next nipple.

Having described our invention, what we claim is—

1. In a nipple-machine, the combination with a reciprocating carriage carrying radially-movable dies, of a rotatable cam-ring for actuating said dies, mechanism for holding said cam-ring in position to close the dies, mechanism operated by the forward movement of the carriage for releasing said cam-ring at a predetermined point, and a spring for actuating the cam-ring when the latter is released to open the dies, substantially as described.

2. In a nipple-machine, the combination with a reciprocating carriage carrying radially-movable dies, of a cam-ring for actuating said dies, a spring operating to turn said cam-ring in one direction, a rod 14 pivotally connected to said cam-ring, and a pivoted lever 16 pivotally connected at one end to one end of said rod, the arrangement being such that when said rod and lever are brought into alinement the cam-ring will be turned against the action of said spring to close the dies, and when thrown out of alinement the spring will turn the cam-ring in the opposite direction and open the dies, substantially as described.

3. In a nipple-machine, the combination with a reciprocating carriage carrying radially-movable dies, of a cam-ring for actuating said dies, a spring operating to turn said cam-ring in one direction, a rod 14 pivotally connected to said cam-ring, a pivoted lever 16 pivotally connected to one end of said rod and adapted when brought into alinement with the rod to hold the cam-ring turned against the action of said spring, and mechanism op-

erated by the forward movement of the carriage for throwing said lever and rod out of alinement to permit the spring to turn the cam-ring and open the dies, substantially as described.

4. In a nipple-machine, the combination with a reciprocating carriage carrying radially-movable dies, of a cam-ring for actuating said dies, a spring operating to turn said cam-ring in one direction, a rod 14 pivotally connected to said cam-ring, a pivoted lever 16 pivotally connected at one end to one end of said rod, a vertical bolt 18 engaging at its upper end the free end of the lever 16, a spring for depressing said bolt, and a face-plate 25 arranged in the path of the lower end of said bolt, whereby when the carriage is moved forward the bolt will be raised and throw the lever 16 to permit the spring to turn the cam-ring and open the dies, substantially as described.

5. In a nipple-machine, the combination with a reciprocating carriage carrying radially-movable dies, of a cam-ring for actuating said dies, a spring operating to turn said cam-ring in one direction, a rod 14 pivotally connected to said cam-ring, a pivoted lever 16 pivotally connected at one end to one end of said rod, a vertical bolt 18 engaging at its upper end the free end of the lever 16, a spring for depressing said bolt, and an adjustable race-plate 25 arranged in the path of the lower beveled end of said bolt, whereby when the carriage is moved forward the bolt will be raised at varying determined points and throw the lever 16 to permit the spring to turn the cam-ring and open the dies, substantially as described.

6. In a nipple-machine, the combination with a reciprocating carriage carrying radially-movable dies, of a cam-ring for actuating said dies, a spring operating to turn said cam-ring in one direction, a rod 14 pivotally connected to said cam-ring, a pivoted lever 16 pivotally connected at one end to one end of said rod, a vertically-movable bolt 18 having a beveled lower end and at its upper end engaging the free end of the lever 16, a spring for depressing said bolt, a plate 20 adjustably secured to the bed of the machine and provided with an inclined notch 21 adapted to be engaged by said bolt to limit the rearward movement of the carriage, and a face-plate 25 provided with an inclined end and adjustably secured to the plate 20, said face-plate being arranged in the path of the beveled end of the bolt and operated during the forward movement of the carriage to raise the bolt and throw the lever 14 to permit the spring to turn the cam-ring and open the dies, substantially as described.

7. In a nipple-machine, the combination with a reciprocating carriage carrying radially-movable dies, of a cam-ring for actuating said dies, a fixed lug 11 carried by said cam-ring, a spring 12 bearing against said lug and operating to turn said ring in one direction,

a sleeve 13 journaled in said lug, a threaded rod arranged in said sleeve and adjustably held therein by nuts 15, a pivoted lever 16 pivotally connected at one end to one end of said rod and adapted when brought into alignment with the rod to hold the cam-ring turned against the action of said spring, and mechanism operated by the forward movement of the carriage for throwing said lever and rod out of alinement to permit the spring to turn the cam-ring and open the dies, substantially as described.

8. In a nipple-machine, the combination with a reciprocating carriage carrying screw-threading dies, of a vertically-movable cutter-head 26 arranged in bearings in the carriage-frame, means for moving said cutter-head in its bearings, and a knife 30 seated in a recess in said cutter-head and held therein by a key 31, said knife and key being interchangeable, for the purpose specified.

9. In a nipple-machine, the combination with a reciprocating carriage carrying screw-threading dies, of a vertically-movable cutter-head arranged in bearings in the carriage-frame, a knife carried by said cutter-head, oppositely-disposed vise-jaws 33 traveling in ways arranged transversely to the line of the travel of the carriage and adapted to center the pipe to be cut, and a right-and-left screw 34 engaging threaded sockets 33 formed on said jaws and provided with a handle, substantially as described.

10. In a nipple-machine, the combination with a reciprocating carriage carrying screw-threading dies and pipe-cutting mechanism, of an oil-supply pipe, ducts leading from said pipe to the said dies, and means for alternately opening one of said ducts and simultaneously closing the other, substantially as described.

11. In a nipple-machine, the combination with a reciprocating carriage carrying screw-

threading dies and pipe-cutting mechanism, of a duct 41 formed in the die-head and connected with an oil supply, a well in communication with said duct, ducts 45 and 46 communicating at one end with said well and leading respectively to the threading-dies and pipe-cutter, a reciprocating plunger arranged in said well and having an elongated opening registering with the duct 41, and provided with ports 49 and 50 adapted to be alternately brought in coincidence with the ducts 45 and 46 as said plunger is moved up or down, and a lever 51 for raising and lowering the plunger, substantially as described.

12. In a nipple-machine, the combination with a reciprocating carriage carrying screw-threading dies and pipe-cutting mechanism, of a duct 41 formed in the die-head and connected with an oil supply, a well in communication with said duct, ducts 45 and 46 communicating at one end with said well and leading respectively to the threading-dies and pipe-cutter, a reciprocating plunger arranged in said well and having an elongated opening registering with the duct 41 and provided with ports 49 and 50 adapted to be alternately brought in coincidence with the ducts 45 and 46 as said plunger is moved up or down, a lever for raising and lowering the plunger to bring either of said ducts and ports into coincidence, and means for holding said lever in an intermediate position to entirely shut off the supply of oil, substantially as described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

WILLET C. WELLS.
FRANK E. WELLS.

Witnesses:

JACOB M. SCHATZEL,
GEORGE P. SCHATZEL.