(No Model.) 2 Sheets—Sheet 1.

# W. C. & F. E. WELLS.

## MACHINE FOR THREADING, CUTTING, AND REAMING.

No. 355,737. Patented Jan. 11, 1887.

Fig. 1.

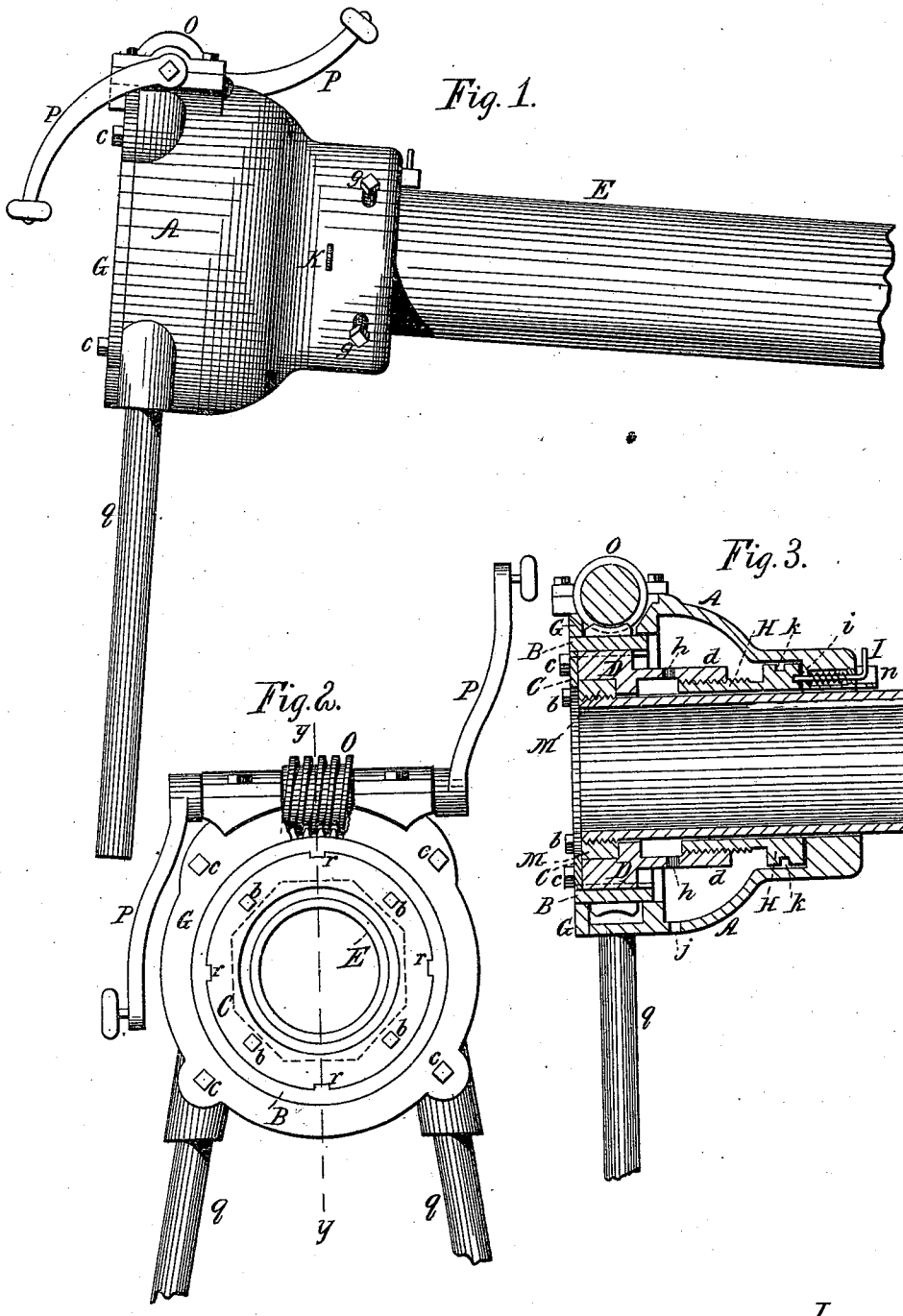



Fig. 2.




Fig. 3.




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(No Model.) 2 Sheets—Sheet 2.

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## MACHINE FOR THREADING, CUTTING, AND REAMING.

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*Fig. 6.*

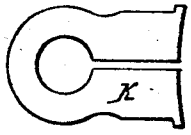



*Fig. 5.*

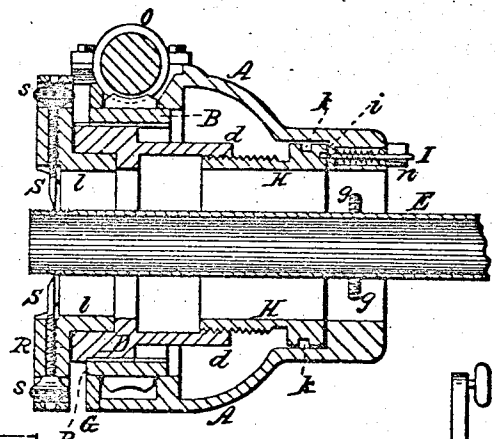



*Fig. 4.*

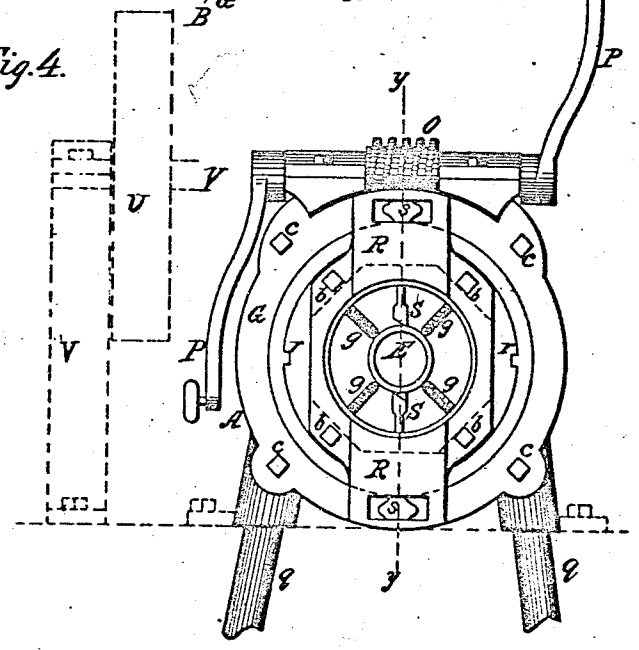
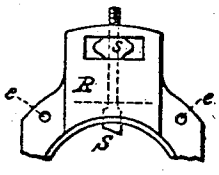



*Fig. 7.*




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# UNITED STATES PATENT OFFICE.

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

## MACHINE FOR THREADING, CUTTING, AND REAMING.

SPECIFICATION forming part of Letters Patent No. 355,737, dated January 11, 1887.

Application filed April 3, 1886. Serial No. 197,674. (No model.)

*To all whom it may concern:*

Be it known that we, WILLET C. WELLS and FRANK E. WELLS, both of Tiffin, in the county of Seneca and State of Ohio, have invented a new and useful Improvement in Machines for Threading, Cutting, and Reaming, of which the following is a specification.

Our invention relates to a machine for screw threading, cutting, and reaming pipe and analogous articles. Its purpose is to provide a machine which will at once grasp and support the pipe and thread it, or cut or ream it, as may be desired, which is readily adapted to pipes of different sizes, which may be conveniently operated by one boy or man without especial skill, and which can be easily moved from place to place and operated wherever wanted, independently of other machinery.

In the drawings, Figure 1 is a perspective of the machine as seen from one side, having grasped therein a pipe, E. Fig. 2 is an elevation of the machine as seen from the rear end, meaning the end opposite that in which the pipe is inserted. Fig. 3 is a vertical section taken on the line *y y*, Fig. 2, showing the pipe E in position and the screw-cutting die M as it appears when the operation of screw-threading is substantially completed. Fig. 4 is a rear end view of the machine when the cutter is substituted for the threading-die. Fig. 5 is a vertical section taken on the line *y y* of Fig. 4. Fig. 6 is a side view of one of the spring-keys which locks against longitudinal movement the sleeve over which the die-holder is advanced. Fig. 7 is an elevation of one-half the cutter or reamer, showing one of the cutting-knives mounted therein.

A is the shell of the machine, mounted on suitable legs, *q q*.

O is a screw-threaded shaft driven by crank-arms P, or other suitable means, through which motive power is applied to the machine.

*g g* are screws, between the ends of which the pipe E is gripped. These screws may be advanced or retracted to adapt them to different-sized pipes. They are screwed up against the pipe until they bite it sufficiently to hold it securely in position.

H is a sleeve screw-threaded at its rear end and provided with an annular groove, *k*, and a notch, *i*, near its forward-end.

B is an annular gear suitably threaded or cogged on its periphery to receive and be actuated by the threads or cogs on the driving-shaft, and having inward-projecting tongues *r*.

D is the die-holder having forward-projecting sleeve *d*, screw-threaded to take into the screw-thread on sleeve H. In the outer face of this die-holder are slots, into which tongues *r* take. These slots are elongated, so as to allow the die-holder to move forward and backward lengthwise of the machine, the tongues *r* serving to impart rotary movement to the die-holder. The recess for the reception of the die is indicated by dotted lines in Figs. 2 and 4. It is shown as octagonal in shape, but may be made with a greater or less number of sides.

G is the outer annular face-plate of the machine, screwed in position by screws *c*.

C is an inner annular face-plate, which serves to secure the die in the die-holder.. This inner face-plate is readily secured in place or removed by screws *b*.

M is the screw-threading die which fits into the die-holder, having its external dimensions correspond, substantially, with the recess of the die-holder into which it is received.

I is a spring-bolt which takes into a notch, *i*, in the sleeve H, as shown in Fig. 3, and prevents that sleeve from turning when the threading-die is in operation.

R (shown in Figs. 4, 5, and 7) is a cutter-frame, in which are mounted any suitable knives for either cutting off the pipe or reaming it, as the case may be. The knives S (shown in the illustration,) are for cutting off the pipe, and are fed forward to their work by feed-nuts *s* on their threaded shanks. When it is desired to ream the pipe, reaming-knives may be substituted for cutting-knives and fed in the same way, their shanks being inserted in the same sockets. This cutter-frame has projecting flanges *l*, (see Fig. 5,) adapted to fit into the die-holder, the configuration of this flange being shown by dotted lines in Figs. 4 and 7.

Instead of the crank-arms mechanical power

may be used to drive the machine, as illustrated by dotted lines in Fig. 4, where V is an upright, upon which is journaled the drive-shaft, which is extended for the purpose, as indicated by Y.

U is a drive-wheel, which may be actuated by a belt or by suitable gearing.

The operation, whether driven by hand or power, is as follows: When the pipe is to be threaded, the screw-cutting die is placed in the die-holder and secured by screwing on the annular face-plate C behind it, the die being selected with reference to the size of pipe to be treated. The pipe is then inserted through the opening at the opposite end of the machine from that at which the die enters, and the screws *g* are advanced until the pipe is securely gripped by them. The drive-shaft being then rotated imparts a rotary movement to the annular gear B, which by means of its tongues *r* (of which there may be one or more, preferably three or four, at least,) imparts a similar movement to the die-holder and the die embraced by it. The spring-bolt I being in the notch *i*, as shown in Fig. 3, prevents the sleeve H from rotating with the die-holder, while the keys K, being in the recesses *k*, lock the sleeve against longitudinal movement. The thread on this sleeve serves as a leader to the die-holder, causing it to advance as it is rotated, and thus direct the cut made by the die in the proper screw-thread. The slots in the periphery of the die-holder allow it to slide lengthwise on the tongues *r*, by which its rotary movement is imparted. When the thread is cut as far as desired, a reverse movement of the drive-shaft retracts the die. To cut pipes of different sizes or with different depths of thread, it is only necessary to substitute the proper die, no special skill on the part of the operator being required. When the pipe is to be cut or reamed, the face-plate C is removed and the cutter-frame R secured in the die-holder, as illustrated in Figs. 4 and 5, the die-holder being first thrown back toward the rear of the machine far enough to readily receive the cutter-frame. The cutter-frame is preferably provided with screw-bolts corresponding in position with those on the face-plate C, and the same screws used to attach it as are used for this face-plate. The spring-bolt I is withdrawn from the notch *i* and locked against entering it by being turned over the lugs *n*, as shown in Fig. 5, or in any other suitable way. The sleeve H is thus left free to revolve with the die-holder, and will no longer cause it to advance when rotated, while the frame of the cutter, coming in contact with the front of the machine, as clearly shown in Fig. 5, will effectually insure its acting on the pipe in a perfect circle. The pipe is placed in position and gripped, as before described, the part to be operated upon being brought between the knives of the cutter. Rotary movement is then imparted to the die-holder in the manner before described, the knives S being fed forward by the feeding-nuts *s*. These knives are thus caused to revolve about the pipe and cut it, as desired.

Instead of the screw-thread on the shaft O, other suitable gearing may be used, and the forward sleeve of the die-holder may fit either inside or outside of the sleeve H, the thread on each being arranged accordingly. By withdrawing the keys K the die-holder and sleeve H can be readily slipped out of the machine.

In order to allow the discharge of the particles of metal cut from the pipe, we make one or more perforations, (preferably two or more,) *h*, in the sleeve of the die-holder, and a corresponding perforation, *j*, in the bottom of the shell.

Two or more legs may be used to support the machine, and they may, if desired, be made adjustable to adapt it to different heights and different inclinations in the presentation of the pipe; but this we consider unnecessary.

If the pipe is short, it will be held in proper line by the machine. If long, the opposite end may rest upon a bench or other suitable support, or upon the floor or ground. The machine can be inclined to align it with a pipe resting on the ground at its other end, as illustrated in Fig. 1. The screws *g g*, mounted in the shell, form a convenient means of grasping and supporting the pipe in proper alignment. Other suitable means may be used for this purpose; but this is at once simple and efficient.

If the keys K are withdrawn, the die-holder may be released from its advancing movement, and thus enabled to rotate as required in cutting, though the locking-bolt I remains in notch *i*, since the sleeve is then free to slide toward the die-holder as their screw-threads travel over each other; but we consider it preferable to provide for the rotary movement required in cutting or reaming by simply releasing the sleeve from confinement against rotation. Instead of placing tongues on the annular gear and slots in the die-holder, the slots may be placed on the gear and the tongues on the die-holder; or other equivalent devices may be used.

We claim—

1. In a threading-machine, the combination of a rotating die-holder sliding longitudinally, and having a seat adapted to receive a removable die, gearing actuating the die-holder, a sleeve locked against both longitudinal and rotary movement and taking by a screw-thread into the die-holder, and means whereby the pipe is gripped and supported in the die-holder in alignment therewith, for the purposes described.

2. In combination with the rotating and sliding die-holder, the annular gear connected therewith by tongue and groove (one or more) sliding upon each other longitudinally of the die-holder, for the purpose described.

3. The combination of a rotating and longitudinally-sliding die-holder, the gear having

tongue-and-groove connection therewith, and the removable face-plate fitting over the seat of the die-holder, whereby the die is locked in position, for the purpose described.

4. The combination of a rotating and longitudinally-sliding die-holder, a sleeve threaded into said die-holder and supported against longitudinal movement, and a lock whereby said sleeve is arbitrarily secured against rotary movement or released to rotate with the die-holder, for the purposes described.

5. In combination with the rotating and longitudinally-sliding die holder, the sleeve threaded into the same, and the spring-bolt taking into the same and locking it against rotary movement, for the purposes described.

6. The combination of the rotating and longitudinally-moving die-holder, the sleeve threaded into the same, the shell supporting said die-holder and sleeve in alignment, the spring-bolt whereby the sleeve is arbitrarily locked from rotary movement or released for such movement, and the lug whereby the spring-bolt is locked out of engagement, for the purpose described.

7. The combination of the rotary and longitudinally-sliding die-holder, the leading-sleeve, the annular groove in said sleeve, and a key, (one or more,) whereby the sleeve is arbitrarily locked against longitudinal movement or released to move with the die-holder, for the purposes described.

8. The combination of rotating and longitudinally-sliding die-holder, leading-sleeve threaded into the same and having annular groove for the reception of keys, a screw or equivalent means whereby the pipe is gripped, a shell within which said die-holder and sleeve are mounted in alignment, a key (one or more) mounted on said shell and taking into said groove, and a lock whereby said sleeve is arbitrarily secured against rotary movement or released for such movement, for the purpose described.

9. The combination of rotating and longitudinally-moving die-holder, removable die seated therein, leading-sleeve locked against rotary movement, means for grasping and supporting the pipe, and shell in which said die-holder, leading-sleeve, and means for grasping the pipe are supported in proper relation to each other, for the purposes described.

10. The combination of containing-shell, rotary die-holder and leading-sleeve mounted in said shell in alignment with each other, cutter-frame taking into the seat of said die and having a flange taking over the fixed face of the machine, and means for arbitrarily releasing the die-holder from the control of the leading-screw, for the purpose described.

11. The combination of die-holder mounted to move freely in both rotary and longitudinal directions, and having seat for the reception of the removable die, rotary gear driving said die-holder, leading-sleeve threaded into said die-holder and having a bearing for rotary movement, a lock whereby said sleeve is arbitrarily secured against rotary movement, a key whereby the same is arbitrarily secured against longitudinal movement, means for grasping and supporting the pipe in alignment with said die-holder and sleeve, and a containing-shell in which each of said elements is mounted and in which said sleeve is free to slide longitudinally when unkeyed, for the purpose described.

12. The combination of threaded drive-shaft, annular gear having corresponding thread taking into the same, a die-holder into which said gear takes by a tongue-and-groove connection, a seat in said die-holder for the reception of removable dies, means for locking said die in said seat, shell in which said die-holder is mounted and free to both rotate and slide, and a detachable leader-sleeve whereby said die-holder is actuated in an advancing path or released to move in a circular path, for the purposes described.

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