5 Sheets--Sheet 1.

E. ROGERS.

Machines for Tapping Pipe-Fittings.

No. 136,621. Patented March 11, 1873.

Fig. 1.

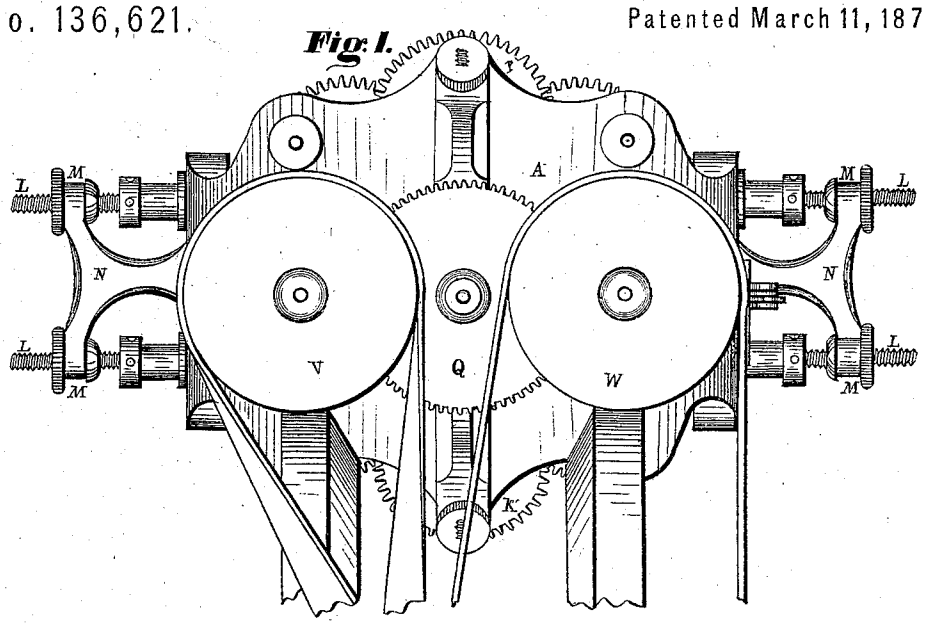
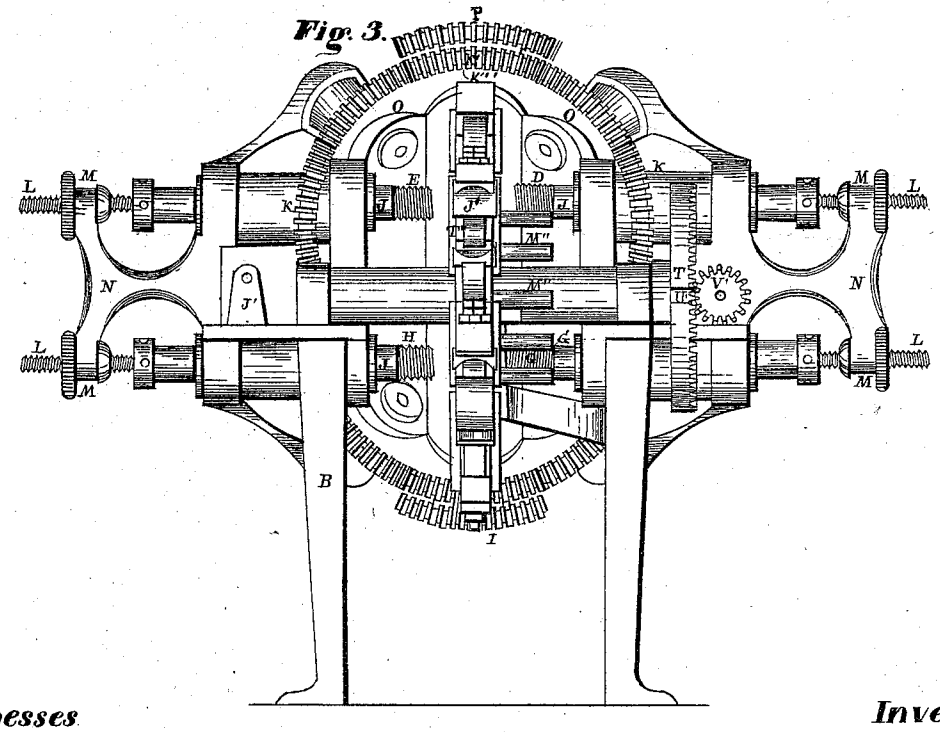


Fig. 3.



Witnesses

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5 Sheets--Sheet 2.

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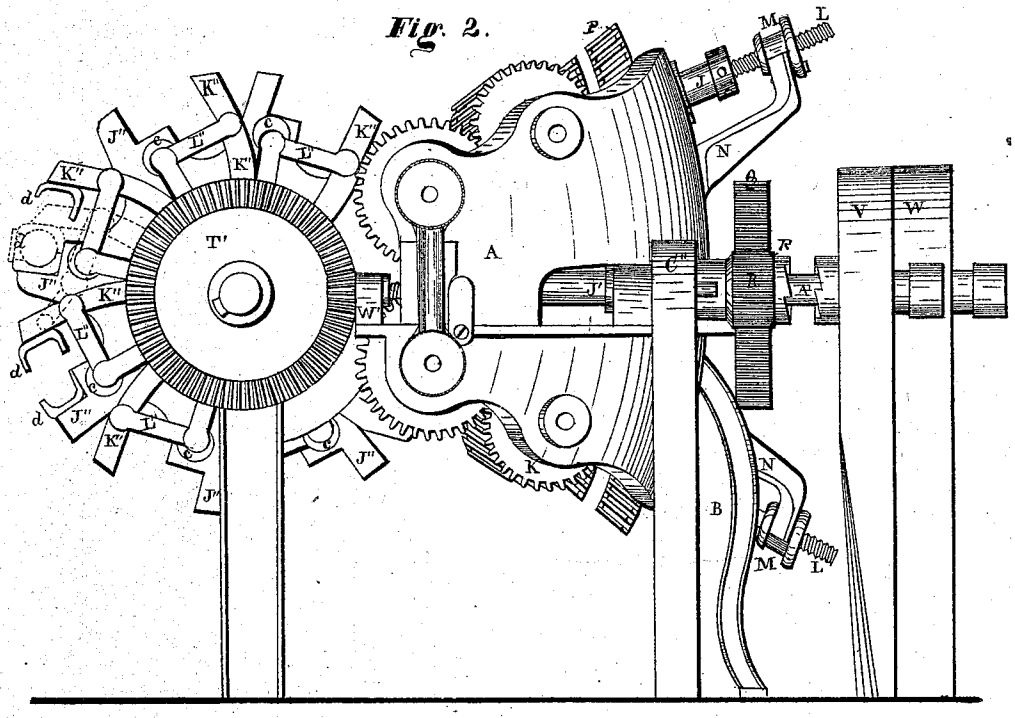
Machines for Tapping Pipe-Fittings.

No. 136,621. Patented March 11, 1873.

Fig. 2.



Witnesses.

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5 Sheets--Sheet 3.

E. ROGERS.

Machines for Tapping Pipe-Fittings.

No. 136,621. Patented March 11, 1873.

Fig. 6.

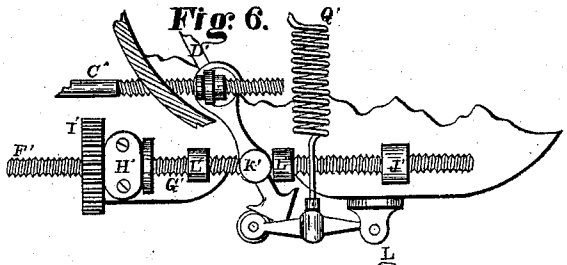


Fig. 5

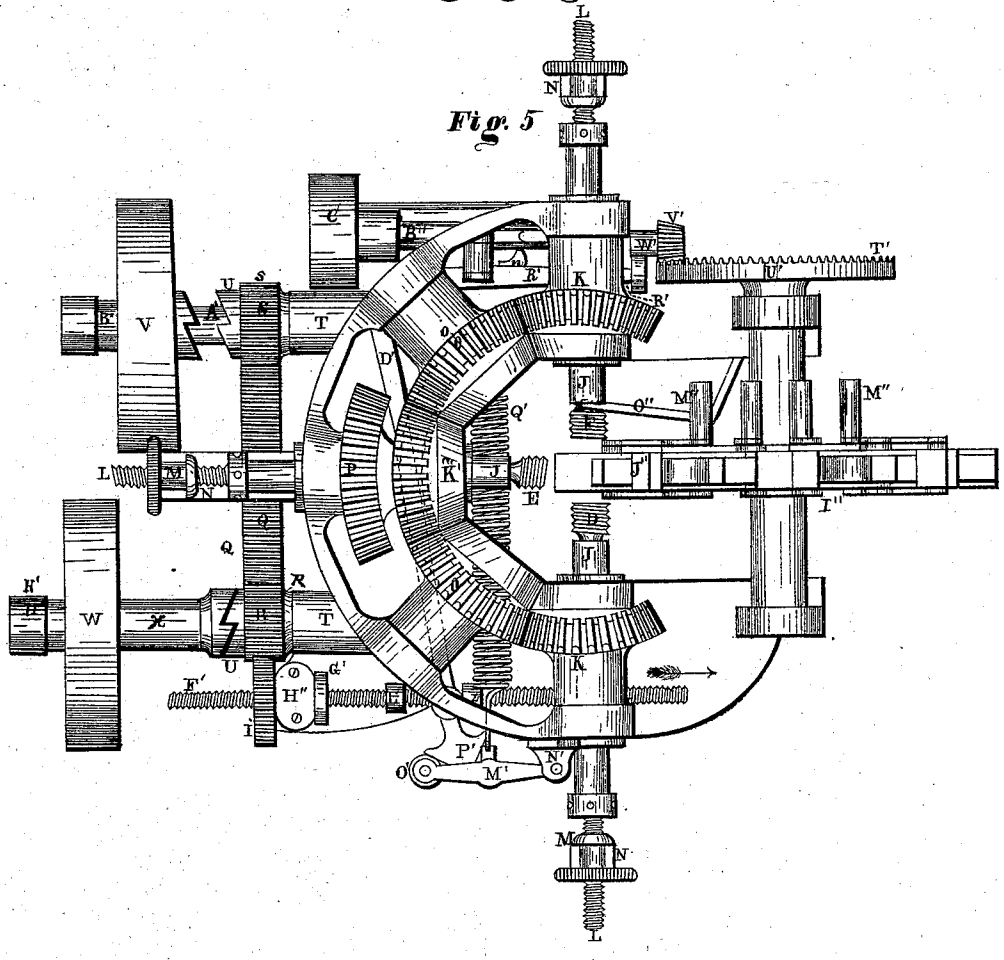
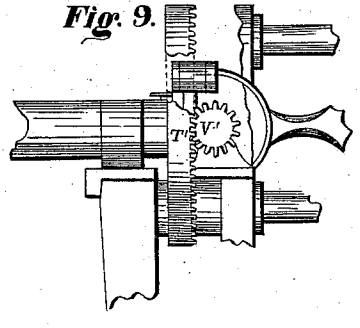


Fig. 9.



Witnesses.

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Machines for Tapping Pipe-Fittings.

No. 136,621. Patented March 11, 1873.

Fig. 8.

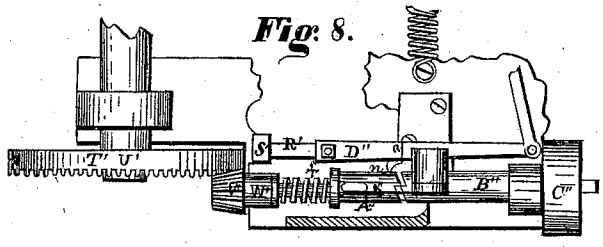


Fig. 4.

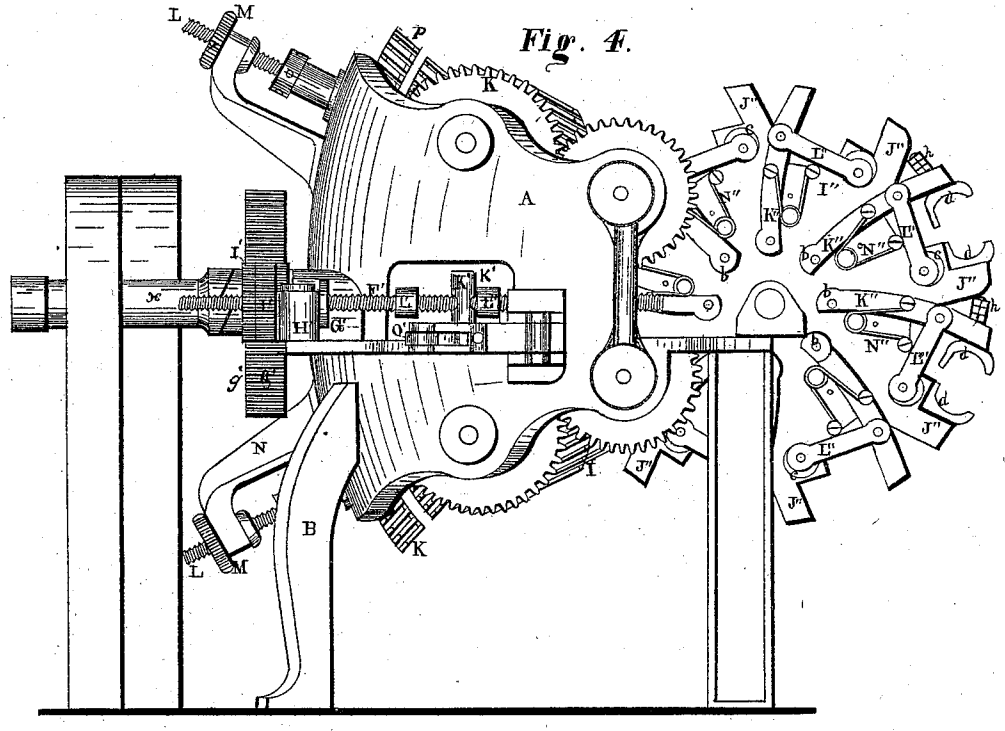
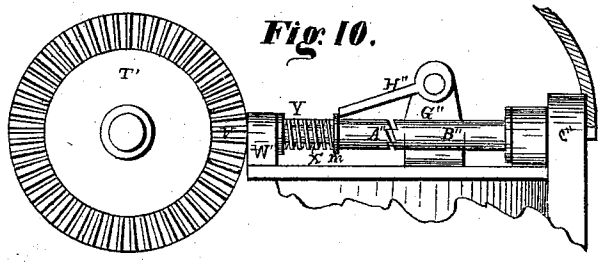


Fig. 10.



Witnesses.

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Machines for Tapping Pipe-Fittings.

No. 136,621. Patented March 11, 1873.

Fig. 7.

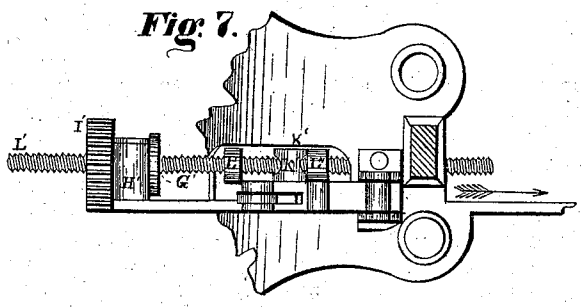


Fig. 11.

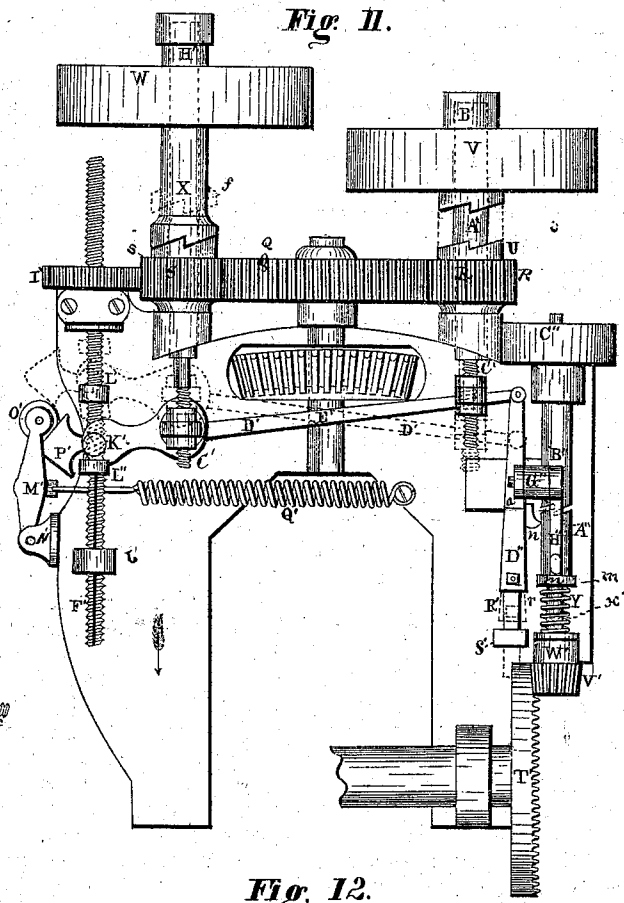


Fig. 13.

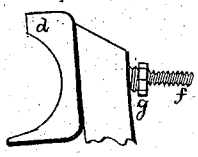


Fig. 14.

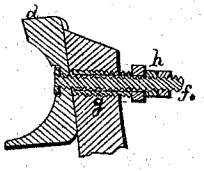
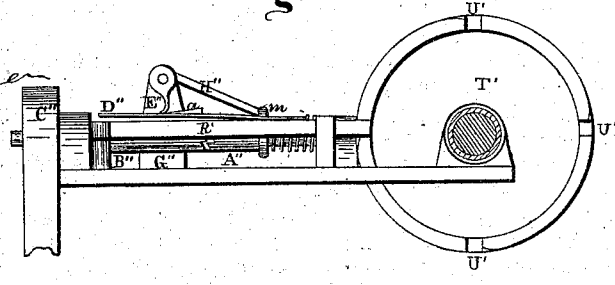


Fig. 12.



Witnesses.

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UNITED STATES PATENT OFFICE.

ETHAN ROGERS, OF CLEVELAND, OHIO.

IMPROVEMENT IN MACHINES FOR TAPPING PIPE-FITTINGS.

Specification forming part of Letters Patent No. **136,621**, dated March 11, 1873.

To all whom it may concern:

Be it known that I, ETHAN ROGERS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and Improved Machine for Tapping Gas-Fixtures, &c.; and I do hereby declare that the following is a full, clear, and complete description thereof, reference being had to the accompanying drawing making part of the same.

Figures 1, 2, 3, and 4 are side elevations of the machine. Fig. 5 is a plan view.

The several figures on Plate 5 are detached sections, to which reference will be made.

Like letters of reference refer to like parts in the several views presented.

The nature of this invention relates to a machine for cutting threads in gas-fittings, &c.; and the object thereof is to facilitate the work of cutting said threads, and to produce them of a uniform size.

The construction and operation of the above-specified machine are as follows:

In the drawing, A represents a frame, supported on the legs B. In the upper side of said frame are arranged the screw-taps D E F, Fig. 5, Plate 3. The relative position they hold to each other is such as shown in the drawing, in which it will be seen that the taps D F are in the same axial line, whereas the tap E is at right angles therewith. Immediately below said screw-taps are arranged in like order screw-taps G H I, Fig. 3. The tap I is not clearly shown, it being hidden by the mechanism. Each of the taps referred to is fitted in the end of a mandrel, J. Said mandrel in turn is loosely fitted in a bevel-wheel, K, whereby said mandrel and taps are made to rotate, the mandrels being feathered in the wheels, which permit of their sliding therein, and at the same time rotate them for working the taps. In the outer end of each mandrel is secured a screw, L; to each screw is fitted a nut, M, the purpose of which will presently be shown. Said nut is formed with a neck, which is fitted in the end of the stay N, whereby the outer end of the screw is supported, and the nut held in position and prevented from running along the screw, the screw being made to work in and through the nut.

Motion is given to the wheels K for operating the taps D F by means of the intermediate or transfer wheels O, Fig. 5, which in turn receive motion from the wheel K‴ on the mandrel of the tap E. In connection with the wheel K‴ is a companion wheel, P, which is made to engage a wheel on the mandrel J′, Fig. 2, on which mandrel is also the driving-wheel Q, Figs. 1 and 2. By this arrangement of wheels, on power being applied to the driving-wheel Q, the taps D E F are operated, and at the same time operating on the lower taps G H I by a similar arrangement and combination of gearing, directly and indirectly engaged with the driving-wheel Q, which taps are all operated in the same direction.

The motive power applied to the wheel Q is received from the pinions R S, Fig. 5, one on each side of the wheel, as shown. The shafts A′, to which the pinions are secured, have their bearings in the bosses T of the frame A. On one side of each pinion is attached a section, U, of a clutch. The corresponding section of each clutch is attached, respectively, to the pulleys V W—directly to the pulley V, and by means of a sleeve, X, to the pulley W, as shown in Fig. 5. Said pulleys are loose on their shafts; hence they are free to slide thereon in order to become engaged or disengaged with the pinions, for a purpose hereinafter shown.

The pulleys are made to slide on the shafts, for the above-specified purpose, by means of the following device: Each of the pulleys referred to is secured to its respective shaft by a sleeve, B′ and H′, Figs. 5 and 11. To each of the sleeves is attached a rod, C′, Figs. 6 and 11; the rod passes through or into the shaft, it being made hollow for its admission. The end of the rod is secured to the end of the sleeve, which is made to fit on over the end of the shaft as a sliding cap, as shown in Fig. 11. The inner ends of the clutch-rods C′ are connected to a lever, D′, Fig. 11, one at each end of the lever, which lever has a pivotal fulcrum at E′, thereby allowing to each end thereof a vibratory motion for sliding the sleeves or clutches of the pulleys into engagement with or disengagement from the pinions R S. The lever D′ is actuated for operating the clutches by a screw, F′, Fig. 5. Said screw is fitted to and works in a barrel-nut, G′. The barrel part of the nut forms a journal, of which H″ is the seat, for the rotation of the nut, which

rotation is effected by a pinion, I′, on the opposite end of the barrel, and in engagement with the pinion R, as shown in said Fig. 5.

It will be obvious that by this arrangement of the nut it will not run along on the screw, but that the screw will work along through the nut, as the nut is made to revolve by the pinion I′.

The opposite end of the screw is supported by a post, J′, Fig. 3, in which it is loosely fitted, but kept from revolving with the nut by a groove in the screw, and a feather in the post-hole, of the ordinary construction. Said screw passes loosely through a lug, K′, attached to and projecting upward from the end of the lever D′. On each side of the lug is a collar or carrier, L′ L″, Figs. 4, 6, and 7, the purpose of which will presently be shown. M′, Fig. 5, is an arm, pivoted in the stay N′. In the free end of the arm is a roller, O′, which is made to run up the edge of the arrow-shaped head P′ of the lever D′, and which is continued in close contact therewith by the spring Q′. To the opposite end of the lever D′ is pivoted a check bar or slide, R′, Figs. 5 and 11. The unpivoted end of said check-bar is held by a stud, S′, Fig. 8, in which it can freely slide backward and forward, to engage the wheel T′, in the periphery of which there are formed four notches, U′, Fig. 12. Said notches have a quartering relation to each other, into which the end of the bar is projected successively as the wheel revolves, for arresting its revolution and holding it for a time, for a purpose hereinafter shown. Said wheel is made to revolve by the miter-pinion V′, Figs. 10 and 11, secured to a journal-sleeve, which sleeve has its bearings in a stud, W′. In said sleeve is secured a shaft, X′, around which is coiled a spring, Y, as shown in Fig. 11. To said shaft the miter-pinion and sleeve are keyed. A″, Figs. 11 and 12, is a sliding clutch, whereby the shaft X′ and pinion are coupled to the shaft B″, driven by the pulley C″. On the upper side of the slide R′, referred to, is secured a spring, D″, on the face of which is formed a shoulder, *a*, Fig. 12, the purpose of which is to engage an arm, E″, for operating the clutch A″. Said arm is secured to a shaft journaled in the standard G″. On the opposite end of the shaft is secured an arm, H″, which is also employed for operating the clutch, as will presently be shown. In combination with the several devices above described, is a clamp-wheel, I″, Figs. 2 and 4, the purpose of which is to hold the gas-fittings, &c., while being tapped. From the periphery of said wheel projects a series of rigid jaws, J″, Figs. 2 and 4; also a series of movable jaws, K″. Said movable jaws are pivoted to the wheel at the point *b*, and are connected to the rigid jaw by a pair of links, L″. The connection of the links with the rigid jaw is made by an eccentric, *c*, to which the ends of the links are pivoted, so that on turning the eccentric by means of the handle M″, Figs. 3 and 5, the free jaws are drawn toward the rigid ones, and are locked in such relation therewith by the axial centers of the eccentric and links coming in a right line or on a dead-center. A reverse movement of the free jaws is effected by springs N″ when the eccentrics are thrown off from such center.

Having described the several parts of the tapping-machine, the practical operation thereof is as follows: As above-said, the use of the machine is for cutting the threads in gas-fittings, such as the T and L couplings connecting the gas-pipes, &c. A T-coupling is placed in the clamp of the wheel I″, between the dogs or boxes *d*, Fig. 2, and in such relation with it as to bring the stem of the T in a radial line of the wheel and the arms transversely therewith, as indicated by the dotted lines, Fig. 2. In this position the T or coupling is clamped by the movable jaws K″, operated in the manner as above described. Each of the jaws is provided with a T, the position of which in their relation to the taps is such as to bring the bore of the coupling or T in direct line with the three taps above and the three taps below on turning the wheel. The oblique position of the tap F and that of the corresponding one below it is such as to allow them to enter the stems of the couplings at the same time that the side taps enter the arms thereof; hence two couplings are tapped at once. Thus, let it be supposed that the wheel has been so turned as to bring two couplings into proper position for receiving the taps, which at this time, by means of the gearing, are running in the right direction for entering the ends of them. The several taps are fed into the ends by means of the screws L, terminating the outer ends of the mandrels J carrying the taps. Said mandrels are loosely fitted in the pinions K, and, being feathered therein, are thereby allowed to slide freely through them at the same time that they are rotated. During the time that the several taps are screwing into the couplings—which is when the clutch U of the shaft A′ is engaged with the pulley V, Fig. 5, and consequently the sliding clutch X disengaged, thus changing their relation from that shown in said Fig. 5 to that indicated by the dotted lines *f*, Fig. 11—the screw F′, Fig. 5, is being worked forward in direction of the arrow by the pinions R and I′. In this working of the screw the collar L′ pushes against the lug K′, thereby forcing the head P′ of the lever D′ forward until the apex of the angle of the head passes the axis of the roller O′. Said roller, in consequence of the spring Q′, forces the lug quickly away from the collar by rolling on the opposite angle of the head, thereby bringing the lever D′ to the position shown in the drawing, the result of which is an immediate disengagement of the clutch U of the shaft A′ and an engagement of the clutch of the pulley W, as shown in Figs. 5 and 11. This reversal of the engagement of the clutches causes a reverse action of the taps, so that they are now working out from the ends of the couplings. Immediately that the taps are released therefrom the clamp-wheel is made to revolve

one-quarter of the way round, in order to bring two more couplings in position for tapping. Those having been tapped are discharged from the clamps by the handles M″ thereof striking upon the trip O″, Fig. 5, which throws the cams off from the dead-centers. The springs N″ open the movable jaws of the clamps, and the couplings fall out below the wheel onto the floor, and are replaced by others while the tapping is being done. The clamp-wheel is made to revolve at the proper time, for the purpose above-said, as follows: The action of the lever D′ in changing the arrangement of the clutches, as above described, at the same time draws back the slide R′ from its engagement with the wheel T′, leaving it free to be rotated; also, during the same time, the action of the screw F′ is reversed, thereby causing the collar L″ to press against the lug K′ and force it back until the roller O′ passes the apex of the head P′, which then rolls down on the edge of the angle on the opposite side to about half-way, it being arrested at that point by the end of the slide R′ impinging upon the edge of the wheel T′. It will be obvious that this movement of the slide is effected by the action of the lever P′ actuated by the reverse movement of the screw F′, forcing the lever back from its position shown in Fig. 11 nearly to that indicated by the dotted lines, but not quite that far, it being restrained from going that far by the slide R′ resting against the edge of the wheel, as aforesaid, which at this time is rotated by the bevel-pinion V′, which the spring Y couples with the shaft B″ by means of the sliding clutch A″, said shaft B″ being driven by the pulley C″, Fig. 11. During this quartering momentary movement of the wheel T′ both of the clutches U are disengaged, as the action of the lever D′ has been only sufficient to disengage the one without causing an engagement of the other. The full action of the lever having been arrested by the end of the slide impinging upon the edge of the wheel, therefore the taps are momentarily at rest, or during the time that the wheel is moving from one notch, U′, to another, into which the slide is slipped by the renewed action of the lever D′ caused by the tension of the spring Q′ exerted upon the head of the lever by means of the arm M′, thereby forcing the lever to the position indicated by the dotted lines *r*, Fig. 11, thus effecting an engagement of the clutch U with the pulley V, which will cause an immediate operation of the gearing and taps which now enter the couplings, just brought into proper position for that purpose by the rotation of the wheel T′ and clamp-wheel actuated thereby. The moment that the slide slips into a notch the motion of the wheel is arrested by the pinion V′ becoming at that instant disengaged from the shaft B″. This disengagement is produced by the renewed action of the slide caused by its slipping forward into the notch, as above described. A lug, *n*, Figs. 5 and 11, on the side of the slide, engages, as said slide springs forward, a collar, *m*, Figs. 10 and 11, and forces the clutch A″ from its connection with the shaft, thus liberating the wheel for the time being, or during the forward and receding operation of the taps. Again, during the time that the taps are working into the couplings, the screw F′, as before, is working forward in direction of the arrow, carrying with it the head end of the lever D′ until the apex of the head is passed over by the roller, which, as aforesaid, shifts the clutches, thereby reversing the movements of the taps for their withdrawal from the couplings. This shifting of the clutches is accompanied by the withdrawal of the slide from the wheel, as above shown; but in order to prevent at this moment an engagement of the clutch A″ with the shaft B″ by the withdrawal of the lug *n* from its contact with the collar of the clutch, the free end of a pawl, H″, is caught on the inside of the collar, as shown in Fig. 10, thereby holding the clutch from slipping back and becoming engaged with the shaft when the lug *n* is drawn therefrom by the withdrawal of the slide from the wheel, as aforesaid. By the time that the taps are withdrawn the lever is again half changed by the reverse action of the screw F′, and for a moment, as before stated, neither of the clutches U X are engaged, so that the taps are for a short period of time inactive. This partial or half action of the lever moves forward the slide, and at the same time the pawl H″ is lifted from its engagement with the clutch A″ by the arm E″, Fig. 12, being caught on the edge of the shoulder *a* raised on the upper side of the spring D″ attached to the slide. The clutch, on being thus released from the pawl, is forced back by the spring Y, and thereby made to engage the shaft B″ for rotating the wheel T′, &c., for the purpose above-said.

The general operation of the machine is such that when the clutch U is engaged with the pulley V the taps are working into the couplings at the same time the screw F′ is operating the lever D′ for reversing the movement of the taps and withdrawing the slide from the wheels T′, so that it may be free to rotate at the proper moment for revolving the clamp-wheel I″, in which is held the work while being tapped, and during the withdrawal of the taps, by the engagement of the clutch U with the pulley W, the screw F′ is operating the lever in the opposite direction for the purpose of again changing the engagement of the clutches U and X, and to project forward the slide into the wheel T′ and cause it to revolve by its clutch connection with the shaft B″ and pulley C″. Each consecutive movement of the wheel T′ turns the clamp-wheel so far around as to bring two couplings in proper relation to the taps—one to the upper set of taps and one to the lower set, both of which are operated on at the same time and discharged from the wheel by the same device.

The length that the thread may be cut in the couplings can be varied by shifting the position of the collars L′ L″ on the screw F′. If the thread is to be a short one the collars

are adjusted nearer to the lug K′, and if a long thread is required the collars are set further apart.

Different sized taps and pitch of thread can be used in this machine, as the work may require, by removing the screw and nut L M of the taps and replacing them with others.

The dogs or boxes attached to the movable jaws K″ may be adjusted nearer to the dogs on the rigid jaw by means of the adjusting-nuts *h*, whereby they are secured to the jaw, so that different sizes of T and L shaped couplings can be held for being tapped; also, a less number of the taps may be used, as the nature of the work may require.

The dog or box *d* attached to the movable jaw is secured thereto by a bolt, *f*, Fig. 13, Plate 5. Said bolt passes through both the jaw and box in a sleeve, *g*, screwed into the jaw, as shown in Fig. 14. On the projecting end of the bolts are jam-nuts *h*. In order to adjust the box nearer to the one in the stationary jaw the sleeve *g* is turned by the application of a wrench to the collar. By this means the box is pushed forward and away from the jaw, but does not become loose, as the jaw-nuts draw the back of the box against the end of the sleeve, which is thereby held firmly in place.

Claims.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The upper system of taps D E F and the lower system G H I, as arranged to co-operate in relation to each other and in combination with the clamp-wheel I″, substantially in the manner and for the purpose set forth.

2. The screw F′ and lever D′, in combination with the clutch U and pulley V and clutch X and pulley W, substantially in the manner as and for the purpose specified.

3. The spring Q′, arm M′, and roller O′, as arranged in combination with the lever D′, in in the manner as and for the purpose set forth.

4. The adjusting-collars L′, as arranged in combination with the screw F′ and lever D′, for the purpose specified.

5. The slide R′, as arranged in combination with the lever D′, wheel T′, and clamp-wheel I″, substantially in the manner as and for the purpose set forth.

6. The shaft B″, clutch A″, collar *m*, spring Y, slide R′, lug *n*, and pinion V′, as arranged to operate in combination with the wheel T′ and clamp-wheel I″, in the manner as and for the purpose set forth.

7. The spring D″, shoulder *a*, pawl H″, and arm E″, as arranged to operate in combination with the clutch A″ and shaft B″, substantially in the manner as and for the purpose set forth.

8. The clamping-wheel I″, consisting of the series of rigid jaws J″ and movable jaws K″, and operated in relation thereto by means of the links L″, cams *c*, handles M″, and trip O″, substantially in the manner as described, and for the purpose specified.

9. The bolt *f*, sleeve *g*, and jam-nuts *h*, as arranged in combination with the movable jaw K″ and box *d*, in the manner as and for the purpose set forth.

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Witnesses:
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