4 Sheets--Sheet 1.

J. KACEROVSKY.

Machine for Tapping Pipe-Fittings.

No. 161,340. Patented March 30, 1875.

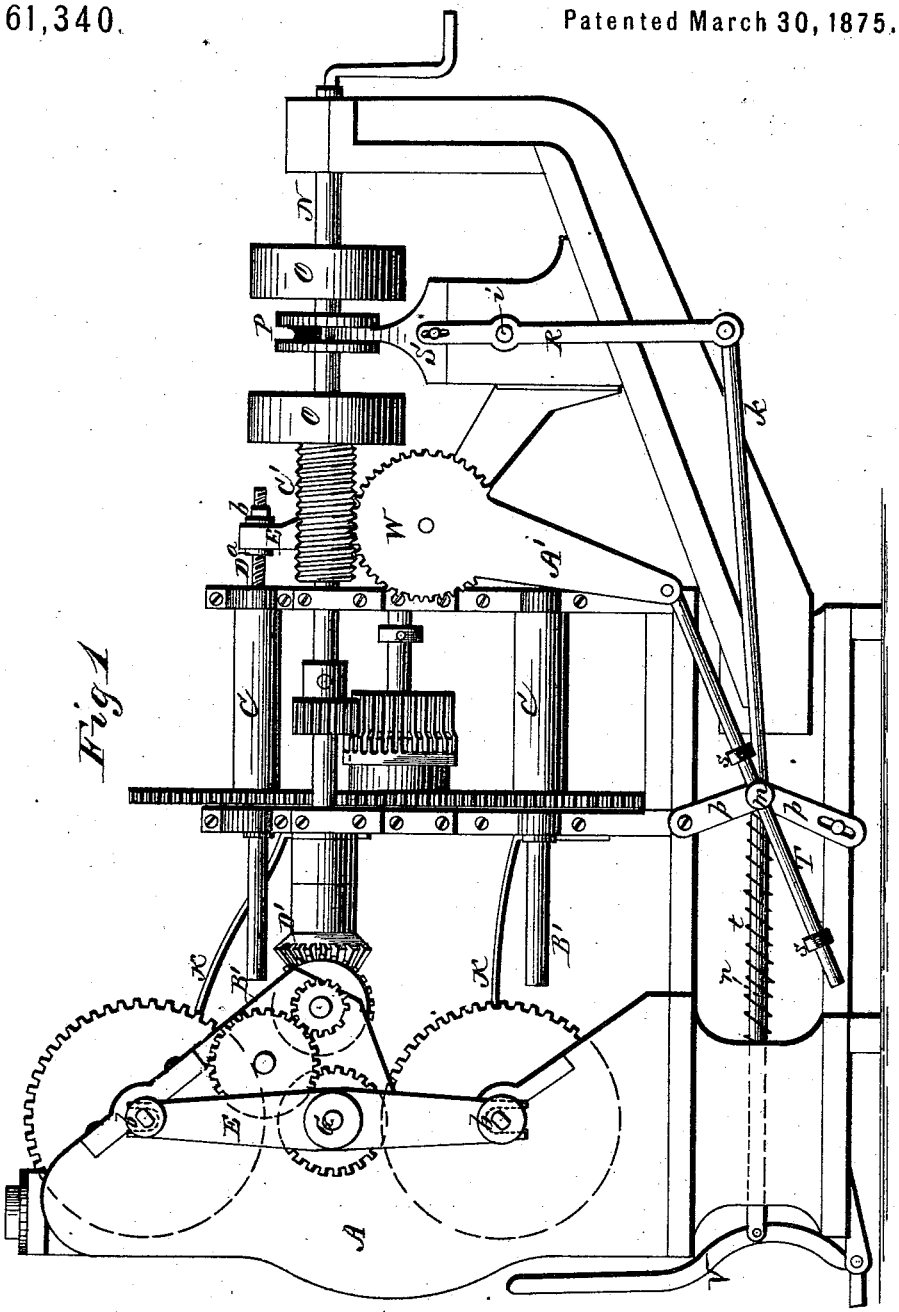

Fig 1

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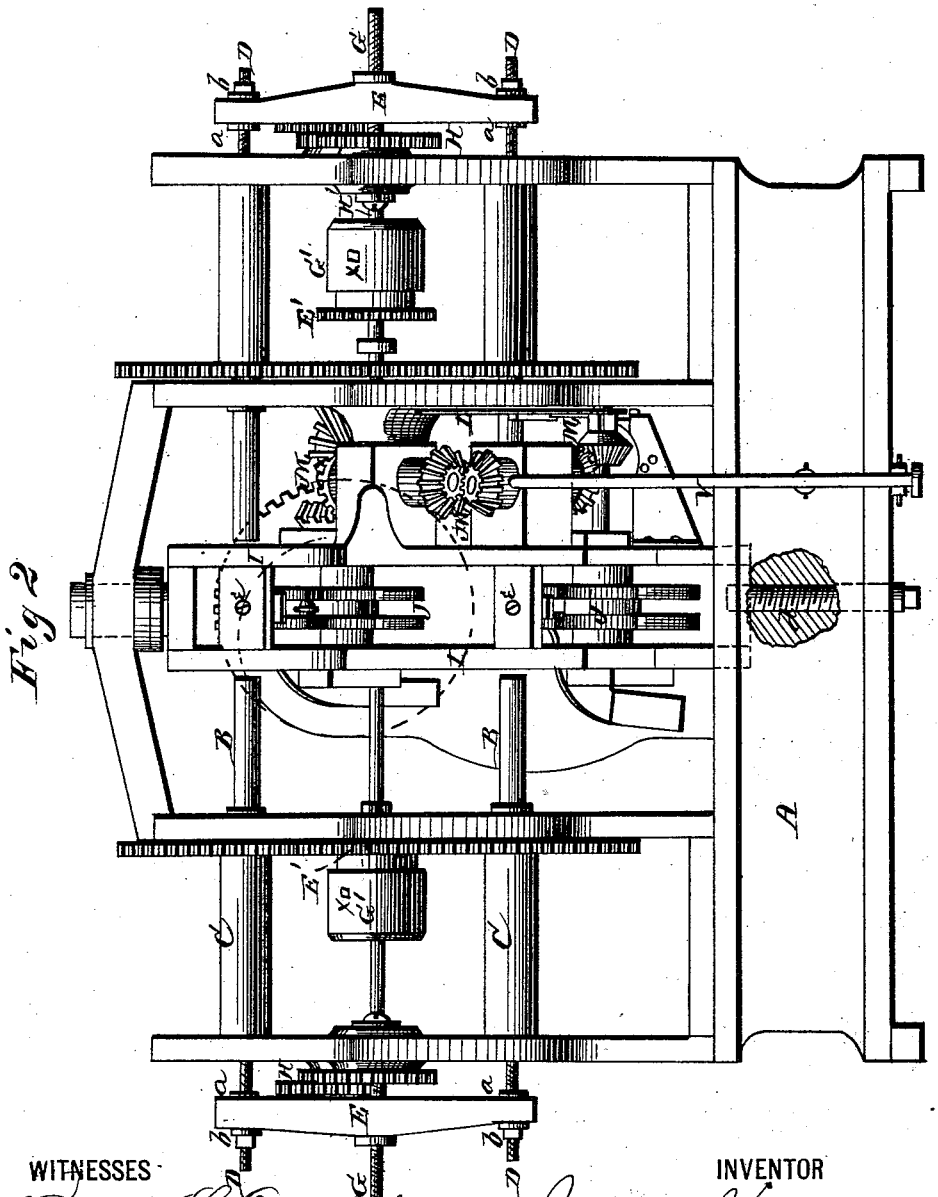

Fig 2

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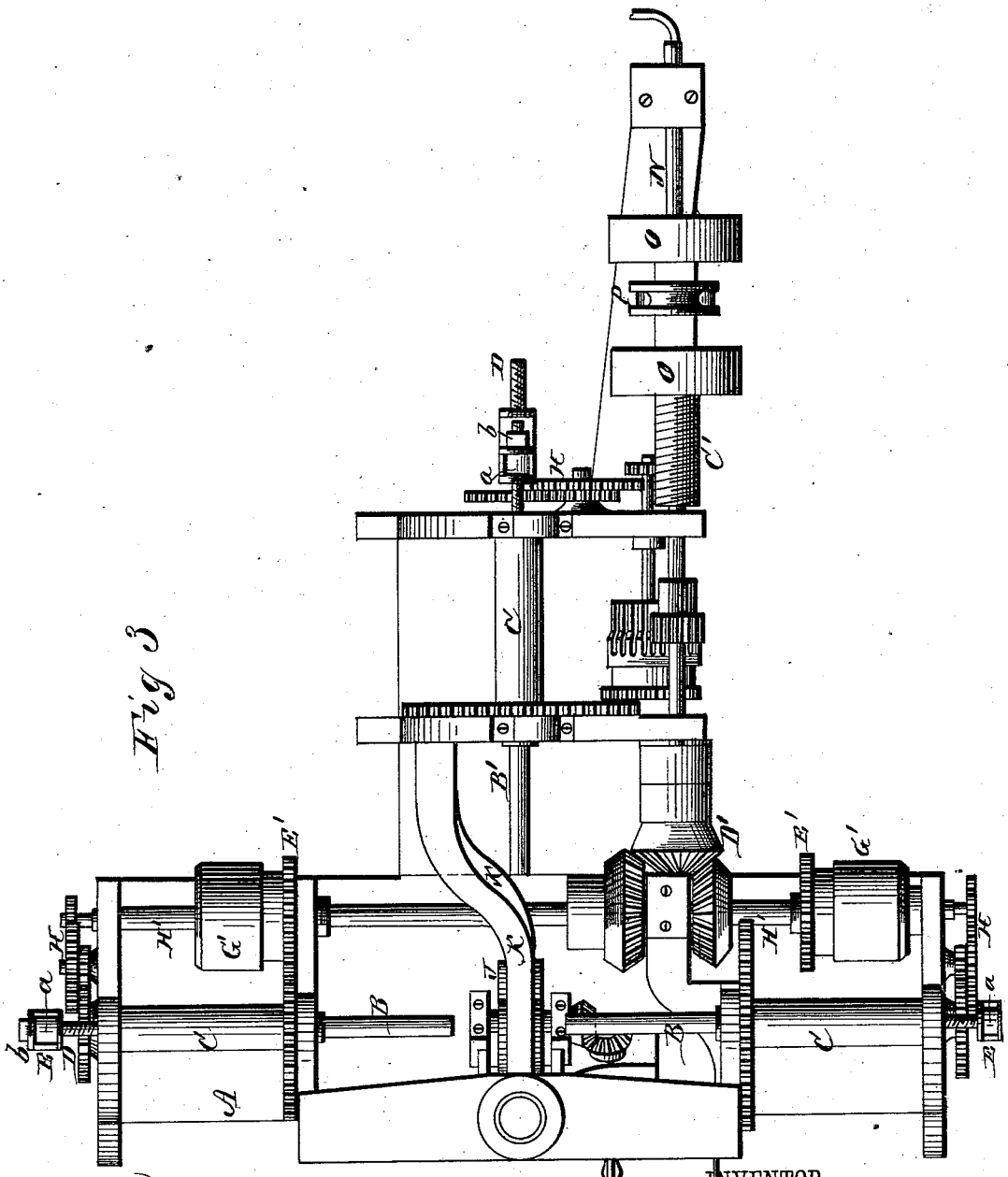
Fig 3



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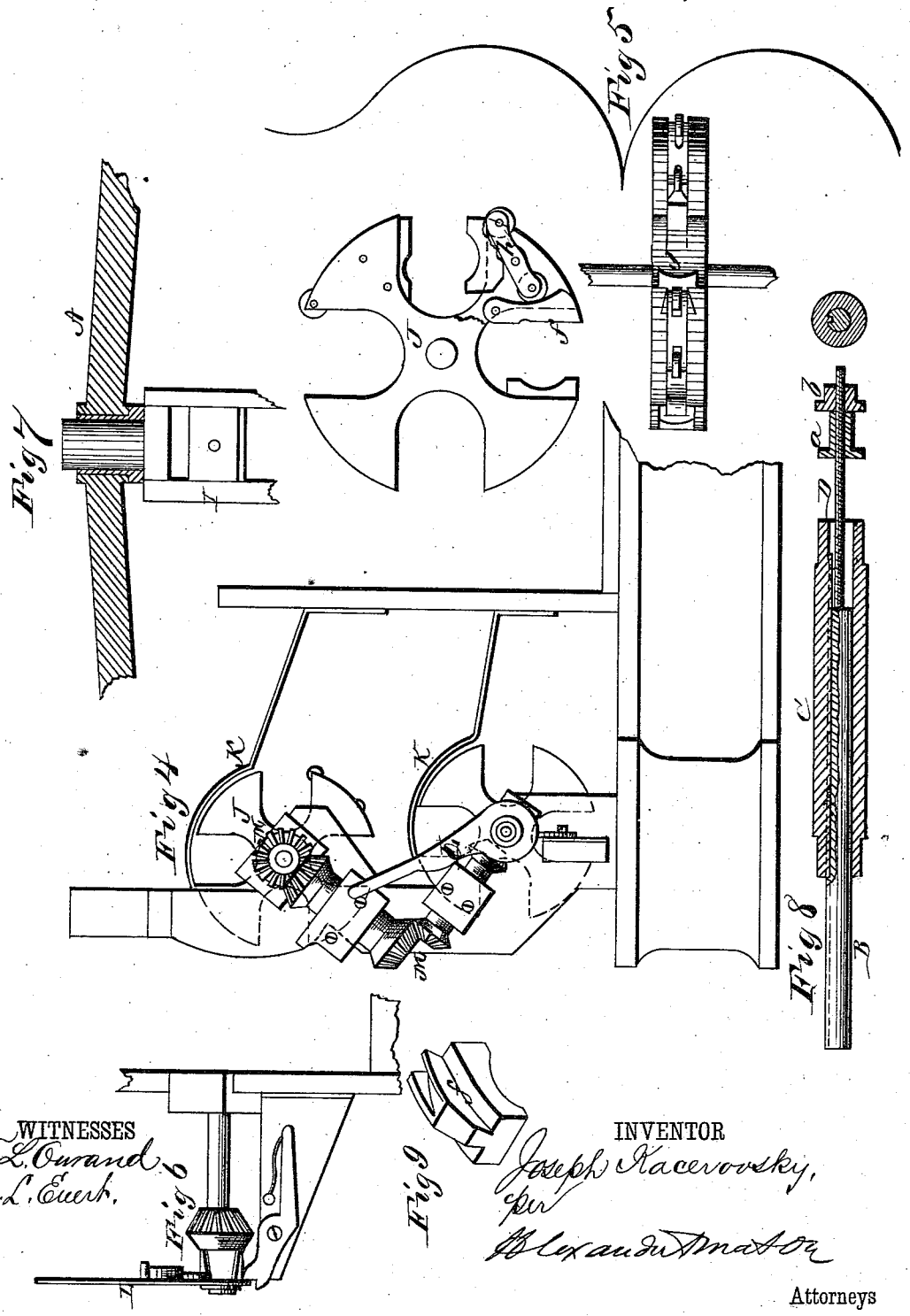

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UNITED STATES PATENT OFFICE.

JOSEPH KACEROVSKY, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO C. M. ALEXANDER AND J. M. MASON, OF WASHINGTON, D. C.

IMPROVEMENT IN MACHINES FOR TAPPING PIPE-FITTINGS.

Specification forming part of Letters Patent No. **161,340**, dated March 30, 1875; application filed August 28, 1874.

To all whom it may concern:

Be it known that I, JOSEPH KACEROVSKY, of Bridgeport, in the county of Fairfield and in the State of Connecticut, have invented certain new and useful Improvements in Machines for Tapping Steam, Gas, and Water Pipe Fittings; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a machine for tapping fittings for steam, water, and gas pipes, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a side elevation of my machine. Fig. 2 is a front view, and Fig. 3 a plan view, of the same. Figs. 4, 5, 6, 7, 8, and 9 are detached views of certain parts thereof.

A represents the frame-work of the machine, constructed in any suitable manner to contain the working parts thereof, as hereinafter described. On each side, running longitudinally with the main part of the frame A, are two mandrels, B B, one a suitable distance above and parallel with the other. B′ B′ are two other mandrels, which work at right angles with, and a suitable distance below the level of, the first mandrels mentioned. Each mandrel passes through and rests in a sleeve, C, which sleeves have suitable journals in the frame A. The outer ends of the mandrels are turned down, and have threads cut on them, as shown at D. These screws pass through barrel-nuts *a a*, which rest in the ends of a yoke, E, there being one yoke for each pair or set of mandrels, and the screws turn in and out through the barrel-nuts. The mandrels are feathered in their respective sleeves, as shown in Fig. 8, or otherwise so connected that the mandrels will be revolved by the revolution of the sleeves, and at the same time the mandrels be capable of moving out and in, as required. On the end of each screw D is a jam-nut, *b*, by means of which the screws can be set so that they may be varied for a longer or shorter tap. G G are feed-screws for each system or pair of mandrels, the upper and lower mandrel of each system being united by the yoke E, and moved in and out together by the feed-screw G, which also passes through the yoke, and is driven by gearing H. The feed-screws G are so arranged that they can be easily taken out and put in, and thus finer or coarser threaded screws used, if needed. I represents a vertically-adjustable frame, which sustains the revolving plates that carry the fittings, said frame being raised or lowered by a screw, *d*, on the under side of the main frame A, the object hereof being to make allowance for any variation of the work, so as to bring the center of the fittings and the taps in perfect range with each other. J J represent revolving plates or chucks for holding the fittings. In each plate are four sections, for receiving the fittings, and in each section is a movable jaw, *f*, which is operated by a swinging lever, *h*.

As the plate holding the fitting revolves, the end of the swinging lever *h* comes under a bar, K, which causes it to press hard on the movable jaw *f*, and thus holds the fitting firmly.

The bar K may be adjusted so as to bring more or less pressure to bear by means of the adjusting-screw *e*.

With this device the jaw will hold the fitting till it has passed the other center, or until after the lower system of taps has operated on the fittings, and the tapping is complete. After the last tapping, the chuck J continuing to revolve as it passes the center, the swinging lever *h* drops by its own weight, thus relieving the jaw *f*, and the fitting completed drops, by the law of gravity, out of the plate or chuck into the receiving-box.

L is a lever used to operate a train of bevel-gears, M, connected with the shafts upon which the chucks J J are placed and secured, said lever being arranged to be operated by the hand or foot, as desired.

By moving the lever a proper distance the plates or chucks are caused to revolve

a quarter of a circle, and the fittings are brought in suitable relation to the taps, to be operated upon. The lever L is provided with a suitable dog or pawl, to take into a notch at every quarter-turn. N is the driving-shaft, upon which are two driving-pulleys, O O, with clutch P between them for connecting the shaft with one or the other of the pulleys, or for working friction-gear. By thus throwing the clutch I am enabled to reverse the motion of the machine for withdrawing the taps. R is a lever or rod fastened loosely to the movable head S, which carries the clutch P. This rod is fulcrumed at *i*, and extends downward to a rod, *k*, to which it is joined by a loose joint. The rod *k* runs at right angles to the lever R, and is fastened to a swivel-pin, *m*, attached to the rod or lever T. Another rod, *n*, is also fastened to the same swivel-pin, and extends to the front of the machine, where it is operated by a lever, V. *p p* are two links, fastened to the main frame A, and also to the swivel-pin *m*, and form a toggle-joint. The rod T passes through and has free play back and forth in the swivel-pin *m*, and is provided with movable collars *s s*, which can be adjusted by set-screws to any points desired on said rod. *t* is a spiral spring, wound on the rod *n*, and working between the links *p p* and swivel-pin *m*, and the frame of the machine. W is a segment, provided with a downward-extending arm, A′, which is pivoted to the rod T. C′ is a worm, which can be moved to different positions on the driving-shaft N, and fastened to any point desired by a set-screw. The segment W is pivoted at a proper point to have its teeth take into the worm C′, and by adjusting the worm it may be set so that the segment will take or act on just so much of the thread as may be desired.

By setting the worm C′, and adjusting the collars *s s* correspondingly, the motion of the machine can thus be reversed at any point or time desired.

If it is desired to work only the side taps the set-screw that holds the gear-wheel D′ on the shaft N is loosened and the wheel moved along on said shaft, thereby throwing the end taps B out of gear. In like manner I can throw the side taps out and run the end taps; or I can, if I choose, throw out of gear the two end taps, and either one of the side taps, and thus work only one tap.

When a tap has been driven in as far as is desired it is necessary to reverse the machine to withdraw the tap. In doing so there is of course some lost motion, and it is necessary to provide for the same. This is accomplished in the following manner: The driving-gears E′ have each a loose collar, G′, which is fastened by a set-screw, *x*, to the shaft H′, and on the inside of the collar is a clutch, so arranged that the gear-wheel makes seven-eighths of a revolution before it acts on the collar G′. This enables the tap to start back square, and prevents stripping the threads.

The general operation of the machine is as follows: The fittings are placed in the revolving chucks J. The lever L is pulled up, which revolves the plate or chuck, and brings the fittings opposite and centered with the side mandrels B, carrying taps. As the section of the chuck carrying the fitting comes under the bar K said bar presses hard on the swinging lever *h*, which causes the jaw *f* to clutch the fitting firmly. The machine is then set in motion by the lever V, the operator using either his foot or hand, as is most convenient. The action of this lever is such that it throws the clutch P into gear with the driving-pulley O. The same action of the lever also compresses the spiral spring *t*, and the two links *p p* are brought in line and on a center with each other, and in this position they crowd each other hard enough to retain the spiral spring thus compressed.

The machine continues to run till the action of the segment W, in combination with the worm C′, draws up the rod T, and the lower collar *s* thereon is brought against the swivel-pin *m*, which pulls the links *p p* off the center, and the spiral spring *t*, immediately acting, throws the clutch P, by means of the connecting-rods T *k* and lever R, into the other pulley O, which is running with a cross-belt. In this manner the motion of the machine is reversed as soon as the taps have been driven as far as desired. As soon as the motion of the machine is reversed the taps stop, owing to the clutch in the collar G′, until the cog-gear E′ has made seven-eighths of a revolution. This gives ample time to make up for lost motion, and prevents stripping the threads or breaking the taps. While the taps are being withdrawn the segment W is traveling the worm the other way, and pushing the rod T downward, so that the upper collar *s*, when set properly thereon, when the tap is withdrawn, will have been brought against the swivel-pin *m*, and links *p p*, which, being connected with the rod *k* and lever R, brings the clutch P to the center between the two pulleys, and out of gear with either, and the machine then stops. Thus the machine stops every time the taps go in and come out, and it is then necessary to work the lever V to start it up again. While the machine is working, however, the operator puts in other fittings, and thus they are all ready in position when the machine stops, and there is no delay in feeding the machine.

It will readily be seen that by setting the worm C′ and the collars *s s*, the motion of the machine may be reversed at whatever point desired, thus accommodating the machine to deep or shallow fittings, as may be demanded.

After the fitting has been tapped at the sides, if it is needed to be tapped at the ends, as in the case of T's, the end taps B′ are run also. The end taps take the fitting after it has been tapped at the sides, and while the side taps are at work on another fitting the end taps are at work on a fitting which has been previously tapped at the sides. Thus,

while all six of the taps may be at work at the same time, they are not at work on the same fitting. This I am enabled to do by not running the end taps on the same level with the side taps, and in practice this has proved to be a great advantage. If all three of the ways were being tapped at once the work would be heated up much more, thus demanding more oil; and, besides this, there is great difficulty in truing or centering three ways at once, and either the fittings or the tools are apt to be injured or spoiled.

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

1. The plate or clutch J, provided with jaws *f* and levers *h*, in combination with the adjustable bar K on the main frame, for holding the fittings to be tapped, and releasing the same automatically, substantially as herein set forth.

2. The combination of the adjustable frame I, set-screw *d*, clutches J, lever L, and gearing M, all constructed substantially as and for the purposes herein set forth.

3. The combination of the adjustable worm C′, segment W, with arm A′, pivoted rod T, passing through the swivel-pin *m*, the adjustable collars *s s* on the rod T, the toggle-links *p p*, rods *k n*, spring I, lever R, and shipper S, all constructed substantially as and for the purposes herein set forth.

4. The combination of the movable clutch P, lever R, rod *k*, swivel-pin *m*, toggle-joint *p p*, rod *n*, spring *t*, and lever V, all constructed substantially as and for the purposes herein set forth.

5. The combination of the mandrels B B, formed with screws D D, the sleeves C C, yoke E, barrel-nuts *a a*, jam-nuts *b b*, adjusting-screw G, and gearing H, all constructed substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 29th day of July, 1874.

JOSEPH KACEROVSKY.

Witnesses:
HERMAN GAUSS,
F. W. SMITH.