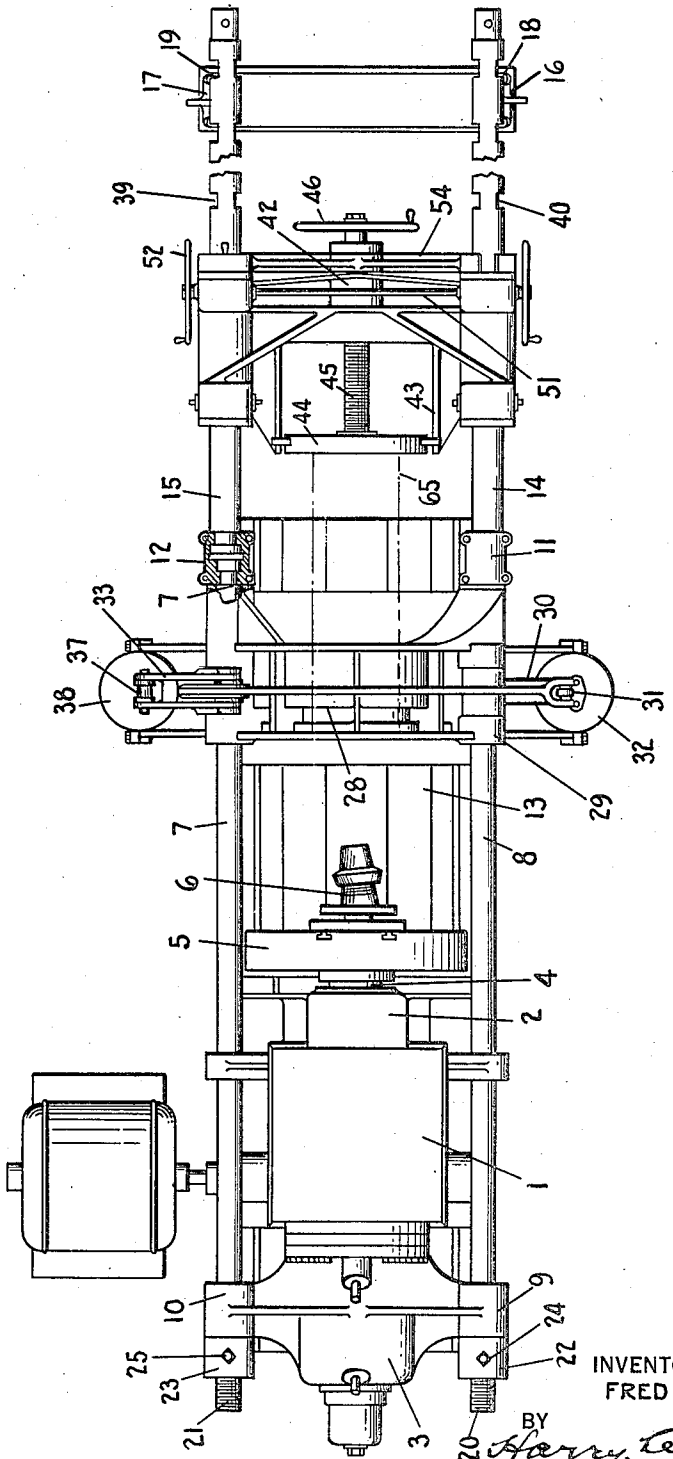
May 5, 1931. F. C. FANTZ 1,804,003

TAILSTOCK FOR MACHINES FOR FLANGING PIPES

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FIG. 1



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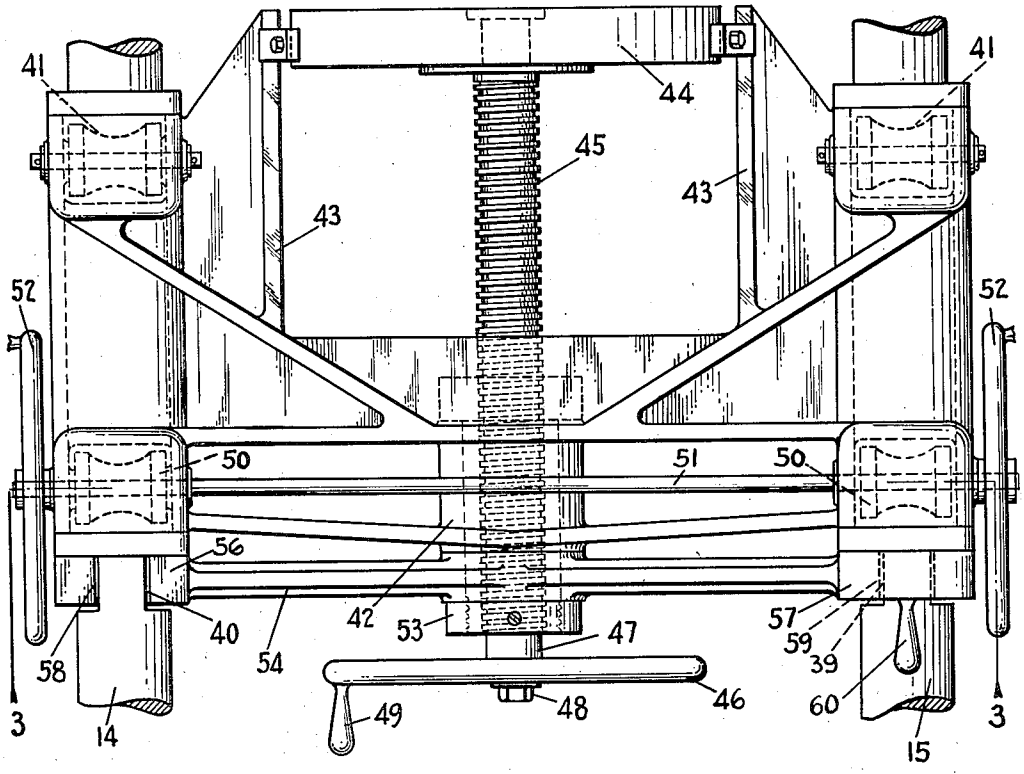


FIG. 2

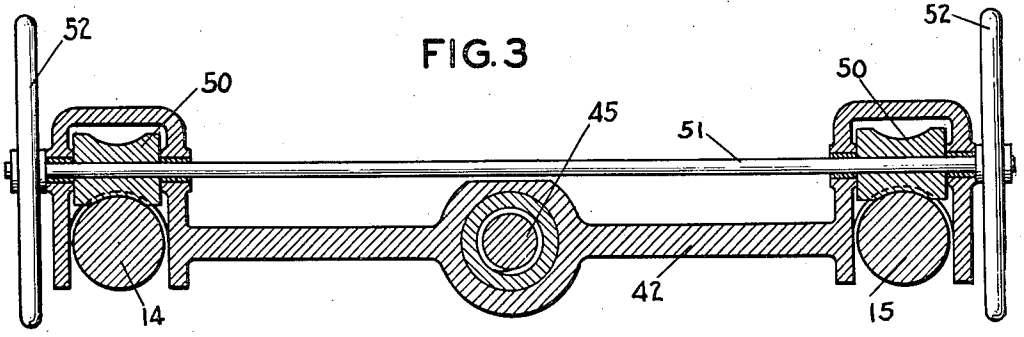


FIG. 3

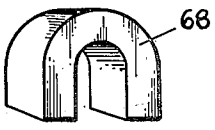


FIG. 10

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TAILSTOCK FOR MACHINES FOR FLANGING PIPES

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FIG. 4

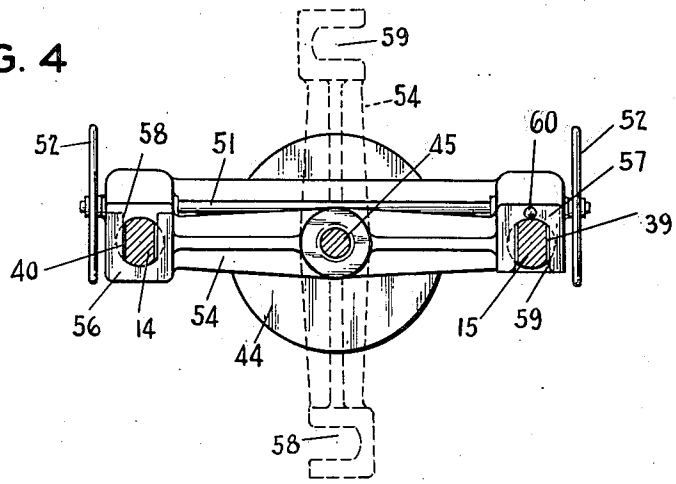
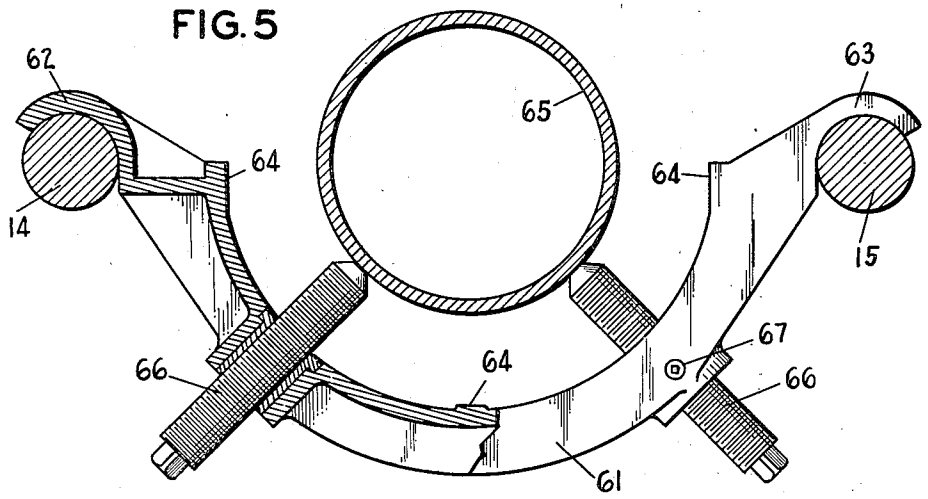


FIG. 5



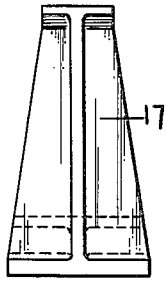


FIG. 7

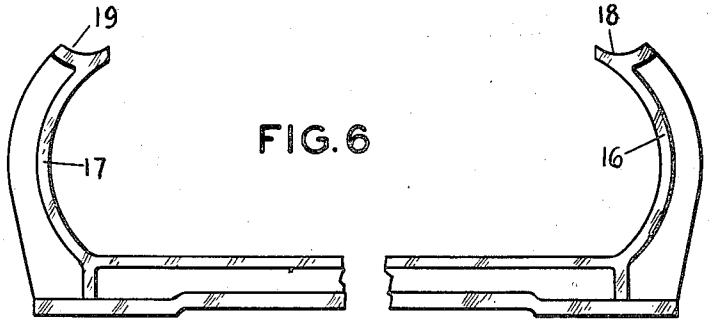


FIG. 6

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TAILSTOCK FOR MACHINES FOR FLANGING PIPES

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FIG. 8

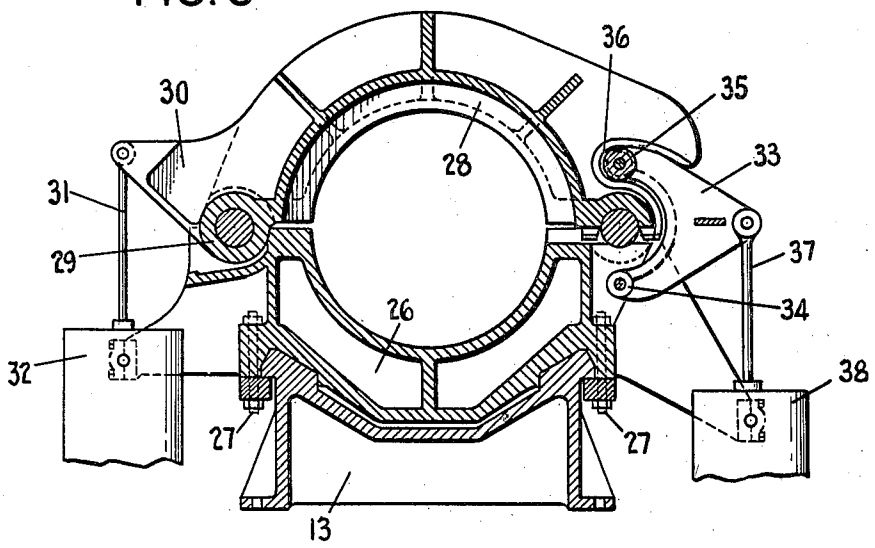
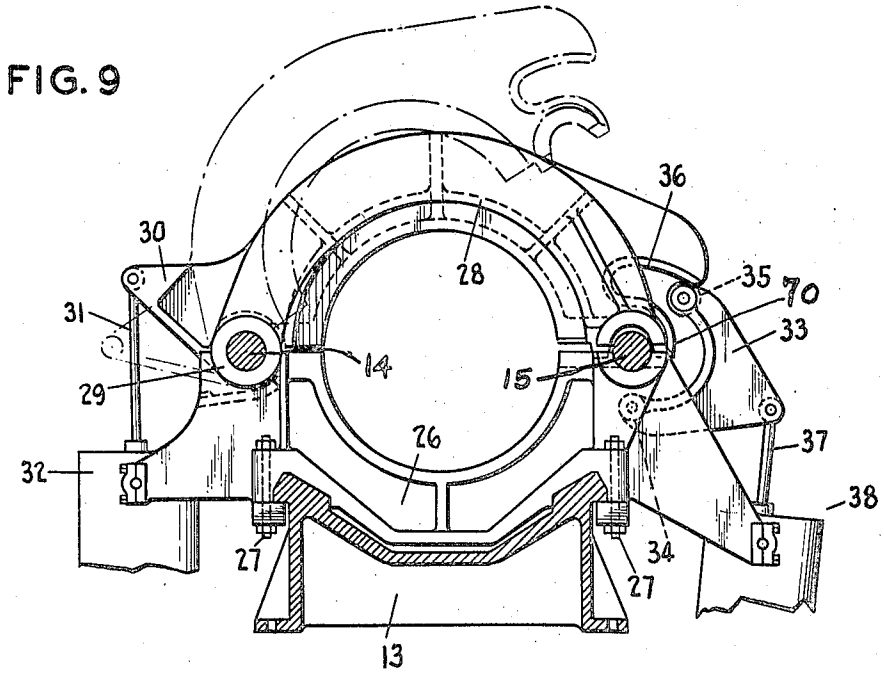


FIG. 9



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UNITED STATES PATENT OFFICE

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TAILSTOCK FOR MACHINES FOR FLANGING PIPES

Application filed August 13, 1930. Serial No. 474,921.

My invention relates to the type of machines described in my copending application, Serial No. 474,920, and has for its object, to provide improved means for holding the work against the forming device. The most important fact to be considered in machines of this class is that time is the most essential element and that everything is directed to that end, the next fact is that these machines are not production machines, i. e., machines designed to handle a quantity of pipes or tubes of the same diameter and length, but are used to fabricate all types of tubing, all lengths and sizes, hence it is of the greatest importance to provide means to change the machine with great rapidity from one size or length to another.

In machines of this character, with which I am familiar, it requires considerable time to adjust the tailstock into the proper position upon the tension rods.

My invention has for its principal object to provide a construction for the tailstock so that it can be quickly and easily locked in position against longitudinal movement upon the tension rods, and which will resist the hydraulic pressure by the tensile strength of the tension rods, rather than by the sheer of pins inserted in holes in the tension rods.

My invention has for its further object, to provide an improved means of carrying the tailstock on the tension rods, so as to greatly facilitate its adjustment for the various lengths of pipe to be flanged.

My invention has for its further object to provide guides for the face plate to slide upon thus relieving the screw, which moves the face plate of the tailstock, from the great weight and tendency to weave when subjected to the tremendous hydraulic pressure required for these machines.

It is well known that in machines of this character, when hydraulic pressure is brought to bear upon the work, there is a tremendous strain on the machine, which tends to buckle or distort it. My invention has for its further object, to provide a construction in which the end thrust produced by the work in the machine will be taken care of by steel tension rods, so that the bed of the machine will serve merely as a means for holding the various parts of the machine in alignment.

My invention has for a further object to provide means whereby the clamp which holds the dies may be adjusted toward or from the spindle face plate, this adjustment being most desirable for the purpose of taking care of various classes of work, some of which require longer operations, and others a greater distance between the clamp and the spindle.

A concrete embodiment of my invention is illustrated in the accompanying drawings, to be considered as part of this specification, in which—

Fig. 1 is a top or plan view of my improved machine;

Fig. 2 is a detail view, in plan, of the tailstock face plate, including the device for clamping the tailstock to the tension rods;

Fig. 3 is a sectional view, taken on line 3—3 in Fig. 2, in the direction indicated by the arrows;

Fig. 4 is a detail view of the clamping device in Fig. 2, showing in dotted lines how it is freed from the tension rods;

Fig. 5 is an assembly of the pipe support, partly in section;

Fig. 6 is a detail view, showing the support for the tension rods;

Fig. 7 is an end elevation of the same;

Fig. 8 is a cross-section of my improved clamping device for holding the forming die;

Fig. 9 is the same, showing the clamping device open; and

Fig. 10 is a perspective view of one of

the U-shaped or horseshoe-shaped take-up blocks.

Similar reference numerals refer to similar parts throughout the entire description.

As shown in the drawings, my device comprises a headstock, which consists of a gear case *i*, (which, as seen, is of a very light casting, and carries no end thrust when the machine is working, contrary to the usual construction,) bearings 2 for a spindle 4 of the machine, hydraulic cylinder 3, and face plate 5, which carries wabbler 6.

The headstock is attached to a bed 13, by resting on inclined surfaces 95 and 96, 97 and 98. It will be apparent, if a line is projected from the center of the work to the surfaces 95 and 96, that the angle is very much wider than would be the case in standard construction, where the headstock is bolted upon a horizontal flange (not shown) cast on the bed 13 adjacent its face; and the tendency of the machine to weave sidewise is resisted, not by the sheer of such bolts, but by the actual metal,—this due to the mounting as shown and described.

The entire strain produced by the work of this machine is taken care of by strain-bars or tension rods 7 and 8, and 14 and 15. The tension rods 7 and 8 are carried by the bed 13 of the machine, and are mounted in supports 9 and 10, and 11 and 12. The supports 11 and 12 also carry the ends of the tension rods 14 and 15, and are provided with sockets to receive heads formed on the ends of the rods 7, 8, 14 and 15, respectively. These rods 14 and 15 are carried by supports, clearly seen in Figs. 11 and 12. These supports are formed with upwardly-extending arms 16 and 17, which terminate in arcuate sockets 18 and 19, in which the rods 14 and 15 rest. These arms 16 and 17 are tied together by a cross-member, the bottom of which is adapted to be bolted to the foundation.

The rods 7 and 8 are provided with threaded ends 20 and 21, which project beyond the supports 9 and 10, and have mounted thereon nuts 22 and 23, which are securely locked on the threads by means of set screws 24 and 25. It will thus be seen that the entire end thrust of the machine is sustained by these rods 7 and 8.

Suitable clamping means for holding the dies (not shown) and the pipe, is provided. This clamp is mounted upon the tension rods 7 and 8, and 14 and 15. The rods 7 and 8 extend through the main body of the clamp, and their ends are secured in sockets formed in the supports 11 and 12. Similar sockets secure the heads on the tension rods 14 and 15. These supports 11 and 12 are formed integral with the main portion of the clamp, so that to all intents and purposes the tension rods 7 and 8, and 14 and 15, extend clear through the clamp, and in that manner the tendency to weaving, and consequent opening of the clamp, is practically avoided.

This clamp consists of a lower half 26, which is secured to the bed 13 by means of bolts 27, in the usual and standard manner. The upper half 28 of the clamp is pivotally secured, by means of a pivot 29, to the lower half 26. This upper half 28 has an outwardly-projecting lug 30, which is secured, by means of a rod 31, to a double-acting air-hoist 32. Means for holding the upper half 28 closed, consists of a lock 33, pivotally mounted on a pivot 34, which is mounted in the lower half 26. The lock 33 is secured, by means of a link 37, to a second double-acting air-hoist 38.

The upper portion of the lock 33 carries a roller 35, which is fitted to a slot 36, formed in the end of the upper half 28 of the clamp. As clearly seen from Figs. 8 and 9, the lower portion 70 of the slot 36 terminates at a point, so that when the lock 33 is swung to open the clamp a slight distance, as indicated in Fig. 9, to permit longitudinal movement of the pipe 65 where that is desirable, it will be in a position to permit the upper half 28 of the clamp to swing upon the tension rod 14, so that any necessity for spotting the lock 33 is avoided, for as soon as the lock 33 has been swung sufficiently to lift the upper half 28 of the clamp so as to permit longitudinal movement of the pipe 65, it is in position to be swung wide open.

The pipe clamp is secured to the bed plate 13, by means of bolts 27. By loosening these bolts 27, the clamp can be moved toward or from the face plate 5, pushing the tension rods 7 and 8 through the supports 9 and 10, and if they project beyond the threaded ends 20 and 21 of these rods 7 and 8, so that the nuts 22 and 23 cannot take up the slack, I provide a number of U-shaped, or horseshoe-shaped, members or take-up blocks 68, clearly shown in Fig. 10. These blocks are of varying dimensions as to thickness, so as to permit the take-up of the projecting portion of the tension rods 7 and 8, to permit the tightening of the nuts 22 and 23 to securely hold the head of the machine in place.

The tension rods 14 and 15 are provided with a plurality of registering slots 39 and 40. The tailstock of the machine is mounted upon two pairs of rollers 41 and 50, which roll upon the tension rods 14 and 15. On the cross-member 42 are parallel horizontal guides 43, to which is slidably secured the face plate 44. This face plate 44 is secured to a central revolvable screw 45, which extends through a threaded portion formed in the cross-member 42, and has a wheel 46 secured to its end 47, by means of a nut 48, or in any other suitable or convenient manner. A handle 49 is provided for convenient manipulation of the wheel 46 and

the screw 45, for the rotating of the face plate 44. From the foregoing it will be seen that the guides 43 sustain the entire weight of the face plate 44 so that all that the screw 45 has to do is to adjust the position of the face plate without having any tendency to bind whatever.

The rollers 50 are fixedly secured to a shaft 51, which is secured to the two rods 14 and 15. This shaft 51 has hand wheels 52, provided with suitable handles, for convenient manipulation thereof. It will be obvious that by rotating these wheels 52, the shaft 51 will advance or retract the tailstock carriage upon the rods 14 and 15, so as to accommodate the varying length of pipe upon which the machine is working.

My improved stop preferably consists of a bar 54, rotatably secured intermediate the cross-member 42 and a collar 55, which takes up the end threads on the screw 45. The ends 56 and 57 of the bar 54 are provided with U-shaped slots 58 and 59, the slot 58 opening upwardly and the slot 59 opening downwardly. These U-shaped slots 58 and 59 are adapted to engage the registering slots 39 and 40 formed in the tension rods 14 and 15. By swinging the bar 54, as indicated in the dotted lines in Fig. 4, the U-shaped slots 58 and 59 will be drawn out of engagement with the tension rods 14 and 15, and the tailstock carriage is then free to move longitudinally upon the tension rods 14 and 15. When it has been moved up to the proper position in which to engage the work, the bar 54 is swung upon its support and the sides of the U-shaped slot 58 will enter the slot 40 and the sides of the U-slot 59 will enter the slot 39. A handle is provided, for the convenient manipulation of the bar 54. When the ends 56 and 57 of bar 54 are in the slots 39 and 40, the face plate 44 can advance or retract so as to take care of any slight discrepancy between the face plate 44 and the end of the pipe 65 to be flanged, as obviously there is considerable distance between the slots 39 on the tension rods 14 and 15. Although I have described in some detail a specific form for this lock, other types of quick acting locks may be used and I do not wish to be understood as limiting myself to such details except as such limitations appear in the claims.

A further desirable feature of this construction is, that the adjustment may be predetermined when a quantity of pipe of given size and length is needed. When the adjustment has once been made, all that is required in changing the pipe is to swing the bar 54, when the tailstock can be easily slid along the tension rods 14 and 15 until the pipe 65 is in position, and then advanced until the face plate 44 contacts the pipe 65, when the ends 56 and 57 of the bar 54 can be swung into the slots 39 and 40 in the tension rods 14 and 15, and work can then proceed without loss of time in adjustment.

In Fig. 5 I have shown a detail view of my improved pipe support for my machine, which comprises an arcuate casting 61, the ends 62 and 63 of which are curved to conform to the tension rods 14 and 15. Finished pads 64 are provided, to furnish satisfactory measuring means to center the pipe 65. Set screws 66 are suitably mounted in the casting 61, to locate the pipe 65 securely, locking screws 67 being provided to hold the set screws 66 in position after the pipe 65 is correctly centered.

Having described my invention, what I regard as new, and desire to secure by Letters Patent of the United States, is:

1. In a machine of the type described, tension rods, supports on the head of the machine through which said rods pass, securing means on said rods adjacent said supports, a die-holding clamp attached to said rods, a tailstock slidably mounted on said tension rods, manually operable means to move said tailstock along said rods, horizontal guides on said tailstock, a face plate slidably mounted on said guides, a screw secured to said face plate mounted in said tailstock, manually operable means to rotate said screw, there being a plurality of registering slots in said tension rods, and means mounted on said tailstock, the ends of which have U-shaped slots therein adapted to engage the slots in the tension rods.

2. In a machine of the type described, tension rods, supports on the head of the machine through which said rods pass, securing means on said rods adjacent said supports, a die-holding clamp attached to said rods, a tailstock slidably mounted on said tension rods, there being a plurality of registering slots in said tension rods, means mounted on said tailstock, the ends of which have U-shaped slots therein adapted to engage the slots in the tension rods, a face plate slidably mounted on guides on said tailstock, and manually operable means to adjust the position of said face plate longitudinally of said tension rods.

3. In a machine of the type described, a headstock, tension rods, supports on the head of the machine through which said rods pass, a tailstock carried by rollers mounted upon said tension rods, manually operable means to rotate said roller from either side of the machine, there being a plurality of slots in said tension rods, and quick operating means carried by said tailstock which engages the slots in said tension rods.

4. In a machine of the type described, tension rods, supports on the head of the machine through which said rods pass, securing means on said rods adjacent said supports, means to space said securing means from

said supports, a die-holding clamp attached to said rods, a tailstock slidably mounted on said tension rods, manually operable means to move said tailstock upon said rods, there being a plurality of registering slots in said tension rods, and means mounted on said tailstock, the ends of which have U-shaped slots therein adapted to engage the slots in the tension rods.

5. In a machine of the type described, tension rods, supports on the head of the machine through which said rods pass, securing means on said rods adjacent said supports, a die-holding clamp attached to said rods, a tailstock slidably mounted upon said tension rods, there being a plurality of registering slots in said tension rods, rollers mounted in said tailstock which roll upon said tension rods, a shaft upon which a pair of rollers is mounted, means manually operable from either side of the machine to rotate said shaft, and a bar rotatably mounted on said tailstock, the ends of which have U-shaped slots therein adapted to engage the slots in the tension rods.

6. In a machine of the type described, tension rods, supports on the head of the machine through which said rods pass, securing means on said rods adjacent said supports, means to space said securing means from said supports, a die-holding clamp attached to said rods, a tailstock slidably mounted upon said tension rods, there being a plurality of registering slots in said tension rods, a bar rotatably mounted on said tailstock, the ends of which have U-shaped slots therein adapted to engage the slots in the tension rods, a face plate slidably mounted on guides formed on said tailstock, and manually operable means to adjust the position of said face plate longitudinally of said tension rods.

7. In a machine of the type described, a headstock, tension rods, supports on the head of the machine through which said rods pass, a tailstock slidable upon said tension rods, manually operable means to move said tailstock along said rods, quick operating means secured to said tailstock to detachably engage a predetermined pair of slots formed in said tension rods, to positively hold said tailstock against movement after adjustment by said manual means.

8. In a machine of the type described, tension rods, supports on the head of the machine through which said rods pass, securing means on said rods adjacent said supports, a die-holding clamp attached to said rods, a tailstock slidably mounted upon said tension rods, there being a plurality of registering slots in said tension rods, rollers mounted in said tailstock which roll upon said tension rods, guides formed on said tailstock, a face plate slidably mounted on said guides, and manually operable means to adjust the position of said face plate longitudinally of said tension rods.

9. In a machine of the type described, a headstock, tension rods secured to said headstock, a tailstock carried by rollers mounted upon said tension rods, manually operable means to rotate said rollers, guides on said tailstock, a face plate slidable thereon, means for moving the face plate longitudinally of said rods, and quick operating means carried by said tailstock to engage slots formed in said tension rods.

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