(No Model.)

C. M. CONRADSON.

ROD FEEDING DEVICE FOR TURNING LATHES.

No. 497,631. Patented May 16, 1893.

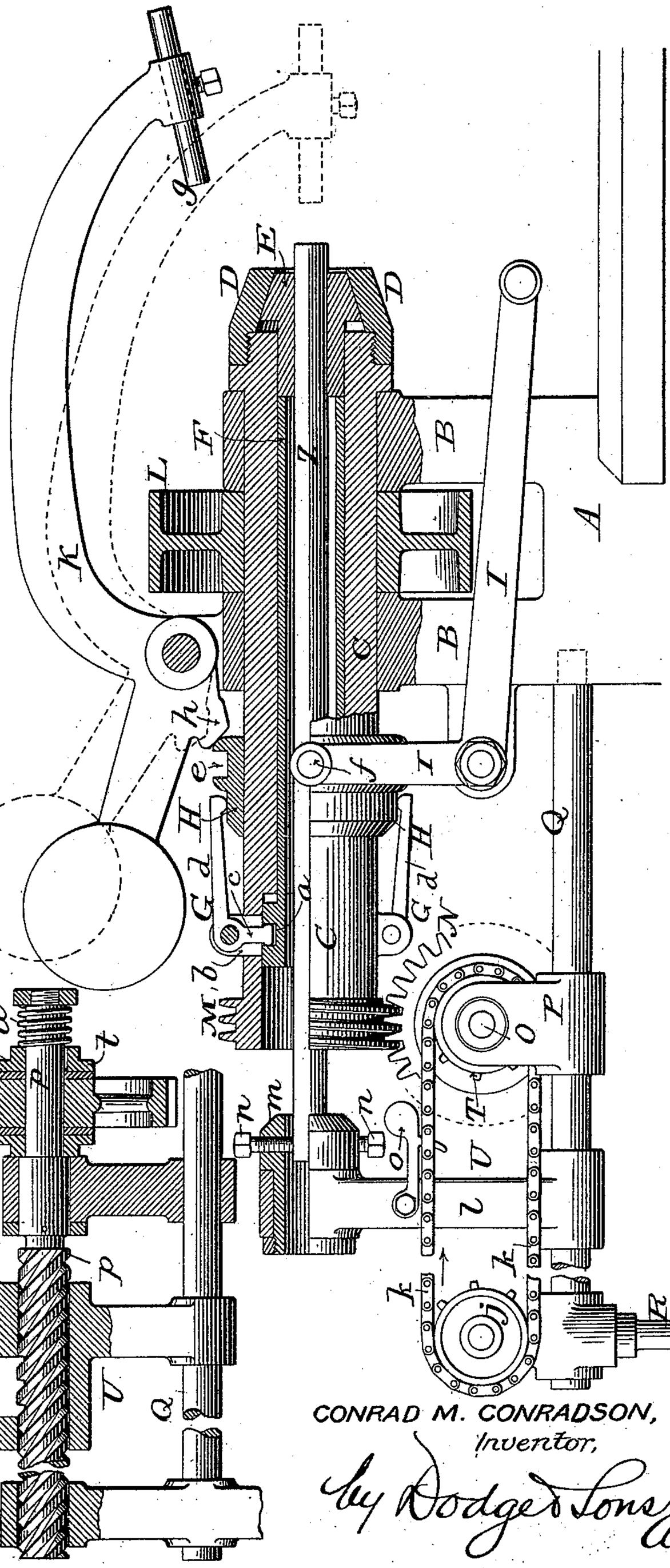

Fig. 1.

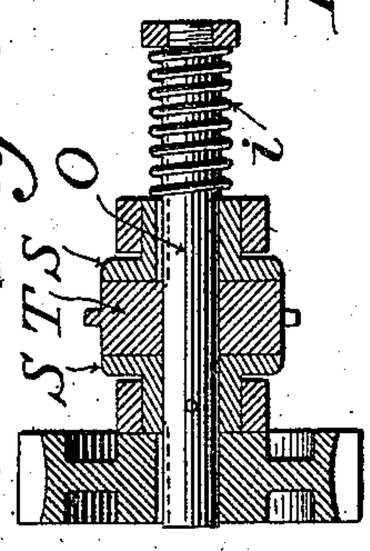

Fig. 2.

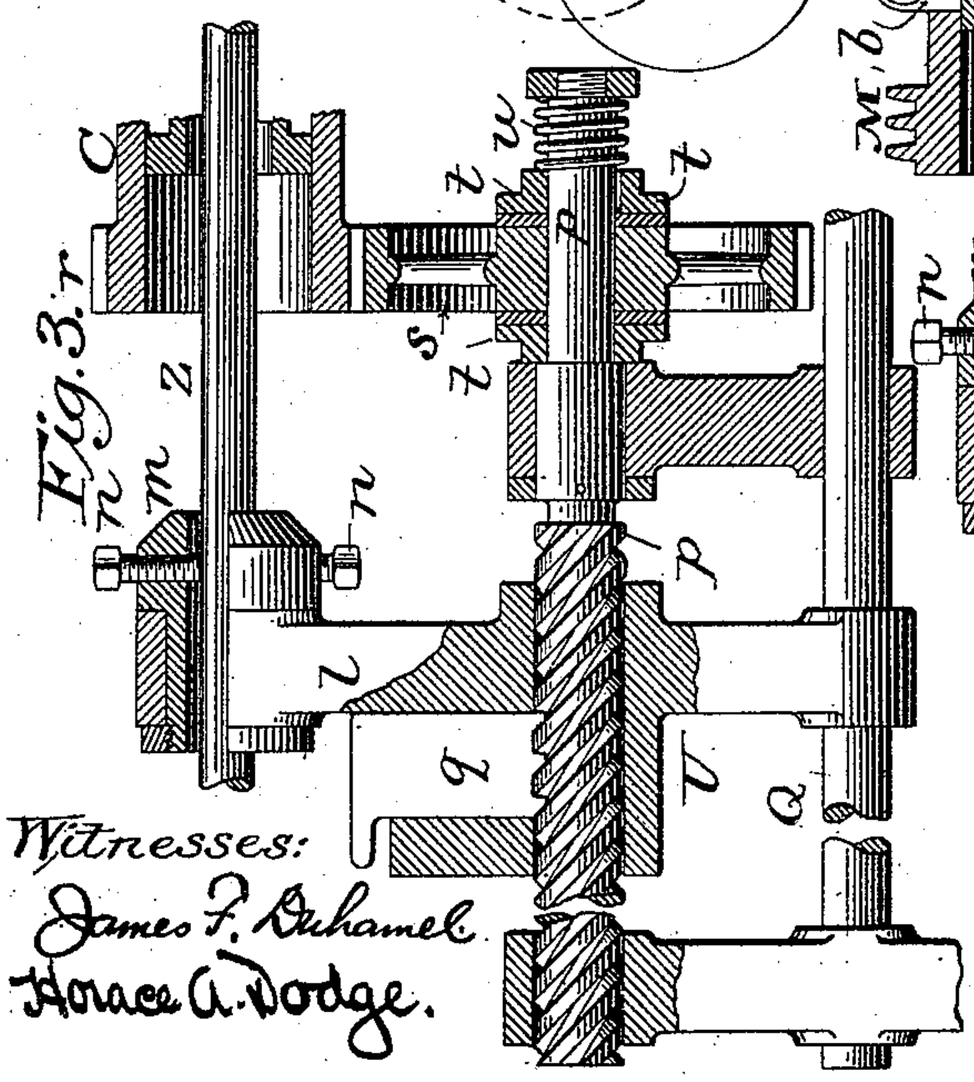

Fig. 3.

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UNITED STATES PATENT OFFICE.

CONRAD M. CONRADSON, OF MADISON, WISCONSIN.

ROD-FEEDING DEVICE FOR TURNING-LATHES.

SPECIFICATION forming part of Letters Patent No. 497,631, dated May 16, 1893.

Application filed November 28, 1892. Serial No. 453,421. (No model.)

To all whom it may concern:

Be it known that I, CONRAD M. CONRADSON, a citizen of the United States, residing at Madison, in the county of Dane and State of Wisconsin, have invented certain new and useful Improvements in Rod-Feeding Devices, of which the following is a specification.

My invention relates to rod or stock-feeding devices for screw machines or similar machines employing a hollow arbor, and consists in a novel construction of the same, as hereinafter set forth and claimed.

In the drawings,—Figure 1 is a side elevation, partly in section; Fig. 2, a horizontal sectional view on the line *x*—*x* of Fig. 1; and Fig. 3, a view illustrating a slight modification.

A indicates a portion of the main frame, and B B uprights or standards thereon, carrying the hollow arbor C. The hollow arbor has at its inner end a conical collar D against which the inclined faces of the sliding jaws E act.

F indicates a tube or sleeve mounted within the hollow arbor and arranged to move the jaws along the inclined faces of the collar, and cause them to grasp or bite the stock Z. This tube or sleeve is provided with a circumferential groove *a* to receive the inner arms or ends *c* of the elbow levers G, which latter are pivoted in the hollow arbor, as shown in Fig. 1; the said arbor being slotted as at *b* to allow the inner ends of the levers to project inward to engage the sleeve. The elbow levers G,—of which there are preferably two,—have their tails *d* extending in the direction of the feed, and are designed to bear upon a collar H encircling the hollow arbor. This collar H is grooved circumferentially as at *e* to receive the studs *f* of the hand lever I which latter is pivoted in an arm or bracket J of the frame of the machine. When the lever I is moved so as to carry the collar H beneath the tails of the levers G, the latter will be rocked or tipped upon their pivots and move the tube or sleeve F forward. This movement of the sleeve causes the jaws E to ride along the inclined face of the collar D and move inward radially to grasp the rod or stock. When the lever I is moved in the opposite direction, the collar H will be withdrawn from beneath the tails of the levers G; and as the tails *d* are heavier than the arms *c*, the levers will be rocked, and, through their arms *c*, move the tube F backward and release the jaws.

In order to properly gage or determine the feed of the rod or stock, I employ a weighted arm K which is pivoted at a point between its ends to one of the uprights, the inner end of said arm being provided with an adjustable stop or bar *g*. At or near its pivotal point the arm or lever K is provided with an inclined heel *h* which is designed to be acted upon by the sliding collar H. Now when the collar moves in such direction as to release the chuck jaws, it will strike the heel of the lever, rock the same upon its pivot, and bring the stop *g* into line with the projecting end of the stock (as shown in dotted lines) so that the latter cannot be fed any farther through the arbor than is permitted by the stop against which the stock will strike. If the collar H be moved in the opposite direction to cause the jaws to grasp the stock, the weight on the arm or lever K will throw the stop or bar *g* up out of line with arbor as shown in Fig. 1. From this it will be seen that the gage or stop is brought automatically into position whenever the chuck jaws are released to permit the feeding of the stock, and is automatically thrown up out of the way upon the clamping of the stock by the jaws.

At a point between the uprights B B, the arbor C is provided with a band wheel L, while at its outer or rear end it is provided with a worm M, which latter is designed to engage a worm wheel N, as shown in Fig. 1. This worm wheel is keyed to a shaft O journaled in blocks or bearings P,—the said blocks P being supported on rods or bars Q, secured at one end to the main frame and supported at other points by feet R. Any other suitable supporting frame may be substituted for that shown.

Mounted upon the shaft O, between two collars S S, is a sprocket wheel T, which is designed to be held normally in engagement with the collars, by means of a coiled spring *i*, but which when meeting with a predetermined resistance will remain at rest while the shaft continues to rotate. The collar next to the worm wheel is secured to the shaft by a pin, while the other is keyed to the shaft so that while it turns or rotates with the shaft,

it may also move toward and from the face of the sprocket a limited distance. By varying the force or action of the spring, the point at which the sprocket will begin to slip or turn independently of the shaft and its collars, may be accurately regulated. A second sprocket *j* is mounted upon the supporting frame, in line with wheel T, and about these two sprockets a chain *k* passes,—the said sprocket wheels being separated a distance from each other, preferably equal to the length of the stock or rod to be fed through the arbor.

U indicates a traveling rod-carriage or holder which in the present instance is shown as comprising a block *l* adapted to move lengthwise upon the rods Q or other suitable supports, and having at its upper end a rotatable thimble *m* and rod-clamping screws *n*.

The holder or carriage U is provided with a latch or hook *o* which is designed to engage the chain *k*, so that when motion is imparted to the chain, the holder or carriage will also be caused to travel in the same direction.

The operation of this rod feeding mechanism is as follows: The hollow arbor is rotated, and, through the worm gearing, this motion is imparted to the shaft O. The spring *i* pressing upon the outer collar S holds the latter in contact with the sprocket T and causes the latter to turn with the shaft O. Motion thus imparted to the sprocket is transmitted through the chain *k* and latch *o* to the holder or carriage U in which the rear or outer end of the stock is clamped. The carriage being thus fed toward the chuck or main frame, feeds the rod or stock through the hollow arbor until the front end of the stock strikes against a gage or stop and prevents any further feed of the stock. Although the feed of the stock is stopped, the arbor, the worm wheel, and the shaft O, continue to turn or rotate, while the sprocket T remains at rest; the resistance offered to further feed of the stock exceeding the friction exerted by the spring *i*. As soon, however, as the rod is ready to be fed forward another predetermined distance, it is only necessary to release the hold of the chuck jaws on the stock, whereupon (the resistance to the feed of the stock being removed) the friction produced by the spring *i* will at once cause the sprocket to turn with the rotating shaft, and, acting through the chain, again feed the carriage U forward the predetermined distance. This step-by-step feed of the rod is repeated until the rod or stock has been mostly consumed. The latch *o* is then raised up out of engagement with the chain, and the carriage U moved back to the outer wheel *j* by hand, preparatory to feeding a new rod or stock, and its hook or latch *o* engaged again with the chain. So far as the operation of this rod feeding mechanism is concerned, it is obvious that the special gage or stop K which I have herein shown and described, is not essential; any means which shall offer sufficient resistance to the feed of the stock being all that is required. For instance, the chuck jaws may themselves perform this function.

In the construction shown in Fig. 3, I dispense with the worm-gearing, chain, and sprockets, and employ a screw-shaft *p* which is journaled and turns freely in the frame P. The carriage or holder is provided with a threaded block or nut *q* which, fitting in a socket in the holder, engages the screw shaft and causes a travel of the carriage as the shaft rotates. By withdrawing this nut or block *q*, the carriage can be moved back to starting position. Under this arrangement the arbor is provided with teeth *r* to engage a pinion *s* mounted upon the end of the screw,—the said pinion being clamped between two collars *t t* by means of a coiled spring *u*. This mechanism operates in substantially the same manner as that illustrated in Fig. 1, and hardly seems to require further explanation.

Having thus described my invention, what I claim is—

1. In combination with an arbor and a rod-gripping or chucking device carried thereby, a gage or stop to determine the length of the feed of the rod, and means operatively connecting the gage with the gripping or chucking mechanism; whereby when the chuck is actuated the gage will be brought automatically into or out of operative position.

2. In combination with an arbor and rod-gripping devices carried thereby; the pivoted lever K provided with a stop or gage *g* and a heel *h;* and the collar H, adapted to actuate the lever K and the rod-gripping devices.

3. In combination with a rotatable hollow arbor; a rod-supporting device in which the rod is clamped and which is movable toward the outer end of the arbor to feed the rod therethrough; and the intermediate connections between the arbor and said rod-supporting device, whereby the arbor is adapted to impart to the rod a step-by-step travel or feed, substantially as shown and described.

4. In combination with a hollow arbor; a rod-holder movable toward the outer end of the latter to feed the material therethrough; means for resisting the feed of the rod; and gearing substantially such as shown and described for causing a travel of the rod-holder when the resistance to the feed of the rod has been removed or falls below a predetermined amount.

5. In combination with a hollow arbor; a rod-holder to feed the rod therethrough; mechanism for causing travel of the rod-holder; and means for producing a resistance to the feed of the rod and throwing the holder-actuating mechanism out of action.

6. In combination with a hollow arbor and a traveling rod-holder; a yielding feed mechanism for said holder; and means for producing sufficient resistance to the feed of the rod to overcome the action of holder-feed mechanism, all substantially as shown and described.

7. In combination with a hollow arbor and

a traveling rod-holder; slip gearing for causing proper travel of the holder when a predetermined resistance to the feed of the rod has been removed.

8. In combination with a hollow arbor; a chain *k* and means for imparting motion in one direction to said chain; a rod holder movable upon a suitable guide toward and from the end of the arbor; and a hook *o* detachably connecting the rod-holder and chain, whereby when the holder is disconnected from the chain it may be moved backward while the chain remains at rest.

9. In combination with the rotatable hollow arbor having worm M; a shaft O provided with the worm wheel N and sprocket T; a chain *k* actuated from the sprocket; a slip connection between the sprocket and its shaft; and a rod-holder U adapted to be connected with the chain.

In witness whereof I hereunto set my hand in the presence of two witnesses.

CONRAD M. CONRADSON.

Witnesses:

W. A. BAGLEY,

C. H. ALLYN.