No. 629,161. Patented July 18, 1899.

J. HARTNESS.

STOCK FEEDING MECHANISM FOR SCREW MACHINES.

(Application filed Apr. 27, 1899.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

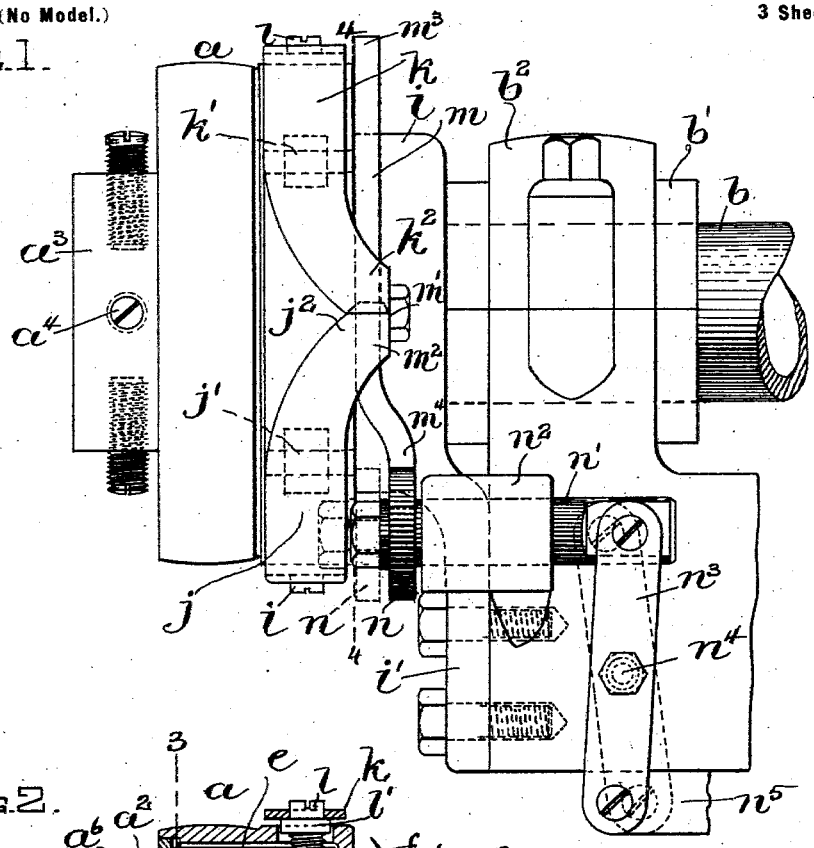

Fig. 2.

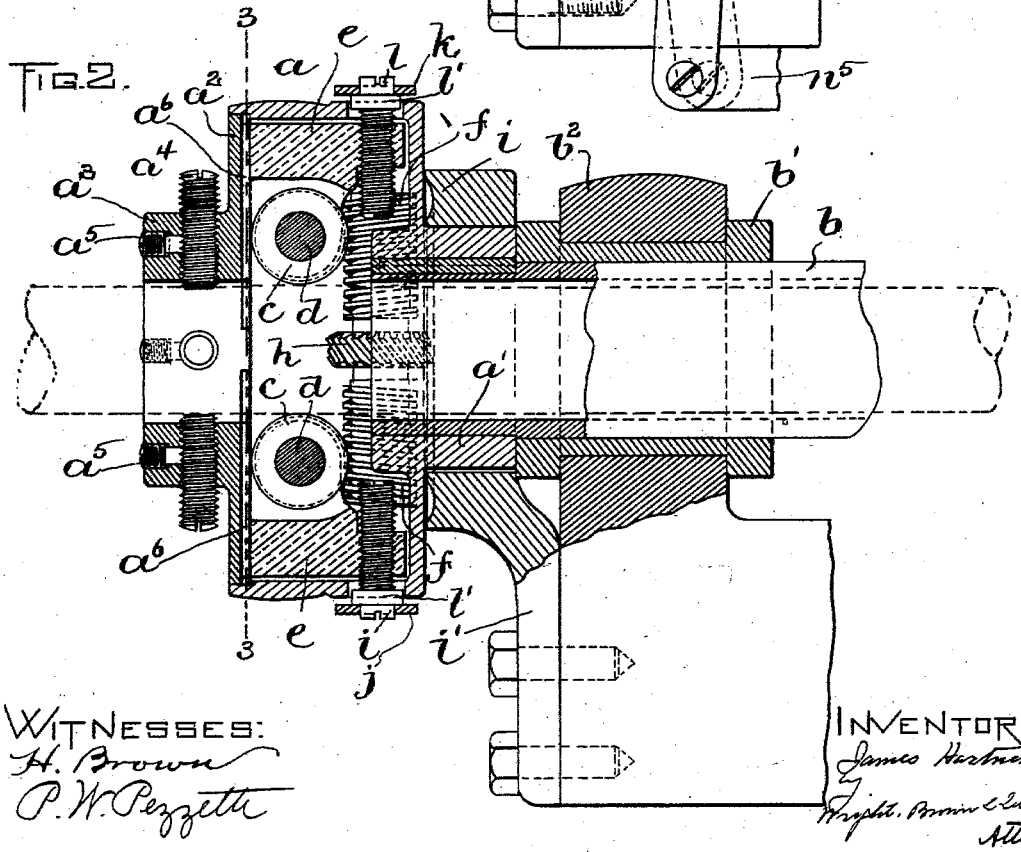

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FIG. 3.

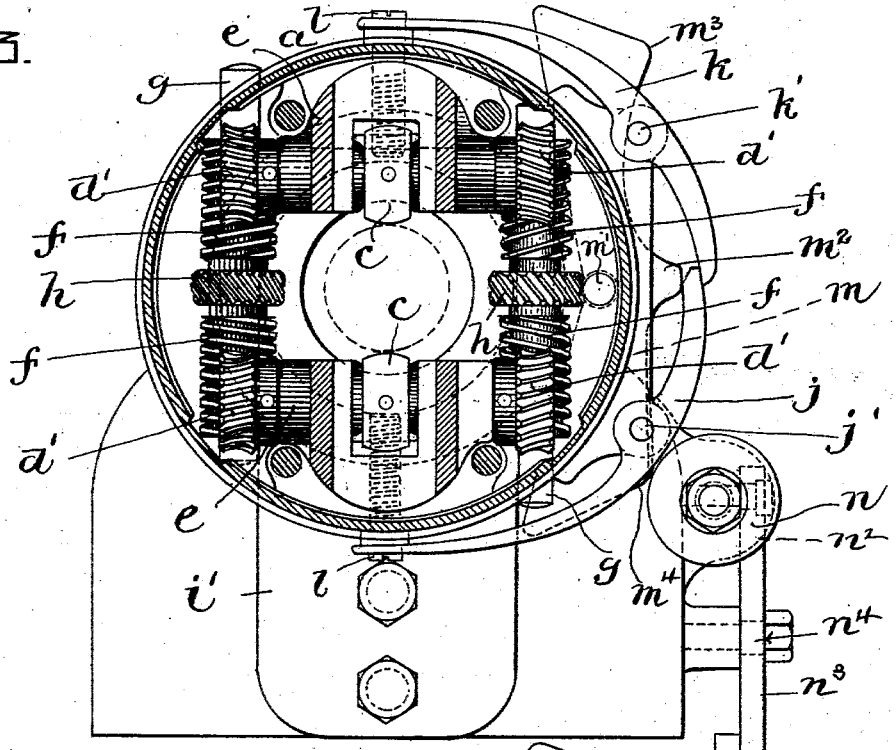

FIG. 4.

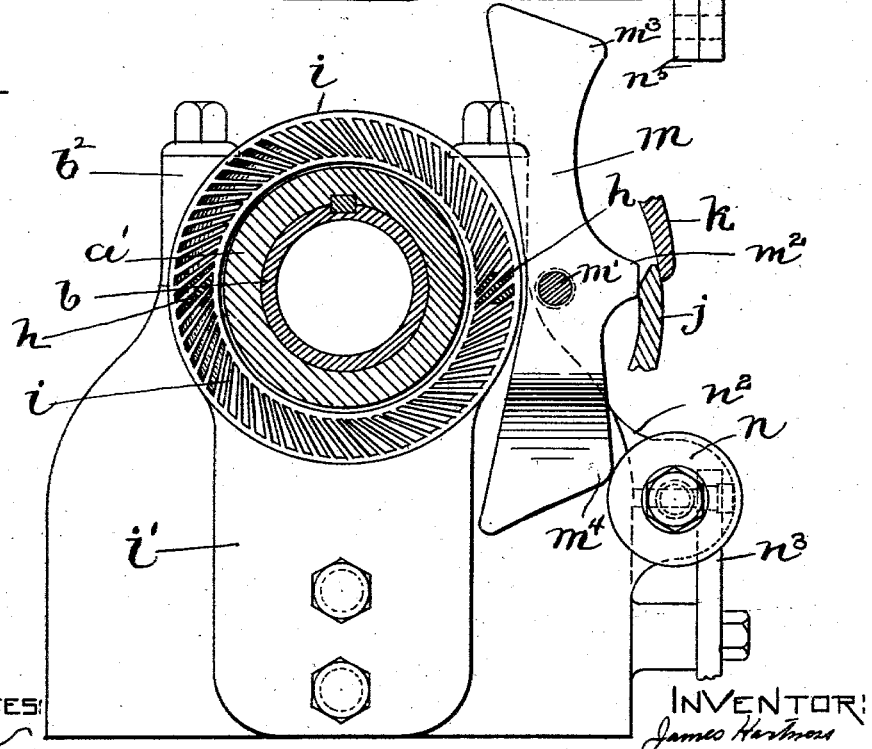

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FIG. 5.

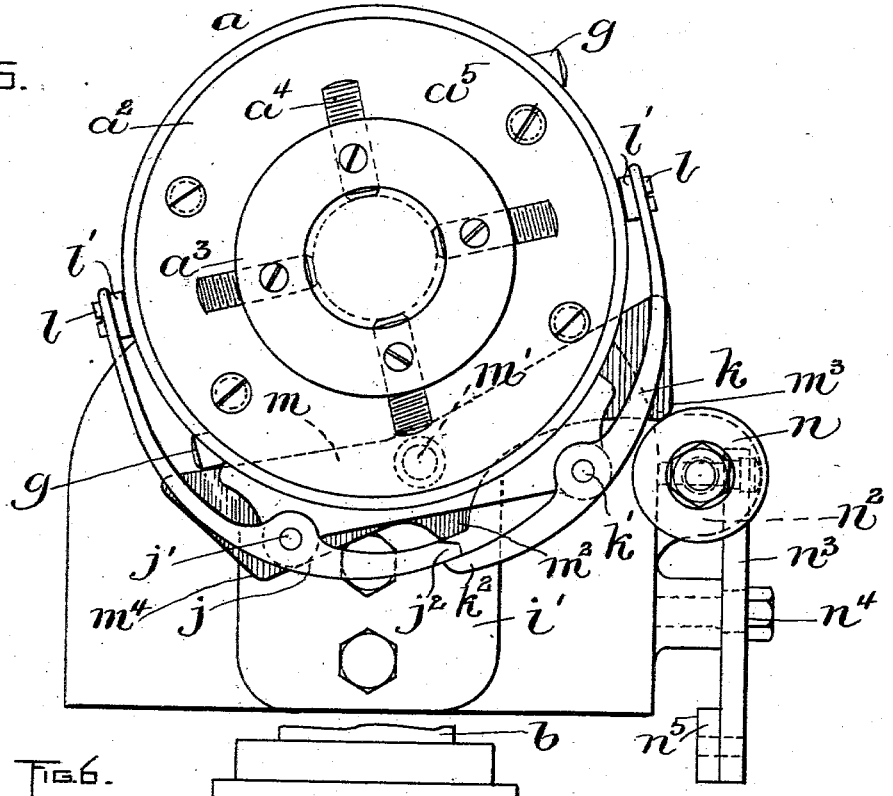

FIG. 6.

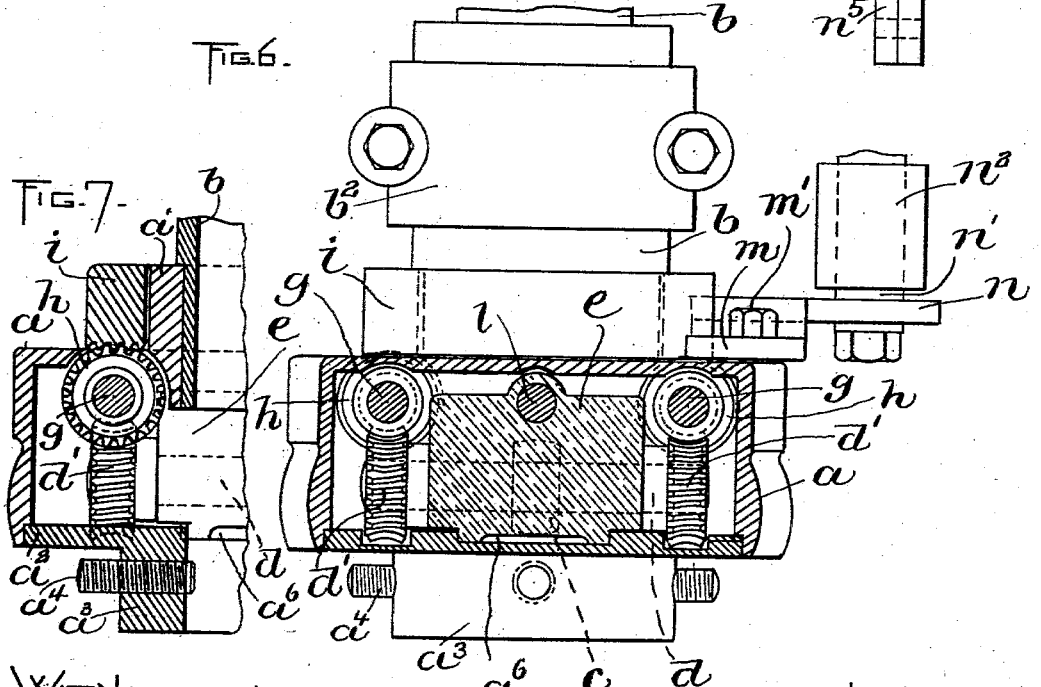

FIG. 7.

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UNITED STATES PATENT OFFICE.

JAMES HARTNESS, OF SPRINGFIELD, VERMONT.

STOCK-FEEDING MECHANISM FOR SCREW-MACHINES.

SPECIFICATION forming part of Letters Patent No. 629,161, dated July 18, 1899.

Application filed April 27, 1899. Serial No. 714,673. (No model.)

To all whom it may concern:

Be it known that I, JAMES HARTNESS, of Springfield, in the county of Windsor and State of Vermont, have invented certain new and useful Improvements in Stock-Feeding Mechanism for Screw-Machines, of which the following is a specification.

This invention has relation to means for feeding rotating stock—such as bars, rods, or wires of metal—through the holding-chucks of screw-machines, and particularly to those feeding devices in which the feed-wheels rotate about their own axes and also revolve about the axis of the stock.

Heretofore in such machines as just referred to the feeding-wheels have been in continuous operative engagement with the stock and were caused to rotate intermittently when desired by suitably-controlled mechanism. It was necessary therefore to engage and disengage the members of the gearing, which, as is well known, is frequently an undesirable operation on account of the difficulty in bringing said gear members properly into mesh.

The present invention contemplates the employment of feed-wheels which are in constant rotation (while the stock is being rotated) and mechanism for bringing them into operative engagement with the stock when it is necessary to feed the latter, said wheels being at all other times in an inoperative position. By this construction the gear members for rotating the feed-wheels may remain constantly enmeshed, and the stock may be fed through the chuck without retarding or otherwise affecting its rotation.

Reference is to be had to the accompanying drawings, and to the letters marked thereon, forming a part of this specification, the same letters designating the same parts or features, as the case may be, wherever they occur.

Of the drawings, Figure 1 represents in side elevation a portion of the head-stock of a screw-machine and my improved mechanism for feeding the stock through the chuck-spindle. Fig. 2 represents a longitudinal section through the same. Fig. 3 represents a transverse section on the line 3 3 of Fig. 2. Fig. 4 represents a transverse section on the line 4 4 of Fig. 1. Figs. 5 to 7, inclusive, represent the invention in detail.

Of the drawings, a represents a head or holder having a hub a', which is affixed to the spindle b of a lathe or screw-machine, as in my prior patent, No. 425,377, dated April 8, 1890. Chuck mechanism may be secured to the other end of the spindle, which is tubular, to admit the passage therethrough of the stock. By "stock" I mean to include the rod, bar, or wire by which screws or other like articles are made by the mechanism with which the machine having my improved feeding devices is provided. The spindle is suitably journaled in a bushing b', carried by the head-stock b^2, of which only a portion is shown.

The head a has a face-plate a^2 with an annular flange a^3 to receive the guiding-screws a^4, which are adjustable radially therein and which may be secured after adjustment by set-screws a^5, passed into the end of the flange, as shown.

The feeding-rolls are indicated at c c, respectively, and are rigidly secured upon shafts d d, which are journaled in blocks or carriers e, arranged to slide in guides a^6, formed in the inner face of the plate a^2. These blocks or carriers are simultaneously movable in opposite directions radially of the head to move the feeding devices into and out of operative engagement with the stock, the mechanism for affording such movement being preferably connected to the devices by means of which the chuck is opened and closed. On the ends of the shafts d which project out from the carriers are rigidly secured worm-wheels d' d', which intermesh with worms f f, rigidly secured to shafts g g, journaled in bearings in the head a, as clearly shown in Fig. 3, each shaft g being provided with two worms, between which is a worm-wheel h, which projects through an aperture in the head into operative engagement with a stationary scroll or worm i. The last-mentioned part consists of a ring supported by a bracket i', rigidly attached to the head-stock, and it encircles the hub a' of the head. On its front face the ring is provided with teeth, which are cut tangentially, each tooth being a tangent of a circle of less diameter than the interior of the ring, as shown in Fig. 4.

The worms on each shaft g are threaded right and left hand, respectively, and they are all so arranged that when the head is rotated the engagement of the worm-wheels h

with the scroll or worm i causes the feeding-rolls c to be rotated in opposite directions simultaneously and at the same speed to feed the stock through the head and the tubular spindle.

All of the members of the gearing by means of which the feeding-rolls c c are rotated are constantly enmeshed, so that as long as the head rotates the feed-wheels revolve about the axis of the head and also rotate about their own axes, for the purpose described. The rapid rotation of the head is sufficient under ordinary circumstances to throw the carriers e e upward and out of operative engagement, so that the feed-rolls will be out of operative engagement with the stock, and hence to move said carriers inward radially of the head I provide spring-levers j k, which are fulcrumed at j' and k', respectively, on ears projecting outward from the head. Said spring-levers overlap at their inner ends, as at j^2 k^2, and their outer ends take over the heads of screws l l, threaded into the carriers e e, said levers bearing against shoulders l' l', formed on said screws. The levers are arranged outside of the head a, and the screws project through the periphery thereof, as indicated in Fig. 2.

A rocker m is fulcrumed upon a stud m' on the rear face of the head and is provided with a central cam projection m^2 to engage the inner end of the lever j to operate it and the lever k simultaneously to force the carriers e e inward radially of the head. Said rocker consists of a lever with cam portions m^3 m^4 at its ends, said last-mentioned cam m^4 being offset, as best shown in Fig. 1. When said rocker is in the position shown in Fig. 3, the cam projection m^2 forces the inner ends of the levers j k outward, and thereby move the carriers e e inward to operatively engage the feed-rolls c c with the stop, said carriers being moved inward yieldingly by the outer spring ends of said levers j k; but when the rocker is moved into the position shown in Fig. 5 the carriers are permitted to separate and move outward, this being accomplished by centrifugal action as the head rotates, although, if desired, I may use a spring for accomplishing this purpose.

To swing the rocker m about its fulcrum into and out of operative position, I employ a roller n, journaled upon the end of a slide n', movable through a bracket n^2, formed on or attached to the head-stock. By moving the slide n' the roller n may be moved into the path of the cam m^3 or the cam m^4 of the rocker m to tilt it in one direction or the other, as the case may be. Said slide n' is pivotally connected to a lever n^3, fulcrumed at n^4 on the head-stock and connected by a connecting-rod n^5 to the chuck-operating devices, (not shown,) the construction being such that when the chuck is opened the slide n' is moved to cause the spring-levers j k to move the carriers and thrust the feed-rolls into operative engagement with the stock.

Normally the parts are in the position shown in dotted lines in Fig. 1; but when the chuck is opened the slide is moved to the position shown in full lines in said last-mentioned figure, so that the cam m^4 strikes against the roll and swings the rocker about its fulcrum or stud m', whereupon the cam m^2 engages the end j^2 of the lever j and forces the inner ends of the two said levers outward to move the feed-rolls into operative position; but when the chuck is closed the roller n is moved back to the position shown in dotted lines in said figure and engages the end m^3, and the rocker disengages the cam m^2 from the levers j k and permits the carriers e e to separate.

It is evident that my invention is not limited to the devices which I have shown and described for rotating the feed-rolls or for moving them into and out of engagement with the stock, for any other mechanisms which will accomplish the functions specified are included thereby.

Having thus explained the nature of my invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes of its use, what I claim, and desire to secure by Letters Patent, is—

1. The combination of a rotatable head, continuously-rotating feed-rolls carried by said head, and means for moving said rolls radially of said head, or releasing them from operative engagement with the stock while the head is rotating.

2. The combination of a rotatable head, feed-rolls carried by said head and normally disengaged from the stock, means for rotating said rolls, and means for moving said rolls into operative engagement with the stock during the rotation of the head.

3. The combination of a rotatable head, feed-rolls carried by said head and normally disengaged from the stock, means for rotating said rolls continuously during the rotation of said head, and means for moving said rolls into engagement with the stock.

4. The combination of a rotatable head adapted to permit the passage of stock centrally therethrough, feed-rolls carried by the head normally out of operative engagement with said stock and adapted to simultaneously bear upon the stock, mechanism for imparting a rotation to said rolls so long as the head rotates, and mechanism for moving said rolls into operative engagement with the stock comprising carriers for the rolls, and means for moving the carriers.

5. The combination of a rotatable head, rolls carried by the head for feeding stock through said head, means for rotating said rolls, and mechanism for moving said rolls into operative engagement with said stock said mechanism comprising carriers for the rolls, and a rocker controlling said carriers.

6. The combination of a rotatable head, rolls carried by the head for feeding stock through said head, means for rotating said

rolls, and mechanism for moving said rolls yieldingly and simultaneously into operative engagement with said stock during the rotation of the head.

7. The combination of a rotatable head, rolls carried by the head for feeding stock through said head, means for rotating said rolls, and mechanism for moving said rolls into operative engagement with said stock, said mechanism comprising carriers for the rolls, pivoted levers connected to said carriers, and means for swinging said levers simultaneously about their fulcrums.

8. The combination of a rotatable head, rolls carried by the head for feeding stock through said head, means for rotating said rolls, and mechanism for moving said rolls into operative engagement with said stock, said mechanism comprising carriers for the rolls, a rocker for actuating said carriers and having an offset end, and means for tilting said rocker.

9. The combination of a rotatable head, rolls carried by the head adapted to feed the stock therethrough, means for continuously rotating the rolls, means for adjusting the rolls radially of the head, and mechanism for moving said rolls into or releasing them from engagement with the stock.

In testimony whereof I have affixed my signature in presence of two witnesses.

JAMES HARTNESS.

Witnesses:
F. P. LOVEJOY,
W. LE ROY BRYANT.