No. 714,895. Patented Dec. 2, 1902.

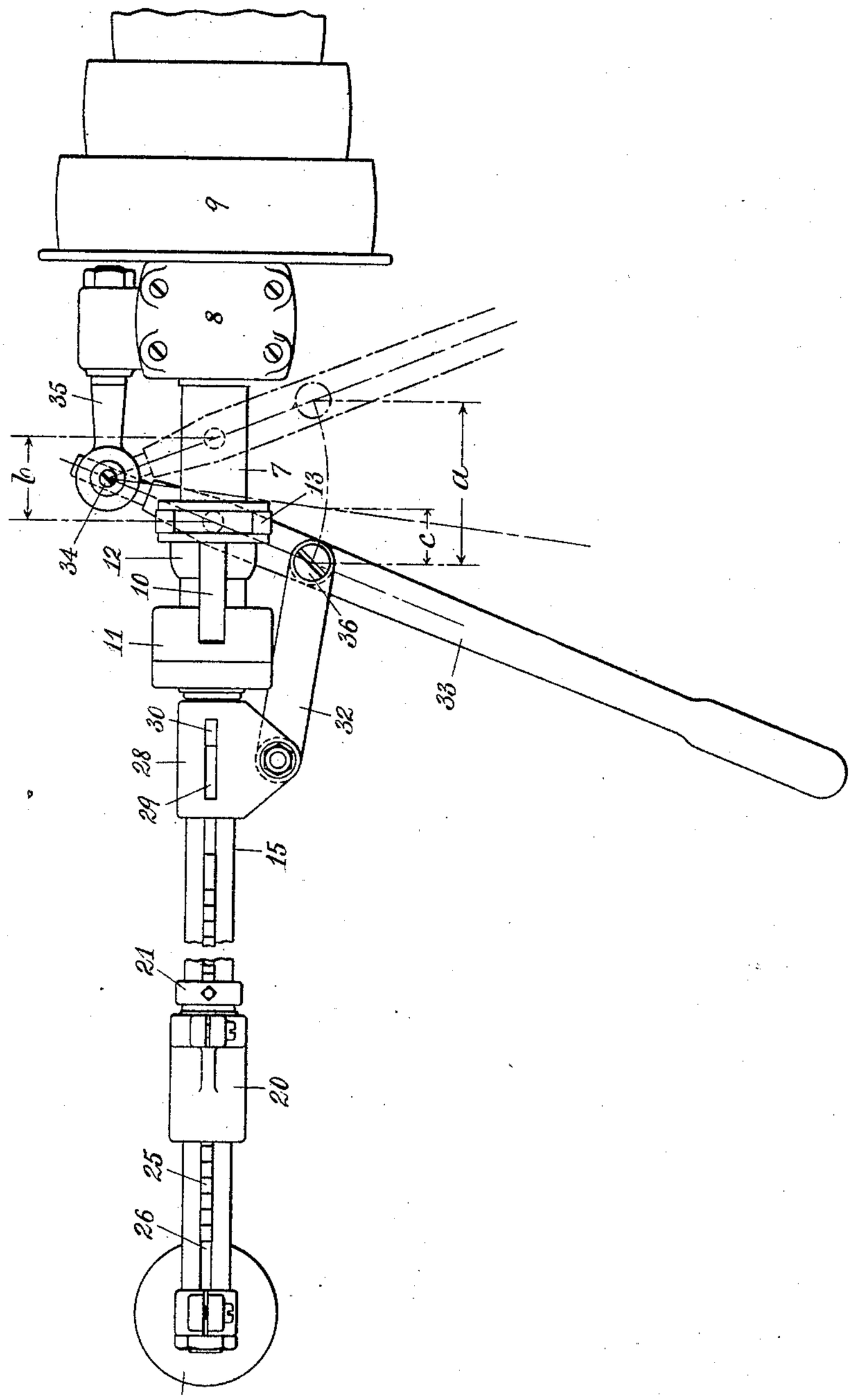
B. M. W. HANSON.

CHUCK OPERATING AND FEEDING DEVICE.

(Application filed June 5, 1902.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1



Witnesses:
H. Mallner
Joseph Merritt.

Inventor
B. M. W. Hanson
By Wm. H. Howiss. Atty.

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Fig. 2

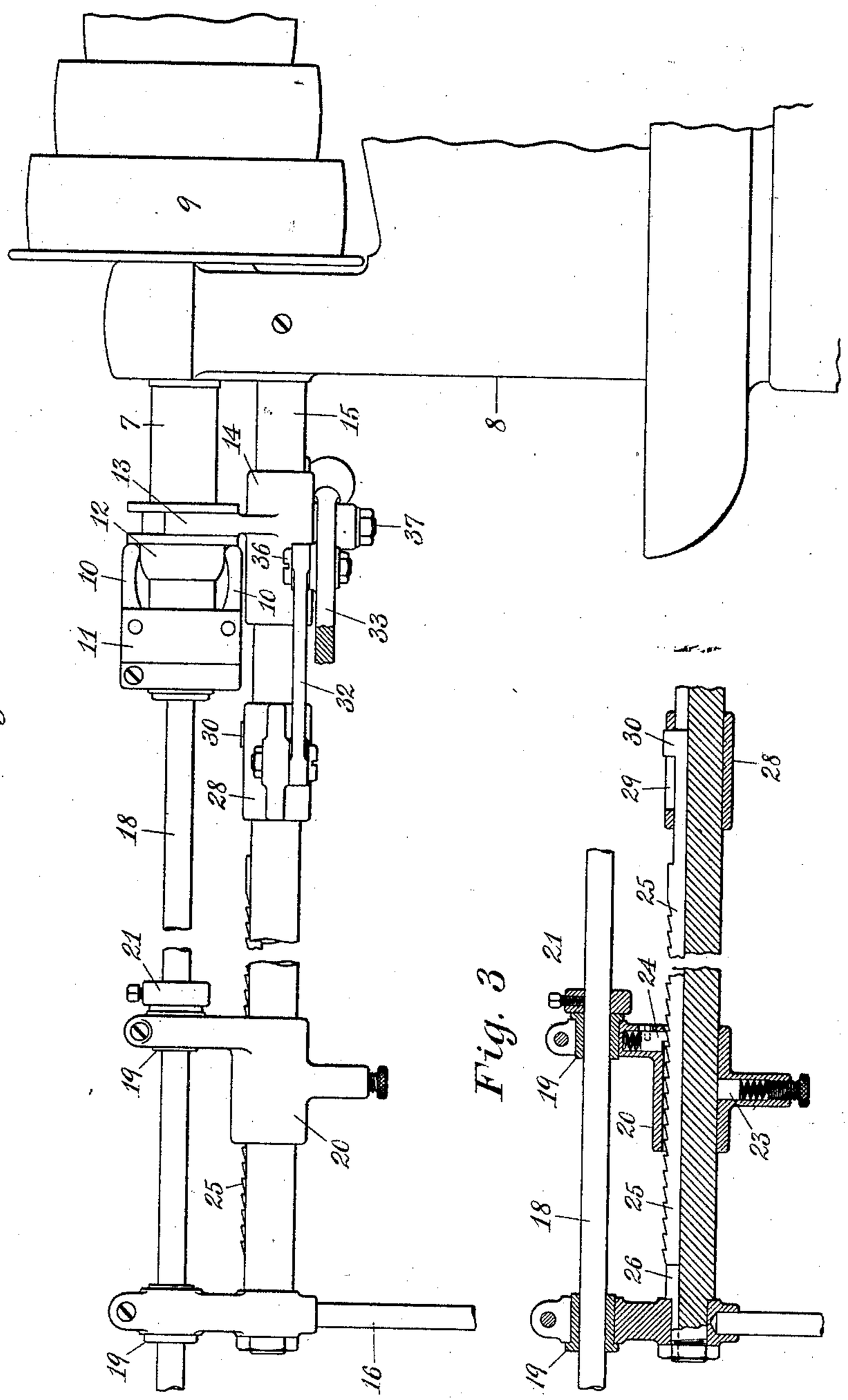

Fig. 3

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UNITED STATES PATENT OFFICE.

BENGT M. W. HANSON, OF HARTFORD, CONNECTICUT, ASSIGNOR TO PRATT & WHITNEY COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF NEW JERSEY.

CHUCK OPERATING AND FEEDING DEVICE.

SPECIFICATION forming part of Letters Patent No. 714,895, dated December 2, 1902.

Application filed June 5, 1902. Serial No. 110,330. (No model.)

To all whom it may concern:

Be it known that I, BENGT M. W. HANSON, a citizen of Sweden, and a resident of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Chuck Operating and Feeding Devices, of which the following is a full, clear, and exact specification.

This invention relates to the devices employed for feeding forward and gripping rods of stock in connection with screw-machines, lathes, and similar machines which require the rods of stock to be thus fed forward to be operated upon. This device is an improvement upon the type of apparatus shown and described in United States Patent No. 118,481, of August 29, 1871, to E. G. Parkhurst, in which the opening and closing movements of the work-gripping device of the chuck and the advancing movement of the rod of stock are controlled by a hand-lever requiring the use of only one of the operator's hands, the other hand being left free for other purposes. These hand-levers are connected with and operate a sliding sleeve which carries the fork for operating the chuck and also feeds forward the rod or wire, the extent of movement of the respective parts being the same—namely, that of the clutch and of the sleeve to which the hand-lever is connected. In practice, however, it is found that if the lever is connected to the sleeve at a point suitable for exerting a proper leverage to enable the operator to close the chuck with ease the movement of the sleeve is frequently insufficient to advance the wire to the desired extent, so that the operator is often required to operate the lever two or three times in order to advance the length of stock required for each operation.

In my improved device the hand-lever is adapted to communicate a differing extent of movement to the chuck-plunger and to the rod-feeding device, these devices being coupled to the lever at different distances from its axis of movement, so that each part receives from the lever the extent of movement suited to its particular requirements.

In the accompanying drawings my improved device is shown as applied to the rod feeding and gripping devices of an ordinary hand-screw machine.

Figure 1 is a plan view, and Fig. 2 a side view, of the device, showing also a sufficient amount of the adjacent portions of the machine to enable its application thereto to be understood. Fig. 3 is a side view in longitudinal section, showing the details of the rod-advancing devices.

The work-carrying spindle 7 is journaled in the head 8 of the machine and is driven by the pulley 9. The spindle 7 is provided with any well-known form of collet or chuck, the plunger of which is operated by the clutch-finger 10, pivotally mounted in the collar 11, the fingers 10 being operated to open and close the chuck by means of the sliding clutch-collar 12, which is moved longitudinally upon the spindle 7 to operate the fingers 10 by means of the clutch-fork 13, appurtenant to the sleeve 14. That sleeve slides upon a guide-rod 15, which is supported at one end in the head and when of extended length is also supported at the opposite end, as here shown, by means of the standard 16, which also supports the rearward end of the rod of stock 18, the different sizes of stock being accomodated by means of changeable bushings 19. The work-advancer 20 is fitted to slide upon the guide-rod 15 and upon the rod of stock 18, being also provided with changeable bushings 19 for different sizes of stock. A collar 21 is clamped upon the rod of stock in front of the advancer 20. The latter is preferably provided with a spring-pressed friction-plug 23 to prevent it from moving too freely upon the guide-rod 15. The advancer 20 is also provided with a spring-pressed pawl 24, the end of which engages with the ratchet-shaped teeth of the feed-rack 25, which is fitted to slide in a groove 26 in the top of the guide-rod 15. The front end of this rack is engaged by the advancer-sleeve 28, which is fitted to slide freely upon the guide-rod 15 and is provided with a slot 29, preferably through its upper wall, through which extends a projection 30 of the rack, forming shoulders which engage with the

ends of the slot 29. The length of the slot 29 is considerably greater than that of the projection 30, thus providing for a sufficient amount of lost motion to enable the chuck to be unlocked before moving forward the feed-rack 25. The advancer-sleeve 28 is coupled, by means of a link 32, to the hand-lever 33 of the machine, which is or may be of the form usually employed in such machines for the purpose of advancing the stock and locking and unlocking the chuck. These hand-levers are usually pivotally mounted, as at 34, upon a suitable stud or standard or lug 35, attached to or integral with the head 8 of the machine. This hand-lever is connected to the clutch-sleeve 14 in the usual way, as by means of a stud 37. In order to permit the hand-lever to adjust itself to the straight-line movement of the sleeve 14, the end of the hand-lever is constructed to slide longitudinally through its pivot-stud 34. The distance from the pivot 34 of the hand-lever to its pivotal connection 37 with the sleeve 14 is suited to the leverage required for operating the chuck through the clutch-fingers 10, allowance being also made for a convenient extent of movement of the operator's hand upon the end of the hand-lever 33.

The link 32 is connected to the hand-lever 33 by means of a stud 36 at a distance suitable for imparting the required amount of feeding movement to the feed-rack 25 after allowing for the lost movement between the advancer-sleeve and the feed-rack required for loosening the chuck. By connecting the link 32 to the hand-lever 33 at a distance from the pivot 34 considerably greater than the distance between the pivot 34 and the connection with the clutch-sleeve 14 advantage is taken of the angular movement of the hand-lever, and since but little power is required to operate the feed device as compared with that required for closing the chuck to grip the work it is permissible thus to connect the link 32 at a point much nearer the operator's hand. In the arrangement illustrated in the drawings the relative distances from the pivot 34 of the studs 36 and 37 for the feed and for the chuck-operating movements, respectively, is about two to one, as shown by the dimensions *a* and *b*. (Indicated in Fig. 1.) Thus in this case the movement of the advancer-sleeve 28 would be about twice that of the clutch-sleeve 14. The lost movement of the advancer-sleeve equals the amount by which the length of the slot 29 exceeds the length of the projection 30, as represented by *c* in Fig. 1, which must be subtracted from the dimension *a*, the balance of that dimension representing the effect of the advancing movement of the sleeve for the given angular movement of the hand-lever.

The operation of this device is as follows: While the chuck is gripped upon the work and the latter is being operated upon by the tools the parts rest in the position shown in Figs. 1 and 2, with the lever in its full-line or backward position. When the work is finished and cut off from the end of the stock and the operator desires to advance a new length of stock to be operated upon, he draws the hand-lever 33 forward to the position shown in dot-and-dash lines. The first portion of the forward movement serves to withdraw the clutch-collar from between the fingers 10, so as to permit the chuck to open, and as the rod of stock cannot be pushed through the chuck until the latter is opened sufficiently to release its grip it is obvious that the feed devices must rest during the first portion of the forward movement of the hand-lever; hence the provision for lost movement (shown in Figs. 1 and 3) by the relative lengths of the slot 29 of the advancer-sleeve 28 and the projection 30 of the feed-rack 25. The amount of this lost motion is adapted to the movement of the sleeve 28, which accompanies the releasing movement of the chuck, after which by the forward movement of the hand-lever the sleeve 28 draws forward the feed-rack 25, the teeth of which engage with the pawl 24 of the work-advancer 20, thus pushing the rod of stock 18 forward through the chuck against the gage or stop usually provided for regulating the length of stock to be fed forward. Then the operator pushes the handle backwardly to its full-line position of Fig. 1, so as to grip the chuck upon the work in its new position. During this backward movement of the hand-lever the rack slides backwardly beneath the pawl 24, the friction-plug 23 serving to prevent the advancer 20 from being pushed backwardly with the rack. Thus the feeding devices stand in readiness for again advancing the rod 18 at the succeeding operation of the hand-lever.

The hand-lever may be provided with a series of holes at different distances from the pivot 34 to suit different amounts of feed required, or the hand-lever may be slotted longitudinally to receive the pivot-stud 36, which may then be adjusted to any desired distance from the pivot 34 to suit the amount of forward feed.

I claim as my invention—

1. In a machine of the class specified, provided with chuck-operating devices, and a work-feeding device, comprising a feed-rack, independently-mounted sleeves for operating the chuck, and a feed-rack, and an oscillating lever operatively connected with the said sleeves at different portions of its length.

2. In a machine of the class specified, provided with chuck-operating devices, and a work-feeding device, comprising a feed-rack, independently-mounted sleeves for operating the chuck, an oscillating lever pivotally connected with the chuck-operating sleeve, and a link connecting the rack-operating sleeve with the lever, at a distance from its center of oscillation greater than that of the connection with the chuck-operating sleeve.

3. In a machine of the class specified, the

combination of the chuck-operating sleeve 14, the feed-rack 25, the advancer-sleeve 28, the hand-lever 33 connected with the sleeve 14, and the link 32 connecting the sleeve 28 with the hand-lever 33 at a distance from the center of oscillation of the lever, greater than that of the connection with the sleeve 14.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, June 3, 1902.

BENGT M. W. HANSON.

Witnesses:
H. E. BAILEY,
WM. H. HONISS.