D. T. WADHAMS.

FEEDING MECHANISM FOR CUTTING MACHINES.

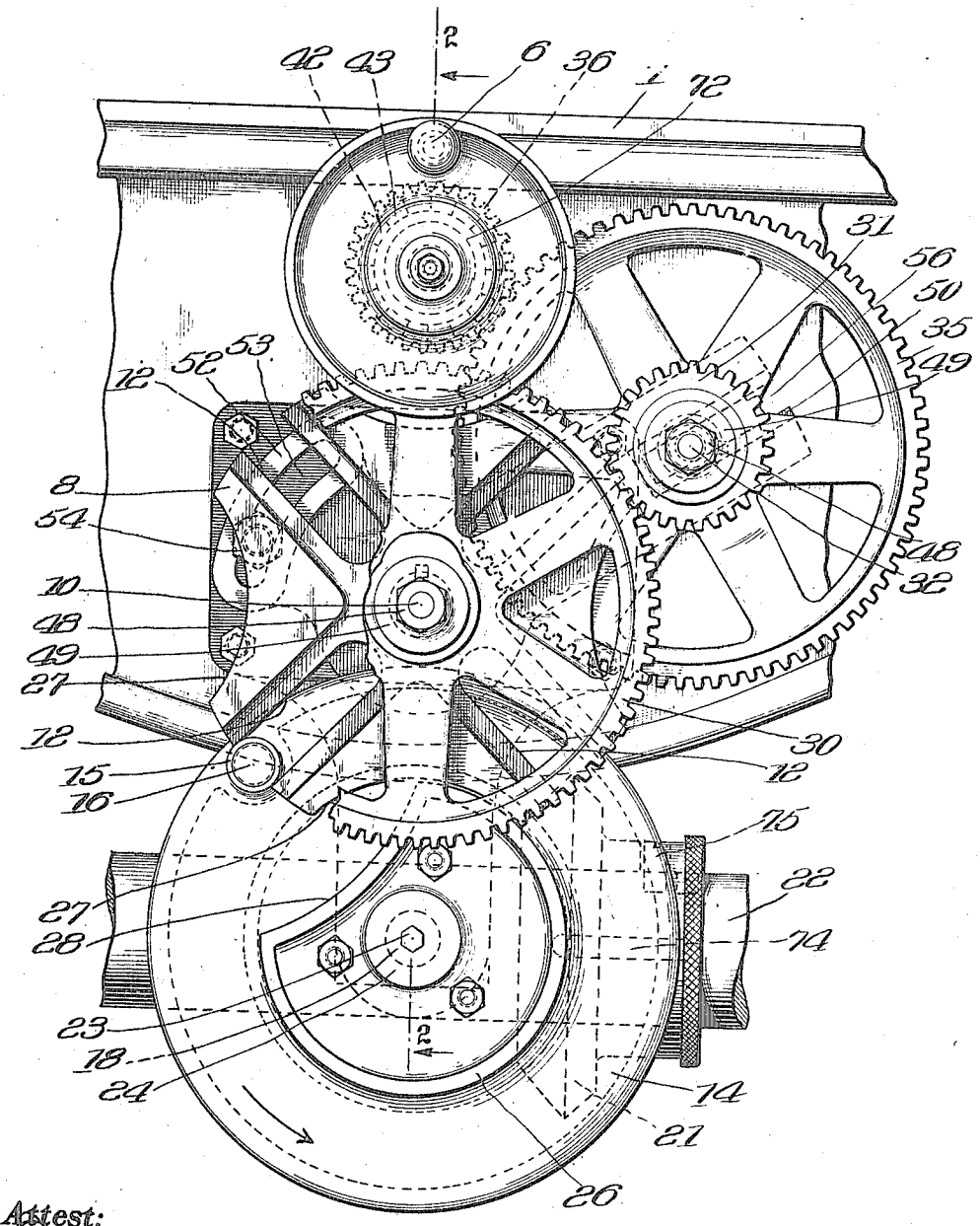
APPLICATION FILED JULY 2, 1915.

1,264,715.

Patented Apr. 30, 1918.

3 SHEETS—SHEET 1.

Fig. 1.



Attest:

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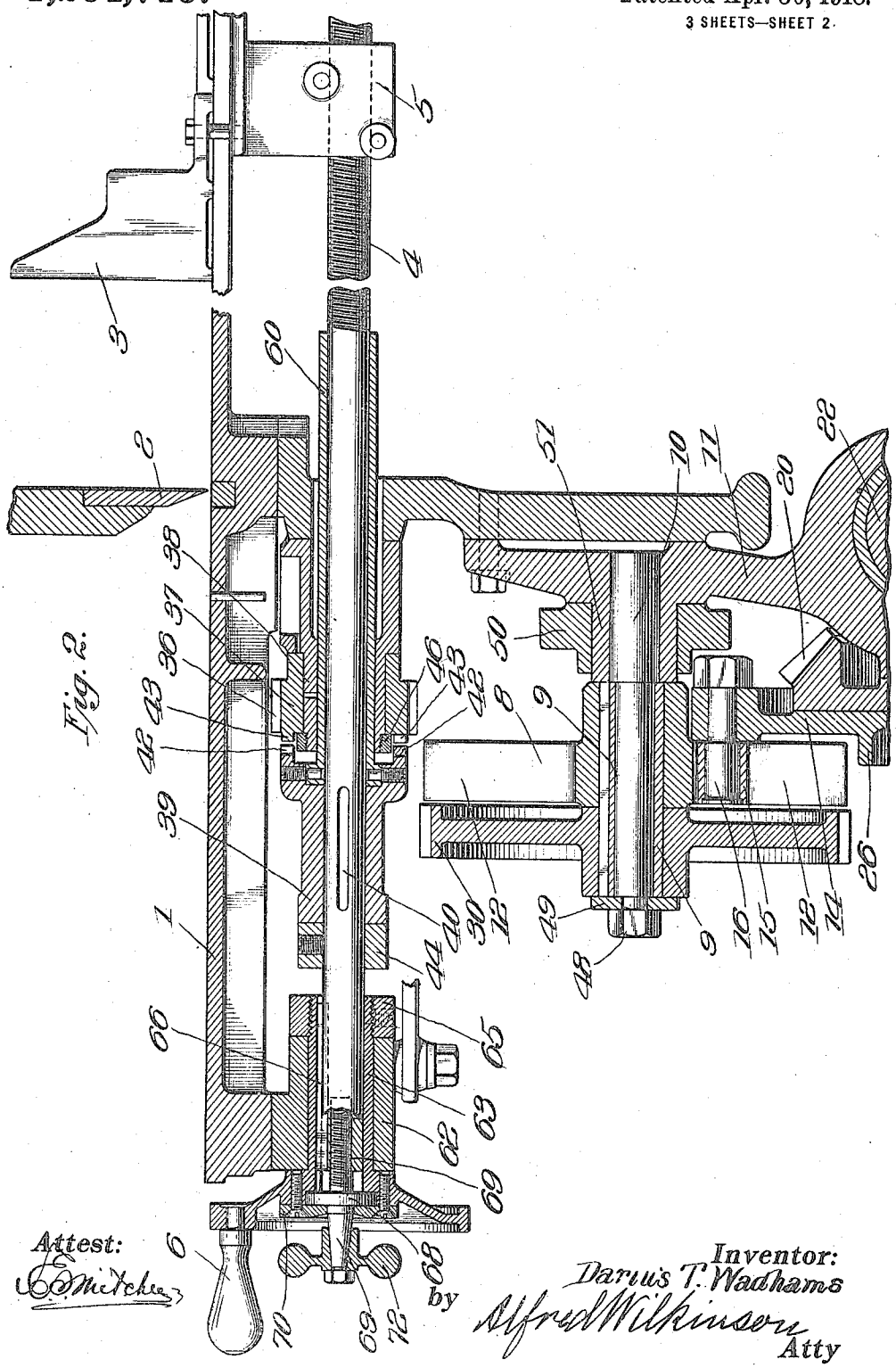


Fig. 2.

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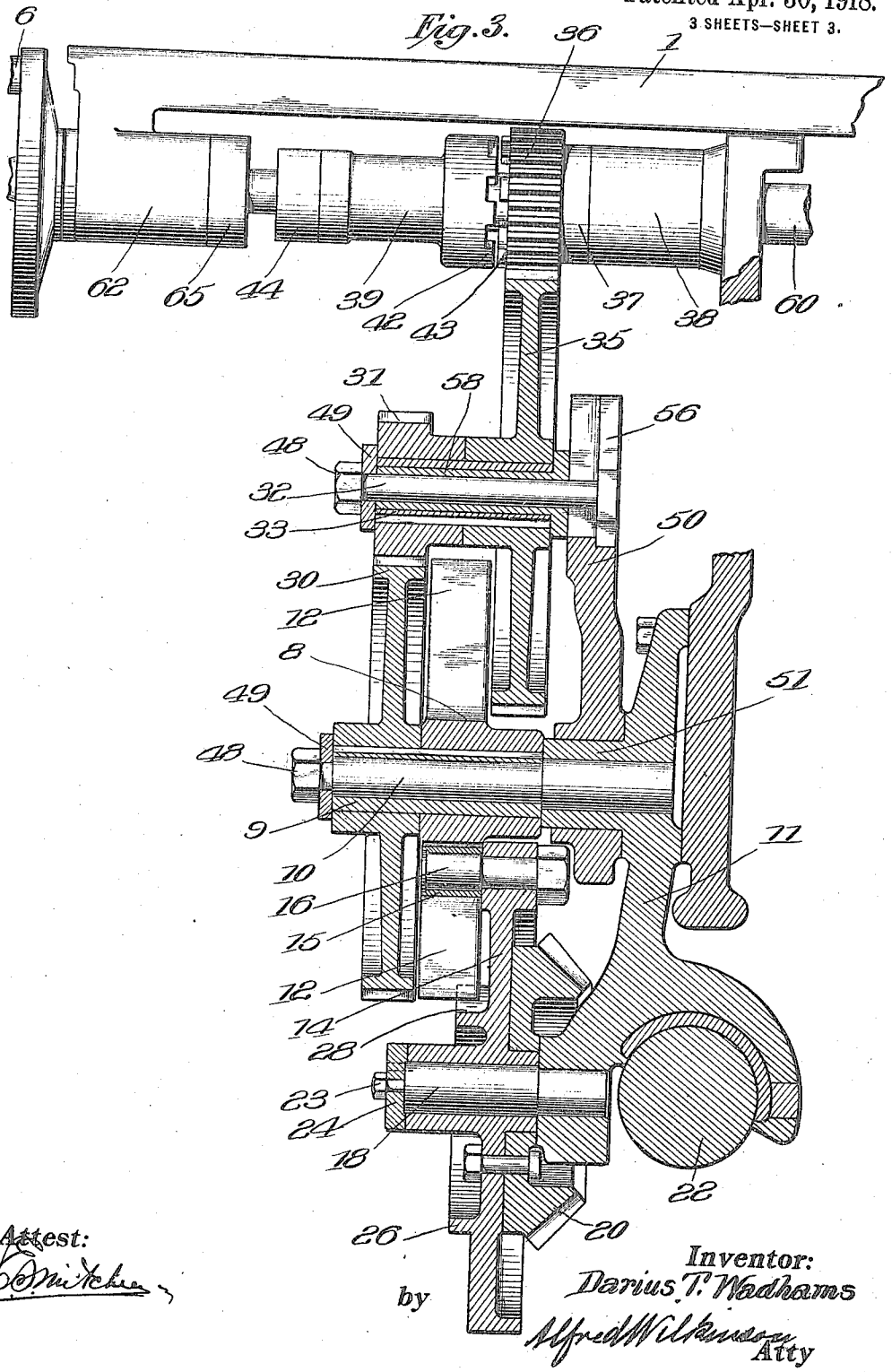
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3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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FEEDING MECHANISM FOR CUTTING-MACHINES.

1,264,715. Specification of Letters Patent. Patented Apr. 30, 1918.

Application filed July 2, 1915. Serial No. 37,670.

To all whom it may concern:

Be it known that I, DARIUS T. WADHAMS, a citizen of the United States, residing at Oswego, in the county of Oswego and State of New York, have invented new and useful Improvements in Feeding Mechanisms for Cutting-Machines, of which the following is a specification.

This invention relates to a feeding and spacing mechanism designed particularly for advancing the back gage of a cutting machine with successive, accurately measured, feed movements so as to advance the stock to the knife progressively for cutting it into small pieces. As is well known this manner of operating the back gage has an extended commercial use in the cutting up of large stock into small pieces for instance long lengths of cloth into the small pieces of but a few inches in dimension for distribution to the trade as samples.

The mechanism of my invention is operative automatically to advance the work with successive or intermittent feed movements, of the desired length and properly timed with respect to the operation of the cutting knife. A further important feature of my improved mechanism consists in the arrangement whereby it will automatically be thrown out of operation when the gage has advanced to its extreme forward position. Other valuable features thereof comprise an arrangement whereby the automatically operating connections may conveniently be connected and disconnected to the usual gage screw thereby to operate therethrough and to permit of independent manual operations of the screw in the customary manner; means to permit of conveniently changing the distance of movement imparted to the gage; means for disconnecting the automatic connections entirely and means for minutely adjusting the relation of the gage screw to the automatically operating connections to compensate for slight variation in the coupling engagement.

The described and other features of my invention are illustrated in the accompanying drawings wherein a desirable embodiment of my invention is shown and wherein the reference numerals of the following descriptions are applied to corresponding parts in the several views.

Figure 1 is a partial front elevation of a cutting machine embodying my improved mechanism. Fig. 2 is a vertical, longitudinal section of the machine taken on the central line 2—2 of Fig. 1. Fig. 3 is a diagrammatic sectional view with the axes of the chain of gears extended or straightened to be in alinement so as more clearly to trace the movement.

In the drawings, I have shown my invention in connection with only sufficient of the cutting machine as is necessary to convey a complete understanding of its operation. As shown, the cutting machine is provided with the usual horizontal supporting table 1 for the work with reference to which the cutting knife 2 is vertically reciprocated. The table is extended rearwardly of the knife and made of any required length and the material if to be cut into a plurality of small pieces is customarily placed upon a series of suitable cutting boards not shown which rest upon the table and into which the knife edge is adjusted to cut. The cutting boards, and the work thereon are advanced toward the knife 2 by the usual arrangement of back-gage 3 which is mounted to slide on the table toward the knife for feeding the work thereto. Suitable means for imparting movement to the gage is provided and is here shown consisting of a longitudinally arranged feed screw 4, threaded to a lug 5 depending from the gage through the usual longitudinal slot therefor in the table, not here shown. The feed screw is suitably journaled in the usual forward and rearward supporting bearings and is provided on its extreme forward end with an operating lever 6 for manually rotating the screw and causing the gage lug to travel upon the thread thereof for moving the gage with reference to the knife.

An important feature of my invention consists in providing automatically operating mechanism for successively imparting the desired feed movement to the gage so as to advance the work after each cutting stroke into proper position for the succeeding cut. My improved mechanism, as designed for this purpose, is arranged to be operative to move the gage after the knife has completed its cut and is being again raised into its extreme elevated position. As here shown the gage movement is produced during the last quarter revolution of the usual crank-shaft for the knife, which in the well known manner is connected to

the knife to pull it down and again raise it for each complete rotation of the shaft. The mechanism therefor comprises the Geneva stop movement parts consisting of the slotted disk 8 mounted upon the elongated key bushing 9 journaled upon the bearing stud 10 carried by a bracket 11, suitably secured to the frame of the machine. The disk 8 is provided with the four radial slots 12—12 and journaled with relation thereto is the crank-disk 14 having an anti-friction roller 15 journaled upon the bearing pin 16 in position to register with the slots. The crank-disk is journaled upon bearing stud 18 carried by bracket 11 and has attached thereto a bevel gear 20 to mesh with a similar gear 21 on the crank shaft 22. A bolt 23 and washer 24 is attached to the end of stud 18 for securing the crank-disk thereon. The arrangement as described provides for a like rotation of the crank shaft 22 and the crank disk 14 and as the former controls the knife stroke there is thus produced one complete revolution of the roller 15 for each cutting stroke. As the initial position of the roller 15 is as shown in Fig. 1, it will be seen that movement is only imparted to the slotted disk 8 during the last quarter of the knife stroke, which is the last half of the up or return stroke of the knife.

A concentric flange 26 is formed on the crank-disk 14, for the purpose of co-acting with concentrically curved surfaces 27 on the slotted disk 8 for retaining the slotted disk from movement until engagement therewith of the roller 15 within the slots. The flange 26 as shown is suitably depressed at 28 in radial alinement with the roller 15 to permit of the disk 8 being turned thereby.

The movement so imparted to the slotted disk, is transmitted to the gage through gearing suitable for producing the desired length of movement. As here shown upon the same bushing 9, which carries the slotted disk 8, is also keyed the large gear 30 which meshes with small gear 31 journaled upon a bearing stud 32 by being keyed to the bushing 33 loose on the stud. Likewise keyed on this bushing 33 is the large gear 35 in mesh with gear teeth 36 of clutch member 37 journaled upon the bearing flange 38 secured on the frame. A movable clutch member 39 is slidably keyed to the gage screw 4 by key 40 which permits of the clutch member moving longitudinally of the shaft. On their opposed faces the clutch members are provided with suitable clutch teeth 42—43 spaced for interlocking engagement to couple the driving clutch member 37 with the gage screw. A stop collar 44 is shown arranged to limit the movement of the movable clutch member 39 and a retaining nut 46 is shown threaded to the end of the bearing flange 38. As will be readily understood, upon uncoupling the clutch members 37—39 the gage screw may be freely turned by the handle 6 for manually feeding the work or for returning the gage to its rearward position and also for setting of the gage with respect to the automatic feeding and spacing mechanism described whereby it is operated upon coupling of these clutch members. When so coupled the intermittent feed movement of the slotted disk 8 will transmit motion to the gage through the screw 4 proportionate to the ratio of the gearing between the disk and the screw.

In accordance with a further feature of my invention I provide for conveniently changing the gearing connection intermediate the slotted disk and the gage screw. As a desirable means of accomplishing this I have shown this gearing arranged to be readily interchangeable with gearing of different ratio. Accordingly the gears 30, 31 and 35 are clamped in position by readily accessible nuts and washers 48, 49; the nuts 48 being threaded on the ends of the stud 10 and the pin 32, respectively. Upon removing the nuts 48 the gears 30—31 and 35 are readily removed. To substitute gearing of different size therefor requires shifting of the axis of the gears 31—35 which I have provided for by supporting the bearing pin 32 upon a shiftable supporting arm 50 upon which it is arranged to be adjustable radially. As best shown in Figs. 1 and 3, the arm 50 is bored to fit flange 51 on the bracket 11 and it is also provided with a segment 52 having curved slot 53 to receive the clamping bolt 54 threaded to the bracket 11 for rigidly clamping the arm in position. The upper end of the arm 50 is slotted at 56 with a T shaped slot for receiving a squared head on the pin 32. This pin 32 has immediately surrounding it a bearing and clamping sleeve 58 which bears against the front face of the supporting arm for clamping the pin 32 in its radially adjusted position upon tightening of the nut 48 thereon.

When operating the gage automatically as described it is desirable to provide for disconnecting the feeding mechanism when the gage has been advanced thereby to its extreme forward position. A simple means which I have devised for this purpose is shown in Fig. 2, consisting of an elongated sleeve extension 60 connected to the movable clutch member 39 and adapted to be engaged by the lug 5 of the advancing gage whereby the clutch members will be disengaged and the gage movement stopped. The operation is thus completely automatic and so as not to require the presence of an operator and danger of jamming of the parts is entirely eliminated.

Associated with mechanism as described I desirably employ supplementary means for slightly changing the relative position

of the gage with respect to the spacing mechanism described thereby to compensate for the slight movements necessary for properly engaging the coupling members, as it will be understood that the coupling teeth cannot be made infinitely fine and the slight movement required for obtaining the proper mesh will slightly affect the relative position of the gage to the spacing means. For this purpose and for conveniently making accurate adjustments when required, I have provided the arrangement now to be described. At the front end of the table is supported the bearing bracket 62 of the hand wheel 6 which has an elongated bearing sleeve 63 journaled therein and threaded on its inner end for the nut 65 whereby it is clamped in position and end motion thereof is taken up. As shown the hand wheel is slidably keyed to the gage screw by key 66. At its forward end the wheel is recessed to receive a flange 68 of an adjusting screw 69 threaded to the end of the gage screw. The flange 68 of the adjusting screw 69 is held within the recess by a retaining washer 70 whereby endwise movement of the adjusting screw is not permitted. A small hand wheel 72 is affixed to the outer end of the adjusting screw 69 whereby upon being turned it will move the gage screw forwardly or rearwardly and with it the gage; this longitudinal movement being entirely independent of the feeding and spacing mechanism and without rotation of the gage screw. Thereby independent adjustment of the back gage is permitted for starting the cuts correctly and means are provided for conveniently adjusting the cuts for the accurate cutting of labels and the like.

In addition to the foregoing I have provided for throwing the whole spacing mechanism out of action when desired by the loosening of the bevel gear 21 and sliding it along the crank-shaft to disengage its teeth. For this purpose I have shown the gear 21, slidably keyed to its shaft by key 74 and held in engaged or disengaged position by a screw 75 threaded to suitably positioned bores in the shaft.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof it is intended that all matter contained herein shall be interpreted as illustrative and not in a limiting sense.

I claim—

1. In a cutting machine, the combination with the frame and a table for the work thereon, of a knife, a gage supported to be movable with relation to the knife for advancing the work thereto, a feed screw connected to the gage for manually moving the same, means for automatically advancing the gage with successive feed movements, coupling means between the advancing means and the screw whereby the movement is transmitted from the advancing means therethrough and means for manually effecting an adjustment of the gage with reference to the advancing means said last means being operative without affecting the relation of the coupling means, substantially as described.

2. In a cutting machine the combination with the frame and a table for the work thereon, of a knife, a gage supported to be movable with relation to the knife for advancing the work, connections for manually moving the gage, means for automatically advancing the gage with successive feed movements, coupling means between the connections and the advancing means whereby the latter transmits its motion through the connections and permits of independent operation of the connections, means for manually effecting an adjustment of the gage with reference to the advancing means and operative independently of the coupling engagement of the connections with the advancing means, means for locking the advancing means intermediate of its movement, and means automatically to disengage the advancing means when the gage has completed its advance movement, substantially as described.

3. In a cutting machine the combination with the frame and a table for the work thereon, of a knife, a gage supported to be movable with relation to the knife for advancing the work, connections for manually moving the gage, means for automatically advancing the gage with successive feed movements, coupling means between the connections and the advancing means whereby the latter transmits its motion through the connections and permits of independent operation of the connections, and means automatically to disengage the advancing means when the gage has completed its advance movement, substantially as described.

4. In a cutting machine the combination with the frame and a table for the work thereon, of a knife, a gage supported to be movable with relation to the knife for advancing the work connections for manually moving the gage, means for automatically advancing the gage with successive feed movements, coupling means between the connections and the advancing means whereby the latter transmits its motion through the connections and permits of independent operation of the connections, means for manually effecting an adjustment of the gage with reference to the advancing means and operative independently of the coupling engagement of the connections with the advancing means, means automatically to disengage the advancing means when the gage has completed its advance movement and

said advancing means being changeable to permit of changing the length of movement imparted to the gage thereby, substantially as described.

5. In a cutting machine, the combination with the frame and a table for the work thereon, of a knife, a gage supported to be movable with relation to the knife for advancing the work thereto, a gage screw adapted for manually moving the gage, means for effecting an intermittent feed movement, gearing therefrom to the gage screw comprising removably mounted transmission gears and a supporting member therefor shiftably mounted, a radially adjustable bearing therein and means for securing the supporting member in adjusted position whereby the gearing may be changed for changing the movement transmitted to the gage.

6. In a cutting machine, the combination with the frame and a table for the work thereon, of a knife, a gage supported to be movable with relation to the knife for advancing the work thereto, a gage screw adapted for manually moving the gage, means for automatically advancing the gage with successive feed movements, comprising means for effecting an intermittent feed movement, gearing therefrom, a coupling member journaled to surround the gage screw, a co-acting movable coupling member slidably keyed on the gage screw and movable into interlocking engagement therewith, and a rearward extension on the movable member adapted to be engaged by the gage in its advance position for disconnecting the coupling members.

7. In a cutting machine, the combination with the frame, and a table for the work thereon, of a knife, a gage supported to be movable with relation to the knife for advancing the work thereto, a gage screw adapted for manually moving the gage, means for automatically advancing the gage with successive feed movements, comprising means for effecting an intermittent feed movement, gearing therefrom, and a coupling member journaled to surround the gage screw, a co-acting movable coupling member slidably keyed on the gage screw and movable into interlocking engagement therewith, substantially as described.

8. In a cutting machine the combination with the frame and a table for the work thereon, of a knife, a gage supported to be movable with relation to the knife for advancing the work thereto, a feed screw connected to the gage for manually moving the same, means for automatically advancing the gage with successive feed movements, coupling means between the advancing means and the screw whereby the movement is transmitted from the advancing means therethrough, a hand wheel suitably journaled to be held from longitudinal movement and slidably keyed to the gage screw, an adjusting screw journaled in the hand wheel and held from longitudinal movement thereby and a threaded connection between the adjusting screw and the gage screw whereby the latter is shifted longitudinally by the adjusting screw for adjusting the gage independently of the gage screw substantially as described.

9. In a cutting machine the combination with the frame and a table for the work thereon, of a knife, a gage supported to be movable with relation to the knife for advancing the work thereto, connections for manually moving the gage, means operative automatically to advance the gage with successive feed movements and a second means for manually effecting an adjustment of the gage with reference to the advancing means without affecting the relation of the connections and the automatically operating means substantially as described.

10. In a cutting machine, the combination with the frame and a table for the work thereon, of a knife, a gage supported to be movable with relation to the knife for advancing the work thereto, a feed screw connected to the gage for manually moving the same, automatically operating means for advancing the gage with successive feed movements, coupling means between the advancing means and the screw whereby the movement is transmitted from the advancing means therethrough, means for manually effecting an adjustment of the gage with reference to the advancing means and operative without effecting rotation of the feed screw and means automatically to disengage the advancing means when the gage has completed its movement.

In testimony whereof I have signed my name to this specification.

DARIUS T. WADHAMS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."