

E. W. WIGHT.  
 METAL WORKING MACHINE.  
 APPLICATION FILED SEPT. 1, 1910.

1,009,948.

Patented Nov. 28, 1911.

4 SHEETS—SHEET 1.

Fig. 1

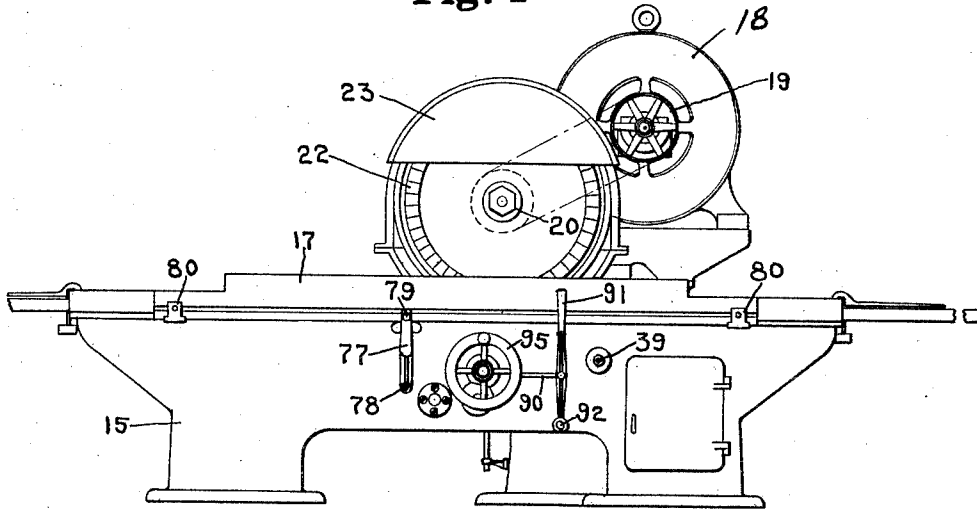
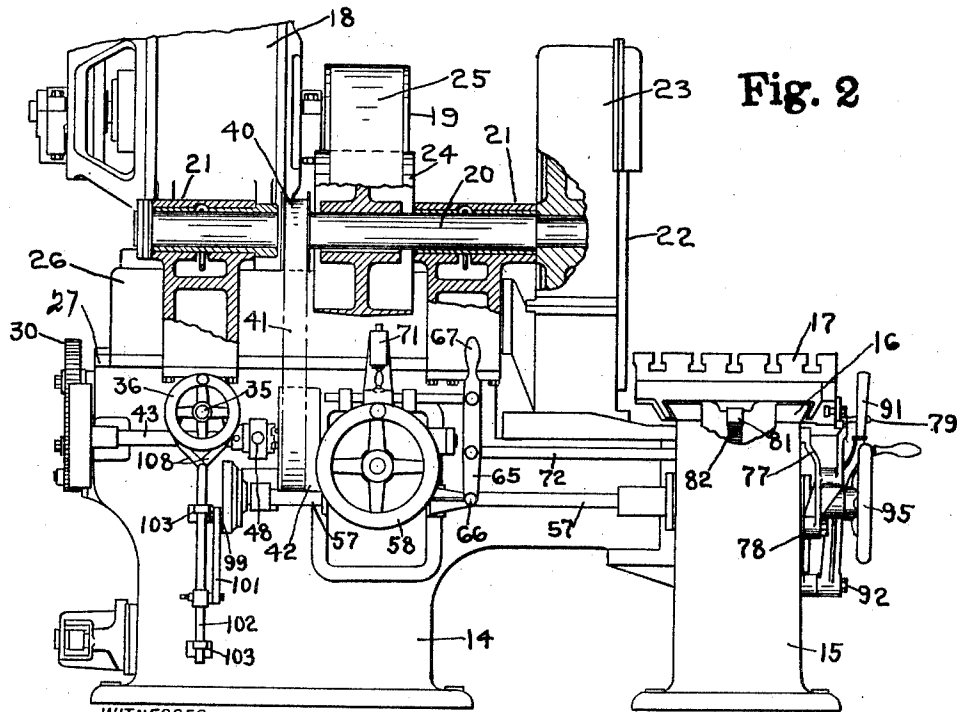


Fig. 2



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4 SHEETS-SHEET 2.

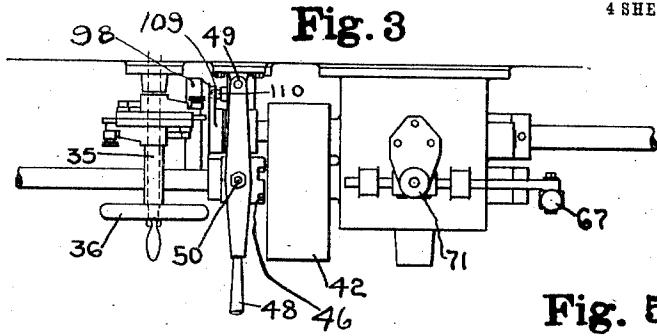


Fig. 3

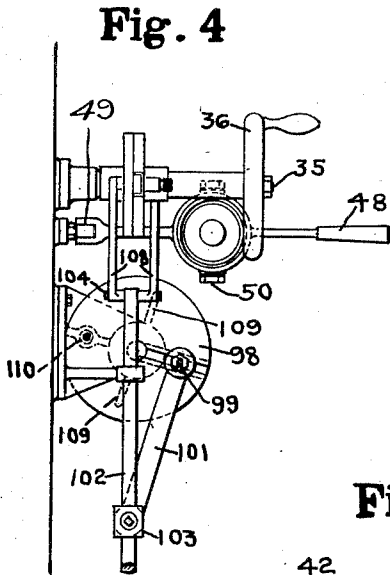


Fig. 4

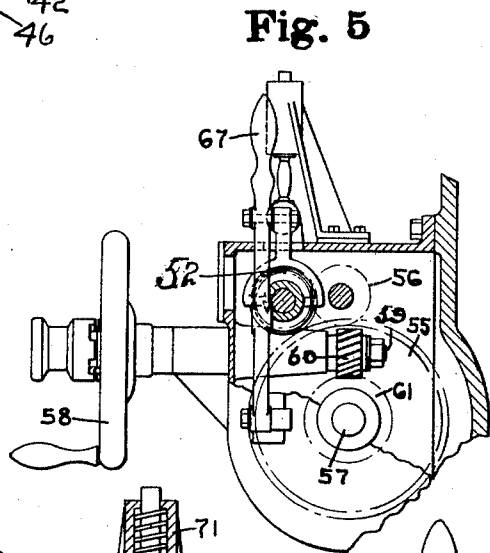


Fig. 5

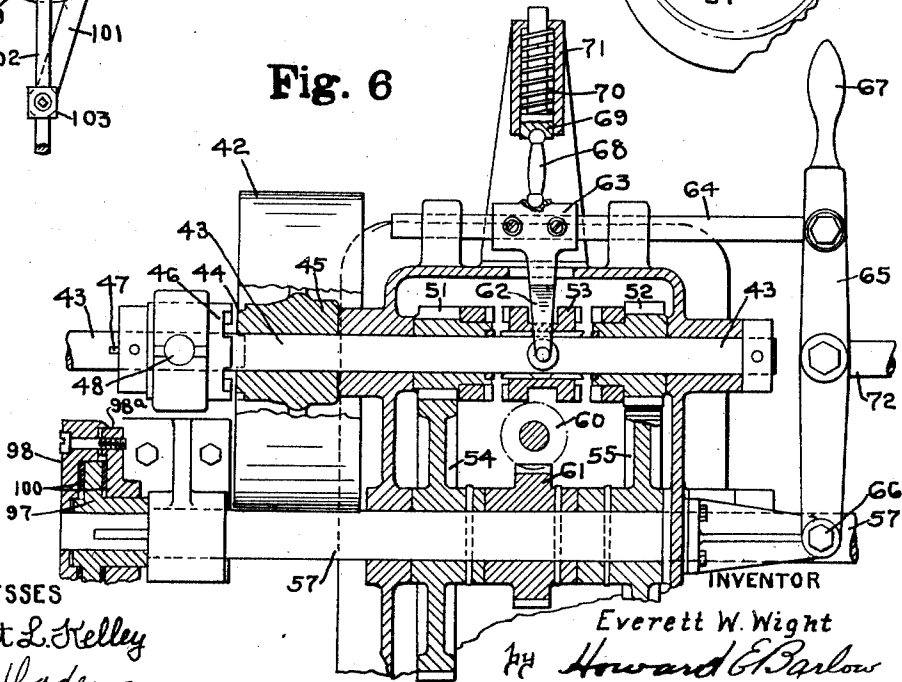


Fig. 6

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Fig. 7

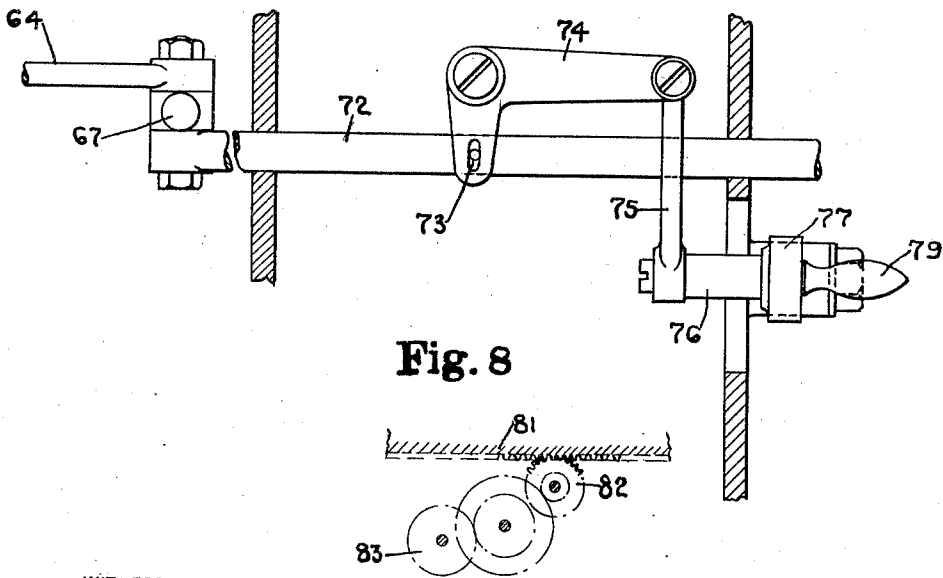
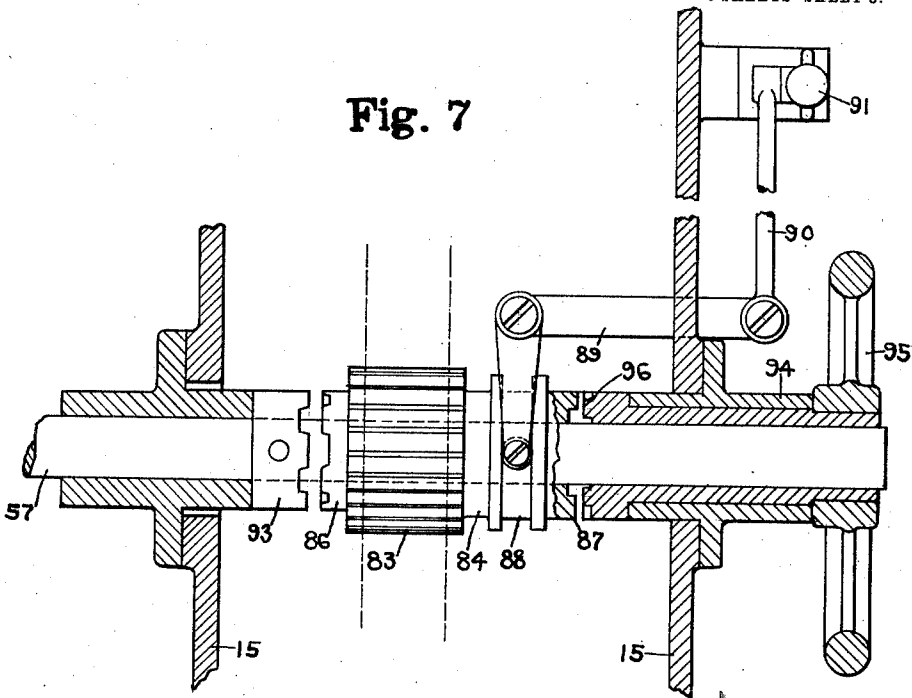


Fig. 8

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4 SHEETS—SHEET 4.

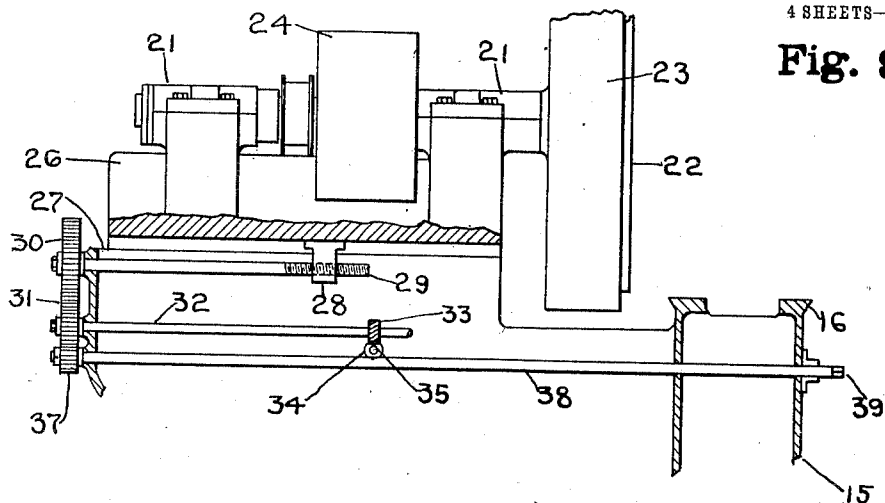


Fig. 9

Fig. 10

Fig. 11

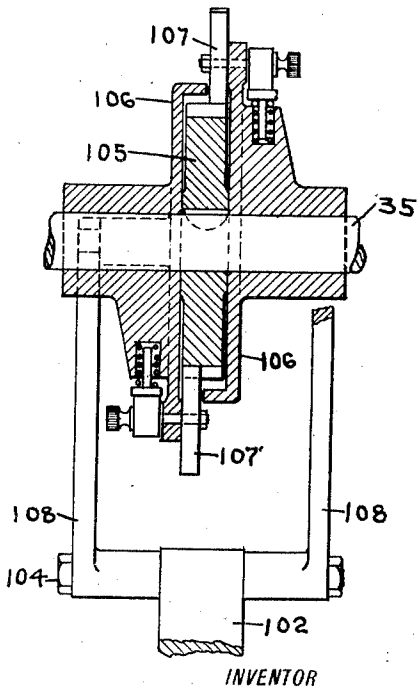
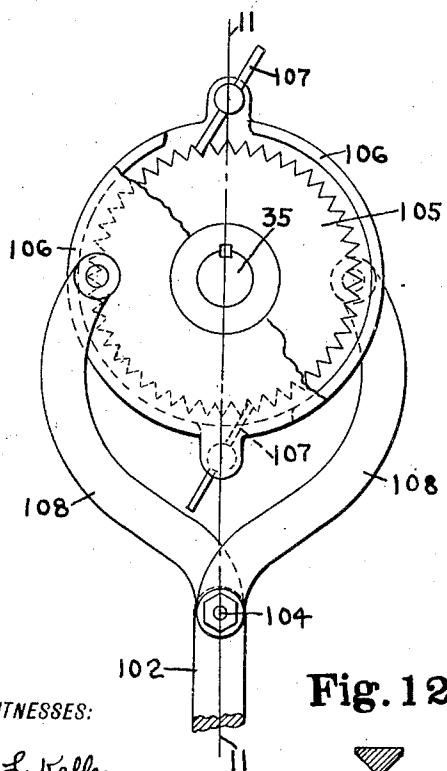
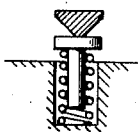


Fig. 12

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# UNITED STATES PATENT OFFICE.

EVERETT W. WIGHT, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO DIAMOND MACHINE COMPANY, OF PROVIDENCE, RHODE ISLAND, A CORPORATION OF RHODE ISLAND.

METAL-WORKING MACHINE.

1,009,948.

Specification of Letters Patent.

Patented Nov. 28, 1911.

Application filed September 1, 1910. Serial No. 580,110.

*To all whom it may concern:*

Be it known that I, EVERETT W. WIGHT, a citizen of the United States, residing at the city of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Metal-Working Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to metal working machines, especially of that type having a long reciprocating table for carrying the work back and forth past the tool, the latter being advanced at intervals toward one side of the work, usually at the end of each movement of the table. When the attendant has to control the operations of the machine from a point at the side of the table opposite the location of the tool, he must frequently go around one end of the table to inspect the face of the work being operated upon. For purposes of brevity of description, this side of the table is herein referred to as the front. To get to the back of the table, to watch the progress of the work being done or inspect that which has been done, the attendant must go quite a distance around one end of the table, which is frequently quite long, and often he must first stop the machine to allow time for the inspection.

The object of this invention is to provide a machine of this character with means whereby it may be fully controlled by an attendant at the rear of the table, from which point he can watch the progress of the work. Preferably the machine is also provided with means whereby the movements can be controlled from the front when desired.

To these ends, the invention consists in the construction and combination of parts substantially as hereinafter described and claimed.

In the accompanying drawings, the machine illustrated is of a form well adapted for grinding the side face of a piece of work carried by the table, and wherein the grinding tool is rotated by a shaft mounted horizontally at a right angle to the line of travel of the table; but I do not limit myself to a grinder as the working tool, nor to the angle

at which the tool shaft is mounted relatively to the table.

Of said drawings: Figure 1—is a front elevation of the machine. Fig. 2—is an end view, from the left of Fig. 1, on a larger scale, and partly in section. Fig. 3—is a plan view of a portion of the mechanism shown in Fig. 2. Fig. 4—is an elevation from the left of Fig. 3, on a larger scale. Fig. 5—is a detail view, partly in section, from the right of Fig. 3, on a larger scale than either of Figs. 3 and 4. Fig. 6—is a detail elevation, partly in section, of the parts shown in Fig. 3, and on a larger scale. Fig. 7—is a detail plan view of parts of the automatic reverse mechanism. Fig. 8—is a detail of the gear train for reciprocating the work table. Fig. 9—is a detail side elevation, partly in section of the tool mounting and cross-feed mechanism. Fig. 10—is a detail elevation, partly broken out, of portions of the automatic feed mechanism. Fig. 11—represents a section on line 11—11 of Fig. 10. Fig. 12—is a detail showing the spring pressed pin for engaging the angular shaped member to hold the pawl either into or out of engagement with the ratchet wheel.

Similar reference characters indicate the same or similar parts in all of the views.

Suitable base portions 14 and 15 are provided for the machine, the portion 15 having ways 16 for the reciprocating table on which the work is supported or held in the usual manner. A motor 18 has its shaft provided with a driving pulley 19. A shaft 20 mounted in bearings 21 carries the working tool 22 which may be a ring-shaped grinder, a hood casing 23 inclosing a portion of the tool. The shaft 20 has a pulley 24, driven by a belt 25 from the motor pulley 19. The frame 26 for the bearings 21 is mounted on ways 27 of the base 14 (see Figs. 2 and 9) and has a nut 28 engaging a screw shaft 29 by means of which the tool is given its cross feed, or movement to and from the work on the table. Secured to said screw shaft is a gear 30 which meshes with a gear 31 carried by a counter shaft 32 having a skew gear 33. The latter is actuated by a similar gear 34 carried by a shaft 35 to which a crank or wheel 36 is secured, the latter being located behind the table, as

shown in Fig. 2, it being understood that by the front of the table is meant that portion at the extreme right of said figure. This enables the tool to be fed up to the work 5 by hand, while the attendant stands where he can see the rear face of the piece of work. To enable this same cross feed to be controlled from the front of the table, a pinion 37 meshing with gear 31 is secured to one 10 end of a shaft 38, the other end of which projects through base 15 at the front thereof said shaft being shown as squared at 39 to receive a crank.

A pulley 40 see Fig. 2 secured to the tool 15 shaft 20, is connected by a belt 41 with a pulley 42 loose on a shaft 43 mounted in suitable bearings in base 14. The hub 45 of pulley 42 is formed or provided with clutch teeth 44 to cooperate with similar 20 teeth carried by a clutch block 46 connected to shaft 43 by a spline 47 (see Fig. 6). A lever 48 (see Figs. 3 and 4) is pivoted at 49 to the base or frame of the machine and has yoke pins 50 engaging the clutch 25 block 46.

Loosely mounted on the shaft 43 are two pinions 51—52 (see Fig. 6) and between them a clutch 53 is splined on said shaft. Meshing with pinion 51 is a gear 54. A gear 30 55 meshes with an idler 56 (see Fig. 5) which, in turn, meshes with pinion 52. The gears 54, 55 are secured to a counter-shaft 57. When shaft 43 is running, the counter-shaft 57 will be driven in one direction or 35 the other according to whether the clutch 53 is shifted to engage pinion 51 or pinion 52, and if the clutch is in the intermediate position shown in Fig. 6, the shaft 57 possesses no power-driving connections and may be 40 rotated by hand. Such hand operation may be effected by a crank wheel 58 at the outer end of a shaft 59 the inner end of which has a skew gear 60 meshing with a skew gear 61 secured to shaft 57 (see Figs. 5 and 6). 45 The clutch is engaged by a yoke 62 carried by a block 63 secured to a slide bar 64, the latter being operated by a lever 65 pivoted at 66 and having a handle 67 whereby the clutch may be manually shifted. To cause 50 the clutch to quickly take its new position after passing the intermediate position, a link 68 bears at one end against the block 63, a plunger 69 actuated by a spring 70 in a housing 71 bearing on the other end of 55 said link.

To effect the automatic shifting of the clutch 53 at the end of each direction of travel of the work table, to cause the table to return through the connections herein- 60 after described, the lever 65 is connected to a slide or link 72 having a pin 73 (see Figs. 6 and 7). An elbow lever 74 has a slot engaging said pin and is connected by a link

75 with a stud 76 projecting rearwardly from a lever 77 pivoted at 78 to the front of 65 the table support or base 15 (see Fig. 1) and having a handle 79 by means of which it may be manually operated from the front of the machine to shift the clutch 53 to reverse the direction of travel of the work 70 table. This lever 77 is automatically operated by either one of two dogs or blocks 80 carried by the table as shown in Fig. 1.

The under side of the work table is provided with a rack 81 engaged by a gear 82 75 at one end of a train such as shown in Fig. 8, the gear 83 at the other end of the train being carried by a hub 84 splined on shaft 57 (see Fig. 7). Said hub is provided with clutch teeth 86, 87 at its ends, and with an 80 annular groove 88 engaged by a yoke carried by an elbow lever 89 which is connected by a link 90 with a hand lever 91 pivoted at 92 to the front of base 15. By means of said hand lever, the hub 84 can be shifted 85 so that its teeth 86 will engage, or be disengaged from, similar teeth of a collar 93 secured to shaft 57. When engaged, and when the parts shown in Fig. 6 are in relative positions to drive shaft 57, the table 90 will be moved along by the train of gearing just described. When the teeth 86 are disengaged, the table may remain stationary while the rest of the machine is running. 95 In order that the table may be manually operated from the front of the machine, a sleeve or hollow shaft 94 is mounted on the front end of the shaft 57, said sleeve having a hand wheel 95 at one end and clutch teeth 96 at its other end, so that, 100 if the hub 84 be shifted to the extreme right in Fig. 7, it can be operated by the hand wheel 95. In order that the table may be similarly operated from the rear of the table, the hand wheel 58 hereinbefore described, is provided. And while the lever 91 at the front of the machine may be used to stop and start the table, the lever 48 at the rear of the table performs practically 105 the same function although it does so through the medium of a different clutch from the one that is shifted by said lever 91.

As has been described, the tool 22 may be fed up to the work, in a direction transverse of the path of movement of the work, 115 by hand, either from the front or rear of the table, operation from the latter position being effected through the medium of shaft 35. In order that this shaft may be automatically actuated intermittently 120 so as to advance the tool toward the work at the end of each travel of the latter, I provide the mechanism best shown in Figs. 10 and 11 in connection with Figs. 2, 4 and 6. On the rear end of shaft 57, which 125 is running continuously when the ma-

chine is to operate automatically, is secured a disk 97. A disk 98 having a crank pin 99 is held against the face of disk 97 by a ring-shaped disk 98<sup>a</sup> as by bolts connecting the two beyond the periphery of the disk 97. Disks or plates of suitable friction material 100 are interposed between the disk 97 and the disks 98, 98<sup>a</sup>. The crank pin 99 is connected by a link 101, with a vertically reciprocating slide 102 mounted in bearings 103 see Fig. 4, and having a cross head 104 at its upper end. Keyed on shaft 35 is a ratchet wheel 105 having double-faced teeth. Loosely mounted on said shaft, on opposite faces of the ratchet wheel, are two disks 106, each carrying a spring actuated pawl 107. Each disk 106 is connected by a link 108 to the cross-head 104, but the points of connection of the two links with the two disks are diametrically opposite each other, and the pawls are inclined, so that on each stroke of slide 102 up or down, the disks are oscillated in opposite directions, one pawl actuating the ratchet and the other riding idly over it. As has been mentioned, the shaft 57 is rotated continuously when the machine is being run automatically, and consequently the disk 97 must rotate continuously. It becomes essential of course to prevent continued rotation of the shaft disk 98, and permit this to be done only at the end of each longitudinal movement of the work table. To effect the stoppage of rotation of the crank disk 98, I provide the back of the disk 98<sup>a</sup> with two ribs 109 either one of which may cooperate with a fixed stop pin 110 projecting from a fixed part of the machine. Therefore, whenever the table starts on a return movement, the crank disk is rotated until one of the ribs 109 contacts with the stop pin 110 after which the disk 97 slips during the continued movement of the table and rotation of shaft 57. The partial rotation of the crank disk 98 has, through the connections described, rotated the screw shaft 29 and has slightly fed the tool up to the work. The slipping of the disks continues to the end of the movement of the work table, but when the reverse movement begins, the disk 97 rotates in the other direction and of course the friction disks 100 cause the disk 98 to rotate in the opposite direction until the other rib 109 contacts with the stop pin, the resulting partial rotation of disk 98 actuating the other pawl 107 so as to give another advance movement of the tool toward the work.

It will now be understood that a machine constructed as described can be entirely controlled by the operator standing in one position behind the work table where he can watch the progress of the work, so as to re-

quire no running around the end of the table to watch the results on the face of the work. 65 Another advantage is that one operator can run two machines from practically one position, provided the second machine has the mechanism for controlling it located behind the other end of the table from that shown 70 in Fig. 1. That is, it being understood that in the machine illustrated the mechanism for controlling from the rear is located behind the left hand end of the table. With a second machine having its mechanism for 75 controlling from the rear located behind the right hand end of the table, and with such other or second machine turned around so that the two machines are placed back to back, then the attendant simply stands in the 80 space between two tables and can watch the work being done by both machines, and control both of them.

I claim:

1. A machine of the character described 85 comprising a longitudinally movable work table, means for feeding the same, a tool for operating upon work supported by said table, manually operable means at the front of the machine for relatively adjusting the 90 tool and the work, a manually operable device located behind the table for relatively adjusting the tool and the work.

2. A machine of the character described 95 comprising a longitudinally movable work table, means for feeding the same, a tool for operating upon work supported by said table, means at the front of the machine for relatively adjusting the tool and the work, a manually operable device located behind 100 the table for relatively adjusting the tool and the work, a second manually operable device located behind the table for effecting adjustment of the table independently of the first-mentioned adjustment. 105

3. A machine of the character described 105 comprising a longitudinally movable work table, a tool for operating on one side face of the work carried by said table, a shaft having connections for reciprocating the 110 table, means for rotating the shaft first in one direction and then in the other, a crank disk frictionally connected with said shaft at the rear of the table, means for advancing the tool toward the work, and connections 115 with said crank disk for advancing the tool at the end of each reciprocation of the work table.

4. A machine of the character described 120 comprising a longitudinal movable work table, a tool for operating on one side face of the work carried by said table, a shaft having connections for reciprocating the table, means for rotating the shaft first in one di- 125 rection and then in the other, a crank disk frictionally connected with said shaft at the

rear of the table, means for advancing the tool toward the work, and connections with said crank disk for advancing the tool at the end of each reciprocation of the work table, and connections between said pawls and crank disk for actuating the pawls. 10

5 said connections including a screw shaft for advancing the tool, a shaft for driving said screw shaft and having a ratchet, a pair of pawls for alternately operating said ratchet, In testimony whereof I affix my signature in presence of two witnesses.

EVERETT W. WIGHT.

Witnesses:  
E. C. ATKINS,  
SAMUEL RAYNOR.

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