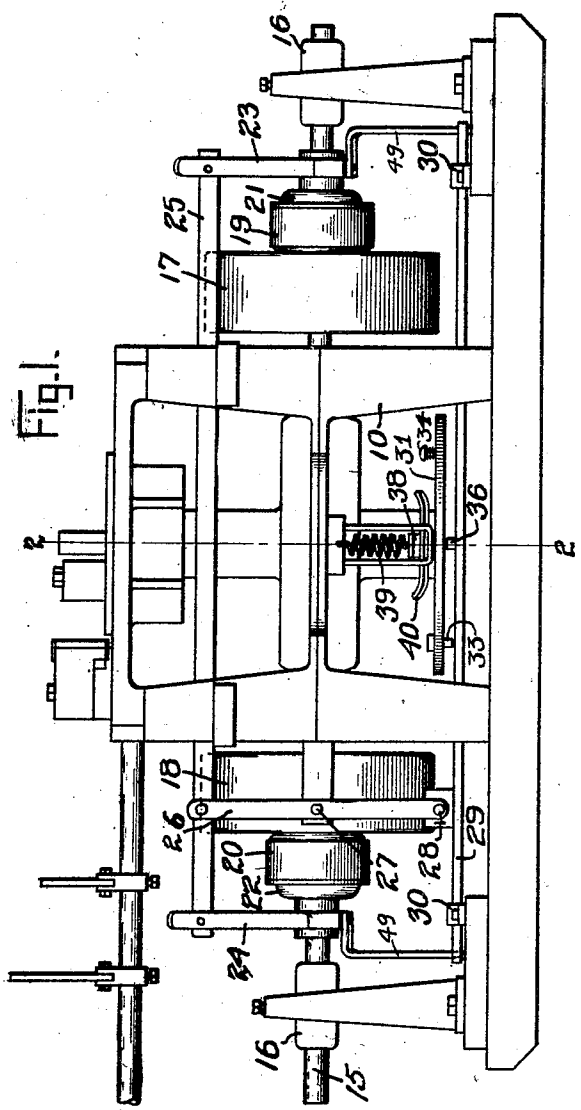
July 22, 1924. 1,502,633

J. H. HOLMGREEN

STOP MECHANISM FOR BENDING MACHINES

Original Filed Aug. 4, 1919 2 Sheets-Sheet 1

Fig. 1.



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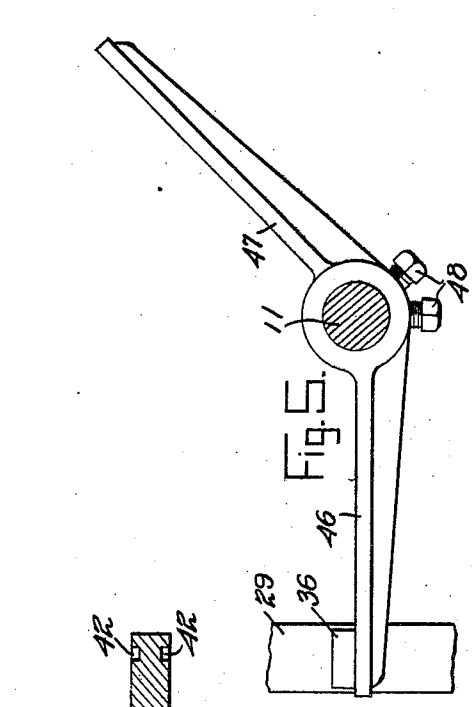


Fig. 5.

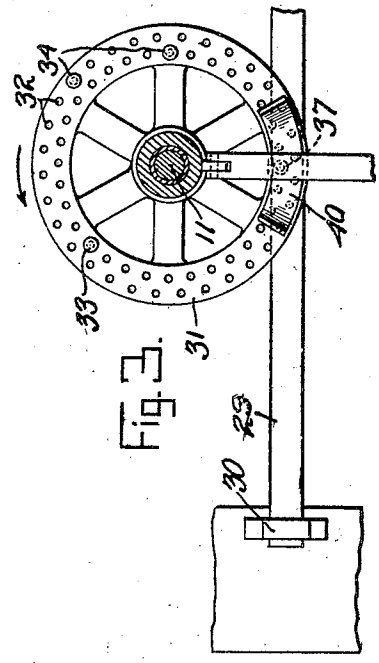


Fig. 3.

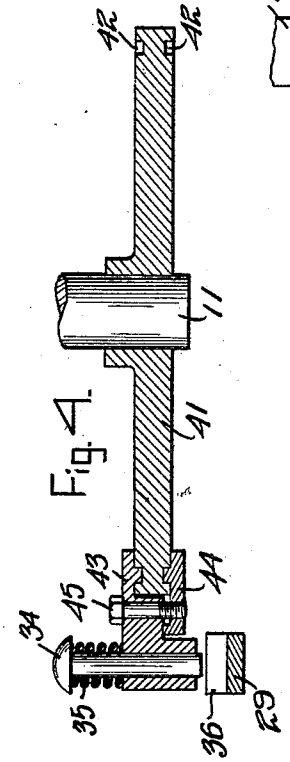


Fig. 4.

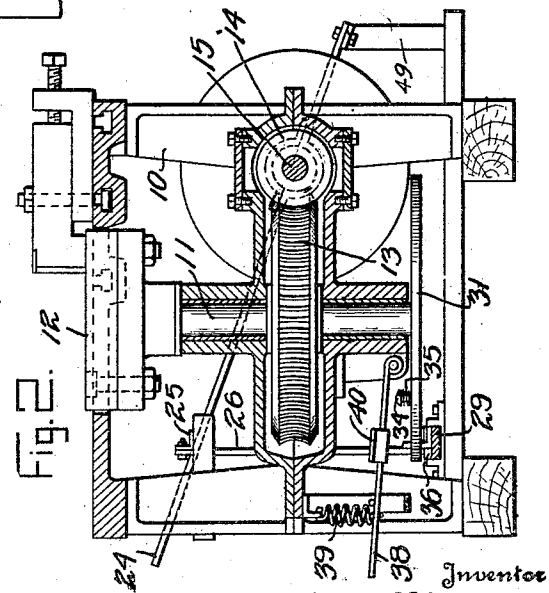


Fig. 2.

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Patented July 22, 1924. 1,502,633

UNITED STATES PATENT OFFICE.

JULIUS HERMAN HOLMGREEN, OF SAN ANTONIO, TEXAS.

STOP MECHANISM FOR BENDING MACHINES.

Original application filed August 4, 1919, Serial No. 315,154. Divided and this application filed November 6, 1922. Serial No. 599,408.

To all whom it may concern:

Be it known that I, JULIUS H. HOLMGREEN, a citizen of the United States, residing at San Antonio, in the county of Bexar and State of Texas, have invented certain new and useful Improvements in Stop Mechanism for Bending Machines, of which the following is a specification.

My said invention relates to a stop mechanism intended primarily for use with bending machines but which may be used in various other types of mechanisms, this application being a division of application No. 315,154, filed August 4, 1919, Patent No. 1,465,733, dated August 23, 1923. One object of the invention is to provide selective means for stopping a driven shaft automatically after it has moved through a predetermined angle or semi-automatically after it has moved through a lesser predetermined angle.

Another object of the invention is to provide an initial position or zero point to which the machine may return after each operation and from which it may be driven in either direction of rotation to a predetermined extent.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts,

Figure 1 is a front elevation of my improved machine,

Figure 2 a section on line 2—2 of Figure 1,

Figure 3 a plan of an indexing mechanism forming part of the machine,

Figure 4 a modified form of index plate, and

Figure 5 a further modification of the indexing means.

In the drawings reference character 10 indicates the frame of the machine in which is supported a vertical shaft 11, which shaft carries at its upper end a bending head 12 such as shown in my copending application. A worm gear 13 is provided for driving the shaft, this worm gear being driven by a worm 14 on a horizontal shaft 15. The shaft 15 is supported in bearings on the machine frame and in out-board bearings 16 on the shop floor or other support for the machine.

For driving the shaft 15 I have provided a pair of loose pulleys 17 and 18, said pulleys driving clutch members 19 and 20 respectively; these levers being fulcrumed at their rear ends on posts 49. These clutch members cooperate with clutch members 21 and 22 splined to the shaft 15. A pair of levers 23 and 24 are provided for shifting the clutch members 21 and 22. At their upper ends these levers are connected to a shifter bar 25 and as shown in Figure 2 they project to the front of the machine for convenient operation. The bar 25 is pivotally connected near one end to a vertical bar 26 having a fulcrum 27 and pivoted at its lower end to a block 28 on a shifting bar 29 slidable in bars 30. It will be seen that when the shifter bar 29 is moved endwise the bar 25 will also be moved to throw out whichever clutch is engaged at that time.

For stopping the rotation of the shaft 11 at a predetermined time the following mechanism is provided:

At the lower end of the shaft there is fixed a disk 31 rotating with the shaft and this disk has a number of perforations 32 about its circumference, such perforations being arranged in one or more series as may be desirable or convenient.

A plurality of pins 33 and 34 are provided for insertion in these openings and the pins 34 are supported by springs 35 in such a manner as to maintain their lower ends above the lower face of the plate 31. The bar 29 has a pin 36 projecting upward in a position to be engaged by a depending pin or lug on the index plate. A pin at 37 on the index plate remains always in place for stopping the shaft at the end of a reverse rotation.

A treadle 38 is pivoted on the machine frame adjacent the lower end of the shaft 11 and is normally held up by spring 39. A laterally extending plate 40 on the treadle has its ends bent upward to depress any of the spring supported pins which may come in its path, this action taking place, of course, only when the treadle is held down by the operator.

In the operation of the device so far described when the driven shaft 11 is to be rotated, as in the direction of the arrow (Figure 3), a lever 23 is operated for throwing in the clutch member corresponding to the desired direction of rotation, pins 33 and spring supported pin 34 having been previously located in position to limit the ex-

tent of rotation as desired. Assuming the rotation to take place in the direction of the arrow and the pin 33 to be located at an angle of 240° from pin 37 the shaft will rotate through that angle and will then be stopped by the impingement of pin 33 against projection 36 after which the bar 29 will be moved endwise to throw out the clutch 21. The right-hand clutch is now thrown in by the operator to return the shaft to its initial position where it will be stopped by engagement of the pin 37 with projection 36 of the shifter bar. If it be now intended to rotate the shaft through an angle of 90° it can be stopped at that point by depressing the treadle whereupon the first pin 34 will be moved down by the plate 40 to stop the shaft in the manner above described.

After this the shaft may return to zero position and may again be set in motion and stopped by a second pin 34 at an angle of 135° by providing pins of different heights or treadles with plates of different conformation to coact with the different pins.

In Figure 4 I have shown a different form of indexing means comprising a plate 41 having grooves 42 about its circumference at both sides of the plate. Rims 43 and 44 having projections to enter the perforations in the plate are held in place on the plate by screws 45. These rims may extend all the way around the plate or may comprise any desired number of separate segments arranged about the same. The upper rim 43 in any case is provided with one or more openings about its periphery to support pins such as shown in Figures 2 and 3, a pin 34 being shown in Figure 4 supported by a spring 35. Such a pin coacts with the projection 36 on the shifter bar 29 to stop the machine. For changing the stopping position the screws 45 are loosened and the rims (or rim segments) are moved about the plate to the desired position, where they are fixed by said screws.

In Figure 5 is shown another form of indexing means comprising a pair of arms 46 and 47 which may be formed in one piece or independently and which are held to the shaft 11 by set screws 48. These arms cooperate with the projection 36 on a shifting bar 29 in a similar manner to the index plate of Figure 3. For additional positions additional arms may be provided.

It will be evident to those skilled in the art that my device may be modified in various other respects without departing from the spirit of the invention, the true scope which is shown in the appended claims.

Having thus fully described my said invention what I claim as new and desire to secure by Letters Patent, is:

1. Indexing means for bending machines comprising a plate, having a series of holes in a face thereof, a stop member adapted to be inserted in one of said holes comprising a shank and a head, yielding means on said shank for retaining said stop member in retracted position on said plate, and means for pressing the stop member downward.

2. Indexing means for bending machines comprising a plate, having a series of holes in a face thereof, a stop member adapted to be inserted in said holes comprising a shank and a head, a spring on said shank, and manually operated means for pressing said stop member downwardly, substantially as set forth.

3. Indexing means for bending machines comprising a plate, having a series of holes on a face thereof, a stop member adapted to be inserted in said holes comprising a shank, a head and a spring, a pedal pivoted to the frame of said machine, a plate fixed thereto for engagement with said stop member, and means for retracting said pedal and plate.

4. Indexing means for bending machines comprising a plate, having a series of holes on a face thereof, a stop member adapted to be inserted in said holes comprising a shank, a head and a spring, a pedal pivoted to the frame of said machine, a plate having its edges curved upwardly adapted to contact with said stop member to press the same downwardly when said pedal is depressed, and a spring for retracting said pedal, substantially as set forth.

5. A stop mechanism comprising a rotary shaft, means for driving the same, automatic means for stopping the shaft when it has rotated through a predetermined angle, including a disk having a plurality of holes and a pin adapted to be selectively positioned therein, and a manually controlled normally retracted pin on said disk for stopping the shaft when it has rotated through another predetermined angle of less extent than the first, substantially as set forth.

6. A stop mechanism comprising a rotary shaft, a disk thereon, means for driving the shaft, means on the disk for interrupting the drive automatically at the end of a full rotation in either direction and manually controlled means on the disk for stopping it at an intermediate position, substantially as set forth.

7. A stop mechanism comprising a rotary shaft, means for driving the shaft, a disk on the shaft, means on the disk for stopping the shaft automatically in a substantially identical position after an approximately complete rotation in either direction, means adapted to be located on the disk for stopping it automatically after a partial rotation from said position, and means on the disk under control of the op-

erator for stopping it after a lesser predetermined rotation from said position, substantially as set forth.

8. In a bending machine, driving means, a controller therefor, a rotary plate having a series of holes, pins adapted to be inserted in said holes, one of said pins normally projecting into position to engage the controller and stop the machine, and another normally held out of active position, substantially as set forth.

9. In a bending machine, driving means, a controller therefor, a rotary plate having a series of holes, pins adapted to be inserted in said holes, one of said pins normally projecting into position to engage the controller and stop the machine, other pins normally held out of active position, and means for rendering them active in selective succession, substantially as set forth.

10. A stop mechanism comprising a shaft, a plate on the shaft having a plurality of holes, normally retracted pins adapted to be positioned in a plurality of such holes, and means for actuating said pins selectively for stopping the shaft in various positions, substantially as set forth.

11. A stop mechanism comprising a shaft, a plate on the shaft having a plurality of holes, normally retracted pins adapted to be positioned in a plurality of such holes, means for actuating said pins selectively for stopping the shaft in various positions, and a pin on the disk for stopping the reverse motion of the shaft at a constant position, substantially as set forth.

In witness whereof, I have hereunto set my hand and seal at San Antonio, Texas, this 31st day of October A. D. nineteen hundred and twenty-two.

JULIUS HERMAN HOLMGREEN. [L. S.]

Witnesses:

RICHARD J. HOLMGREEN,

LEE F. CRAIG.