Aug. 13, 1946. O. J. E. OLSSON 2,405,709

STOP MECHANISM

Original Filed Dec. 26, 1940

Fig. 1

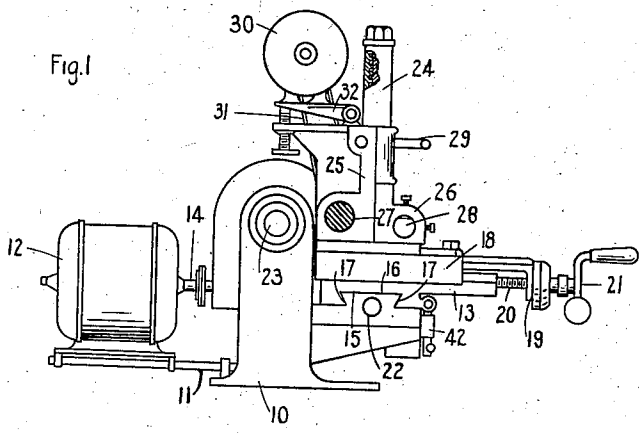


Fig. 2

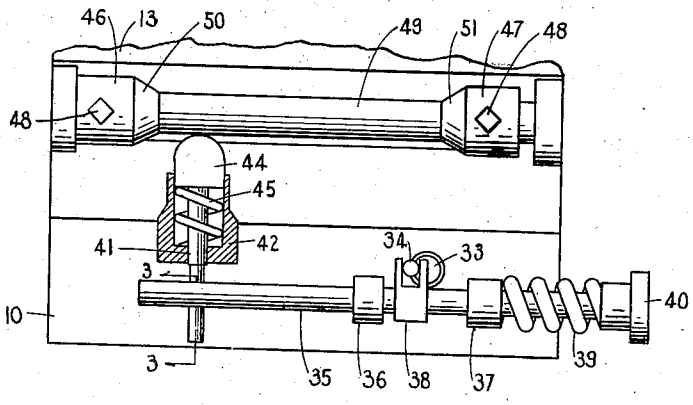


Fig. 3

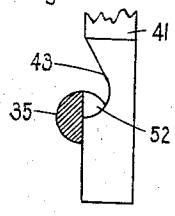


Fig. 5

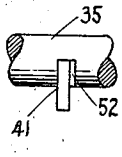
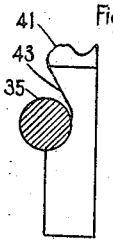


Fig. 4



INVENTOR
OLOV J. E. OLSSON

BY G. H. Braddock
ATTORNEY

Patented Aug. 13, 1946

2,405,709

UNITED STATES PATENT OFFICE

2,405,709

STOP MECHANISM

Olov J. E. Olsson, Minneapolis, Minn., assignor to Storm Manufacturing Company, Inc., Minneapolis, Minn., a corporation of Minnesota

Original application December 26, 1940, Serial No. 371,813. Divided and this application December 22, 1943, Serial No. 515,272

10 Claims. (Cl. 192—143)

1

This application is a division of my pending application Serial No. 371,813, for Machine for grinding and turning brake drums, filed December 26, 1940.

The invention here presented relates to a stop mechanism, so-called.

An object of the invention is to provide a stop mechanism of the present character which will be of novel and improved construction.

A further object is to provide a stop mechanism wherein will be incorporated various improved features and characteristics of construction novel both as individual entities of the stop mechanism and in combination with each other.

And a further object is to provide a stop mechanism of construction as hereinafter set forth.

With the above objects in view, as well as others which will appear as the specification proceeds, the invention comprises the construction, arrangment and combination of parts as now to be fully described and as hereinafter to be specifically claimed, it being understood that the disclosure herein is merely illustrative and intended in no way in a limiting sense, changes in details of construction and arrangement of parts being permissible so long as within the spirit of the invention and the scope of the claims which follow.

In the accompanying drawing forming a part of this specification,

Fig. 1 is a side or end elevational view of a machine in which the features and characteristics of the invention are incorporated, a grinding tool supporting shaft of the machine being shown in section;

Fig. 2 is an enlarged fragmentary elevational view, partially in section, of mechanism for controlling operation of the machine of Fig. 1; a so-called stop mechanism;

Fig. 3 is a detail sectional view of latch means of said control mechanism, taken on line 3—3 in Fig. 2;

Fig. 4 is a view corresponding generally with the disclosure of Fig. 3 but showing the latch means in a different position; and

Fig. 5 is a fragmentary elevational view further detailing said latch means.

With respect to the drawing and the numerals of reference thereon, a frame of the machine, which is a grinding and turning machine, is denoted generally at 10. Said frame 10 rigidly supports an extension portion 11 of the frame which in turn rigidly supports an electric motor 12.

The frame 10 also supports a carriage 13 adapted to be reciprocated upon the frame in

2

direction longitudinally thereof and transversely of the shaft 14 of the electric motor 12. More explicitly, said carriage 13 includes a base portion 15 thereof slidably movable over an adjacent surface 16 of the frame 10, and oppositely disposed, oblique or bevel flange portions 17 thereof slidably movable over oblique or bevel surfaces of said frame 10 which are opposite said base portion 15 and said surface 16. Stated otherwise, the oppositely disposed, oblique or bevel flange portions 17, 17 are spaced from the base portion 16, as well as from each other, and extend inwardly in oblique relation to said base portion 15 to provide oppositely disposed guideways of the carriage 13 extending longitudinally of the frame of the machine in which opposite side edge portions of the frame 10 are snugly, slidably situated. The carriage 13 is adapted to be reciprocated longitudinally of the frame 10 by slidable movement of said carriage and its oppositely disposed guideways along the opposite side edge portions of said frame.

The carriage 13 supports a bracket member 18 adapted to be adjusted transversely of the frame 10 and perpendicularly to the direction in which said carriage is reciprocable along said frame. The bracket member 18 includes a base portion thereof slidably movable over an adjacent surface of the carriage 13, and oppositely disposed, oblique or bevel flange portions thereof slidably movable over oblique or bevel surfaces of said carriage which are opposite said base portion and the carriage surface. Stated otherwise, the oppositely disposed, oblique or bevel flange portions of the bracket member 18 are spaced from the base portion of said bracket member, as well as from each other, and extend inwardly in oblique relation to the base portion of the bracket member, to provide oppositely disposed guideways of said bracket member extending transversely of the carriage 13 in which opposite side edge portions of said carriage are snugly, slidably situated. The bracket member 18 is adapted to be adjusted transversely of the carriage 13 by slidable movement of said bracket member and its oppositely disposed guideways along the opposite side edge portions of said carriage.

Said bracket member 18 supports, or includes, several, or a number of, parts of the grinding and turning machine, and mechanism is included for accomplishing sliding adjustment of the bracket member, with parts supported thereby, transversely of the carriage, and for causing said

bracket member to be secure at any position to which set crosswise of said carriage.

As disclosed, the bracket member 18 includes an integral arm 19 disposed perpendicularly to the base portion of said bracket member and situated adjacent the side portion of the carriage 13 which is opposite the electric motor 12, in spaced relation to and alining relation with said carriage. An adjusting member or screw 20 is rotatably mounted and fixed against longitudinal movement in the arm 19, and an end portion of said adjusting member or screw 20 is threadably mounted in said side portion of said carriage opposite said electric motor 12. A slot (not shown) in the carriage 13 at the side of the last mentioned side portion of said carriage which is opposite the arm 19 provides clearance for relative movement of the carriage and the adjusting member or screw. Said adjusting member or screw 20 is arranged perpendicularly to said arm 19 and parallelly of, or alined with, the carriage 13, and the end portion of the adjusting member or screw 20 which is opposite the threaded end portion fixedly supports a hand piece 21 through the instrumentality of which said adjusting member or screw can be rotated, thus to accomplish adjustment of the bracket member 18 transversely of the frame 10 and the carriage 13. By turning adjustment of the member or screw 20 in one direction, it will be caused to move inwardly of the carriage, thus to cause the bracket member 18 to be adjusted inwardly, and by turning adjustment of said member or screw in opposite direction, it will be caused to move outwardly of said carriage, thus to cause said bracket member to be adjusted outwardly. Obviously, the bracket member 18 will be secured in fixed relation to the carriage 13 at any location along the width of said carriage to which said bracket member may be adjusted.

A work driver, or mechanism for supporting and rotating a brake drum (not shown), or the like, to be ground and turned in the machine, is also included, as well as is mechanism for accomplishing reciprocation of the carriage 13, together with the bracket member 18 and the parts supported, or included, by said bracket member, upon the frame 10 and relative to an article, such as a brake drum, to be operated upon. Neither the work driver, or mechanism for supporting and rotating an article to be operated upon, nor the specific mechanism for accomplishing reciprocation of the carriage, is a part of the present invention, and, therefore, need not be specifically described. Speaking generally, the driven shaft 14 of the electric motor 12 is operatively connected to cause the article or work to be operated upon to be rotated and also to cause a feed member or screw 22 of the machine to be rotated selectively in either direction. Said article or work is adapted to be supported in the machine upon an arbor 23 constituted as a part of the work driver, or mechanism for supporting and rotating the article or work, and said electric motor 12 is adapted to cause said arbor to be rotated.

The feed member or screw 22 is suitably and conveniently mounted in the frame 10. Means (not shown) is provided for precluding longitudinal movement of the feed member or screw. Said feed member or screw 22 is disposed longitudinally of said frame 10 and includes an externally threaded portion thereof which meshes with an internally threaded portion of the carriage 13. The manner in which the feed member or screw is engaged with the carriage forms no part of the present invention.

Rotation of the feed member or screw 22 selectively in opposite directions is to the purpose of causing the carriage selectively to be fed forwardly or rearwardly, as may be predetermined, relative to an article or work being operated upon. The manner in which said feed member or screw is driven by the electric motor 12 forms no part of the present invention.

A hand wheel (not shown) is fixed upon an end of the feed member or screw 22 to the purpose that manual rotational actuation of said feed member or screw can be accomplished. The construction and arrangement will be such that the feed member or screw can be freely manually rotated in either direction through the medium of said hand wheel when clutch means (not shown) constituted as a part of the driving connection between the electric motor 12 and said feed member or screw is in neutral position.

A cylindrical tool post 24 of the machine is situated at the midwidth of the bracket member 18 and is rotatably supported by said bracket member in upstanding, perpendicular relation thereto. The manner in which the cylindrical tool holder is supported upon the bracket member forms no part of the present invention.

A grinding tool holder of the machine is indicated at 25, and a turning tool holder is denoted at 26. The grinding tool holder and the turning tool holder are so mounted upon the cylindrical tool post 24 that either the grinding tool (not shown) upon a supporting shaft 27 or the turning tool 28 can be brought into engagement with an article or work to be operated upon, such, for example, as the internal surface of a brake drum.

The machine includes mechanism, denoted generally at 29, for raising and lowering, or longitudinally moving, the grinding tool holder 25 along the cylindrical tool post 24. The just mentioned mechanism need not be specifically described. It is no part of the present invention.

The supporting shaft 27 for the grinding tool is rotatably mounted upon the grinding tool holder 25, and is adapted to be rotated through the instrumentality of a second electric motor 30 suitably and conveniently supported upon said grinding tool holder 25. A belt 31 rides a pulley fixed upon the shaft of the electric motor 30 and also rides a pulley fixed upon said supporting shaft 27. A bracket 32 supports the electric motor 30 upon the grinding tool holder 25.

The electric motors 12 and 30 are adapted to be energized by current from a source (not shown) of electrical energy, and a circuit for said electrical motors is adapted to include an on-and-off switch 33 having an actuating lever 34. Said actuating lever is adapted to be manually moved to the on position of said switch 33, and mechanism for controlling operation of the actuating lever, thus to control operation of the electric motors 12 and 30, includes latch means adapted to normally maintain said actuating lever in the closed condition of said switch 33 and cam means for causing said latch means to release the actuating lever 34 for movement to the open condition of the switch upon movement of the carriage 13 to both its forward and rearward limit positions.

The on-and-off switch 33 having the actuating lever 34 is mounted upon the frame 10. An operating rod 35 for said actuating lever 34 is slidably mounted in spaced apart bearings 36 and

37 upon said frame and is disposed in parallel, adjacent relation to a guideway of the carriage 13. A bifurcated element 38 rigid with the operating rod 35 straddles said actuating lever 34, and a coil compression spring 39 upon said operating rod and between the bearing 37 and a head 40 on the rod 35 has potential to urge the operating rod to position said actuating lever in the off condition of said switch 33.

A latch element 41 is slidably mounted in a cup-shape member 42 rigid with the frame 10 and is disposed transversely of the operating rod 35. A portion of the latch element at the closed side of the cup-shape member is notched, as at 43, a portion of said latch element at the open side of said cup-shape member includes a button 44, and a coil compression spring 45 upon the latch element and between the base of the cup-shape member and the button 44 normally maintains said button at elevation somewhat above the open end of said cup-shape member.

Spaced apart cams 46 and 47 are adjustably supported, as at 48, upon a rod 49 fixed to the carriage 13 and disposed parallelly of the operating rod 35. Working surfaces 50 and 51 of said cams 46 and 47, respectively, are in facing relation to each other.

The working surface 50 is adapted to cause the button 44 to be depressed against the resilient action of the coil compression spring 45 when the carriage 13 reaches the limit of its rearward movement, and the working surface 51 is adapted to cause said button 44 to be depressed against the resilient action of said coil compression spring 45 when said carriage reaches the limit of its forward movement. The construction and arrangement are such that when the button 44 is in elevated position, as in Fig. 2, the notched part of the latch element 41 lies in a transverse slot 52 of the operating rod 35 so that the notch 43 is out of alinement with the operating rod, as in Fig. 3, and when said button 44 is depressed by either the working surface 50 of the working surface 51 said notch 43 becomes alined with said operating rod 35, as in Fig. 4. Upon alinement of the notch 43 with the operating rod, the coil compression spring 39 will of course act to move said operating rod longitudinally thus to remove the transverse slot 52 from the location of the latch element 41 and its notch 43.

In practice, as the carriage 13 comes to rest at either of its limit positions the latch element 41 will become depressed by one of the cam working surfaces 50 or 51, and the operating rod 35 will be longitudinally slid by the coil compression spring 39 so that said operating rod will cause said latch element to be held depressed against the action of the coil compression spring 45 while the machine is at rest. The longitudinal sliding movement of said operating rod caused by the coil compression spring 39 will of course move the actuating lever 34 to the off condition of the switch 33. When the carriage reaches either of its limit positions, clutch means of the machine will be manually operated to cause the direction of feed of the carriage to be reversed. Then, upon manual actuation of the operating rod 35 inwardly against the resilient action of the coil compression spring 39 to cause the actuating lever 34 to be moved to the on condition of the switch 33, the transverse slot 52 will be alined with the latch element 41 and said latch element obviously will be released from its switch-off position as in Fig. 4 to become situated at its switch-on position as in Figs. 2 and 3 with the commencement of feeding of the carriage and movement of the cam working surface, 50 or 51, which was in engagement with the button 44 in direction away from said button. Attention is called to the fact that the button 44 will be released by either of the cam working surfaces 50 or 51 in response to quite slight feeding movement of the carriage 13, so that the latch means will cause the actuating lever 34 to be fastened in the on condition of the on-and-off switch 33 substantially immediately after the electric motor 12 is set in operation. Of course, either of the cam working surfaces 50 or 51 can be removed from the button 44 by manual rotation of the hand wheel fixed upon the feed member or screw 22. The switch 33 can be placed in the circuit of only one of the electric motors 12 or 30 in an instance where this is desirable.

What is claimed is:

1. In combination, a first member, a second member, a device for causing said first and second members to be relatively moved in parallel relation to each other, an operating element upon one of said members, a switch including an actuator upon the other of said members, means adapted to be manually actuated to move said actuator to the "on" condition of said switch, a resilient member for moving said means to the "off" condition of said switch, and mechanism for retaining said means in the "on" condition of said switch upon manual actuation of said means, said operating element being adapted to actuate said mechanism in response to relative movement of said first and second members to cause the mechanism to release said means and said resilient member being adapted to move said means to the "off" condition of said switch when said mechanism is actuated to release said means.

2. In combination, a first member, a second member, a device for causing said first and second members to be relatively moved in substantially parallel planes, cam means upon one of said members, a switch having an actuator upon the other of said members, mechanism for controlling operation of said actuator including manually actuable means for moving said actuator to the "on" condition of said switch and latch means for retaining said manually actuable means in the "on" condition of said switch when said actuator is manually moved to "on" condition by said manually actuable member, said cam means being adapted to cause said latch means to release said manually actuable means in response to relative movement of said first and second members, and a spring for urging said manually actuable means to the "off" condition of said switch when released by said latch means.

3. In combination, a first member, a second member, a device for causing said first and second members to be relatively moved in substantially parallel planes, spaced apart cams upon one of said members, a switch having an actuator upon the other of said members, mechanism for controlling operation of said actuator including manually actuable means for moving said actuator to the "on" condition of said switch and latch means for retaining said manually actuable means in the "on" condition of said switch when said actuator is manually moved to "on" condition by said manually actuable means, each of said cams being adapted to cause said latch means to release said manually actuable means in response to relative movement of said first and second members, and a spring for urging

said manually actuable means to the "off" condition of said switch when released by said latch means.

4. In combination, a first member, a second member, a device for causing said first and second members to be relatively moved in substantially parallel planes, cam means upon one of said members, a switch having an actuator upon the other of said members, mechanism for controlling operation of said actuator including manually actuable means for moving said actuator to the "on" condition of said switch and latch means for retaining said manually actuable means in the "on" condition of said switch when said actuator is manually moved to "on" condition by said manually actuable means, said cam means being adapted to cause said latch means to release said manually actuable means in response to relative movement of said first and second members in either direction, and a spring for urging said manually actuable means to the "off" condition of said switch when released by said latch means.

5. In combination, a first member, a second member, a device for causing said first and second members to be relatively moved, cam means upon one of said members, said cam means being constituted as spaced apart cams, a switch having an actuator upon the other of said members, mechanism for controlling operation of said actuator including manually actuable means for moving said actuator to the "on" condition of said switch and latch means for retaining said manually actuable means in the "on" condition of said switch when said actuator is manually moved to "on" condition by said manually actuable means, said cam means being adapted to cause said latch means to release said manually actuable means in response to relative movement of said first and second members in either direction, and a spring for urging said manually actuable means to the "off" condition of said switch when released by said latch means.

6. The combination as specified in claim 5, and means adjustably supporting said spaced apart cams.

7. The combination as specified in claim 2, and means for resiliently urging said latch means toward said cam means.

8. The combination as specified in claim 5, and means for resiliently urging said latch means toward said cams.

9. The combination as specified in claim 2, wherein said manually actuable means is constituted as an operating rod slidably mounted upon one of said members.

10. The combination as specified in claim 2, wherein said manually actuable means is constituted as an operating rod slidably mounted upon one of said members, and a bifurcated element rigid with said operating rod and arranged in straddling relation to said actuator.

OLOV J. E. OLSSON.