July 9, 1946. S. L. CASELLA 2,403,581

CROSS SLIDE

Filed Aug. 6, 1943 3 Sheets-Sheet 1

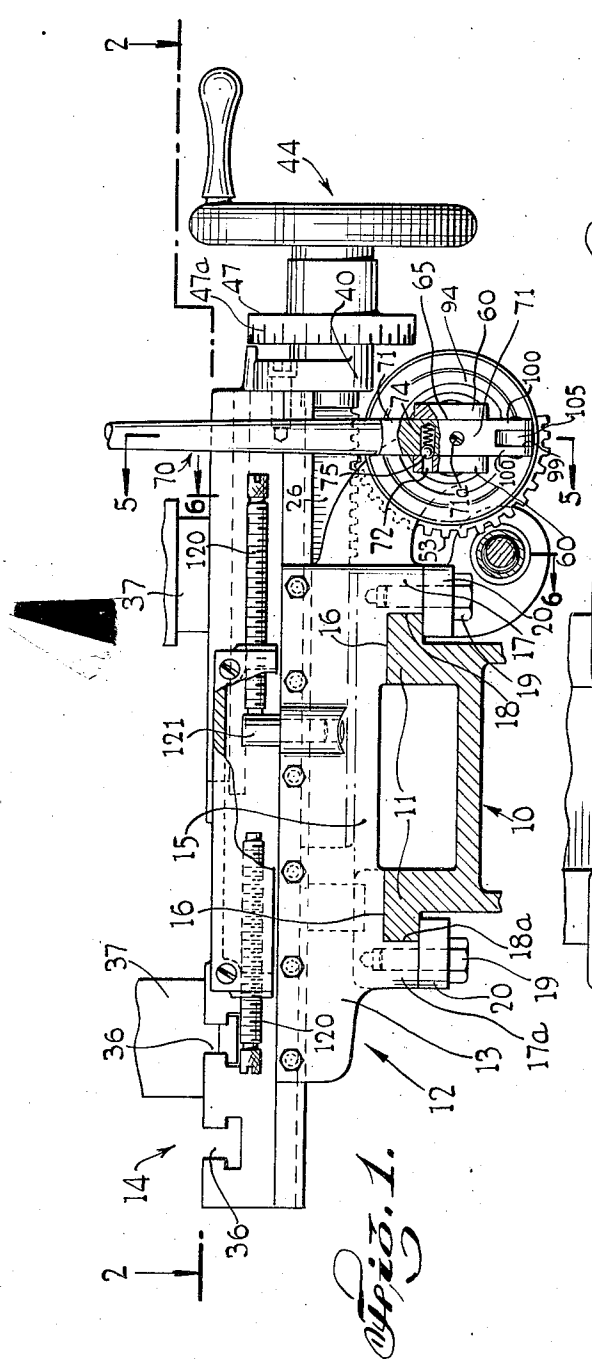


Fig. 1.

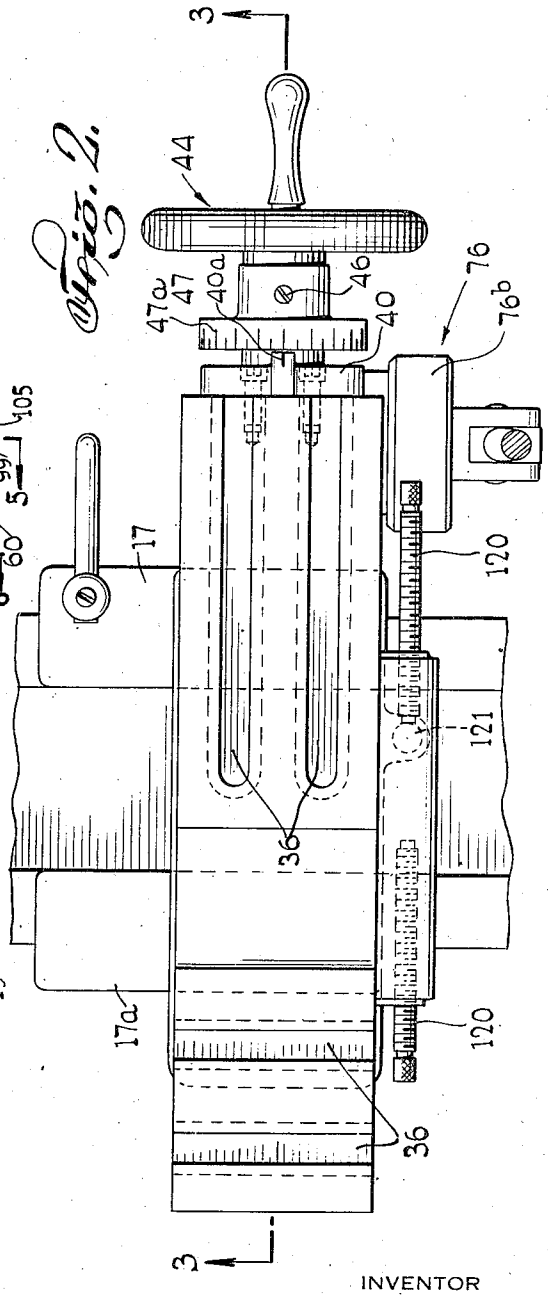


Fig. 2.

INVENTOR
SECONDO L. CASELLA
BY
J. B. Felshin
ATTORNEY

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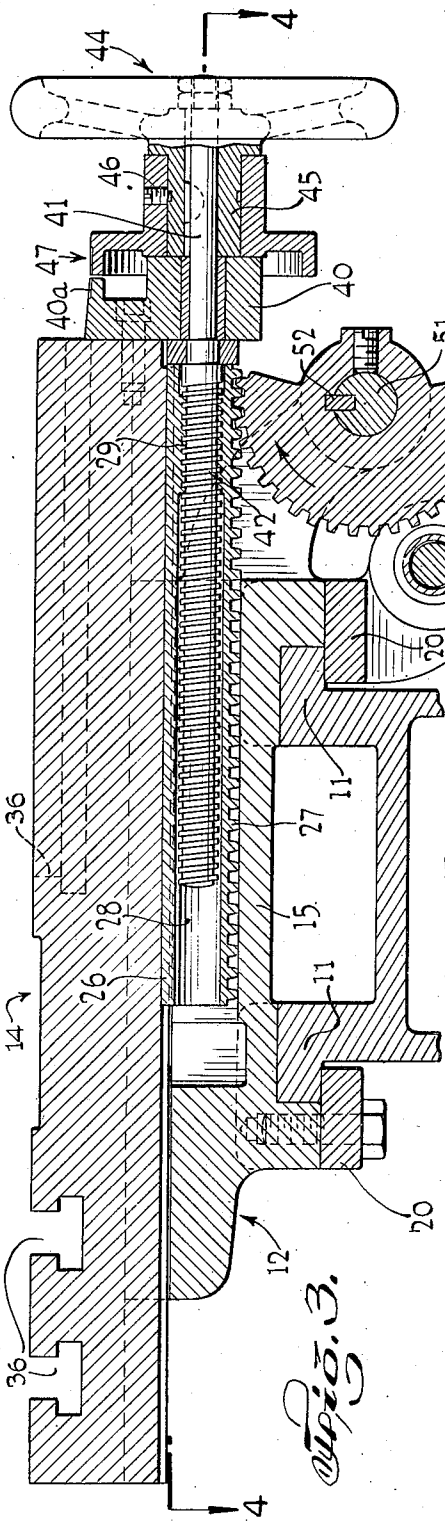


Fig. 3.

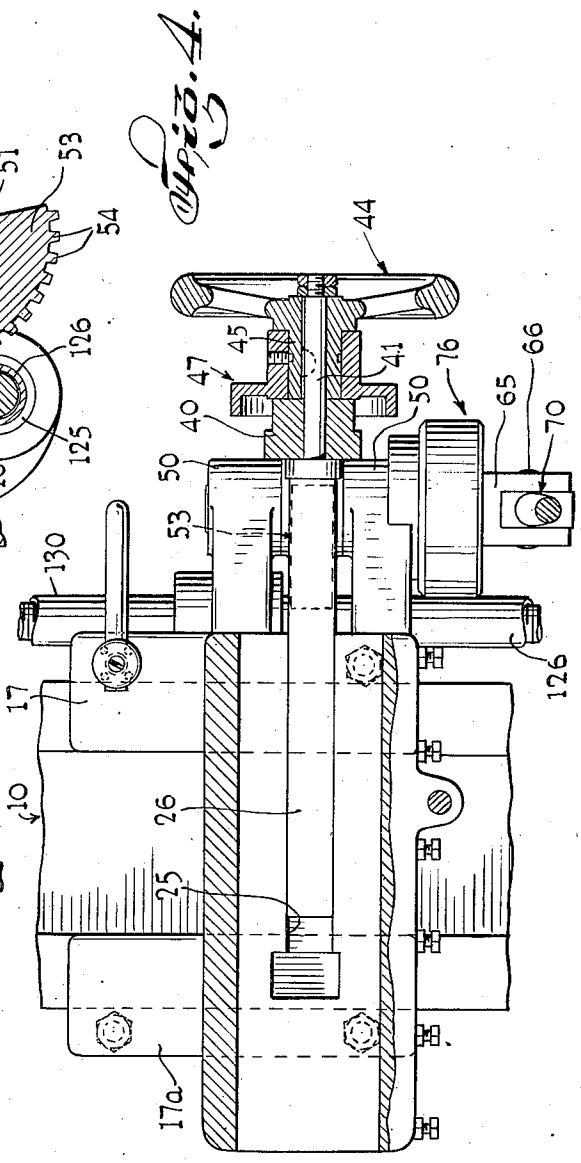


Fig. 4.

INVENTOR
SECONDO L. CASELLA
BY
J. B. Fellshun
ATTORNEY

July 9, 1946. S. L. CASELLA 2,403,581

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Fig. 5.

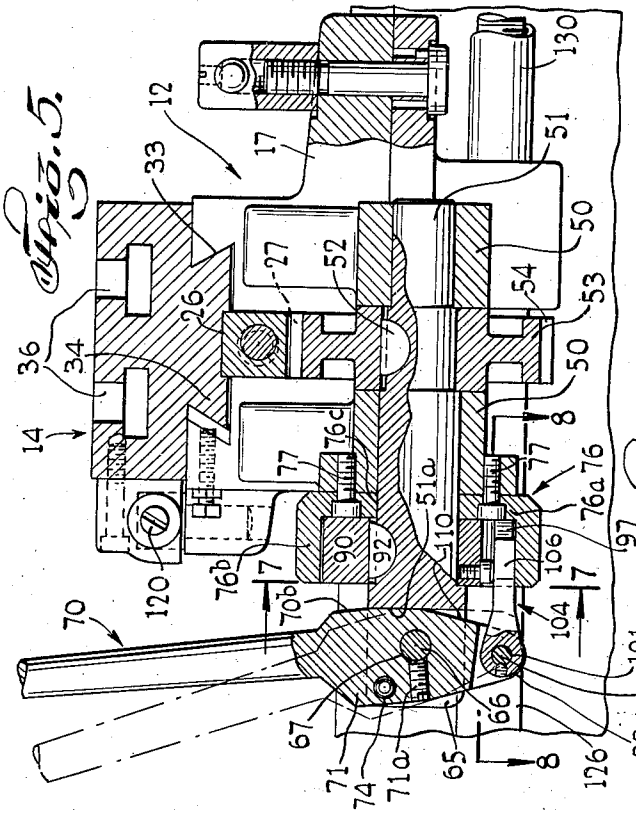


Fig. 8.

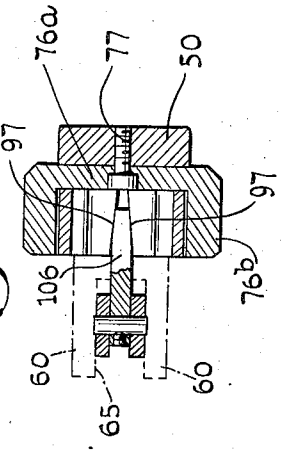


Fig. 6.

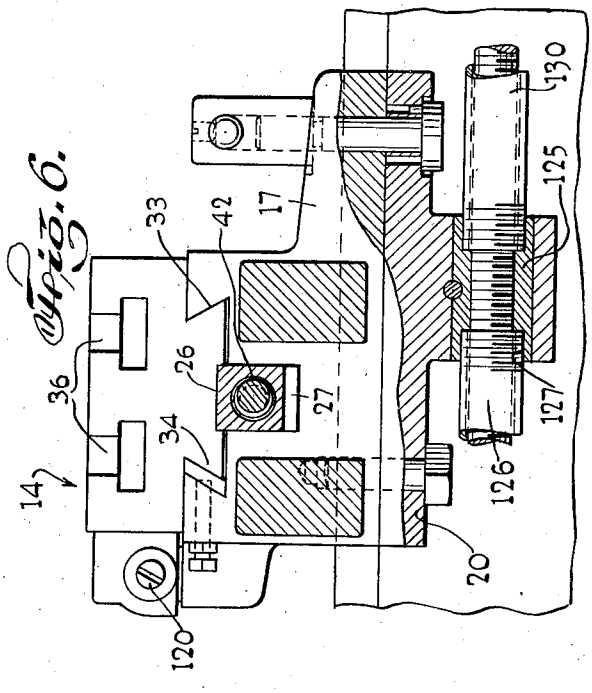
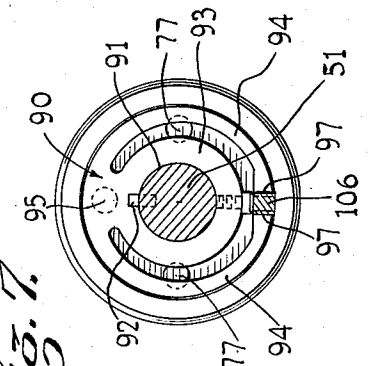


Fig. 7.



INVENTOR

SECONDO L. CASELLA

BY

J. B. Fellows

ATTORNEY

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2,403,581

UNITED STATES PATENT OFFICE

2,403,581

CROSS SLIDE

Secondo L. Casella, New York, N. Y., assignor to Morey Machinery Co., Inc., New York, N. Y., a corporation

Application August 6, 1943, Serial No. 497,620

5 Claims. (Cl. 82—24)

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This invention relates to cross slides, and it is particularly directed to a cross slide for a lathe.

An object of this invention is to provide a cross slide of the character described, having highly improved means for moving the slide relative to the saddle, for both rough and fine adjustment.

A further object of this invention is to provide in a cross slide of the character described, a saddle slidably mounted on the bed of the lathe, and a slide mounted on the saddle for transverse movement relative to the bed, a gear rotatably mounted on the saddle, a rack meshing with the gear, and a screw rotatably and non-slidably connected to the slide and having threaded engagement within a threaded opening in the rack, whereby the slide can be moved by rotating the gear or by turning the screw.

Yet a further object of this invention is to provide in a cross slide, of the character described, a highly improved brake means to hold the gear against movement when turning the screw.

A still further object of this invention is to provide a cross slide of the character described, including a lever for rotating the gear which meshes with the rack on the slide, and means on the lever to actuate the brake to retain the gear against movement.

Still a further object of this invention is to provide a strong, compact, and durable cross slide of the character described, which shall be relatively inexpensive to manufacture, smooth and positive in operation, and practical and efficient to a high degree in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of the application will be indicated in the following claims.

In the accompanying drawings, in which is shown various possible illustrative embodiments of this invention,

Fig. 1 is an elevational view of a cross slide embodying the invention, on the bed of a lathe, and with parts broken away and in cross section.

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 3.

Fig. 5 is a sectional view taken on line 5—5 of Fig. 1.

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Fig. 6 is a sectional view taken on line 6—6 of Fig. 1.

Fig. 7 is a sectional view taken on line 7—7 of Fig. 5.

Fig. 8 is a sectional view taken on line 8—8 of Fig. 5.

Referring now in detail to the drawings, reference numeral 10 designates the bed of a turret lathe provided with parallel ways 11; and reference numeral 12 designates a cross slide embodying the invention, and mounted on said ways. The cross slide 12 comprises, generally, a saddle 13 and a slide 14 slidably mounted thereon. The saddle 13 comprises a wall 15 having a pair of aligned surfaces 16 contacting the top surfaces of the ways 11. Extending downwardly from wall 15 are front and rear guides 17 and 17a having inner surfaces 18 and 18a, respectively, contacting outer surfaces of said ways 11.

Attached to the undersides of the guides 17 and 17a, as by screws 19, are gibs 20 engaging the undersides of the ways 11. The wall 15 is formed on the underside thereof with a longitudinal slot 25, and slidably mounted in said slot is longitudinal rack 26 formed with gear teeth 27 on the underside thereof.

The rack 26 is formed with a longitudinal through opening 28. At the forward end of the rack, the opening 28 is formed with screw threads 29 for the purpose hereinafter appearing.

The saddle 12 is formed on this upper side with longitudinal dove-tailed groove 33. The slide 14 is slidably mounted on the saddle and has a dove-tail projection 34 on its underside received within the dove-tail groove 33. The slide may be formed with usual T slots 36, both longitudinal and transverse to mount the front and rear two posts 37.

Fixed to the forward end of the slide 14, is a bearing member 40. Non-slidably journalled in said member 40 is a longitudinal shaft 41 having an elongated threaded portion 42 extended within the opening 28 of the rack member 26, and engaging the threads 29. Keyed to the forward end of shaft 41 is a hand wheel 44 having a hub 45 receiving the shaft. Mounted on the hub 45 and fixed thereto by said screw 46, is a dial member 47, which may be appropriately stamped or marked with a scale 47a.

Member 40 has a pointer 40a at the top to cooperate with the scale.

The saddle 12 is provided with a pair of spaced, parallel aligned bearing members 50. Journalled within said bearing members is a horizontal shaft 51. Mounted on said shaft and between said

bearings 50, and keyed to the shaft, as by a Woodruff key 52, is a segmental gear 53 having teeth 54 meshing with the teeth 27 of the rack 26.

It will now be understood that rotation of the shaft 51 will cause rotation of the segmental gear, and hence, longitudinal movement of the rack 26, and of shaft 41 and slide 14. Furthermore, rotation of the hand wheel 44 will cause movement of the slide relative to the rack and saddle due to the threaded engagement between the shaft portion 42 and the internal threads 29 of the rack. The shaft 51 may thus be rotated to obtain quick or rough adjustment of the slide, whereas the handwheel 44 may be rotated to obtain fine adjustment.

Means is provided to rotate the shaft 51. To this end shaft 51 is formed at one end with a transverse vertical slot 65 forming a pair of parallel walls 60 on opposite sides of said slot. The walls 66 are formed with aligned bearing openings 67. The axis of said openings is perpendicular to the axis of shaft 51 and crosses said axis. Mounted within said openings 67 is a transverse pivot pin 68. Mounted on said pivot pin for rotation about the axis thereof, is a lever 70 having an upwardly extending handle.

The lever 70 has a portion 71 received within the slot 65 and contacting the inner surfaces of walls 66. The lever may be fixed to the pivot pin 67 by a set screw 71*a*.

One of the walls 66 may be formed with an opening 72 and the lever may be provided with a socket 74. In the socket is a spring pressed ball 75 adapted to snap into opening 72 to retain the lever against accidental rotation about the axis of pin 68 in the position of the lever shown in full lines. In this position, the lever may be rotated about the axis of shaft 51 to rotate gear 53.

In this position, furthermore, edge portion 70*b* of the lever, contacts the inner surface 51*a* of shaft 51 at the bottom of the slot 65. It will be noted that the lever can be rotated about the axis of pin 68, for the purpose therefor appearing.

When it is desired to rotate shaft 51, the lever 70 is first rotated in clockwise direction about the axis of said pivot pin to the position shown in Fig. 5 of the drawings and in this position the ball 75 snaps into the opening 72, and edge 70*b* contacts the bottom surface 51*a* of the slot 65.

The lever may then be rotated to the right or left about the axis of the shaft 51 for moving the slide, as heretofore explained.

Means is provided to retain the said segmental gear 53 against movement so that the hand wheel 44 may be rotated for moving the slide 14 relative to the rack. To this end there is fixed to one of the bearing members 50, a brake cup 76 concentric with shaft 51. Said cup 76 has a bottom wall 76*a* fixed to the bearing as by screws 77. It also has a cylindrical wall 76*b* extending from said bottom wall.

The bottom wall 76*a* has a central opening 76*c* to freely receive the shaft 51. Mounted on the shaft 51 and disposed within the cup 76 is a brake member 90 formed with a central opening 91 to receive said shaft. Brake member 90 is keyed to the shaft 51 by key 92. Said brake member 90 is formed with a center hub 93, from which there extend integral semi-circular wings 94, connected to the hub as at 95, at a point diametrically opposite to the end portions 97 of said wings.

The end portions 97 are inclined inwardly and towards the bottom wall 76*a* of the cup, for the purpose hereinafter appearing. The wings 94, are normally loose within the cylindrical wall 76. When they are forced apart, however, they will engage the inner surface of said cylindrical wall, thus serving as a brake for the shaft 51.

Means is provided controlled by the lever 70 to actuate the brake 90. To this end, lever portion 71 has a downward extension 98 projecting below the shaft 51. Said extension is formed with a slot 99 to provide a pair of parallel walls 100. Said parallel walls 100 are formed with aligned openings 101 in which is journalled a transverse pin 102.

Mounted on said pin is a wedge member 104. Wedge member 104 is formed with an eye portion 105 disposed between the walls 100 and receiving the pin 102 therethrough. Extending from the eye 105 is a wedge 106 received between the ends 97 of the brake wings 94. Wedge 106 tapers to conform to the inclined edges 97.

It will now be understood that when lever 70 is rotated in a counter-clockwise direction, (looking at Fig. 5 of the drawings) the wedge pin 106 will be moved toward the bottom wall of the cup and force brake wings 94 apart to grip the cylindrical wall 76*b* of the cup, thus causing a braking action for retaining shaft 51 against movement.

In this position, segmental gear is retained against rotation, thus permitting the hand wheel 44 to be rotated for the screw adjustment of the slide.

The friction of the wedge 106 between the brake wings 94 will retain the lever in braking position. In such position, the lever cannot be rotated sideways about the axis of the shaft 51. Portion 71 of the lever is furthermore formed with an inclined edge 110 adapted to contact the bottom surface 51*a* of the slot 65 to serve as a stop for limiting wedge movement of the wedge pin 106.

The slide 14 may be provided with a pair of symmetrical stop screws 120 disposed on opposite sides of a stop 121, fixed to the saddle 13 for limiting movement of the slide relative to the saddle.

The cross slide may be moved longitudinally of the bed 10 by means of an internal screw threaded nut 125, fixed to the saddle, and receiving therethrough a screw shaft 126 meshing with said nut. The shaft 126 may be rotated in any suitable manner. The nut 125 may be provided with enlarged internal screw threaded openings 127 at the ends thereof, to which are screwed pipes 130 covering the shaft.

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

1. In a cross slide, a saddle, a slide slidably mounted thereon, a rack slidably mounted relative to said slide, screw threaded means rotatably and non-slidably connected to the slide and having threaded engagement with said rack, a shaft on said saddle, a gear on said shaft meshing with said rack, and a lever on said shaft for rotating the same about its axis, said lever being pivoted to said shaft about an axis perpendicular to and intersecting the longitudinal axis of said shaft, a fixed brake member fixed to said saddle, an expandible brake member keyed to the shaft and rotatable therewith and disposed within the first brake member, and means on the lever to expand the second brake member and cause it to grip the first brake member.

2. In a cross slide, a saddle adapted to be slidably mounted on the bed of a lathe, a slide slidably mounted on the saddle transversely thereof, a rack extending longitudinally of said slide, a

shaft on said saddle, a gear keyed to the shaft and meshing with said rack, screw threaded means to cause movement of said slide relative to said rack, said shaft being formed with a slot, a pivot pin on said shaft traversing said slot and intersecting the axis of said shaft, a lever having a portion received within said slot and pivoted to said pivot pin, a brake cup fixed to said saddle and surrounding said shaft, an expandible brake member within said cup surrounding said shaft and keyed to said shaft, and means on a lever to expand said expandible member to grip the inner surface of said cup.

3. In a cross slide, a saddle adapted to be slidably mounted on the bed of a lathe, a slide slidably mounted on the saddle transversely thereof, a rack extending longitudinally of said slide, a shaft on said saddle, a gear keyed to the shaft and meshing with said rack, screw threaded means to cause movement of said slide relative to said rack, said shaft being formed with a slot, a pivot pin on said shaft traversing said slot and intersecting the axis of said shaft, a lever having a portion received within said slot and pivoted to said pivot pin, a brake cup fixed to said saddle and surrounding said shaft, an expandible brake member within said cup surrounding said shaft and keyed to said shaft, and means on a lever to expand said expandible member to grip the inner surface of said cup, said lever being adapted to release the expanded means in one angular position thereof about said pin and being adapted to actuate said expanding means in another position thereof about said pin.

4. In a cross slide, a saddle adapted to be slidably mounted on the bed of a lathe, a slide slidably mounted on the saddle transversely thereof, a rack extending longitudinally of said slide, a shaft on said saddle, a gear keyed to the shaft and meshing with said rack, screw threaded means to cause movement of said slide relative to said rack, said shaft being formed with a slot,

a pivot pin on said shaft traversing said slot and intersecting the axis of said shaft, a lever having a portion received within said slot and pivoted to said pivot pin, a brake cup fixed to said saddle and surrounding said shaft, an expandible brake member within said cup surrounding said shaft and keyed to said shaft, and means on a lever to expand said expandible member to grip the inner surfaces of said cup, said lever being adapted to release the expanded means in one angular position thereof about said pin and being adapted to actuate said expanding means in another position thereof about said pin, and means to limit rotation of said lever about said pin upon moving said lever towards either of said positions.

5. In a cross slide, a saddle adapted to be slidably mounted on the bed of a lathe, a slide slidably mounted on the saddle transversely thereof, a rack extending longitudinally of said slide, a shaft on said saddle, a gear keyed to the shaft and meshing with said rack, screw threaded means to cause movement of said slide relative to said rack, said shaft being formed with a slot, a pivot pin on said shaft traversing said slot and intersecting the axis of said shaft, a lever having a portion received within said slot and pivoted to said pivot pin, a brake cup fixed to said saddle and surrounding said shaft, and expandible brake member within said cup surrounding said shaft and keyed to said shaft, and means on a lever to expand said expandible member to grip the inner surface of said cup, said lever being adapted to release the expanded means in one angular position thereof about said pin and being adapted to actuate said expanding means in another position thereof about said pin, means to limit rotation of said lever about said pin upon moving said lever towards either of said positions, and spring ball means to retain said lever in brake release position.

SECONDO L. CASELLA.