G. G. FLOYD.

RAZOR BLADE SHARPENER.

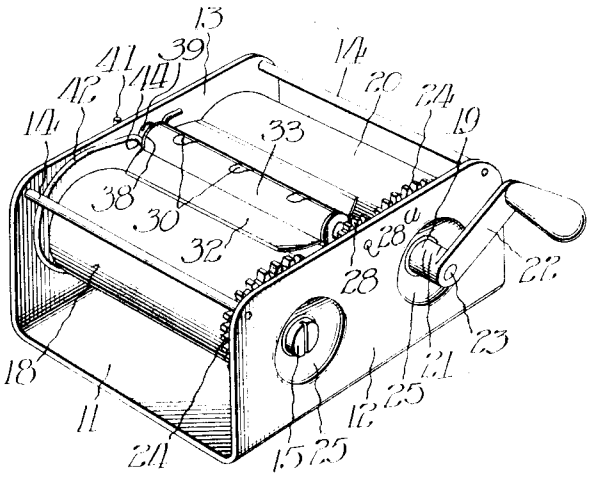
APPLICATION FILED JUNE 8, 1910.

1,135,511.

Patented Apr. 13, 1915.

3 SHEETS—SHEET 1.

Fig. 1.



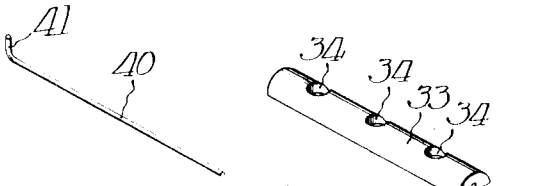


Fig. 3.

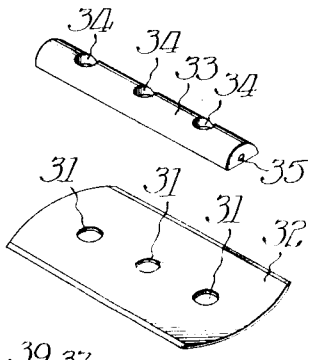
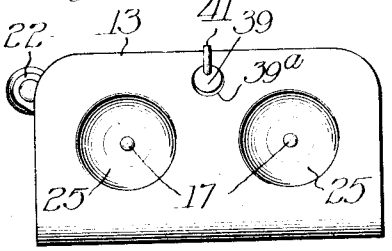
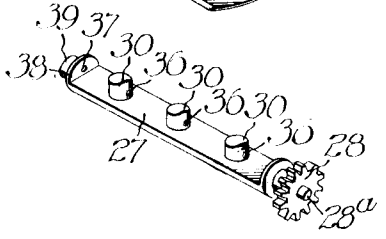


Fig. 2.





Witnesses:
Robert H. Weir
Henry M. Shepley

Inventor:
George G. Floyd
By: Smith, Brown, Bell & Fuller
Attys

G. G. FLOYD.

RAZOR BLADE SHARPENER.

APPLICATION FILED JUNE 8, 1910.

1,135,511.

Patented Apr. 13, 1915.

3 SHEETS—SHEET 2.

Fig. 4.

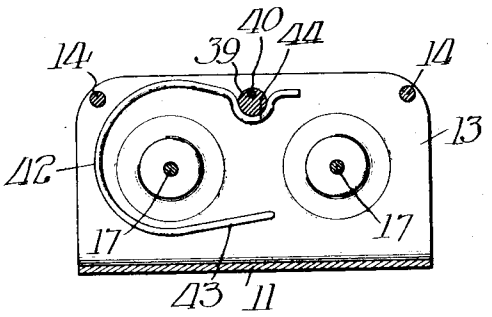


Fig. 5.

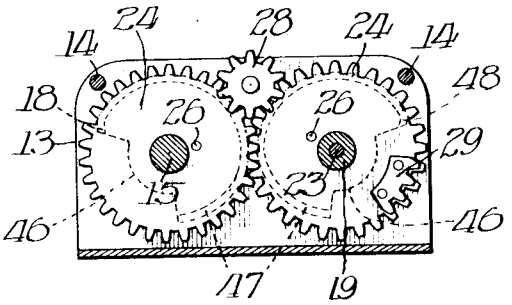


Fig. 6.

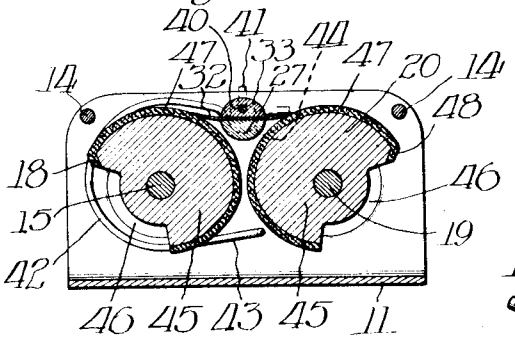


Fig. 7.

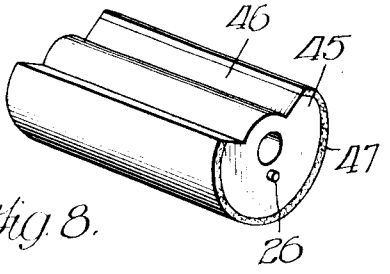
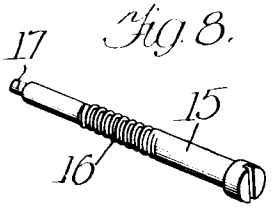


Fig. 8.



Witnesses:
Robert H. Weir
Henry M. Shurtleff.

Inventor:
George A. Floyd
By: Smith, Brown, Boltz & Fuller
Attys.

G. G. FLOYD.

RAZOR BLADE SHARPENER.

APPLICATION FILED JUNE 8, 1910.

1,135,511.

Patented Apr. 13, 1915.

3 SHEETS—SHEET 3.

Fig. 9

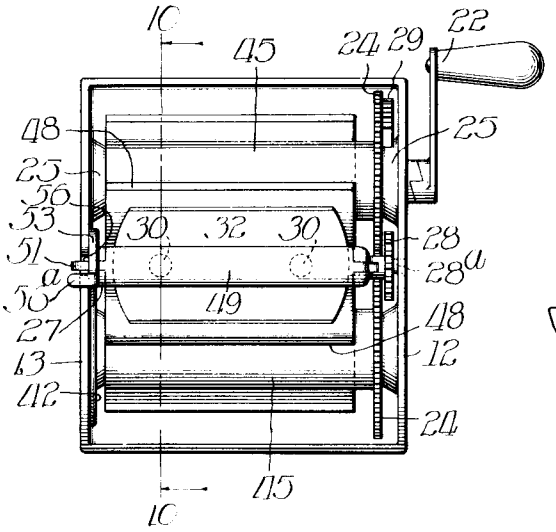


Fig. 13.

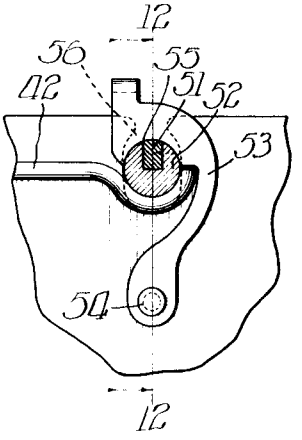


Fig. 10.

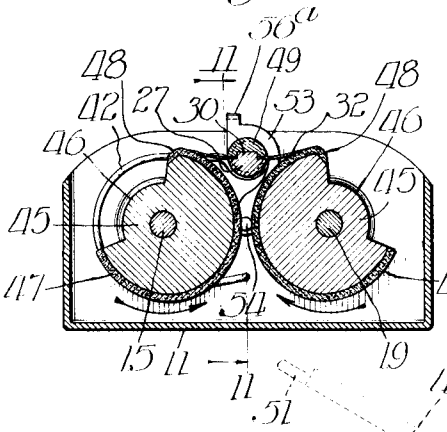


Fig. 12.

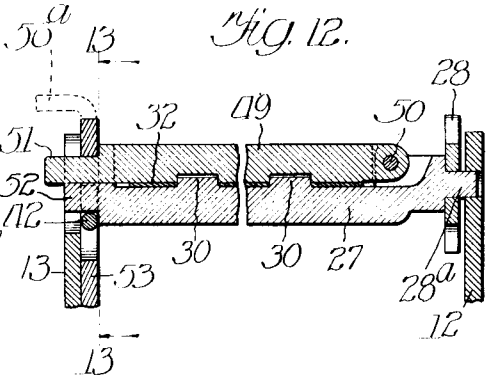
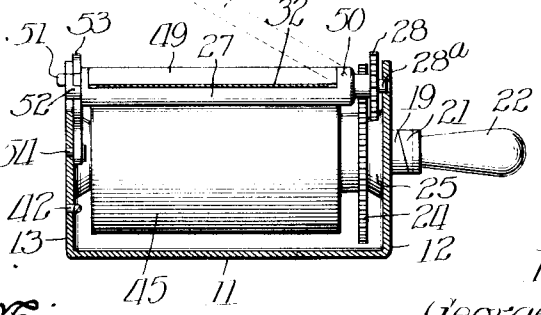


Fig. 11.



Witnesses

Robert N. Weir

Henry M. Shurtleff

Inventor:

George G. Floyd

By: Smith, Brown, Bell & Fuller

Attys

UNITED STATES PATENT OFFICE.

GEORGE G. FLOYD, OF GRANITE CITY, ILLINOIS, ASSIGNOR TO TWINPLEX MANUFACTURING COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

RAZOR-BLADE SHARPENER.

1,135,511. Specification of Letters Patent. Patented Apr. 13, 1915.

Application filed June 8, 1910. Serial No. 565,843.

To all whom it may concern:

Be it known that I, GEORGE G. FLOYD, a citizen of the United States, residing at Granite City, in the county of Madison and State of Illinois, have invented certain new and useful Improvements in Razor-Blade Sharpeners, of which the following is a specification.

My invention relates to razor blade sharpeners and has particular reference to a form of sharpener which is adapted though not restricted for use in connection with the double edged blades employed in certain types of safety razors.

In my Patent 959,496, granted May 31, 1910, I have described a form of razor blade sharpener which has many characteristics similar to that which forms the subject matter of my present application. In such patented construction, however, I employ a spring device for keeping the razor blade in contact with the sharpening elements at the requisite amount of pressure. In my device of the present application the axis of rotation of the razor blade holder is fixed, and the requisite pressure of the sharpening elements is obtained by the resiliency of the blade itself. This improvement has rendered the razor sharpener much simpler in its operation, and more economical to construct.

It is a further object of my invention to provide means by which the razor blade holder is prevented from free rotation when the edges of the razor blade are not in contact with the sharpening elements. This result is accomplished by providing a spring member which has contact with the blade holder, the friction of this member preventing the free rotation of the holder. The construction is such that when the spring member above mentioned is removed from its normal connection with the razor blade holder, this holder may be longitudinally shifted to free its ends from their bearings in the frame of the device, and the holder may be bodily removed from the frame, if occasion demands, provided other cooperating elements have been previously removed. These and other advantages of my invention will be more apparent by reference to the accompanying drawings which represent a preferred embodiment of my invention and in which:

Figure 1 is a perspective view of a razor blade sharpener embodying my invention, showing the various parts in their normal positions. Fig. 2 is a rear elevation of the parts shown in Fig. 1. Fig. 3 shows in perspective, the razor blade holder, the razor blade, the clamping member, and the locking pin, all of these parts being separated from each other. Fig. 4 is a vertical section taken in a plane to the rear of the sharpening elements, and showing the spring member associated with the rotatable blade holder. Fig. 5 is a vertical section taken on the plane just in front of the gears associated with the ends of the two sharpening elements. Fig. 6 is a vertical cross section through the sharpening elements and the rotatable blade holder. Fig. 7 is a perspective view of one of the sharpening elements. Fig. 8 is a perspective view of the wood screw or shaft used in connection with one of the sharpening elements and on which said element is rigidly mounted. Fig. 9 is a plan view of a modified form of sharpener. Fig. 10 is a transverse vertical section on the line 10—10 of Fig. 9. Fig. 11 is a vertical section taken on the line 11—11 of Fig. 10. Fig. 12 is an enlarged vertical longitudinal section through the blade holder and clamping member with their associated parts taken on the line 12—12 of Fig. 13. Fig. 13 is an elevation and partly sectional view taken on the line 13—13 of Fig. 12.

The main frame 11 of my razor blade sharpener is preferably constructed of sheet metal, and has the upturned front and rear portions 12 and 13 respectively, which are suitably connected by means of the rods or braces 14, 14. The front part 12, and the rear portion 13 are each provided with a pair of openings therein, a wood screw 15 passing through one of the openings of the front 12 to a corresponding opening in the rear wall 13. This wood screw 15 has a threaded portion 16 as clearly shown in Fig. 8, and its end 17 is made of considerably smaller diameter than the main body of the screw for insertion in the opening in the rear wall 13.

Rigidly mounted on the wood screw 15 is a sharpening roll 18, preferably constructed of wood or some similar material. A wood screw 19, similar to the wood screw 15, except as will presently be described

passes through the second opening in the front 12 and has its rear end inserted in a suitable opening in the rear wall 13. On this screw is mounted the sharpening element 20. The use of the threaded screws or shafts 15 and 19 which I employ is of special advantage inasmuch as they may readily be removed from the wooden sharpening elements 18 and 20 and subsequently replaced, in the manner described hereafter.

It will be noted that instead of having a head of the ordinary type, the head of the screw 19 is in the form of a clutch or ratchet member having a pair of engaging shoulders 21, only one of these shoulders being shown in Fig. 1. A handle 22 provided with a pin 23 which is adapted for insertion in a suitable opening in the front end of the screw 19 is provided with shoulders which are adapted to engage the shoulders 21. By this construction it will be evident that the handle 22 when rotated in a clock-wise direction will turn the screw 19 and its sharpening element 20, and when rotated in a contra-clock-wise direction, the shoulders of the handle 22 will be disengaged from the shoulders 21 of the screw 19, and no rotation will take place. The object of this construction will be more apparent hereafter.

Associated with the front end of each of the sharpening elements 18 and 20 is a gear 24 loosely mounted on the shafts 15 and 19, the front faces of these gears bearing against bosses 25 which are pressed inwardly from the front wall 12. Each of the gears 24 is provided with an opening which is engaged by a small pin 26 mounted on the front end of each of the two sharpening elements 18 and 20. By means of this pin, independent rotation of the gear 24 and its associated sharpening element is effectually prevented.

As will be clear from Fig. 5, the two gears 24, 24 are in mesh with each other, and for this reason when the screw or shaft 19 is rotated by means of the handle 22, the shaft 15 is rotated in the opposite direction on account of the action of the engaging gears 24, 24.

Rotatably mounted between the front and rear walls 12 and 13 of the frame 11, is a rotatable blade holder 27, on which near the front end thereof is fixedly mounted a pinion 28. This pinion 28 lies in a plane in front of the plane of the two gears 24, 24. Rigidly mounted on the gear 24 which is associated with the sharpening element 20, is the gear sector 29 which is adapted to intermittently engage the pinion 28.

The ratio of the gear teeth of the sector 29 and the pinion 28 is such that on each revolution of the sharpening element 20, the blade holder 27 is given a half revolution.

The blade holder 27 is provided with the pins 30 which are adapted to pass through the openings 31 in the double-edged razor-blade 32 when this blade is placed in position on the holder. The clamping member 33, having the openings 34, is placed over the razor blade 32. A hole 35 passes longitudinally through the clamping member 33 and a hole 36 passes through each of the pins 30, these holes 36 registering with hole 35 when the clamping member is placed in position. A hole 37 passes through the shoulder member 38 of the holder 27 and also through the journal 39. When the blade 32 and the clamping member 33 are placed in position on the holder 27, the locking pin 40 having a bent end or handle 41, is passed through the hole 37 of the holder 27, through the hole 35 in the clamping member 33, and through the holes 36 in the pins 30. It will be apparent that in this way the holder 27 of blade 32 and the clamping member 33 are securely locked together.

As shown in Figs. 1, 4, and 6, a spring 42 is mounted on the inner side of the rear wall 13 at its end 43, whereas its free end is bent to form a semi-circular loop 44 which engages the inner side of the wall 13 and the shoulder portion 38 of the holder 27, respectively. It will thus be evident that the spring 42 performs two functions: first, it prevents free rotation of the holder 27 when the edges of the blade 32 are disengaged from the sharpening elements 18 and 20, as will be explained hereafter; and at the same time this spring serves to prevent longitudinal movement of the holder 27 toward the rear wall of the main frame 11, the holder 27 thus being held strictly in its proper position, it being possible at the same time to move the holder 27 longitudinally toward the rear wall 13, under the circumstances which will be described hereafter.

As shown most clearly in Figs. 6 and 7, each of the sharpening elements 18 and 20 consists of a round wooden block 45, which is mutilated or cut away on its periphery to form the recess 46. The periphery of each sharpening roll is provided with a strop 47 of leather or other similar material. It will be evident that as the sharpening elements are rotated, the peripheries will pass in the direction away from the holder 27 containing the razor blade 32.

When the blade 32 is placed in position on the holder 27, the sharpening elements 18 and 20 are preferably rotated to a position so that when the blade 32 is placed on the holder 27, the edges of the blade will not come in contact with the peripheries of the sharpening elements.

As the two sharpening elements 18 and 20 are rotated by turning the handle 22, the two edges of the blade 32 will be forced upwardly by the sharpening elements and the pressure exerted on these elements will be caused by the resiliency of the blade itself. That portion of the periphery of each

sharpening element which is adjacent to the recess 46 and comes in contact with the edge of the blade 32 during the latter part of the rotation of the sharpening element, is made of a gradually decreasing radius so that the pressure exerted by the edges of the blade on the sharpening elements gradually decreases, thus avoiding a sudden release of pressure on the blade when its edges reach the recesses 46. The strop 47 at this portion of each sharpening element is preferably turned inwardly at 48.

When the edges of the blade are clear of the peripheries of the two sharpening elements, the gear sector 29 engages the pinion 28 and the blade holder 27 is given a half revolution, the blade 32 turning within the recesses 46. After the blade is turned, the sharpening elements again engage the two edges of the blade but on the opposite side of the blade to that which was previously in contact with the sharpening elements. Inasmuch as the action of the gear sector 29 on the pinion 28 is completed before the edges of the blade 32 are engaged by the sharpening elements, it will be clear that a free rotation of the blade-holder 27 at this point would be very disadvantageous, and it is to prevent such a free rotation that the spring 42 above mentioned is used, the loop portion 44 of this spring affording friction on the journal 39 of the blade-holder 27.

It is very desirable that a device of this kind be so made that it can be easily taken apart and assembled. After the blade 32 and the clamping member 33 have been removed by withdrawal of the locking pin 40, the wood screw 15 is next disengaged from the sharpening element 18, and withdrawn through the front wall 12 of the main frame 11. The sharpening element 18 may now be removed from the frame 11, the pin 26 engaging the opening in the gear 24 being withdrawn from this opening. The gear 24 is readily removed from the frame 11 after the sharpening element 18 has been removed.

The next operation consists in unscrewing the screw or shaft 19 from the sharpening element 20 and removing this sharpening element and its associated gear 24 in exactly the same manner as in connection with the sharpening element 18. In order to remove the holder 27, the spring 42 is depressed so that the loop 44 is disengaged from the journal 39 and may be shifted from the journal to the main body of the holder. The holder 27 may now be moved longitudinally of its own axis toward the rear wall 13 and the journaled end 28^a of the holder which engages an opening in the front wall 12 is thereby disengaged from the same. This end 28^a of the holder 27 is much smaller than the end 39, which is itself considerably smaller than the opening 39^a in which it has its bearing. When the holder 27 is removed, there is thus ample room to raise its front end, and then withdraw the end 39 from hole 39^a without any binding action. The various parts may, of course, be assembled in a manner exactly opposite to that which has just been described.

Referring to the modified form of razor blade sharpener shown in Figs. 9 to 13 inclusive, the construction of the parts will be readily apparent. The sharpener is made in exactly the same manner as the form which we have already described with certain minor changes which reside chiefly in the form of the blade holder and clamping member and means for holding the clamping member in contact with the blade.

The blade holder 27 is constructed in much the same manner previously described as will be clearly apparent by reference particularly to Figs. 11 and 12. Instead of using a clamping member 33, however, which is held in position by the locking pin 40, the clamping member 49 is hinged to the blade holder 27 by means of the pin 50. As clearly shown in Figs. 11 and 12, the blade 32 is placed in position on the pins or posts 50 of the blade holder 27 and the clamping member 49 is then moved downwardly from its elevated position until the blade 32 is securely gripped between the blade holder 27 and the clamping member 49. The free end of clamping member 49 has an extension 51 which fits within a corresponding groove in the end 52 of the blade holder 27 so that when the clamping member is brought into its blade retaining position, the end 52 of the blade holder 27 and the extension 51 form a substantially perfect circle, this condition being most clearly shown in Fig. 13. The end 52 of the blade holder 27 bears against the spring 42 which tends to force the blade holder and the clamping member in an upward direction. In order to counter-act this action, the locking member 53 pivoted at 54 is provided. This locking member which has a surface 55 adapted to engage the upper surface of the ends 51 and 52 of the clamping member 49 and the blade holder 27, respectively, is moved to the right as indicated in Figs. 10 and 13 when it is desired to raise the clamping member 49. The latter operation is readily performed inasmuch as it will be noted that the end 51 projects slightly beyond end 52. When the blade has been placed in position, the locking member 53 is readily moved into the position shown in Figs. 9, 10 and 13, by means of its projection 56^a and the upward pressure on the end of the blade holder serves to securely hold the locking member in position. In the same way that the opening 39^a shown most clearly in Fig. 2 is made somewhat larger than the end 39 in order to allow freedom of motion, the opening 56, shown in dotted

lines in Fig. 13, is made considerably larger than the ends 51 and 52 when the same are brought into their operative positions.

I have found that in certain cases it is desirable to make the frame or casing of the razor blade sharpener so that it surrounds the mechanism on all of its sides except the top, and the modification shown in Figs. 9 to 13 inclusive is constructed in this manner. Except as explained above, the construction and operation of the modification which I have just explained, is exactly the same as the form of razor blade sharpener which I described in connection with Figs. 1 to 8 inclusive.

It will be apparent to those skilled in the art that many changes could be made in the various parts of the devices which I have described without departing from the spirit of my invention.

What I claim is:

1. In a sharpening-device of the character described, the combination of a pair of rotatable sharpening-elements, means to revolve said elements, and a holder adapted to hold resilient blade-means with two cutting edges in flexed concave condition with the same sides of both cutting-edges in coöperative relation with said sharpening elements, the axis of said holder being immovable away from the axes of the sharpening-elements during the sharpening operation, whereby the degree of flexure is constant for all blade-means, substatially as described.

2. In a sharpening device of the character described, the combination of a pair of rotatable sharpening-elements, means to revolve said elements, and a holder adapted to hold resilient blade-means with two cutting-edges in flexed concave condition with the same sides of both cutting-edges in cooperative relation with said sharpening-elements, the axis of said holder being immovable away from the axes of the sharpening elements during the sharpening operation, the yielding-pressure of the blade-edges on the sharpening-elements residing solely in the resiliency of said blade-means, substantially as described.

3. In a sharpening-device of the character described, the combination of a frame or casing, a pair of sharpening elements having interrupted cylindrical operative faces revolubly mounted in said frame or casing, means to rotate said elements, and a blade-holder having an axis fixed during the sharpening operation and adapted to unyieldingly hold resilient razor-blade means with two cutting-edges in flexed engagement with the operative faces of said elements during their rotation, the yielding pressure of the blade-means on the sharpening-elements residing solely in the resiliency of said blade-means, substantially as described.

4. In a sharpening-device of the character described, the combination of a pair of rotatable sharpening elements having interrupted operative faces, a rotatable blade-holder having an axis of rotation immovable away from the axes of rotation of the sharpening elements during the sharpening operation to unyieldingly hold yielding razor-blade means with two cutting-edges in flexed engagement with the operative faces of said elements, and means for periodically rotating the blade-holder when the interruptions in the operative faces of the sharpening-elements come opposite the blade-edges, substantially as described.

5. In a sharpening-device of the character described, the combination of a pair of rotatable sharpening elements having operative faces interrupted by recesses and also having fixed axes of rotation, a rotatable blade-holder having an axis of rotation immovable away from the axes of rotation of the sharpening-elements during the sharpening operation whereby to unyieldingly hold a double-edged resilient blade in flexed concave engagement with the operative faces of said elements, and means for rotating said blade-holder when the face interruptions of the sharpening-elements come opposite the blade-edges, substantially as described.

6. In a device of the class described, the combination of a pair of rotatable sharpening-elements having fixed axes of rotation, each element having a recess in its periphery, means for rotating said elements in opposite directions, a rotatable blade-holder adapted to contain a double-edged blade to be sharpened, said blade on its opposite edges engaging the peripheries of the sharpening-elements, the axis of said holder being immovable away from said sharpening elements during the sharpening operation, friction means for restraining the free rotation of said holder when the blade is disengaged from said sharpening elements, and means for rotating said blade holder and its contained blade within said recesses when the sharpening-elements are rotated to such a position that the edges of the blades are disengaged from the sharpening-elements, substantially as described.

7. In a blade-sharpening device, the combination of a frame, a shaft revolubly mounted in said frame with a fixed axis of rotation, a sharpening-element rigidly mounted upon said shaft, a blade-holder mounted in said frame and adapted to rotate about an axis immovable away from said sharpening element during the sharpening operation, friction-means bearing upon said holder to prevent free rotation thereof when the blade is disengaged from the sharpening-element, and means to actuate said shaft and holder, substantially as described.

8. In a blade-sharpening device, the combination of a frame, a pair of sharpening

elements having interrupted operative faces mounted in said frame and revoluble about fixed axes, a blade-holder mounted in said frame and adapted to revolve about an axis immovable away from said elements during the sharpening operation, a spring adapted to bear on said holder and by its friction resist turning of the holder, and means to rotate said sharpening-elements and intermittently rotate the blade-holder, substantially as described.

9. In a blade-sharpening device, the combination of a frame, a shaft revolubly mounted in said frame with a fixed axis of rotation, a sharpening-element rigidly mounted on said shaft, a blade-holder mounted in said frame adapted to revolve about an axis immovable away from said element during the sharpening operation, a friction spring adapted to engage the holder and resist free rotation thereof, said friction spring being also adapted to prevent lateral movement of the holder, disengagement of said spring from the holder permitting longitudinal movement of the holder and its removal from the frame, and means to actuate said shaft and holder, substantially as described.

10. In a blade-sharpening device, the combination of a main-frame, a pair of shafts revolubly mounted in said frame with fixed axes of rotation, a pair of cylindrical sharpeners rigidly mounted on said shafts, each of said sharpeners having a recess in its periphery, a gear associated with each of said sharpeners, said gears being in mesh with each other, a blade-holder mounted in said frame and having an axis of rotation immovable away from said sharpeners during the sharpening operation, said holder being provided with a shouldered journal, a pinion rigidly mounted on said blade-holder, a gear sector mounted on one of said gears and adapted intermittently to mesh with said pinion, thereby rotating said holder when the sharpeners are in positions in which the blade may be rotated within said recesses, and spring-friction means engaging the shouldered journal of said holder and thereby preventing free rotation of the same, said spring-means being also adapted to prevent longitudinal movement of said holder, substantially as described.

11. In a device of the character described, the combination of a pair of rotatable sharpening-elements, each element having a recess in its periphery, a rotatable blade-holder, a clamping-member hinged to said holder and adapted to retain the blade to be sharpened in connection therewith, a locking-member adapted to retain the clamping-member in contact with said blade-holder and to unyieldingly hold the blade holder against lateral movement away from said sharpening elements, the opposite-edges of said blade engaging said elements and thereby preventing rotation of said holder, and means for rotating said blade-holder when the sharpening-elements are in such position that the edges of the blade are disengaged from their peripheries, substantially as described.

GEORGE G. FLOYD.

Witnesses:
E. B. SHERZER,
J. A. LAMONT.