To all whom it may concern:

Be it known that I, John G. Bestgen, a citizen of the United States, and a resident of Quincy, in the county of Norfolk and State of Massachusetts, have invented an Improvement in Sharpening Devices for Edge-Tools, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to machines for sharpening and polishing edge tools and has special reference to that type of machine wherein traveling and rotatable sharpening members are employed.

The embodiment of my invention selected for illustration and description herein is adapted especially for sharpening, stropping and polishing razor and similar blades, but it may also be conveniently used for knives and other edge tools.

In the drawings: Figure 1 is a front elevation of my improved edge tool sharpener, Fig. 2, a side elevation, Fig. 3, a plan of the same, Figs. 4 to 9 inclusive illustrate the manner of securing safety razor blades of different forms to the lower face of the holder, preparatory to adjusting the same in position for sharpening the blade, Fig. 10 illustrates one method of securing the ordinary razor blade to a modified form of the holder for the same purpose, Fig. 11 is a vertical section on the line 11—11, Fig. 10, looking toward the right, Fig. 12 is a side elevation of the work table showing a modified form of tool holder with a usual razor blade secured therein and showing an edge view of a modified form of cushion member adapted for use with the ordinary razor blade, Fig. 13 is a side elevation of a modified form of machine wherein sharpening rollers or wheels are in place in the belts, the work table being omitted and Fig. 14 a front elevation of the same partly broken away for convenience.

Referring to Figs. 1 and 2, the construction shown therein comprises two similar side frame members 1 and 2, consisting herein of upright sections 3—4 and base sections 5—6, which latter, in this instance, are shown as integral with said upright sections, although obviously they may be separate members, quickly connected thereto. These frame members 1 and 2 may be connected and secured by any convenient means, as by spacing tie rods 7, 8, at the upper and lower ends respectively of the upright sections 3, 4, thereof and by a tie plate 9 at the forward end of the base sections 5, 6. The tie rods 7, 8, are herein provided with threaded reduced end portions 10—11, respectively, at each end thereof, in the upper and lower ends respectively of said upright sections. The tie rods 7, 8, are secured to the frame members 1, 2, herein by means of nuts 12, 13, on the threaded ends of said reduced end portions 10, 11, respectively. The forward ends of said base sections 5, 6, Figs. 1, 2, are properly spaced and connected by the tie plate 9 referred to, positioned between said ends and secured thereto by screws 14 threaded into the ends of said plate 9 and adjustable in slots 15 in the ends of said sections 5, 6. Suitably mounted in said uprights 3—4, Figs. 1, 2, are shafts 16, 17, carrying 25 rollers or pulleys 18, 19 and carrying also at one of their ends suitable gear wheels 20, 21, secured thereto in any desired manner and in mesh with each other. One of said wheels herein the upper one 20, may be provided with a crank 22, herein shown as secured, to one of the spokes 23 of said wheel 20 by a screw 24, the inner end of said crank being shown enlarged and drilled to receive the end of the shaft 16 of said wheel 20 and secured thereon by any of the well known means for that purpose. On the opposite end of one of said shafts, herein the upper one, 16, I have provided a pulley 25, adapted to be connected by a belt with a suitable source of power, and by means of which said gears 20, 21, and rollers 18, 19, may be rotated by power when hand operation is not desired. A detent 19 is provided to prevent rotation of the gears 20, 21, in the wrong direction.

Auxiliary sharpening or belt carrying rollers 26, 27, see Fig. 2, of suitable material, herein wood, are provided, and positioned herein substantially opposite rollers 18, 19. The shafts 28, 29 of said belt carrying rollers are journaled in the outer ends 30, 31 of roller carrying arms 32, 33, accurately secured through slots 36, 37, at their inner ends 34, 35, to the ends 10, 11, of the tie rods 7, 8, referred to, by the nuts 12, 13.

For a purpose to be referred to later the roller 26 is shown adjustably mounted in the ends 30 of the arms 32, Fig. 2, by journaling the shaft 28 of said roller in slots 110.
30° in said arms. The ends of the shaft 28 are retained in their proper positions in the lower ends of said slots by means of cam-shaped lock nuts 33 provided to the arms 32, said members being provided with finger pieces 39, Fig. 1, by outturning a portion of the upper edges thereof. The member 38 is also provided with an inward stop 40 at its upper edge to retain it in locked position.

Herein the tool sharpening members shown as belts 41, 42 are carried by the rollers 18, 26, and 19, 27 respectively, said belts being of any preferred material, herein leather. The roller carrying arms 32, 33, Fig. 2, are herein made adjustable relative to the uprights 1, 2, by providing the inner ends of said arms with the slots 36, 37 referred to, so that if either one or both of said belts stretches materially the slack therein may be taken up by adjustment of said arms 32, 33, and rollers 26, 27 thereon by simply loosening the nuts 12, 13, on the ends of said rods 7, 8. To aid in conveniently securing adjusting members 33 pivoted to the arms and rollers, I have shown, Fig. 2, the inner ends of the arms as outturned at 43, 44, respectively, and adjusting screws 45, 46, threaded into outwardly extended bosses 47, 48 on the upper and lower ends of said frame members 1, 2, and impinging against said outturned ends 45, 44 of said arms.

As a support for the tool to be sharpened I have provided herein, Figs. 1, 2, tables 49 supported by posts 50, supported in turn by the plate member 9. Each post is provided with a head plate 51 secured by any suitable means as by providing said plate 51 with an aperture on its lower face, not shown, and securing the upper end of the post 50 therein by means of a pin 52 at the inner edge of said plate. To present blades of different width properly to the sharpening members 41, 42, the table 49, Figs. 1, 2, may be adjusted upon said plate 51 longitudinally of the machine and relative to the members 41, 42, by means of set screws 53 threaded into the lower face of said plate 49 and extended through longitudinal slots 54, shown in dotted lines, Fig. 2, in the plate 51. By tightening said screws against the lower face of said plate 51, the table 49 may be securely locked in desired position. Each post 50 and its table 49 are adjustable vertically upon said frame and relative to the rollers 26, 27 and sharpening members 41, 42, by means of a thread 55 upon the lower portion of said plate 50, which thread is engaged by an adjusting nut 56 thereon, and positioned in a slot 57 in said plate 9, said plate, Fig. 1, being also drilled vertically to receive the post 50, which has preferably a sliding fit therein. Said plate 9 is provided herein with bosses 58 at the points where it is drilled to receive the posts 50. Each post 50 is also provided with a lock nut 59 by means of which it may be securely locked in position in said plate 9 after adjustment. By loosening the screws 14 in the slots 15 in the base sections 5—8, the plate 9 and its table 49 also 70 and table 49 may also be longitudinally adjusted relatively to the belts 41, 42, without separate adjustment of the table 49 relative to the post 50.

For securing the blade to be sharpened to the table 49 any suitable clamping means may be used but I have provided herein, Figs. 1, 2, 3, a blade holding and locking member 60 comprising a substantially rectangular body having a shank 61 slotted at 62, to receive a screw 63 threaded in the upper face of said table. Said screw 63 is provided with a nut 64 by means of which the blade holder 60 and blade locked therein may be secured in desired position on said table relative to the sharpening belts 41, 42. This blade holder, like the work support 49, may of course be of any desired width, corresponding, if desired, to the width of the belts 41, 42. I have here shown the table 49 and blade holder 60 as relatively narrow, and have shown a plurality of them mounted uniformly adjacent the sharpening belts. To lock the blades in the holder I have shown herein Figs. 3 to 9, the holder 60 provided, near its inner edge 65 and near either end thereof, with right angle slots 66 to receive blade clamping or gripping bolts or screws 67, provided with work engaging heads or collars 68 near one end, herein the lower, and, see Fig. 3, having nuts 69 threaded on their opposite, herein upper, ends. The ends of said screws 67 preferably extend through and a little beyond the heads or collars 68 thereon. These screws 67, see Figs. 4 to 9, are flattened slightly on opposite faces thereof to prevent them from turning in the slots 66. To provide a slightly yielding supporting member for the blade and thereby compensate for any possible unevenness in the surface of the sharpening belts, I prefer to interpose a washer or cushion member 70, of leather, or other suitable material, between the blade holder 60 and table 49. This washer 70 and the table 49 are shown as slotted, see Fig. 3, to receive the screws 67. The lower face 71 of the holder is channeled at 72 to receive the reinforcing member 73 on the back edge of certain forms of safety razor blades, when clamped to the holder.

In Figs. 4 to 9 inclusive, I have shown razor blades of different forms secured to the lower face of the holder 60. The blade shown in Fig. 4 is a single edge plain blade of substantially uniform thickness and is secured in position adjacent the lower face 71 of the holder by positioning the ends of the blade between the screws 67 and beneath the heads 68 of said screws, 108
which heads are then tightened against the lower face of the blade by means of the nuts 69.

Fig. 5 illustrates the method of locking in position the well known Gillette double edge blade. In this case the screws 67 are positioned at or near the inner ends of the lateral arms of the slots 66 and at such points that they will receive over their inner ends respectively two of the apertures in the blade. These screws firmly hold the blade against lateral displacement when locked between the holder 60 and table 49.

Fig. 6 illustrates the manner in which a safety razor blade provided with a shoulder at each end may be secured to the holder. In this case the screws 67 are adjusted to such positions in the longitudinal arms of the slots 66 that each screw will engage one of the shoulders on the blade, and hold it against lateral displacement.

The blade shown in Fig. 7 is provided with curved notches at its ends. In this case the screws 67 are adjusted in the longitudinal arms of the slots to engage the corners of said slots.

In Fig. 8 is shown a blade provided with a reinforcing member 73 on one or both faces, at its back edge. In this case the blade is positioned with the inner edge 74 of the reinforcing member 73 against the outer wall 75 of the channel 72 in the lower face of the holder. In Fig. 9 is shown a similar blade provided with a wider reinforcing member 73. In this case the back edge 76 of the reinforcing member is positioned against the inner wall 77 of the channel 72.

In each of the foregoing cases after the blade is clamped to the lower face of the holder, the holder is turned right side up and is so positioned relative to the belts, by means of the slot 62, that the edge of the blade will be properly engaged thereby and is then locked in position by means of the nut 64.

In order that inexperienced persons may properly position the blade without danger of cutting the belts, I have shown the upper roller 26 adjustable in the arms 32. This adjustment is accomplished by means of the slot 30 referred to, in which shaft of said roller is journaled. When the blade is to be adjusted one simply raises the cam 33 at each end of the shaft of the roller 26 by means of the finger pieces 39 thereon, thus permitting him to raise the shaft of the roller 26 slightly in the slots 30 so that edge of the blade may be properly positioned between the members 41, 42, without danger of cutting either of them. The roller 26 is then returned to its proper position by pressing down on the finger pieces 39 thus forcing the ends of the shaft 28 back into their proper positions by means of the face 78 of the cam 38.

In Fig. 10 I have shown the manner of locking the ordinary razor blade to the lower face of the holder, which, for this type of blade is of slightly different construction. The body 60 of the holder is provided at one 70 thereof in this case, see Figs. 13, 11, with a downwardly and laterally turned tool engaging member 79 adapted to engage the hilt of the blade at its inner face. At its opposite end the holder is provided with a laterally extended slot 66 in which is provided a blade gripping screw 67 like that shown in Figs. 4 and 7 inclusive, provided in turn at its lower end with an inturned blade supportingfinger 60. At the back edge of said holder 60 it is provided with additional slots 66, provided in turn each with a blade gripping screw 67. The holder 60 is also provided with shanks 61, slotted at 62 as shown in Figs. 4 to 10. When this type of razor blade is to be locked in the holder the hilt of the blade is positioned with the inner side thereof against and beneath the downturned member 79 with the opposite end of the blade beneath the finger 60 of the screw 67 at the end of the holder. The screws 67 at the back of the holder are then adjusted in positions to engage the back 80 of the blade and are tightened up. The end screw 67 is then tightened up and the blade 85 will be securely locked in the holder. The holder is then adjusted to its proper position on the table 49 and secured thereto by the screw 63 and nut 64 thereon. In order to furnish support for the concave lower face of the razor shown in Figs. 10, 11, I provide a cushion member 70 in this case with a raised section 81, see Fig. 12, adapted to fit said concave face of the blade and give it the required support.

In Fig. 13, I have shown a modified form of machine wherein the belts 41, 42, are dispensed with and the tool is acted upon by suitable sharpening and polishing mediums 82, as leather, on the rollers or wheels 26, 27. In this case the rollers 26, 27, are each provided with a suitable wheel or pulley 83 to which motion is transmitted by suitable means, as belts 84 from pulleys or wheels 85 secured respectively to the shafts 16, 17. In this manner the rollers or wheels 26, 27, are rotated in the same direction as the belts 41, 42, Fig. 3, and of course the blade or tool may be positioned relative thereto by means of the adjustable blade holder 90, screw 93, and nut 64, as in the case of the said belts 41, 42, and also by means of the screw 14 in the slot 15. I prefer, however, the belts or similar members to the rollers as they furnish a longer contacting section on account of their flexibility and give a better edge to the tool.

By the use of my improved sharpener or stropper one may sharpen the blade of a knife, razor or similar article in a few sec-
onds and much better than in a longer period by hand in the old way. When the blade is stropped and alternately turned, in the old way, it is almost impossible to bear with the same pressure on each side of the belt in turn, and this results in one side of the edge being sharpened more than the other. A blade thus unevenly sharpened will not cut satisfactorily.

Various modifications of my invention may be made without departing from the spirit thereof.

Claims:

1. In a machine of the class described a frame; traveling working members thereon, means to impart motion thereto, and longitudinally and vertically adjustable supporting means for said working members.

2. In a machine of the class described a frame, oppositely disposed traveling working members carried thereby, a work support and a combined work holding and locking member provided with combined positioning and gripping members capable of lateral and longitudinal traveling adjustment thereon to position and grip a blade at a plurality of points on one face thereof.

3. In a machine of the class described a frame, oppositely disposed working members carried thereby, a work support and a combined work holding and locking member provided with combined positioning and gripping members capable of lateral and longitudinal traveling adjustment thereon to position and grip a blade at a plurality of points on one face thereof.

4. In a machine of the class described a frame, traveling working members thereon, means to impart motion thereto, longitudinally and vertically adjustable supporting means for said working members and additional means on said supporting means permitting independent adjustment of said working members relative to each other, to said frame and to said supporting means to facilitate positioning of a tool to said working members.

5. In a machine of the class described a frame, oppositely disposed working members carried thereby, a work support and a combined work holding and locking member provided with combined positioning and gripping members capable of lateral and longitudinal traveling adjustment thereon to position, extend through and grip a blade at a point on the face of the blade.

6. In a machine of the class described a frame, oppositely disposed working members carried thereby, a work support and a combined work holding and locking member provided with two-way positioning and adjustable gripping members to grip a blade at a plurality of points on the periphery thereof.

7. In a machine of the class described a frame, oppositely disposed working members carried thereby, a work support and a combined work holding and locking member provided with two-way positioning and adjustable gripping members to grip a blade at each end thereof.

8. In a machine of the class described a frame, oppositely disposed working members carried thereby, a work support and a combined work holding and locking member provided with two-way positioning and adjustable gripping members to extend through and grip a blade at a point on the face of the blade.

9. In a machine of the class described a frame, oppositely disposed traveling working members carried thereby, a work support, and a combined work holding and locking member adjustable relative to said support provided with gripping means and adapted to extend through and lock a blade between said support and said holder to simultaneously present both faces of the edge of the blade substantially at the contacting point of said traveling members.

10. In a machine of the class described a frame, oppositely disposed adjustable working members carried thereby, a work support, a combined work holding and locking member adjustable relative to said support, provided with gripping means and adapted to extend through and lock a blade between said support and said holder.

11. In a machine of the class described a frame, oppositely disposed adjustable working members carried thereby, a work support, a combined work holding and locking member adjustable relative to said support, provided with gripping means and adapted to lock a blade between said support and said holder, and means to adjust one of said sharpening and polishing members in its journal bearings relative to the opposite sharpening and polishing member.

12. In a machine of the class described a frame, oppositely disposed adjustable working members carried thereby, a work support, a combined work holding and locking member adjustable relative to said support, provided with longitudinally and laterally adjustable gripping members and adapted to lock a blade between said support and said holder, and means to adjust one of said sharpening and polishing members in its journal bearings relative to said work support.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JOHN G. BESTGEN.

Witnesses:

ROBERT H. KAMMLER,
EVERETT S. EMERY.