March 14, 1933. H. J. GAISMAN 1,901,829

METAL ALIGNING DEVICE

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Fig. 1

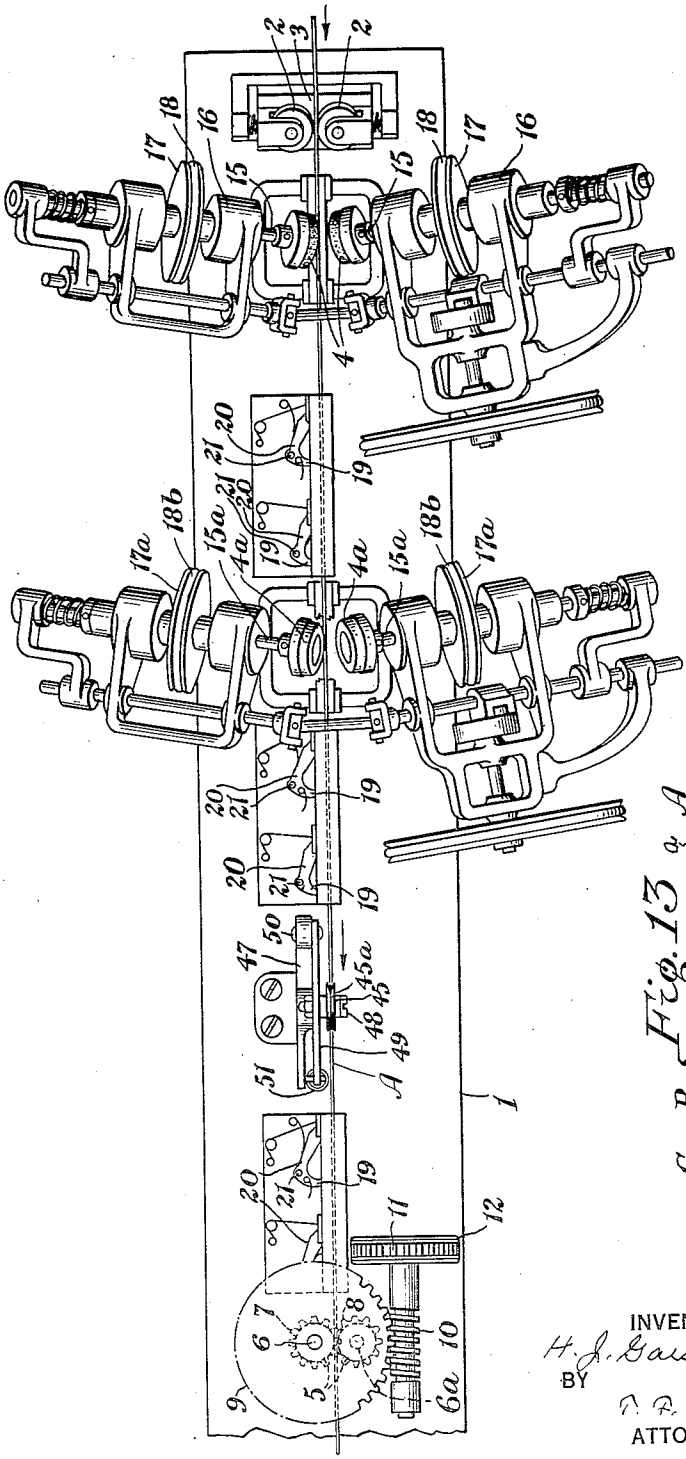
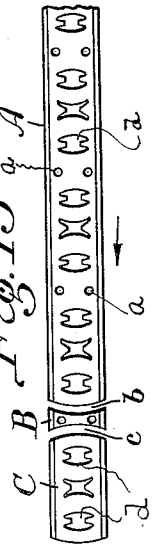


Fig. 13



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METAL ALIGNING DEVICE

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Fig. 3a

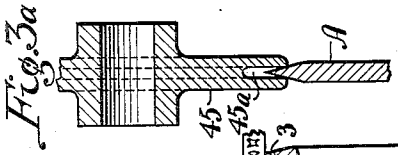



Fig. 3

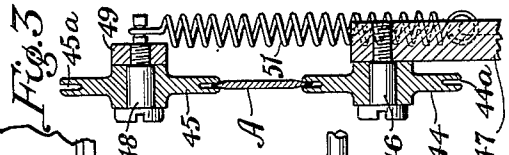
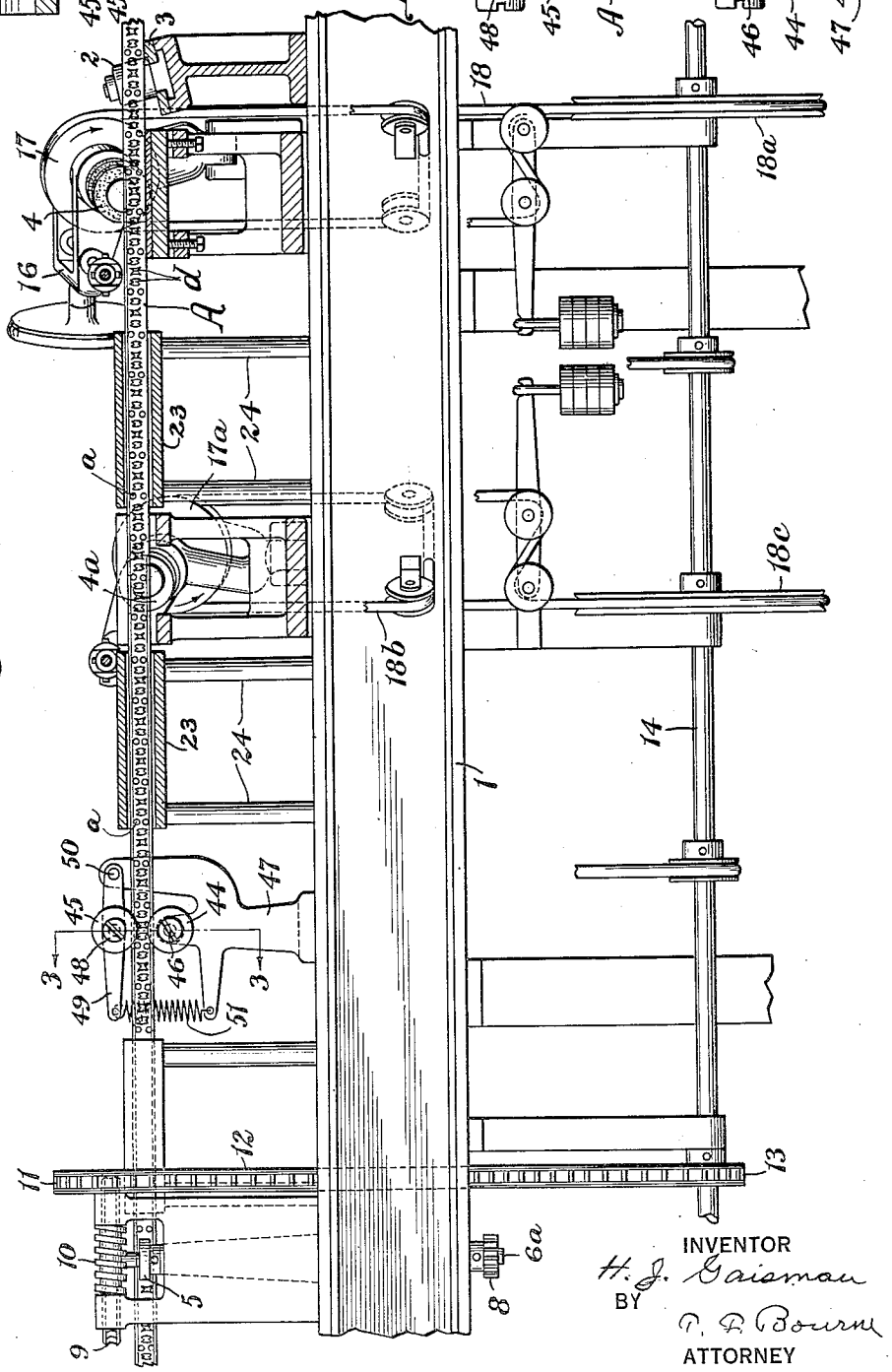



Fig. 2




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METAL ALIGNING DEVICE

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Fig. 4

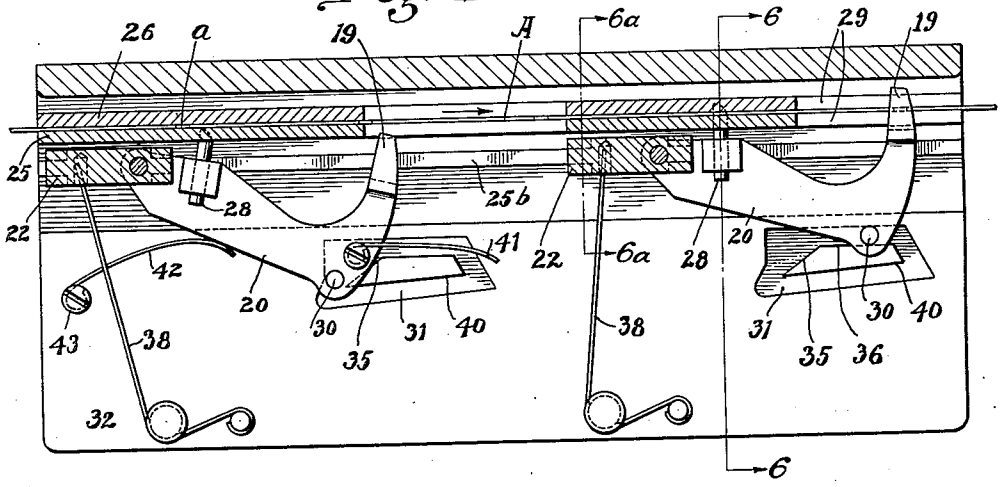



Fig. 5

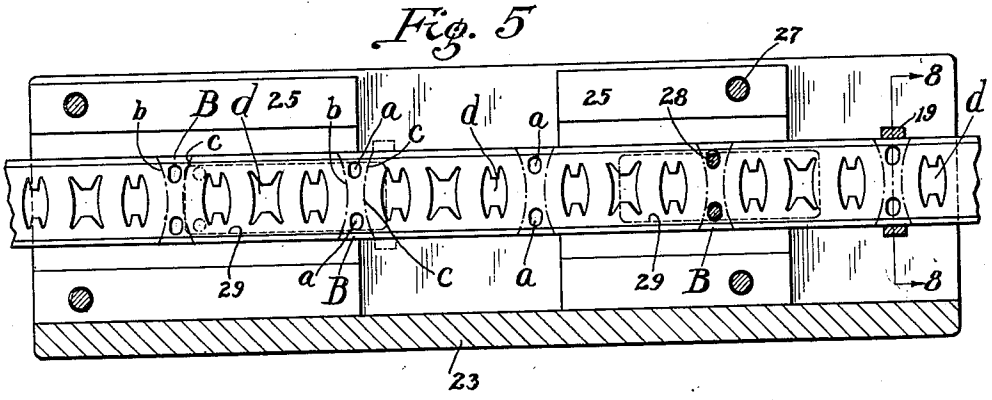



Fig. 6

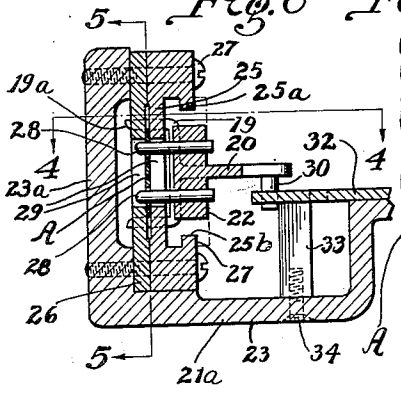



Fig. 6a

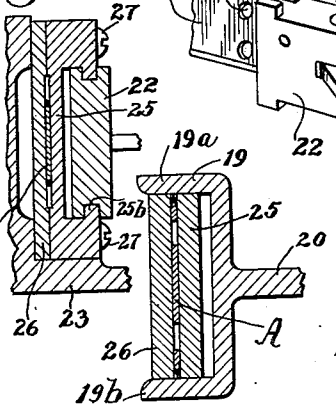
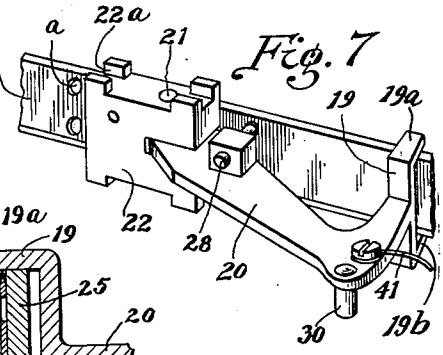



Fig. 8




Fig. 7




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METAL ALIGNING DEVICE

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Fig. 9

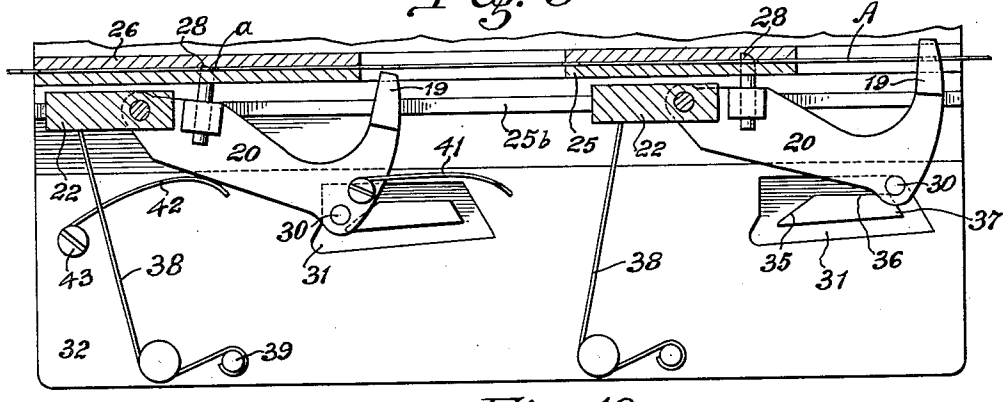



Fig. 10

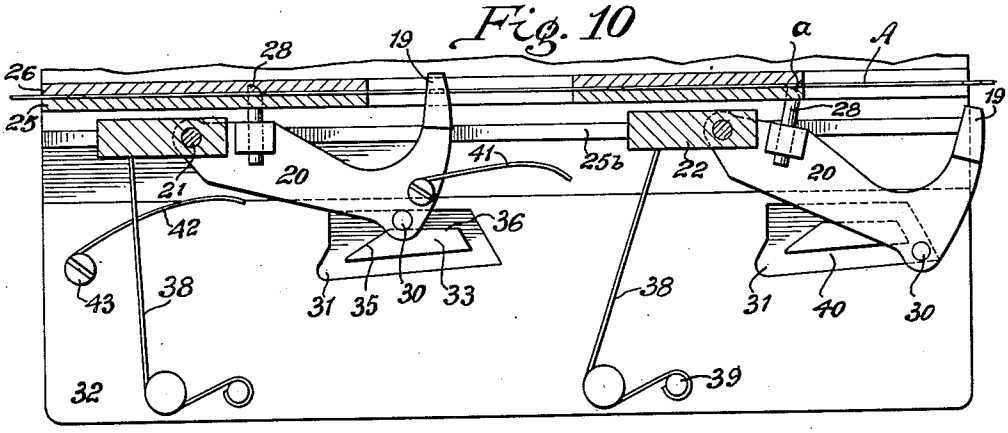



Fig. 11

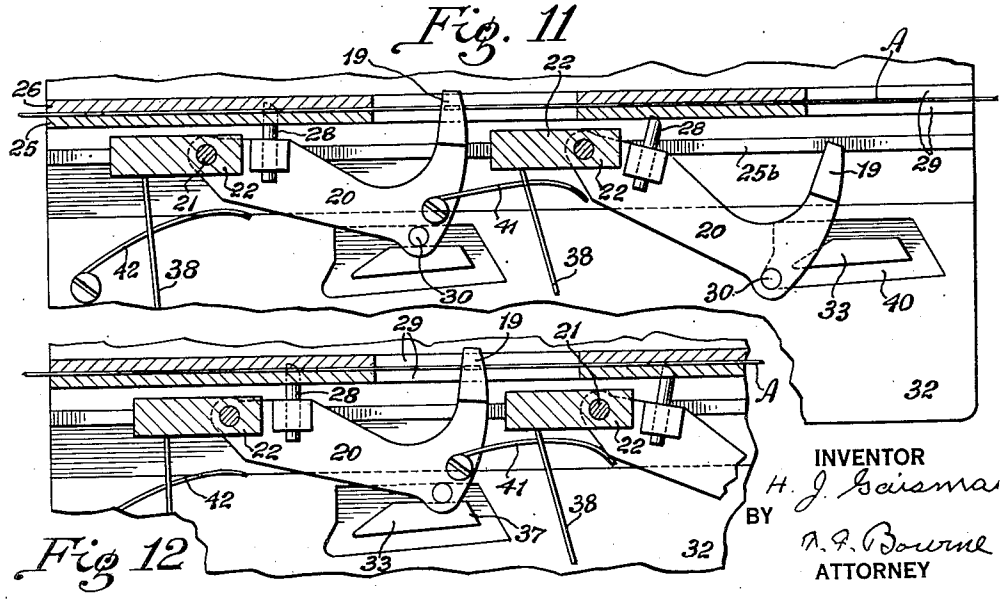



Fig 12

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Patented Mar. 14, 1933 1,901,829

# UNITED STATES PATENT OFFICE

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## METAL ALIGNING DEVICE

Application filed January 18, 1928. Serial No. 247,528.

This invention relates to grinding edges of metal strips while traveling continuously lengthwise, which strips may be severed in suitable lengths to serve as razor blades or for other purposes.

An object of the invention is to provide means to support and align the strip with reference to sharpening means while the strip is traveling and being sharpened in such a manner as not to interfere with or injure the sharpened edge or edges of the strip.

Another object of the invention is to provide means that will engage edge portions of the strip to support or align it with respect to the sharpening means, which portions of the strip, however, are to be removed and discarded between blade-portions of the strip when blades are severed therefrom.

The invention comprises novel details of improvement that will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part hereof, wherein

Fig. 1 is a plan view of a grinding or honing machine embodying this invention;

Fig. 2 is a longitudinal section of Fig. 1;

Fig. 3 is an enlarged detail on line 3, 3, in Fig. 2;

Fig. 3*a* is an exaggerated detail of part of Fig. 3;

Fig. 4 is a sectional plan view substantially on the plane of line 4, 4, in Fig. 6;

Fig. 5 is a section on line 5, 5, in Fig. 6;

Fig. 6 is a cross section on line 6, 6, in Fig. 4;

Fig. 6*a* is a section on line 6*a*, 6*a*, in Fig. 4;

Fig. 7 is a perspective detail of strip-aligning devices;

Fig. 8 is an enlarged section on line 8, 8, in Fig. 5;

Figs. 9, 10, 11 and 12 are detail views showing the strip-aligning devices in different positions, and

Fig. 13 is a view diagrammatically illustrating a blade severed from the strip.

Similar numerals of reference indicate corresponding parts in the several views.

Since this invention has reference more especially to means for supporting or aligning a strip A of metal while the same is being sharpened any desired or suitable means may be provided for sharpening the edge or edges of the strip. Said strip may be supplied on a reel, in a well known way. A main frame 1 may be of any suitable construction. At 2 are spaced guiding rolls for strip A, shown located adjacent to the receiving end of the machine, between which rolls the strip A travels in the direction of the arrow in Fig. 1. The axes of the rolls 2 are shown located at an angle to the plane of the strip, whereby the latter tend to keep the strip from rising and serve to force the strip against a guide 3 supported on the main frame, so that the strip will slide along the guide with relation to grinding or honing rolls 4, shown located above the strip to grind or hone its upper edge, (Figs. 1 and 2). Any suitable means may be provided for propelling the strip through the machine. A pair of feed rolls for the strip are indicated at 5 journaled upon shafts 6, 6*a* at the strip-delivery end of the machine. The shaft 6 is shown provided with a pinion 7 in mesh with a pinion 8 on shaft 6*a*, and shaft 6 is shown provided with a worm wheel 9 in mesh with a worm 10 journaled in bearings in the main frame, the worm being shown provided with a sprocket wheel 11 receiving a chain 12 from a drive sprocket 13 on drive shaft 14 journaled on frame 1, (Figs. 1 and 2). Shaft 14 may be driven in any desired way. During rotation of shaft 14 the strip A will be propelled by the rolls 5 at a desired speed continuously through the machine in the direction of the arrow shown in Fig. 1.

The rolls 4 are shown carried by shafts 15 journaled in supports 16 on opposite sides of the strip, which supports are suitably carried by frame 1. The shafts 15 are shown

provided with pulleys 17 which may be driven in any suitable way for rotating the rolls 4, such as by means of belt 18 operated by drive pulley 18*a* on shaft 14, (Figs. 1 and 2). Where the strip is to be ground or honed on opposite sides a second pair of rolls 4*a* are provided in spaced relation to the rolls 4 and carried by corresponding shafts 15*a* shown supported and operated in manner described with respect to rolls 4, as by means of pulleys 17*a*, belt 18*b* and drive pulley 18*c*. The mechnism described illustrates a construction whereby the strip A may be propelled continuously with its edge or edges being ground or honed, but it will be understood that the improvements hereinafter set forth are not limited for use with the particular sharpening means above set forth, but may be used in connection with any suitable sharpening and propelling means. The rolls 4, 4*a* may be grinding rolls or they may be honing rolls, or the machine may be provided with honing rolls disposed along the strip beyond the grinding rolls in the direction of travel of the strip for honing its edges after grinding the same. Where sharpening is to be produced along one edge only of the strip one of the set of sharpening or honing rolls may be used for such edge.

This invention contemplates supporting strip A and aligning it with respect to the sharpening means or rolls so as to retain the strip during its travel in proper relation to the sharpening means and so that its sharpened edge or edges will be maintained out of contact with any parts of the machine that would tend to dull a sharpened edge. Movable supports to engage the strip A edgewise are indicated at 19, adapted to engage and release the strip and to move with the strip, step by step. The supports 19 are shown in the form of jaws or forks having upper and lower projections 19*a*, 19*b* located in position to straddle and support strip A, (Figs. 6, 6*a*, 7 and 8). The support 19 includes an arm 20 that is pivotally supported at 21 upon a slidable member or block 22 that is guided in proximity to strip A so as to slide back and forth in parallel relation to the strip. The main frame of the machine is shown provided with a longitudinal member 23 secured on the main frame by means of posts 24, which member is provided with spaced longitudinally disposed guides 25, 26 which are shown secured by means of screws 27 to the up-standing web 23*a* of member 23, (Figs. 4, 5 and 6), the guides 25 and 26 being so spaced as to permit the strip A to slide therebetween and be guided laterally thereby. The guide 25 is shown provided with spaced opposing longitudinally disposed ways or rails 25*a*, 25*b*, that receive upper and lower grooves 22*a* on the slide member or block 22 for guiding the latter spaced from strip A, (Figs. 6, 6*a* and 7). Each arm 20 is provided with one or more pins or projections 28 that extend toward the strip A and are adapted to pass through corresponding apertures a in the strip, (Figs. 5, 6 and 7). The projections 28 are also adapted to operate in longitudinal slots 29 in the guides 25 and 26 in order to engage the apertures in strip A, (Fig. 6). The free ends of the projections 28 are preferably tapered for ready entry into the apertures *a* of strip A. While the apertures *a* are shown arranged in pairs transversely respecting the strip, and in desired spaced relation, to receive the corresponding pair of projections 28 on an arm 20, it will be understood that apertures may be arranged singly in spaced relation in the strip, in which case there would be one projection or pin 28 in position to enter the successive apertures.

Means are provided to cause the projections 28 to enter apertures in the strip and to cause the corresponding support 19 to engage and be propelled by and with the strip for supporting or aligning the latter, and to cause withdrawal of the projection 28 and support 19 from the strip in step-by-step manner shown arranged as follows: From arm 20 a pin or projection 30 extends into a groove 31 in a plate 32 that is secured upon the member 23, (Figs. 4 and 6), which groove is shown located at one side of the guide 25. The groove 31 may be formed in any desired way, such as by cutting an opening in plate 32 and inserting a post 33 therein that is secured to the member 23, as by a screw 34, (Fig. 6). The groove has an inclined edge 35 adapted to be engaged by projection 30 when an aperture *a* in strip A approaches projection 28 to permit said projection to enter the aperture, to propel the support 19 with the arm 20 and its slide block 22 by and with the strip, (Figs. 4 and 9). With the projection 28 extending into an aperture in the strip A the travel of block 22 will cause the projection 30 to slide along the edge 35 of groove 31, thereby causing the support 19 to approach and engage opposing edges of the strip to support and align the latter with respect to the sharpening means. As the strip advances it will continue to pull the parts 19, 30, 28 and 22 so that the projection 30 will ride along edge 36 of groove 31, as at the right hand side of Fig. 4, until the projection 30 reaches the right hand end of said edge, (which edge is substantially parallel to the plane of strip A), to keep support 19 in engagement with strip A for aligning the latter. As the block 22 continues to travel the outwardly inclined edge 37 of groove 31 will cause the projection 30 to move in a direction away from strip A, (through the adjacent inclined portion of groove 31), as at the right hand side of Fig. 9, causing the projection 30 to so operate arm 20 as to withdraw projection 28 from the aperture *a* in

strip A and also withdraw support 19 from the strip to release the latter, as at the right hand side of Fig. 10. When the parts are in the last named position a spring 38, (which is secured at 39 to plate 32 and has its free end in engagement with the adjacent block 22), will cause said block to move to the left and thereby will cause the projection 30 to ride along the inclined edge 40 of groove 31 to return the support 19 and projection 28 to an initial position, as indicated in Fig. 11. In the example illustrated two slide blocks 22 with corresponding arms 20, projections 28 and strip-supports 19 are illustrated in adjacent operative relation, each block 22 being provided with a spring 38 to move it toward the left in Figs. 9 to 12. The arm 20 at the left is shown provided with a forwardly extending leaf-like spring 41 which is adapted to engage the right hand arm 20 when the latter has been moved by its spring 38 to the left hand position shown in Figs. 11 and 12. When the left hand arm 20 has been moved by means of the strip A to such a position that the spring 41 will engage the right hand arm 20 the spring will tilt said arm toward strip A to present its projection 28 against the strip, (Fig. 12), so that as the latter travels and an aperture *a* therein opposes the right hand projection 28 the latter will enter said aperture at the appropriate time to cause said arm to be propelled with the strip. When the left hand arm 20 is caused by its spring 38 to move to the left, (Fig. 4), a spring 42, carried by plate 32 at 43, will engage said arm to cause it to move toward strip A so that its projection 28 will bear against said strip to be in position to enter an aperture *a* thereof as the latter is advanced with the strip and opposes said projection.

The apertures *a* in strip A are shown elongated transversely with respect to the strip to receive the projections 28 for propulsion of the latter by and with the strip but not to support the strip with respect to the sharpening means, such support of the strip being effected by means of the supports or jaw-like portions 19. The portions of the strip A adjacent to the apertures *a* are reserved at B, as between the dotted lines *b* and *c* in Fig. 5, to be engaged by the supports 19, so that after the strip has been sharpened the same may be severed along adjacent lines *b*, *c* to cut away and discard the intermediate portions B, and thereby provide portions of the strip at C which, when severed from the strip, will provide razor blades of desired length, (Fig. 13). The blades C may have any suitable openings *d* for use in a safety razor frame.

With two of the independently operated and spaced supports 19, and the strip A traveling continuously, at least one of the supports 19 will always engage the strip to support and align it, two of said supports sometimes engaging the strip, the supports 19 operating alternately to engage, support and release the strip. For instance, when the support 19 at the right of Fig. 4 is in cooperation with strip A and is being propelled with said strip, support 19 at the left of said figure is temporarily retained out of engagement with the strip with the projection 28 of said support riding against the strip, and while the support 19 at the right hand side in Fig. 9 is still in engagement with strip A the projection 28 of support 19 at the left hand side of said figure will be in an aperture *a* in the strip. As the strip proceeds the support 19 and its projection 28 at the right hand side of Fig. 10 will move away from the strip and release it while the support 19 and projection 28 at the left hand side of said figure remain in engagement with the strip, and the last named parts will so remain in engagement with the strip while the support 19 at the right hand side of Fig. 11 is moved toward the other support free from the strip. When the last named support advances sufficiently with strip A its spring 41 will engage the arm 20 of the right hand member to tilt the latter toward strip A, during continued advance of the left hand support 19, substantially as indicated in Fig. 12, so that the projection 28 at the right hand side of Fig. 12 may enter an aperture *a* in the strip and the corresponding support 19 will engage the strip before the support 19 and projection 28 at the left hand side of Fig. 12 release the strip when the projection 30 of the last named support is presented along the edge 37 of the groove 31 to cause release of the corresponding support 19 and projection 28 from the strip. Since the supports 19 engage portions B of strip A that are to be cut from the strip and discarded, when the blades are finally cut from the strip, the supports 19 will not engage the sharpened portions of the strip that are to be used for blades, and said supports will guide and align the strip at all times with reference to the sharpening means 4 and 4*a*.

Any suitable number of supports 19 and their operating devices may be located along strip A, such as in Fig. 1, where three pairs of such supports are shown, one of such pairs of supports being located between the rolls 4 and 4*a* and the other supports between the rolls 4*a* and the feeding rolls 5. A further means for supporting and guiding the sharpened strip A comprises guiding members or rolls 44 and 45, which are spaced apart and have peripheral grooves 44*a*, 45*a*, respectively, receiving the sharpened edges of the strip A. The grooves 44*a* and 45*a* are of such dimensions as to engage the beveled sides or facets of strip A along and adjacent to the corresponding sharpened edges, so that the latter will be kept free from contact with

the rolls, as illustrated in Figs. 3 and 3*a*. The roller 44 is shown journaled upon a stud 46 carried by a standard 47 secured on the longitudinal member 23 of the main frame, and the roller 45 is journaled upon a stud 48 carried by an arm 49 that is pivotally supported at 50 upon the standard 47, whereby the rollers are spaced apart on opposite sides of strip A. A spring 51 connects the arm 49 with standard 47 and thereby causes roller 45 to bear upon strip A resiliently. As the sharpened strip travels through the machine and its beveled sides are guided in the grooves of the rollers 44 and 45 the strip will be supported and aligned, without injury to its sharpened edges, in its passage from said rollers to the feed rolls 5. The guiding members or rollers 44 and 45, by engagement of the side walls of their grooves with the facets or beveled sides of the strip, serve to resist lateral movement of the strip relatively to the sharpening means or rolls 4 and 4*a*.

After the strip A has been sharpened it may be severed at *b*, *c*, to produce the blades C and discard the intermediate portions B, by any suitable means, for which purpose a sharpened strip may be wound upon a reel and removed for operation by suitable blade-cutting-off means, or such strip may run directly from mechanism described to the cutting-off means.

Having now described my invention what I claim is:—

1. Means for aligning a strip of metal while traveling comprising means to propel the strip, a movable support to engage edges of the strip to support and align it as fed by said means, means guiding said support to travel in the direction of the strip, means additional to said movable support cooperative with the strip to cause said support to be propelled by and with the strip in one direction, means to move the support in another direction, and means to cause the support to engage and release the edges of the strip.

2. Means for aligning a perforated strip of metal while traveling comprising means to propel the strip, a movable support to engage edges of the strip as fed by said means, means movably guiding the support to travel in the direction of the strip, means additional to said movable support operative with said support to enter perforations in the strip to cause the support to be propelled by and with the strip in one direction to support and align the strip, means to move the support in another direction, and means to cause the support and the strip engaging means to move into and out of cooperation with the strip.

3. Means for aligning a perforated strip of metal while traveling comprising means to propel the strip, a movable support to engage the edges of the strip to align it as fed by said means, a slidable member movably carrying said support, means connected with said support additional to said movable support to enter perforations in the strip to cause the support and the member to be propelled in one direction by and with the strip, means to move the support and member in another direction, and means to cause said support and the strip-engaging means to engage and release the strip.

4. Means for aligning a perforated strip of metal comprising a support to engage edges of the strip, an arm carrying the support, a member movably carrying the arm, means slidably guiding said member for movement with relation to the strip, a projection connected with said arm to enter perforations in the strip to cause movement of the support and of the member by and with the strip, means to move the support, the arm and the member in a different direction, and means to cause the support and the projection to move toward the strip to cooperate with the latter to align it and to move away from the strip to release the latter.

5. Means for aligning a perforated strip of metal comprising a support having jaws to engage edges of the strip, an arm carrying the jaws, a member movably carrying the arm and slidable with relation to the strip, a projection carried by the arm adapted to enter perforations in the strip to cause the support, the arm and the member to travel with the strip for aligning the latter, means to move the support, the arm and the member in another direction along the strip, and means to move said support and projection toward the strip for cooperation therewith and to move the support and projection away from the strip to release the latter.

6. Means for aligning a perforated strip of metal comprising means to propel the strip, vertically disposed guiding means for the strip, a member guided with respect to the guiding means at one side thereof to travel parallel with the strip, an arm movably carried by the member, a support carried by the arm to engage the strip to support and align it, a projection additional to said support and carried by the arm to enter perforations in the strip to cause the member, the arm and the support to be propelled by and with the strip, and means to cause the support and the projection to move into engagement with the strip and to release the strip.

7. Means for aligning a perforated strip of metal comprising a support adapted to engage edges of the strip to align it, a slide member movably carrying said support, means to guide said member to travel parallel to the strip, means connected with said support to cooperate with the strip to cause the latter to propel said support, means to move said member and support in another

direction, a second projection connected with said support, a plate having a groove receiving said second projection, said groove having an edge cooperative with the second projection to cause the support to engage the strip, said groove having an edge cooperative with said projection to retain the support in cooperation with the strip during travel, said groove having another edge cooperative with said projection to cause withdrawal of the support from the strip, said groove having another edge cooperative with said projection to retain the support out of cooperation with the strip when the support and said member move in said other direction, and means to cause the first named projection to enter an aperture in the strip.

8. Means for aligning a perforated strip of metal while traveling comprising means to propel the strip, a pair of slide members spaced apart adjacent to the strip, guiding means for the slide members, arms pivotally carried by said members, supports for the strip carried by said arms adapted to engage edges of the strip, projections carried by said arms to engage apertures in the strip, means to cause each of the arms to move toward and from the strip to cause the supports to engage and release the strip, means to cause the projection of one arm to enter an aperture in the strip, and means carried by said arm cooperative with the other arm to cause the projection of the last named arm to engage a perforation in the strip.

9. Means for aligning a perforated strip of metal as set forth in claim 8, in which the means carried by one of the arms to cooperate with the other arm includes a spring to engage the latter arm to resiliently press its projection against the strip and to cause said projection to enter an aperture in the strip.

10. Means to align a sharpened metal strip comprising opposing spaced guiding members having peripheral grooves narrower than the thickness of the strip and of such dimensions as to engage the sides of the strip adjacent to and away from the sharpened edges with the said sharpened edges out of contact with the members, and means to rotatively support said guiding members on opposite sides of the strip.

11. Means to align a sharpened metal strip comprising opposing spaced guiding members having peripheral grooves of such dimensions as to engage the sides of the strip adjacent to and away from the sharpened edges with the said sharpened edges out of contact with the members, a standard pivotally carrying one of said rollers, an arm movably carried by the standard and pivotally supporting the other member, and means resiliently operating said arm to resiliently press its member against the strip.

12. Means to align a sharpened metal strip comprising opposing spaced guiding members having peripheral grooves of such dimensions as to engage the sides of the strip adjacent to and away from the sharpened edges with the said sharpened edges out of contact with the members, a standard pivotally carrying one of said members, an arm movably carried by the standard and pivotally supporting the other member, and a spring cooperative with said arm to resiliently press its member against the strip.

13. Means to align a sharpened metal strip ts set forth in claim 12, in which one end of the spring is connected to the member and the other end of the spring is connected to the standard.

14. Means to align a metal strip having portions adapted to be cut into blades and intermediate portions between the first named portions adapted to be cut from the strip and discarded, comprising means to propel the strip, a support adapted to engage the edges of the intermediate portions of the strip additional to said support between blade portions to support and align the strip, means guiding said support to travel with and in the direction of the strip, means cooperative with the strip to cause the support to be propelled by and with the strip in one direction, means to move the support in another direction, and means to cause the support to engage and release said intermediate portion of the strip without engaging the blade portions of the strip.

15. Means to align a sharpened metal strip comprising a strip guiding member having a groove narrower than the thickness of the strip and of such dimensions as to engage the facets of the strip adjacent to and away from the sharpened edge with said edge out of contact with said member, and means to feed the strip along said member with the sharpened edge in said groove and said facets of the strip engaging said member to align it as the strip travels.

16. A metal sharpening machine comprising means to grind edge portions of a strip, a grooved guide for the ground edge portions of the strip, the groove being of sufficient depth to prevent engagement of the guide with the sharpened edge of the strip, means to propel the strip along the guide, and a resiliently operative arm carrying said grooved guide and operative in the direction of the plane of the strip to accommodate differences in the width of the strip.

17. A metal sharpening machine comprising means to sharpen a metal strip, means to propel the strip along the machine, spaced grooved guiding means for the sharpened edge portion of the strip located along its opposite edge portions, and a pivotally supported arm carrying at least part of said guiding means and operative in the direction of the plane of the strip.

18. A metal sharpening machine comprising means to sharpen a metal strip, means to propel the strip along the machine, grooved guiding means for the sharpened edge portions of the strip located along its opposite edge portions, a pivotally supported arm carrying at least part of said guiding means, and a spring operative with said arm to resiliently keep the guiding means in engagement with the strip.

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