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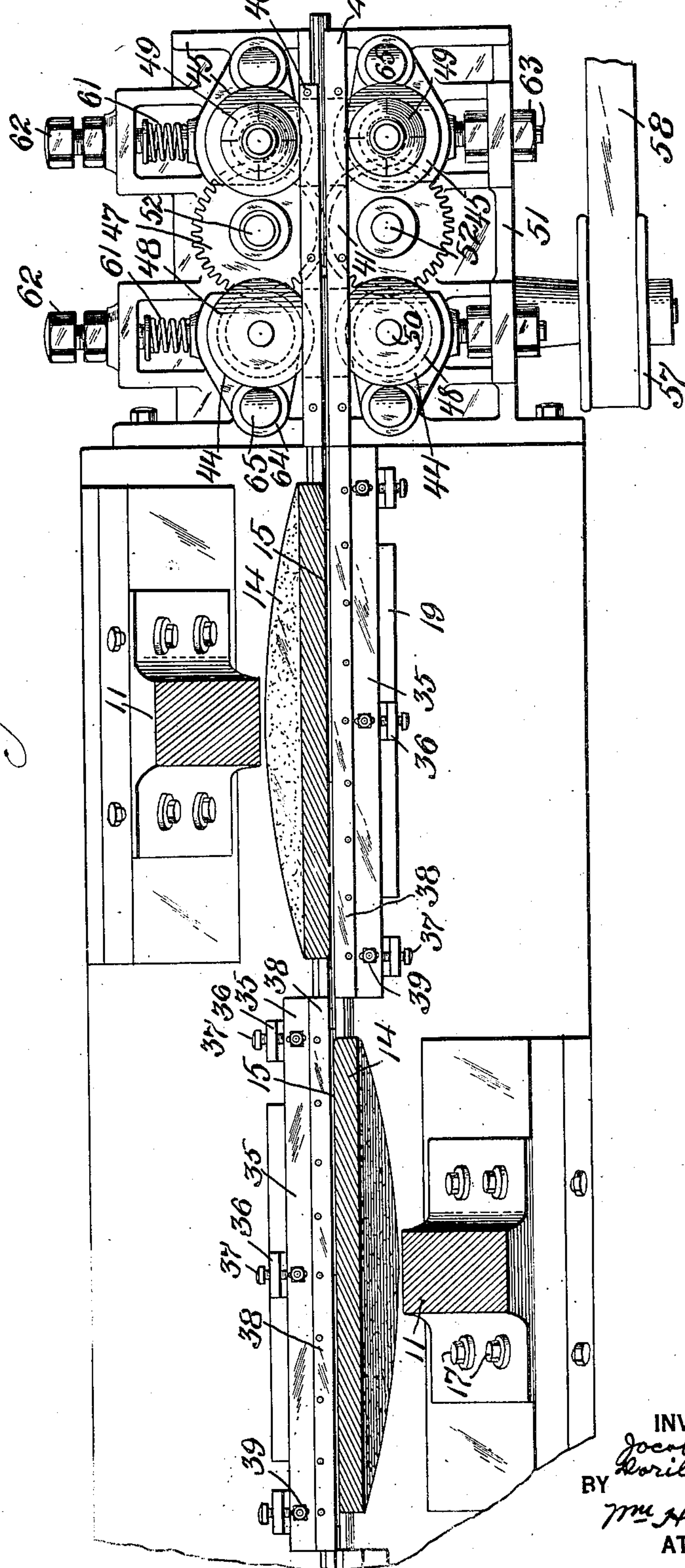
J. SCHICK ET AL
BLADE GRINDING MACHINE

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4 Sheets-Sheet 1

Fig. 1



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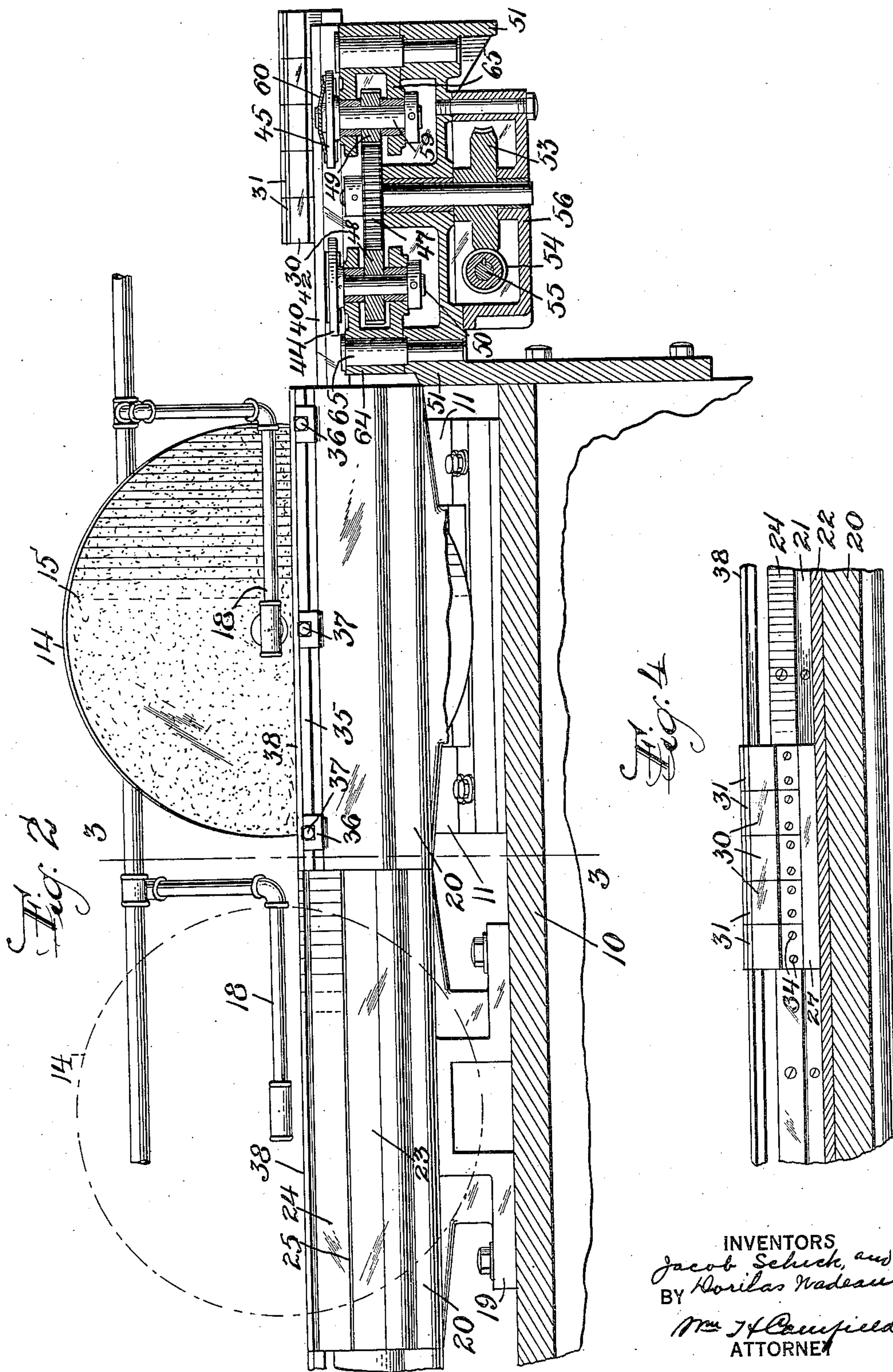
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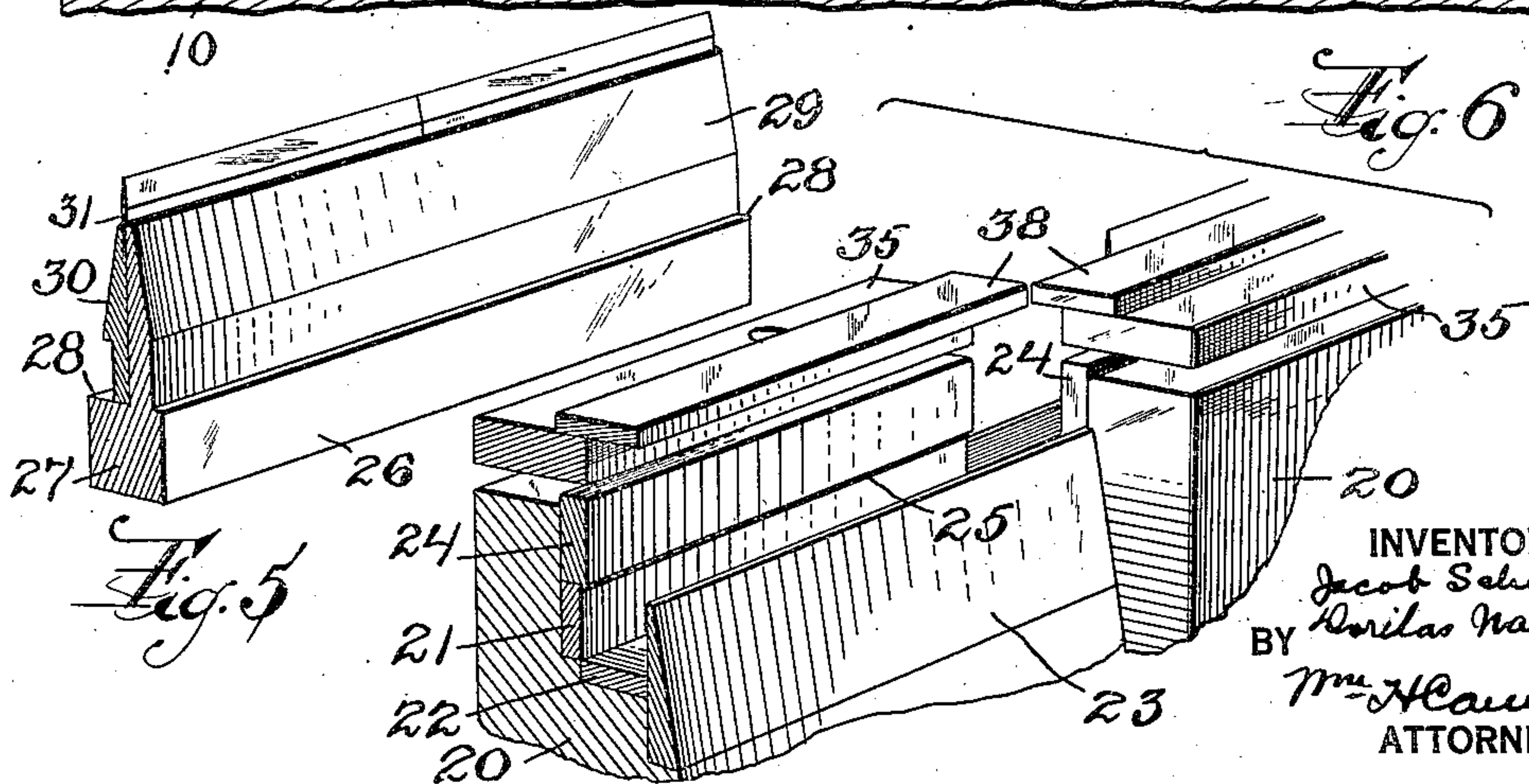
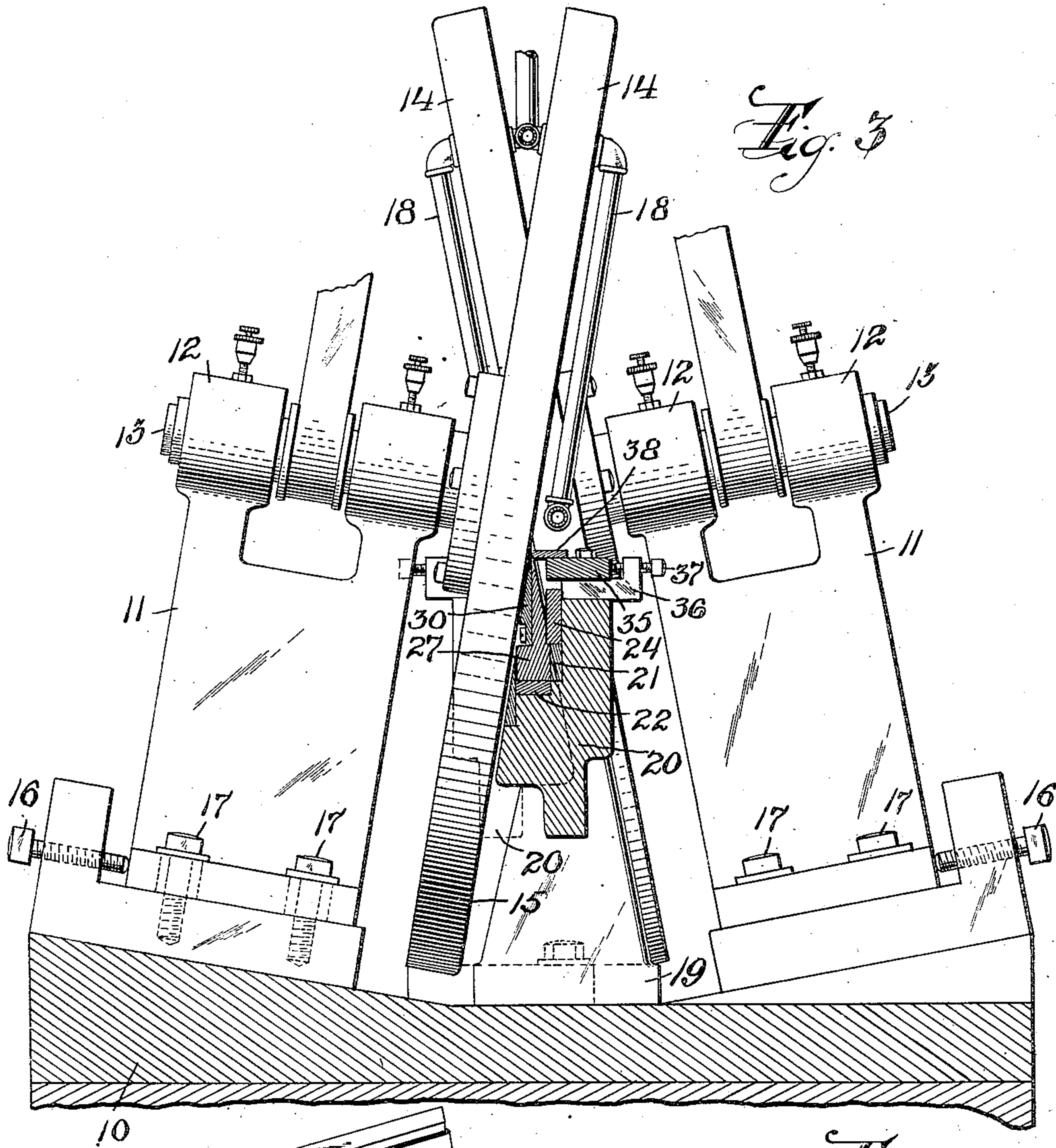
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BLADE GRINDING MACHINE

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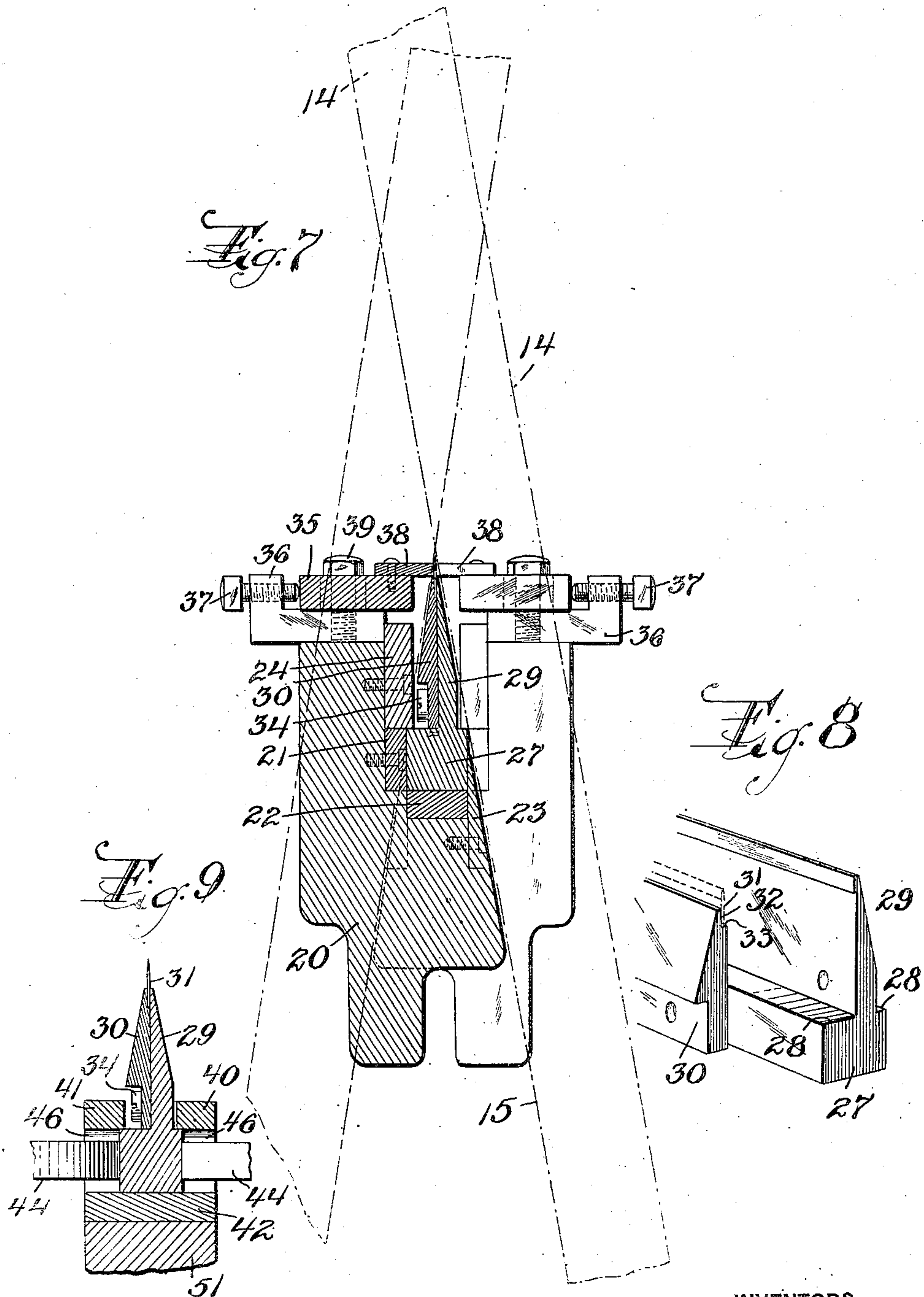
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4 Sheets-Sheet 4



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BLADE GRINDING MACHINE

Application filed May 19, 1926. Serial No. 110,045.

This invention relates to an improved machine for the precision grinding of thin articles and is particularly adapted for grinding razor blades of the wafer type.

It has been difficult heretofore to secure a uniformity of grinding on the edges of thin blades which causes a loss to the manufacturer by reason of the blades that can not be sold and indirectly by the great number of blades that are inadequately sharpened to that keenness that markedly contrasts a perfectly sharpened blade with one that is not so keen.

The present invention is designed to sharpen the blades preparatory to their being given the final step of honing.

In the improved machine the razor and blades are mounted in holders to the required number and for commercial purposes the holders receive five blades, each holder being rigid and supporting the blades so that the edge to be sharpened projects therefrom so that the edge can be engaged by the edge treating devices such as grinding wheels. The holder is passed along a rigid track and in production grinding these holders are passed through as a train, the rearmost of the holders pushing all those that are ahead of it, thus causing an equal duration of grinding to all blades. The rigidity of the holders and the track, and the associated means for supporting the blades assure the blade against any flexing or bending, or any retreat into the holder so that the angle at which the grinding is done and the amount of material removed to form the tapered edges is the same.

The invention therefore is also directed to the method of conducting blades in an absolutely fixed path of travel across firmly secured edge treating devices to produce uniform keen blades.

The invention furthermore relates to details of construction that will be hereinafter more fully described and finally embodied in the claims.

The invention is illustrated in the accompanying drawings in which Figure 1 is a top view of a machine embodying the invention with the grinding wheel shown in section.

Figure 2 is a side view of the construction shown in Figure 1 with a part of the feeding device shown in section. Figure 3 is a section on line 3—3 in Figure 2 but on an enlarged scale. Figure 4 is a section of the track of a machine and showing a holder with blades therein in position in the track. Figure 5 is a sectional perspective of the holder. Figure 6 is a sectional perspective of the track construction illustrating also the juncture of the two ends of adjusting standards for supporting the grinding wheels. Figure 7 is an enlarged section of the track and its supporting brackets and also showing the blade holder with the grinding wheel shown in dotted outline. Figure 8 is a section perspective of the members of the blade holder with the plates therefor separated. Figure 9 is a section of a holder and showing feeding wheels of the feeding or propelling mechanism engaging the sides of the holder.

The machine comprises a suitable base 10, usually in the form of a table on which is mounted a track for feeding the blade holders and also the brackets or standards which support the grinding wheels. The standards are shown at 11 and include bearings 12 for supporting the shafts 13, each shaft having on its end a grinding wheel 14, the grinding wheel being inclined at the proper angle so that its flat face 15 engages the edge of a razor blade at a predetermined angle to bring the edge of the blade to a sharp edge.

In the drawings we show two of these wheels arranged alternately on opposite sides of the blade holder's path of travel but in a machine it is usual to use 10 or 12 of these wheels, the successive wheels of course, being adjusted to take off a little more material than the preceding one on the same side. Such adjustment can be accomplished by a screw 16 to force the bracket and its supported elements toward the blade and when adjusted the bracket is locked in position by the screws 17. Suitable pipes for supplying oil are arranged opposite the faces of the grinding wheels to cause oil to drip or flow on the blades while they are being ground. On suitable standards 19 are the bases 20 for sup-

porting the track, these bases 20 being staggered opposite their respective grinding wheels 14 and being fitted with lining plates 21 and 22 which form one side and bottom part of the track and a side plate 23 forms the outer side of the track as will be evident from Figure 6. Of course, on the next succeeding track section these parts are reversed.

On the side of the plate 21 is an upper side plate 24 which projects to form a shoulder 25 which catches over the edge of an element of the holder of the blade to prevent it from rising, the holder being described hereinafter. These lining plates 21 to 24 inclusive are finished accurately and being mounted on a solid support form a rigid accurately constructed track for the blade holder. The blade holder comprises two members, one, 26, consisting of a base portion 27 which fits between the plates 21 and 23 of the track and has a shoulder 28 on each side, these shoulders engaging first on one side and then on the other with the shoulder 25 of the track structure. The base 26 of the holder thus fits snugly in the track and when moved longitudinally has absolutely no side movement nor any vertical movement during its travel.

The base 27 has a projecting plate 29, the upper part of which is tapered inwardly and a plate 30 fits against the plate 29 and forms a clamp for the blade 31, the plate 30 having a recess 32 to receive the blade, the back of which rests on a shoulder 33 so that the blade is held tightly clamped in the holder, the plate 30 being held in place by screws 34 and while we may make single holders we prefer to make the holders with the plates 30 each clamping the blade but being grouped so that five or six blades are independently held in one holder as will be evident from Figure 4.

To further assist in holding the blade against the alternate wheels 14 while they are being ground, we provide braced plates or abutments 35 which are mounted on brackets 36 and are adjusted by the screws 37, these abutment plates having an end strip 38 which is projected so as to engage the edge of the blade close up to its cutting edge so that the blade has no chance to move or bend at the narrow portion thereof which projects above the plates 29 and 30 of the holder, this being evident from Figure 7. The outside faces of the plates 29 and 30 are tapered so that they are cleared at all points by the grinding wheels and the plate 23 is similarly tapered for the same reason.

The abutments 25 are held in their adjusted positions by the lock screws 39.

The feeding means comprises an extension of the track consisting of side plates 40 and 41 and the bottom plate 42 which receives the base 27 of the holders, one of the tracks as 41 being extended beyond the other as at 43 in Figure 1 so as to facilitate the insertion by

the workman of the holders as they can be more easily seated laterally into one side of the track at 43 and then pushed forward.

The feeding means is provided with feeding rolls 44 and propelling rolls 45, these being arranged in pairs on opposite sides of the tracks and projecting through openings 46 in the sides thereof. On each side is a driving gear 47 which is in mesh with a gear 48 on each driving roll 44 and with a gear 49 on each propelling roll 45, these respective gears and rolls being mounted on shafts 50, these associated parts all being mounted in a frame on bracket 51 and each driving gear 47 being secured to a shaft 52 and each shaft extending down, being driven in turn by a worm gear 53 which are in mesh with worms 54 of the shaft 55, all these being supported by a bearing bracket 56.

The shaft 55 is provided with a pulley 57 which is driven from the belt 58. The rotation of the feeding rolls 44 is at a constant speed to drive the rearmost holder so that the train of holders ahead of it is passed at a constant speed through the machine, but the propelling rolls 45 are driven at a higher speed because the gears 49 are smaller than the gears 48. The propelling rolls 49 are not fast on their shafts 59 but they are held frictionally in feeding position by means such as the spring washers 60.

The reason for this construction is that the workman feeding the machine having a stock of holders at hand begins feeding them into the machine in succession and if he is a little slow in feeding one into place, the propelling rolls 45 accelerates the holder so that it catches and abuts on the holder ahead of it before it passes beyond the rolls 44 on account of the slower speed of these rolls.

The rolls 44 are so adjusted that there is no slipping between them and the holders and when the holder last inserted in the propelling rolls is thrust forward and engages the holder just ahead of it, the propelling rolls 45 slip under the spring washers 60 and this last holder is held in close abutment with the holder in front of it until it is engaged by the feed rolls 44. The rolls are held in position for feeding by spring 61, the tension on which can be regulated by the screws 62. On the opposite side the bearings of the rolls are adjusted in a more permanent manner by the screws 63 and the associated nuts. The bearings for these feeding and propelling rolls are mounted in swinging supports 64 which are secured to the pivots 65.

In the operation of this machine the holders are supplied with blades and then placed one after the other between the tracks 41 of the feeding means. The train of holders so supplied is then pushed steadily through the track and the blades are passed across the flat faces of the inclined wheels 14. As the holders emerge from the other end of the ma-

chine they are either emptied of blades or passed on to be further treated or packed.

By this machine and by this method the accurate grinding to precision can be readily accomplished and uniform properly ground blades can be produced in quantity production.

We claim:

1. A machine for the precision grinding of razor blades of the wafer type comprising rigid holders for clamping aligned blades therein, a rigid track for receiving the holders and conducting them in a fixed longitudinal path of travel, means for forcing a holder into one end of the track and thus cause the advancing of the whole train of holders, and edge treating devices arranged at the sides and in the path of travel of exposed edges of the blades, said devices comprising flat discs each rotating on an axis in a plane perpendicular to the travel of the holder but inclined in such plane.

2. In a precision grinding machine, a straight rigid track with a projecting shoulder on inner side wall, and a blade holder proportioned to accurately fit in the track and having a base portion with its top edge forming a shoulder to ride under the shoulder of the track, the holder having a rigid plate projecting from the base, the plate having its outer face inwardly tapered at the top and having a recess on its inner face at the top to receive a blade, and a second plate secured against the first plate and having its outer face tapered inwardly at the top, the holder having its length in excess of its height and of its width in order that it is held against any movement except longitudinal travel, and an edge treating device for engaging a blade in the holder.

In testimony whereof we affix our signatures.

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