April 23, 1935. E. C. SMITH 1,998,642

STONE SHAPING DEVICE

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Fig. 1.

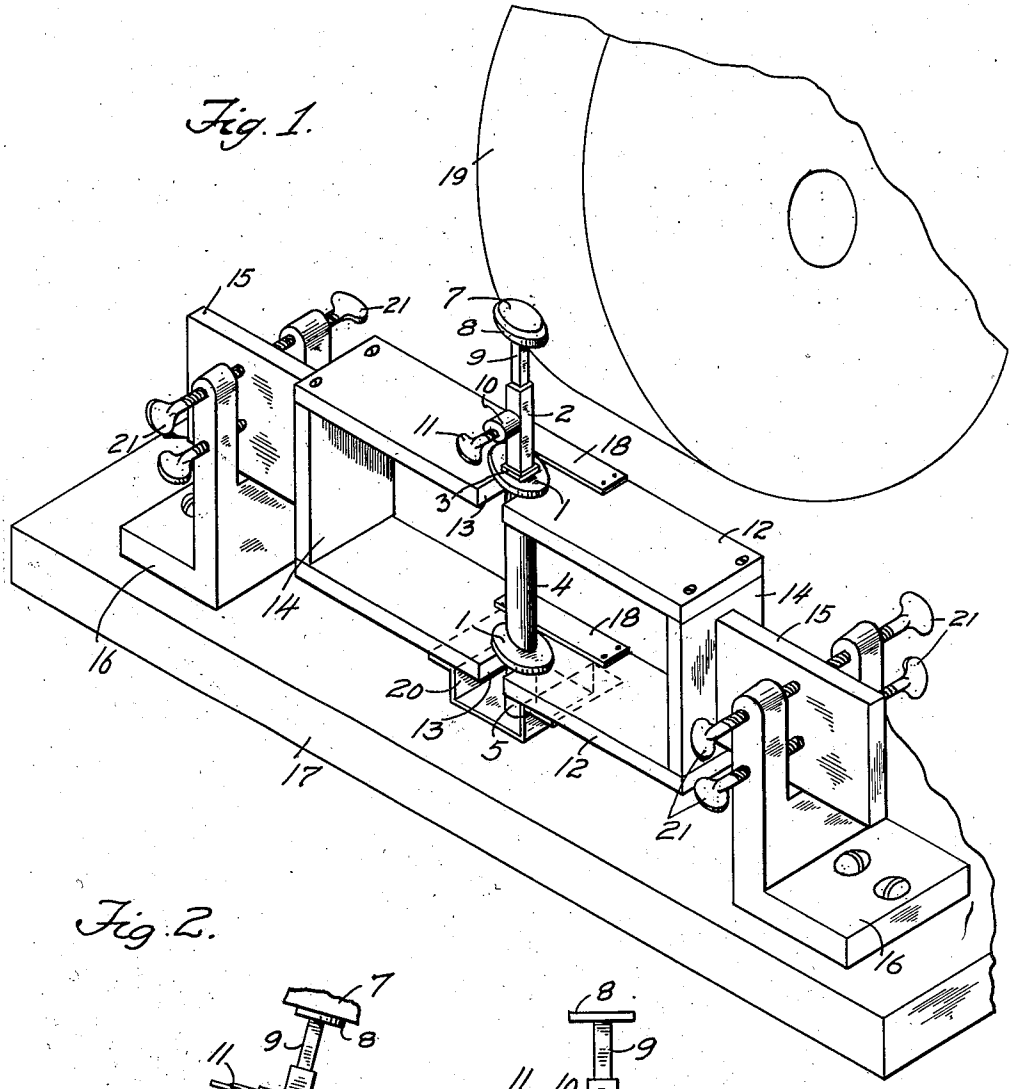
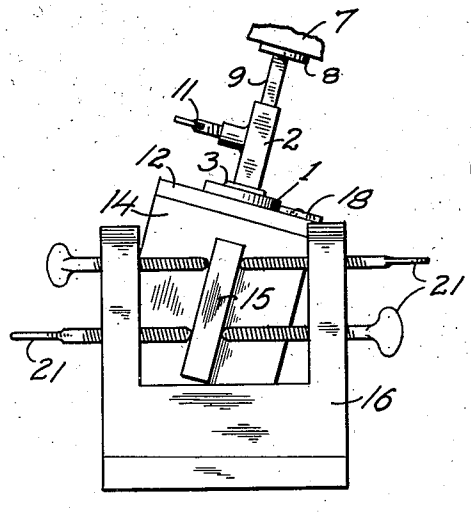


Fig. 2.



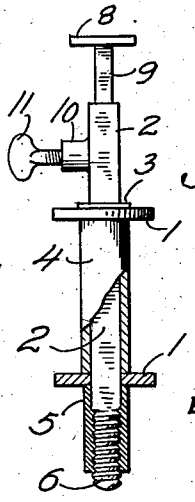


Fig. 3.

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STONE SHAPING DEVICE

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10 Claims. (Cl. 51—101)

This invention relates to means for shaping stones and refers particularly to a jig used in connection with and mountable on the table of a grinding machine for grinding the perimetric contour of gems.

The general object of my invention is to provide a simple and inexpensive jig, by means of which precious or semiprecious stones may be ground to any desired perimetric angular outline. A further object is the provision of a jig by the use of which the contours of a plurality of stones may successively be ground to the same shape and size. Another object is to provide a jig furnished with a plurality of gem supports and shaped successively to receive such supports for the purpose of grinding the gems carried by the supports to the same shape.

With these objects in view, the invention consists in the combinations and important features hereinafter fully described and illustrated in the appended drawing, of which:

Fig. 1 is a perspective view of a gem shaping jig embodying the invention,

Fig. 2 is an end elevation of the device, and

Fig. 3 illustrates the gem support of the invention, as it appears removed from the jig.

The structure of my invention is mounted on a base 17, which may be placed on the table or bench on which a grinding head is mounted, as usual in practice, in close proximity to the grinding wheel 19, of such machine.

The jig is made with vertically alined slots 13, in which a gem support is shown axially seated to rotate. This support comprises a member 2, into which a stem 9 is inserted for longitudinal adjustment. A set screw 11, threaded into a boss 10 of the member 2, serves to maintain the stem in adjusted position. To the top of the stem is rigidly secured a plate 8, upon which a rough gem 7 is shown placed, and this gem is temporarily held fastened to the plate by a suitable cement.

From this brief description, it is seen that the jig may be pushed toward the wheel and the stem adjusted vertically in the support until the edge of the gem touches the periphery of the wheel, whereupon the gem support is manually rotated in the slots by twirling its cylindrical portion 4 between the thumb and index finger. In this manner, a circular contour is given the gem, the angle of which depends upon the height to which the gem support is adjusted. It is not, however, always desired to produce circular gems, but other shapes may be required. For the purpose of obtaining some particular perimetric outline, I mount on the gem support a pair of patterns, or templets 1, for contact with alined, fixed gages 18 of the jig frame. The contour of these templets is made in the shape of the finished gem and, when the support is rotated as aforesaid, bringing slight pressure to bear against the gages 18, such shape is quickly reproduced on the gem. The radial distance of the jig from the wheel center determines the size to which the gem may be ground.

The gem support is withdrawn from the frame when the grinding operation is finished and may then be replaced by other supports on which gems, to be cut to the same size and shape, have been previously cemented. The operation is continued in this maner until all identically shaped gems are finished. Or, instead of a whole new support, it may be preferred merely to exchange stems 9, except that, in such case, care must be taken to adjust each stem to the same height in the support. I wish it understood, also, that more than one set of vertically alined slots may be provided for simultaneous grinding of a plurality of gems. More than one support may be rotated at the same time by the fingers and palm of one hand, or mechanical devices may be introduced for this purpose.

The structure of the jig comprises, a pair of bifurcated standards 16, rigidly mounted on the jig base 17. In the grooves of these standards is seated a rectangular jig frame consisting of longitudinal members 12, in which the aforenamed alined slots 13 are sunk, and these members are combined by end plates 14. Vertical flanges, or ears 15 extend in continued alinement in opposite directions from the frame ends to rest in the grooves of the supports 16. Series of set screws 21, seated in these standards, serve to clamp the jig frame firmly in position, all as clearly shown in the drawing.

This type of mounting permits of sliding the jig frame longitudinally in the standards for the purpose of using up the full width of the face of the grinding wheel. It may be suggested here, that the jig might be moved bodily for such purpose. But it must be remembered that the grinding operation is very delicate and the jig relatively very heavy. Once it is set in alinement with the wheel, it remains in this position until gems of other sizes are to be shaped. For this reason, movement of the jig as a whole, would not be practical, but by slightly loosening the set screws on one side, the jig frame may conveniently be adjusted lengthwise.

By means of these screws it is also possible, within certain limits, to tilt the jig frame, as indi-

cated in Fig. 2, and this is necessary where the wheel is so close to the machine bed that it is not possible, with a vertically positioned gem support, to get far enough under the wheel to obtain the required angle.

In cases where great quantities of stones, of the same shape or size are to be ground, it may be preferred to clamp the jig rigidly on the table or bench on which the grinding head is bolted, but it is important that the jig should be complete and self contained, so that it may readily be moved to any required position or to any grinding wheel on the bench.

For convenience in assembling the gem support, the member 2 is shown made with a raised band, or collar 3, see also Fig. 3, against which the upper templet 1 is first seated. The cylindrical body portion 4 is then pushed on to the member, followed by the lower templet 1, and a threaded sleeve 5 is thereupon caused to engage the threaded end 6, of the member 2, to clamp all the parts firmly together. The member 2 and the stem 9 are shown squared in order to prevent relative rotation, but any other suitable shape may be substituted.

To the underside of the lower frame member 12 is shown attached a bracket 20, on which the lower end of the gem support may be rested in order to raise the templets free of the frame and thereby to prevent unnecessary wear on the adjacent templet and frame surfaces.

Delicacy of touch, and not great precision, is the prerequisite in gem shaping, and this I attain by the use of my very simple and inexpensive jig, constructed substantially as above described.

I claim:

1. A gem grinding fixture comprising, a base, a frame slidable thereon, a telescoping gem support insertable and manually rotatable in recesses of said frame, said support having a head for holding a gem to be ground, means for locking the telescoping support portions together, gages on said frame, and templets mountable on the support to engage said gages.

2. In combination with a grinding machine, an independent fixture having a flat base seatable on the table of said machine, a frame slidable on said base and made with perpendicularly alined recesses, and a gem carrying holder manually insertable and rotatable in said recesses to bring a gem carried by said holder into contact with said wheel.

3. In combination with a grinding wheel, an independent fixture having a base, a frame slidable on said base and made with perpendicularly alined recesses, a gem carrying holder manually insertable and rotatable in said recesses to bring a gem carried by said holder into contact with said wheel, gage stops on the frame, and templets mountable on said holder for engagement with the gage stops of the frame for controlling the perimetric shape to be ground.

4. A fixture placeable adjacent a grinding wheel and freely movable relative to said wheel, a frame longitudinally slidable on the base and made with perpendicularly alined recesses, an axially adjustable gem carrier manually insertable and rotatable in said recesses to bring a gem carried by the carrier into contact with said wheel, alined gage stops on the frame, and templets mountable on said carrier for engagement with said gage stops to control the perimetric shape to be ground.

5. A fixture comprising, a base, a frame longitudinally slidable on said base, and means for clamping the frame in adjusted position on the base, in combination with a gem carrier comprising a cylindrical body laterally insertable and rotatable in vertically alined recesses of said frame, a gem holder axially slidable in said body and terminating in a head for receiving a gem to be ground, means for locking said gem holder in adjusted position in said body, vertically alined gages on said frame, and templets mountable on said body for engagement with said gages to determine the perimetric shape to be ground.

6. For use on a grinding machine, a gem holding jig comprising, a frame seatable on the table of such machine and having vertically alined slots, a post vertically seatable and manually rotatable in the vertically alined slots of said frame, said post terminating at the top in a head on which a stone may be held seated by means of a binder, gages on said frame, and templets on the post for engagement with said gages to determine the contour of the stone to be ground.

7. The combination with a grinding machine, of a jig seatable on the machine table comprising, a slotted frame, a telescoping post vertically seatable and manually rotatable in the slots of the jig frame, said post being fitted on top to receive a gem to be ground, means for locking the telescoping members of said post when vertically adjusted, templets on the post, and gages engageable by said templets to determine the contour of the gem.

8. The combination with a grinding wheel, of a jig made with vertically alined slots in the side, a post manually seatable and rotatable in said slots, and interchangeable gem supports axially seatable in said post, means for locking each support in position in the post, each support being shaped on top to receive a gem to be ground, and means mountable on the post for engagement with the frame for determining the shape to be ground as the post is manually rotated in the slots.

9. A gem grinding fixture comprising, a flat base, bifurcated standards on said base, a frame freely seatable in the bifurcations of said standards and made with alined recesses, means for clamping the frame in adjusted position within said bifurcations, and gem supporting means manually insertable and rotatable in the frame recesses.

10. A gem grinding fixture comprising, a flat base, bifurcated standards on said base, a rectangular boxshaped recessed frame made with end plates seatable in said bifurcations for lengthwise and crosswise adjustment, clamping members in said standards for locking the frame in adjusted position, and gem supporting means seatable in the recesses of said frame.

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