Dec. 22, 1925. **1,566,824**

R. L. CARTER

SHAPER

Filed Sept. 3, 1925 2 Sheets-Sheet 1

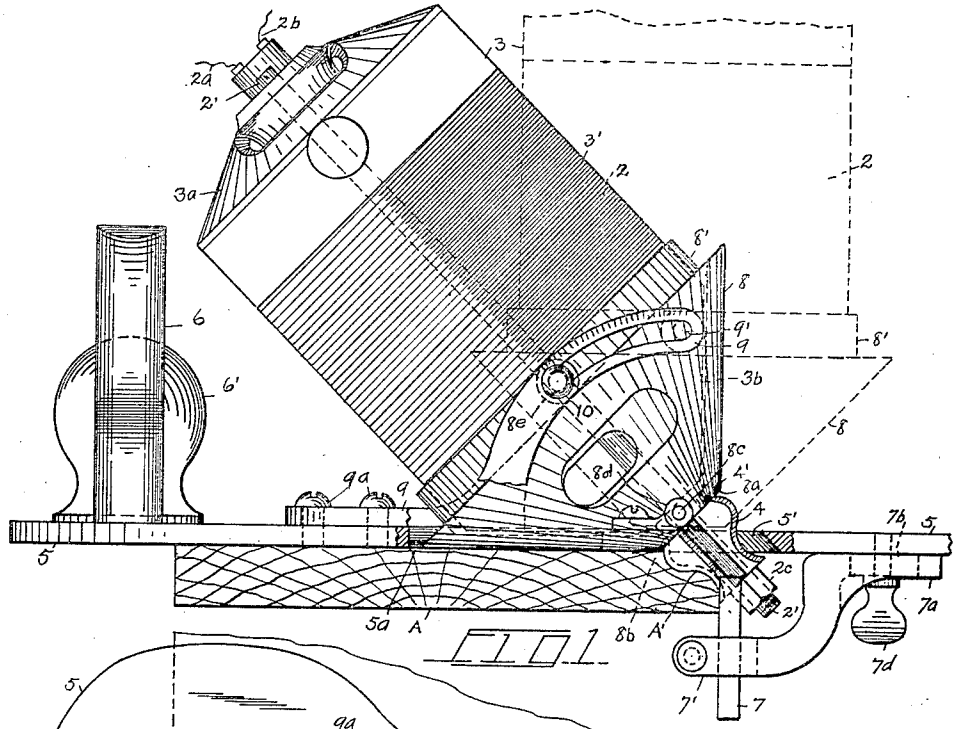


FIG 1

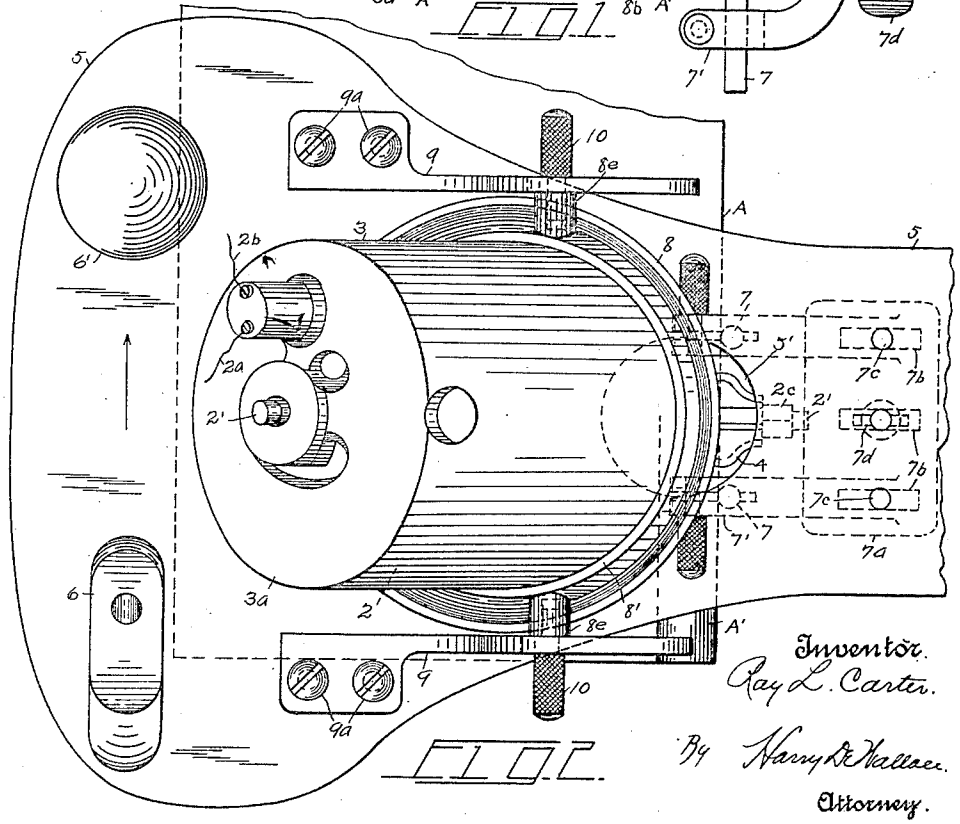


FIG 2

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FIG. 3

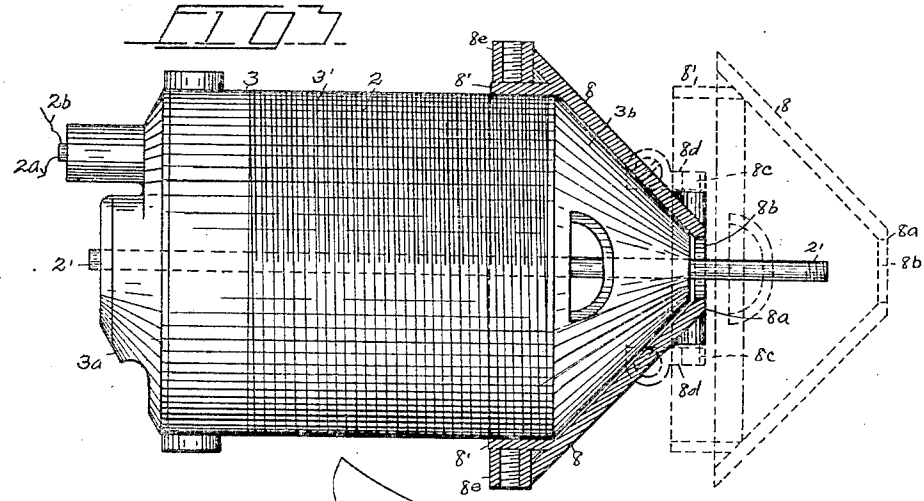


FIG. 4

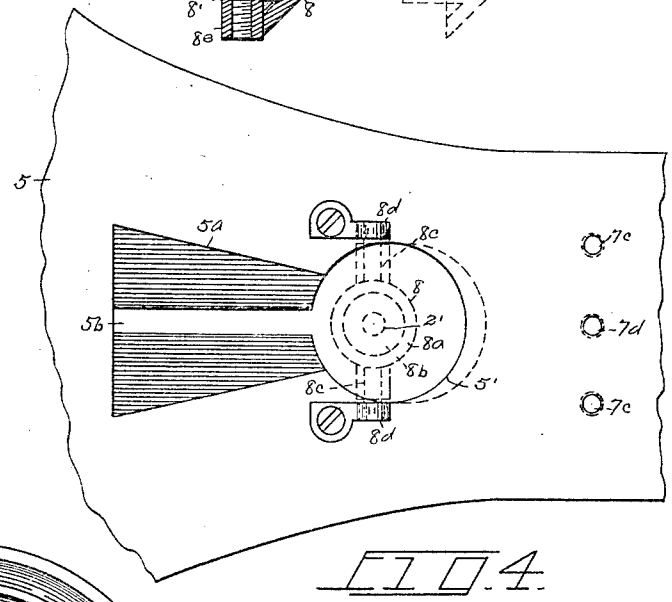
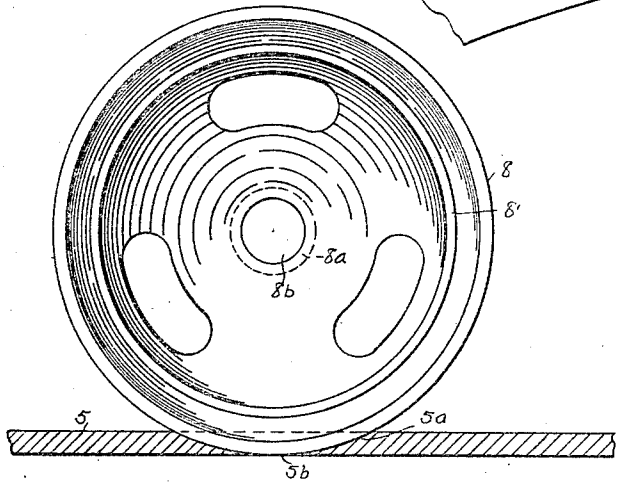


FIG. 5



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UNITED STATES PATENT OFFICE.

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SHAPER.

Application filed September 3, 1925. Serial No. 54,371.

To all whom it may concern:

Be it known that I, RAY L. CARTER, a citizen of the United States, residing at Phoenix, in the county of Oswego and State of New York, have invented certain new and useful Improvements in Shapers, of which the following is a specification.

This invention relates to improvements in shapers, designed for use by wood-workers of various classes, and has for its object to provide a light, easily portable device of the class, adapted for rounding corners, cutting beads, as well as various moulding designs, by the use of suitable interchangeable tools; the said tools being driven by a high-speed electric motor, which is adjustably mounted upon a novel support; the said support being arranged to be guided manually, and being provided with adjustable stops or guards, by which the machine may be maneuvered over the work, for accurately tracing intricate patterns, and the like. A further object is to provide a plane base, which is equipped with novel and simple means for readily and quickly mounting the operating parts, and whereby the shaping mechanism may be set and held at different angles relatively to said base, and also to a surface or margin of the work. And a further object is to provide a detachable cap or head which is pivotally supported by the base and directly and adjustably supports the shaper, the said shaper being detachable from the head and adapted to be employed for performing shaping work not readily accessible when the base and head are attached to the motor casing.

This invention relates particularly to improvements in the shaper shown and described in my U. S. Patent No. 1,433,497, dated September 26, 1922.

The various features and parts of the invention will be understood from the detailed description which follows, and by reference to the accompanying drawings, in which—

Figure 1 is a broken side elevation of the complete device; showing the tool in the act of cutting a moulding pattern. Fig. 2 is a top-plan view of the same. Fig. 3 is an elevational view of the encased motor, and a sectional view of the head. Fig. 4 is a broken plan view of the base; showing the socket that receives the conical head, and the opening through which the tool operates. And Fig. 5 is a rear-end elevation of the head; showing its relation to the base.

In the drawings, 2 represents an electric motor, having an armature shaft 2′. The motor may be supplied with current in the usual manner, as by wires 2^a—2^b.

The motor is preferably completely enclosed by a cylindrical casing 3, which is externally threaded at 3′, for adjustably mounting the motor, in any suitable holder or support. The ends of the casing 3 are respectively closed, by conical caps 3^a and 3^b, both of which are provided with openings, for the entrance and exhaust of the air, by which the motor is cooled. The armature shaft 2′ preferably extends beyond the apex of the cap 3^b, its free end being threaded for receiving a nut 2^c, by which a tool, as 4, may be rigidly but detachably secured to the shaft. The device thus far described, comprises a complete shaper, which may be supported and guided by the hand of the operator, like the shaper referred to in my former patent.

In order to extend the use of my shaper, to classes of shaping work embracing intricate and precise patterns of mouldings, and the like, that require more reliable and positive means for supporting and guiding the machine during the performance of its work, I have found it desirable to provide a novel, convenient and light support, which preferably comprises a plane base, as 5, upon which the motor and related operating parts may be pivoted, so as to enable work to be done at different angles; the said base being fitted with handles, as 6—6′, by which the operator may propel and guide the shaper over the work, as A. The base 5 preferably tapers from its rear towards its forward end, the latter being made narrow in order to expose more or less of the work to be acted upon by the tool 4, and this reduced portion of the base is provided with a relatively large circular opening 5′, through which the tool 4 projects. The tool shown in Fig. 1 is arranged to cut close to the bottom plane of the base, as for example, when executing the design of the common "thumb" moulding, A′. When the shaper is mounted on the base 5, a spacing collar 4′ is usually placed on the shaft 2′, between the cap 3^b and the base of the tool. According to the showing in Fig. 1, the machine is guided by similar gage members 7, preferably disposed beneath the base, and which are adjustable in split arms 7′ of a bracket 7^a, the latter being slotted, as

at 7^b, to receive guide-pins 7^c and also a thumb-screw 7^d, which may be threaded into the base (see Figs. 2 and 4), for holding the gage in the adjusted positions. The cap 3^b is formed with a 45° taper whose external surface normally rests upon a surface of the work and is employed as a guide, when the shaper is operated by hand, without the base 5, or other support. It is desirable, in the preferred embodiment of the device, that the guide surface of the cap 3^b be free from projections or obstructions that might interfere with the handling of the shaper and the performance of its work. To this end, in order to suitably mount the shaper upon the base 5, I provide an enlarged detachable conical cap or head 8, into which the cone 3^b and the adjacent portion of the casing 3 may be inserted, as shown in Figs. 1, 2 and 4. For this purpose, the expanded end of the head 8 is formed with an integral cylindrical internally threaded portion 8′, by means of which the motor casing 3 may be screwed into and adjusted axially relatively to the head. The reduced end of the head is flattened, as at 8^a, and is provided with a concentric opening 8^b, through which the tool 4 and the shaft 2′ project sufficiently to enable the tool to be operatively positioned, as shown in Figs. 1 and 3. Adjacent the opening 8^b, the head 8 is provided with oppositely facing trunnions 8^c, which are journaled in bearings 8^d, the latter being mounted rigidly upon the top face of the base 5, as best seen in Figs. 1 and 4. These trunnions constitute the axis around which the shaper and head rotate when said parts are swung towards or away from the base. At the corresponding sides of the annular flange 8′, is formed bosses 8^e, having threaded sockets which cooperate with slotted brackets 9 and set-screws 10, for adjustably mounting the shaper and head upon the base 5. The threaded portion of the set-screws 10 pass loosely through corresponding arc-shaped slots 9′ of the brackets 9, and thence enter the sockets of the bosses 8^e. The slots 9′ are aranged to allow the shaper to be swung, as from the incline position shown by the full lines, to the vertical position shown by the dotted lines in Fig. 1, for enabling the tool 4 to perform various kinds of work at different angles. In order to incline the shaper 45° and at the same time provide a suitable seat for the head 8, for preventing rocking or vibrating of the shaper due to the high-speed of the motor, the base 5 is formed, in the line of its longitudinal axis, with a tapering trough or seat 5^a, which is arranged to provide a longitudinal slot 5^b, by means of which the incline surface of the head 8 is disposed in the same plane as the bottom of the base, in contact with the work A, and serves as the true guide for the mounted shaper, the same as the cone 3^b, when the shaper is dismounted, as explained. The brackets 9 extend rearwardly at the opposite sides of the shaper, and are secured to the base by screws 9^a. When operating the mechanically supported shaper, shown in Figs. 1 and 2, the combined device is preferably propelled by the operator in the direction of the arrow in Fig. 2.

By the provision of the head 8, the simple shaper of my former patent, may be readily and quickly adapted for effecting shaping and routing work, within a relatively wide range, according to the construction of the slots 9′, which obviously may be lengthened for broadening said range beyond the present showing, and the shaper proper may be applied and removed from the head in a moment's time, without disturbing the connections between the head and the base 5.

Having thus described my invention, what I claim, is—

1. The combination with a hand-propelled shaper including an encased motor and a tool rotated thereby, of a detachable hollow conical head adapted to be adjustably mounted upon the motor casing and having its expanded end formed cylindrical to receive the motor casing, said head having an axial opening in its reduced end through which the tool projects, and trunnions extending laterally from the reduced end of the head adapted for pivotally mounting the head upon a base or other support.

2. The combination with a portable shaper, including an encased motor and a tool driven thereby, of a hollow conical cap adapted to fit the end of the motor casing adjacent the tool, a base for supporting said shaper, means for pivoting said cap to the base, brackets mounted on the base at the opposite sides of the shaper having correspondingly slotted arms, and means engaging the slots of said arms and the opposite sides of said cap for holding the shaper in various adjusted positions.

3. The combination with a portable shaper including an encased motor and a tool driven thereby, of a conical hollow cap adapted to fit the end of the motor casing adjacent the tool, a base for supporting said shaper, means for pivoting the reduced end of the cap to said base, brackets mounted on the base at the opposite sides of the shaper having correspondingly slotted arms, means engaging the slots of said arms and the expanded end of said cap for holding the shaper in various adjusted positions, and means adjustably mounted on the bottom of the base for guiding the shaper.

4. In a portable shaper, a plane base for supporting the shaper having an opening through which the shaping tool projects, bearings mounted at the opposite sides of

said opening, a hollow conical head arranged to adjustably support a shaper, having oppositely facing threaded sockets, the reduced end of said head registering with the opening in the base and having trunnions that journal in said bearings, brackets having arc-shaped slots mounted on the base, the slots of said brackets registering with the sockets of the head, and set-screws passing through said slots and engaging said threaded sockets for locking the head in different angular positions relatively to the base.

5. The combination with a shaper including an encased motor and a tool driven thereby, and a plane base for supporting said parts, of a detachable conical cap adapted to be adjustably mounted upon one end of the motor casing having an axial opening through which the tool projects, said cap being formed with a flange adapted to receive the casing, and having laterally projecting trunnions adapted for pivotally connecting the cap to said base, and means engaging said flange for locking the shaper in different positions relatively of the plane of the base.

6. In a hand-propelled shaping device, the combination with a shaper including an encased motor and a tool driven thereby, of a detachable hollow conical head adapted to be adjustably mounted upon one end of the motor casing, a base for supporting said shaper having an opening through which the tool extends and having a socket to receive said head, means connecting the head and the base pivotally, spaced parallel brackets having slotted arms supported by said base between which the shaper and head are loosely disposed, and means engaging the slots of said arms and the opposite sides of said head for moving and for holding the shaper in different positions relatively to the base.

7. In a hand-propelled shaping device, the combination with a shaper comprising an encased motor and a tool driven thereby, one end of the motor casing comprising a cone adapted for guiding the tool when the latter is cutting certain articles, of a base having a plane bottom and an opening through which the tool projects and beyond which the shaping work is effected, brackets mounted upon said base having correspondingly slotted arms, and means passing through said slots and engaging the opposite sides of said cone adapted to enable the shaper to be rotated around an axis that coincides with the reduced end of said cone.

8. In a hand-propelled shaping device, the combination with a shaper including an encased motor and a tool driven thereby, of a hollow detachable conical head adapted to adjustably support the shaper, said head having trunnions near its reduced end, a base adapted to be moved over a surface of the work for supporting said head, bearings carried by the base adapted to pivotally receive said trunnions and around whose axis the head may be rotated for effecting shaping work at different angles relatively to the plane of the base, locking means for holding the head in the adjusted positions, and adjustable stops mounted ahead of the tool adapted to guide the device during the shaping operations.

In testimony whereof I affix my signature.

RAY L. CARTER.