April 13, 1937. J. STEVENSON 2,077,281

ROTARY PLANE

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Fig. 1.

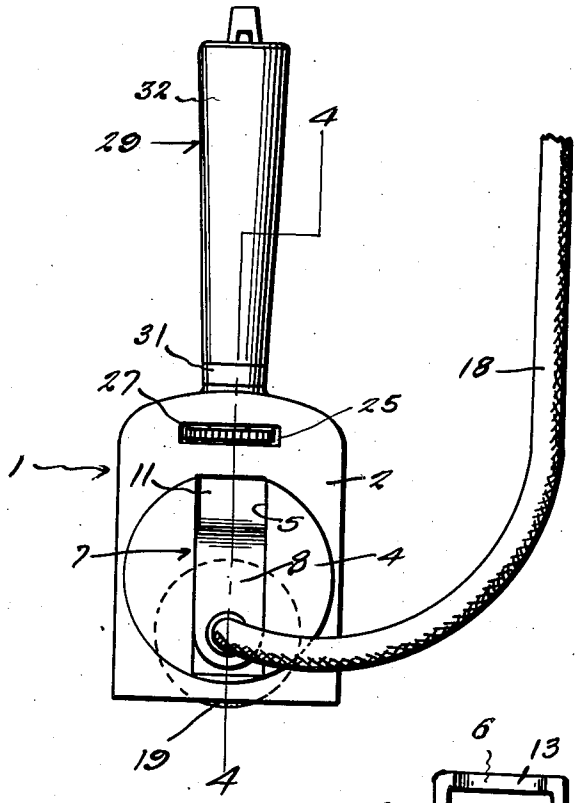


Fig. 2.

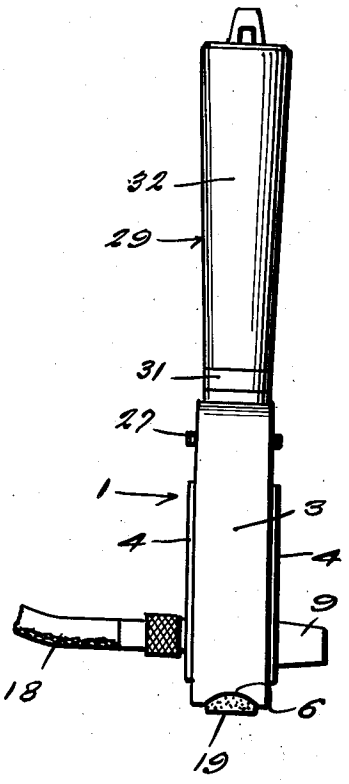
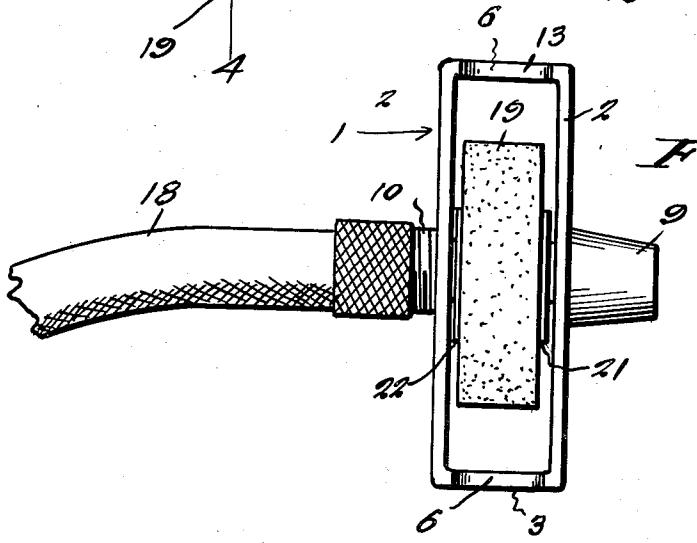


Fig. 3.



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Fig. 4.

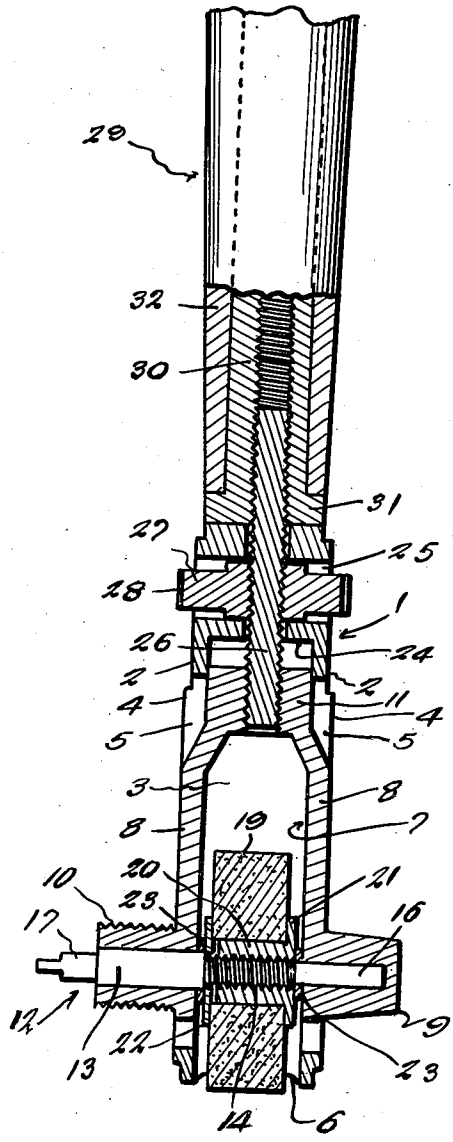


Fig. 5

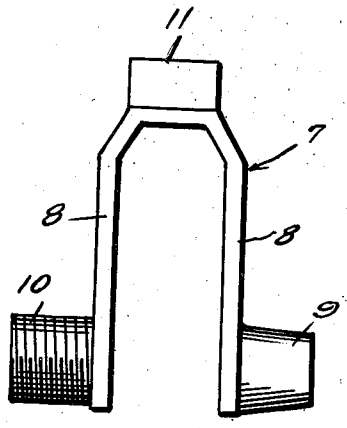
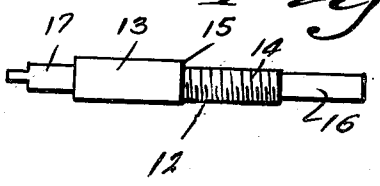


Fig. 6.



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UNITED STATES PATENT OFFICE

2,077,281

ROTARY PLANE

John Stevenson, Withee, Wis.

Application April 11, 1936, Serial No. 73,941

3 Claims. (Cl. 51—170)

The present invention relates to new and useful improvements in rotary planes for use particularly on automobile fenders and bodies although it will be understood, of course, that the device may be used for any purpose for which it may be found adapted and desirable.

An important object of the invention is to provide, in a manner as hereinafter set forth, a tool of the aforementioned character embodying a power driven grinding or abrading wheel rotatably mounted in a housing, together with novel means for adjusting said wheel as desired and securing said wheel in adjusted position.

Another important object of the invention is to provide a rotary plane of the character described embodying a novel mounting for the wheel.

Still another important object of the invention is to provide a rotary plane of the character described which is light in weight and which is adapted to be conveniently moved from place to place for operation.

Other objects of the invention are to provide a rotary plane of the character set forth which will be comparatively simple in construction, strong, durable, highly efficient and reliable in use, compact and which may be manufactured at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views, and wherein:—

Figure 1 is a view in side elevation of the invention.

Figure 2 is a view in front elevation of the device.

Figure 3 is a bottom plan view.

Figure 4 is a view principally in vertical section, taken substantially on the line 4—4 of Figure 1.

Figure 5 is a detail view in front elevation of the adjustable yoke in which the wheel is journaled.

Figure 6 is a detail view in elevation of the wheel shaft.

Referring now to the drawings in detail, it will be seen that the embodiment of the invention which has been illustrated comprises a housing which is designated generally by the reference numeral 1, said housing being of any suitable metal. The housing 1 is closed at its top and open at its bottom, said housing including side walls 2 and end walls 3. The side walls 2 of the housing 1 comprise thickened circular portions 4 having vertical slots 5 therein. The lower ends of the end walls 3 have formed therein arcuate recesses 6.

Mounted for sliding adjustment in the housing 1 is a yoke which is designated generally by the reference numeral 7, the legs 8 of said yoke traveling in the slots 5. On the free ends of the legs 8 of the yoke 7 are bearings 9 and 10, the latter being externally threaded. The yoke 7 further includes a thickened bight portion 11 having a threaded opening therein.

Journaled in the yoke 7 is a shaft which is designated generally by the reference numeral 12. As illustrated to advantage in Figures 4 and 6 of the drawings, the shaft 12 comprises a comparatively large portion 13 which is journaled in the bearing 10 and from which a reduced threaded portion 14 extends in a manner to provide a shoulder 15. Projecting from the threaded portion 14 of the shaft 12 is a further reduced end portion 16 which is journaled in the bearing 9. Projecting from the outer end of the portion 13 of the shaft 12 is an extension 17 for connection with a flexible drive shaft from a suitable source of power which is enclosed in a flexible housing 18. It will be observed that the bearing 9 is closed at its outer end while the bearing 10 is open at its outer end. The flexible housing 18 is threadedly connected to the bearing 10.

Mounted on the shaft 12 for rotation therewith in the housing 1 is a grinding wheel 19 of suitable material. The grinding wheel 19 includes a hub 20 which is threaded on the portion 14 of the shaft 12 and on one end of which is a flange 21. The flange 21, it will be observed, is engaged with one side of the wheel 19. A collar 22 is engaged with the other side of the wheel 19, said collar abutting the shoulder 15. The construction and arrangement is such that when the hub 20 is screwed on the portion 14 of the shaft 12 the wheel 19 is clamped between the flange 21 and the collar 22. Washers 23 are provided on the shaft 12 between the legs 8 of the yoke 7 and the hub 20 and the collar 22.

The thickened bight portion 11 of the yoke 7 is of circular form and is slidably engaged in a socket 24 which is provided therefor in the upper portion of the housing 1. Extending horizontally through the upper portion of the housing 1 is an opening 25. Threadedly engaged in the portion 11 of the yoke 7 is a screw shaft 26 which extends slidably through the upper portion of the housing 1 and rises thereabove, said screw shaft traversing the opening 25. Threadedly mounted on the screw shaft 26 and rotatable in the opening 25 is a circular adjusting nut 27 the milled periphery 28 of which projects

beyond the side walls 2 of said housing 1 for manual rotation. It will be noted that the adjusting nut 27 is confined between the upper and lower walls of the opening 25. Mounted on the upwardly projecting portion of the screw shaft 26 is a handle which is designated generally by the reference numeral 29. The handle 29 includes a metal core 30 which is threaded on the screw shaft 26 and which includes a flange 31 on its lower end engageable with the top of the housing 1. Mounted on the core 30 is a sleeve 32.

It is thought that the operation of the device will be readily apparent from a consideration of the foregoing. With the wheel 19 in motion, the tool is moved over the work, the housing 1 functioning as a gage for said wheel. To adjust the wheel 19 in the housing 1, the handle 29 is backed away from said housing 1 on the screw shaft 26 after which the nut 27 is rotated to raise or lower said screw shaft with the yoke 7. When this is done the legs 8 of the yoke 7 slide in the slots 5 of the housing 1. Then, the handle 29 is screwed tightly against the top of the housing 1 for locking the screw shaft 26 in adjusted position. If desired, the shaft 12 may be engaged in the chuck of a conventional electric drill for driving the wheel 19 directly from said drill.

It is believed that the many advantages of a rotary plane constructed in accordance with the present invention will be readily understood, and although a preferred embodiment of the device is as illustrated and described, it is to be understood that changes in the details of construction and in the combination and arrangement of parts may be resorted to which will fall within the scope of the invention as claimed.

What is claimed is:—

1. A rotary plane comprising a housing open at its bottom and closed at its top, said housing including opposed side walls having slots therein, a yoke slidably mounted in the housing and engaged in the slots, a grinding wheel journaled in said yoke, a screw shaft connected to said yoke, a nut rotatably mounted in the housing and threadedly connected with the screw shaft for adjusting the grinding wheel, a socket in the housing, an extension on the yoke slidable in the socket to secure the yoke against lateral movement in the housing, and a handle threadedly mounted on said screw shaft and engageable with the housing for releasably locking said screw shaft in adjusted position.

2. A rotary plane comprising a housing open at its bottom and closed at its top, said housing including opposed side walls having vertical slots therein, said housing further having a vertical socket in its upper portion above the slots, said housing still further having a transverse opening therein above the socket, a yoke mounted for sliding adjustment in the housing, said yoke including legs slidably engaged in the slots and further including an annular, thickened bight portion slidably engaged in the socket, bearings on the free end portions of the legs, a shaft journaled in said bearings, a grinding wheel fixed on said shaft, a screw shaft secured in the thickened bight portion of the yoke and extending slidably through the upper portion of the housing and rising therefrom, said screw shaft traversing the opening, a manually operable nut threadedly mounted on the screw shaft and rotatable in the opening, said nut constituting means for adjusting the grinding wheel in the housing, and a handle threadedly mounted on the upper portion of the screw shaft and engageable with the housing for releasably locking the grinding wheel in adjusted position.

3. A rotary plane of the class described comprising a housing, a yoke mounted for sliding adjustment in said housing, means for adjusting said yoke, aligned bearings on said yoke, a shaft rotatably mounted in the yoke, said shaft including a comparatively large portion journaled in one of the bearings and a reduced threaded portion, said reduced threaded portion providing a shoulder on the shaft, said shaft further including a reduced end portion extending from the threaded portion and journaled in the other of said bearings, a collar mounted on the shaft in abutting engagement with the shoulder, and a grinding wheel mounted on said shaft for rotation therewith, said grinding wheel including a hub threadedly mounted on the threaded portion of the shaft, and a flange on one end of said hub engaged with one side of the grinding wheel, the other side of said grinding wheel being engaged with the collar.

JOHN STEVENSON.