March 31, 1942. I. C. KARP ET AL 2,278,109

COIL SUPPORTING ARBOR

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FIG. 2.

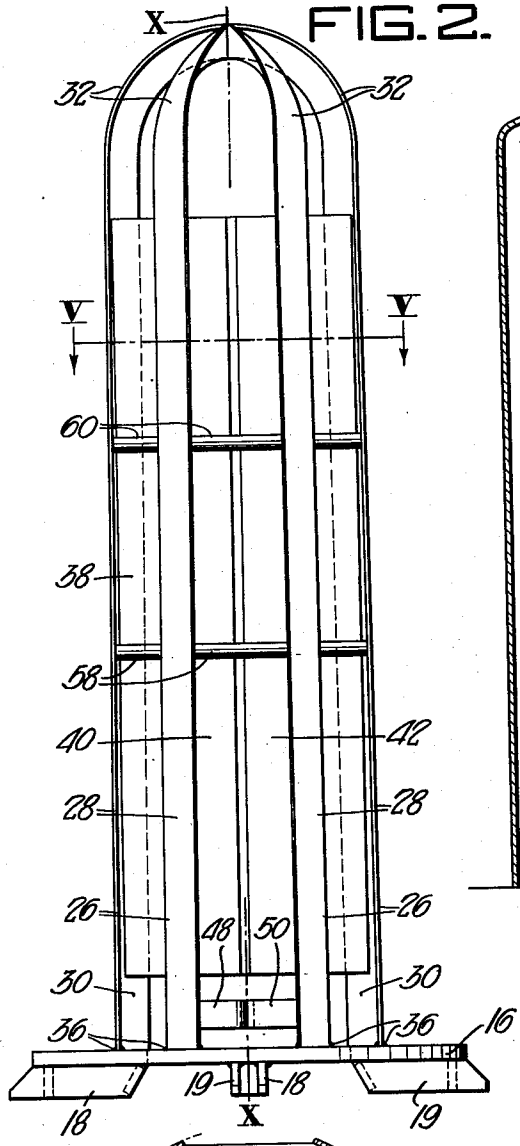


FIG. 1.

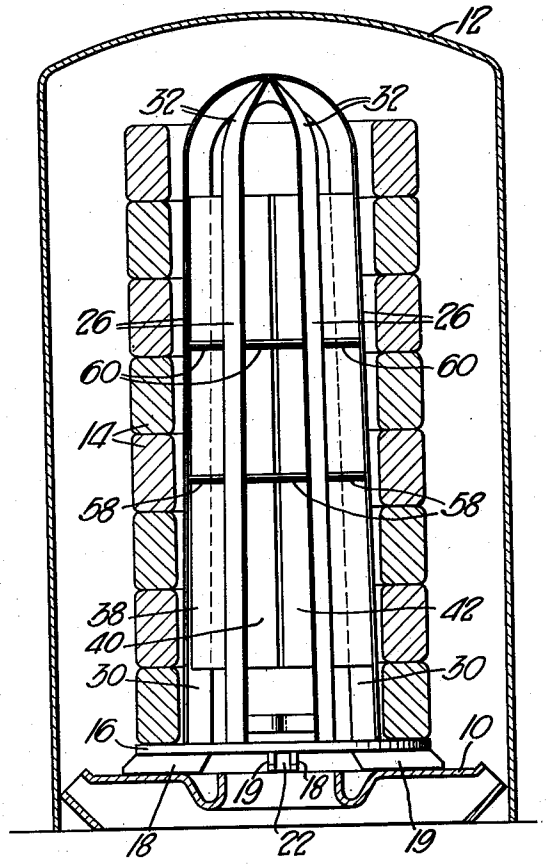
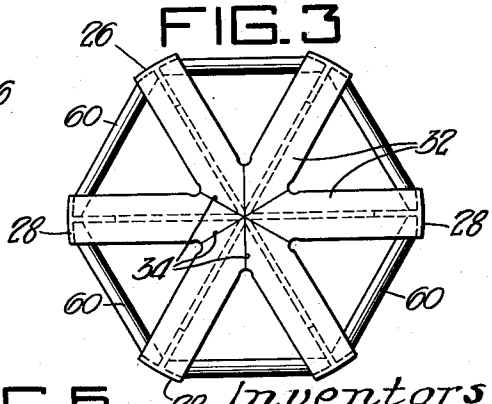


FIG. 3



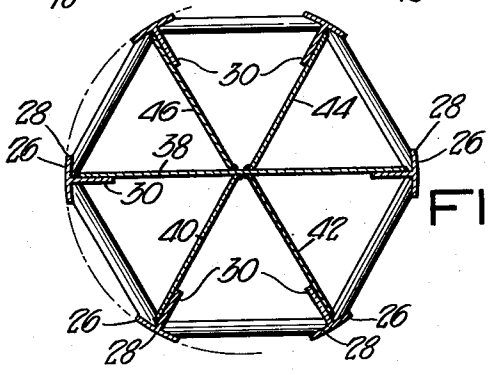


FIG. 5.

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FIG. 6.

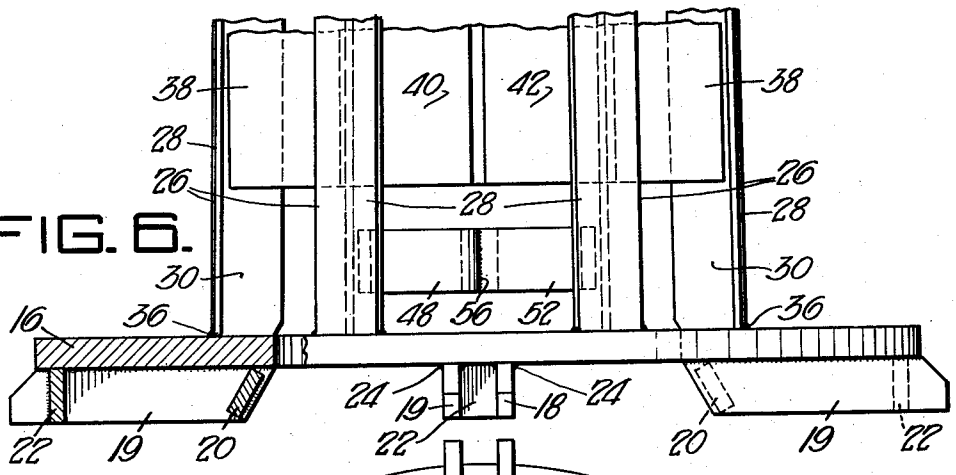
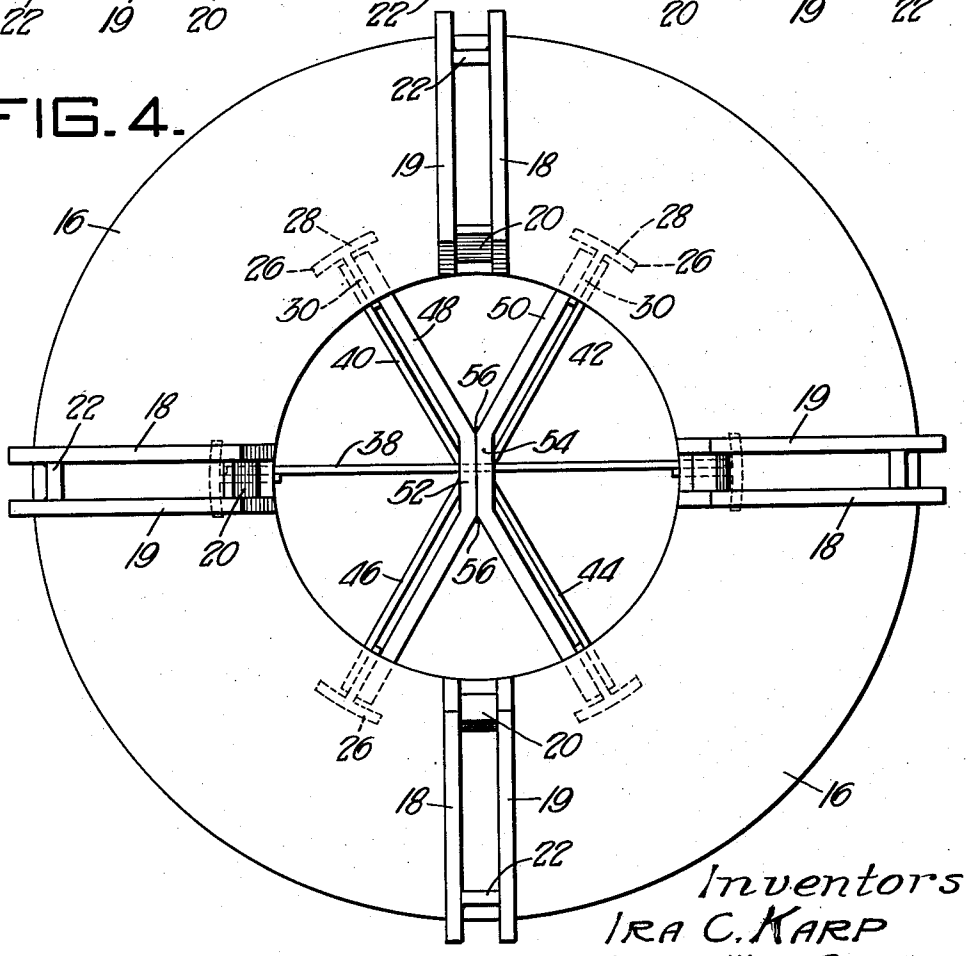


FIG. 4.



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FIG. 7.

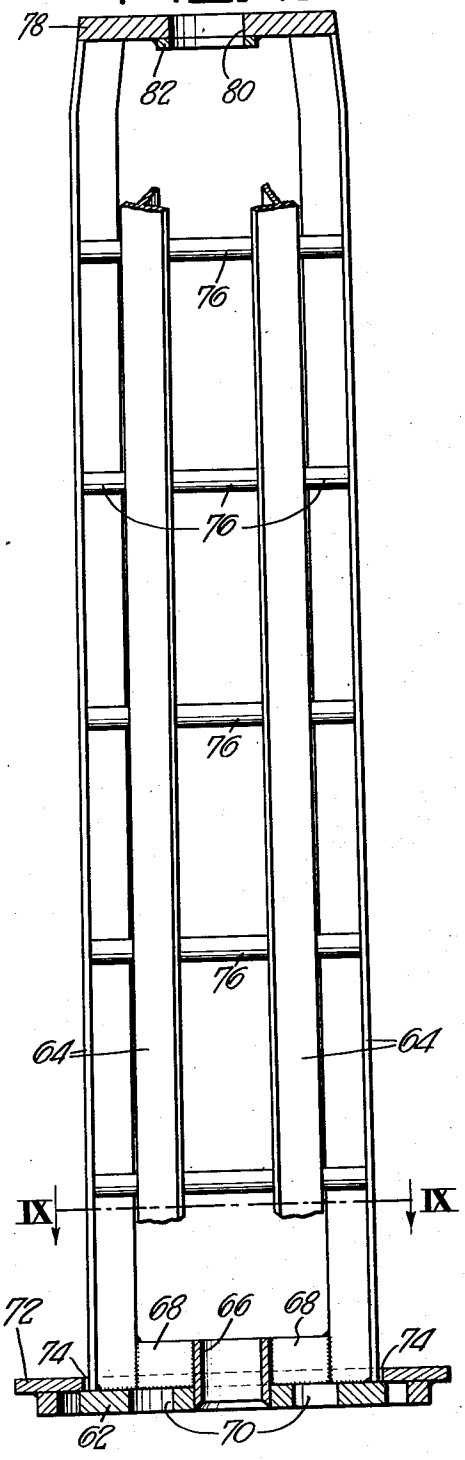


FIG. 8.

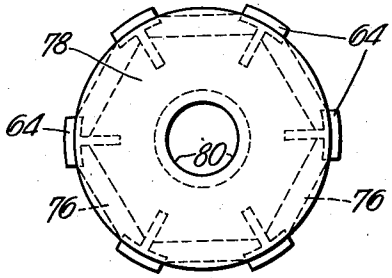


FIG. 9.

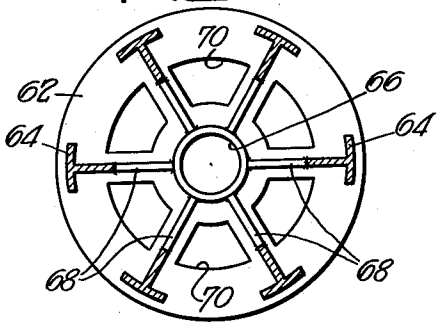
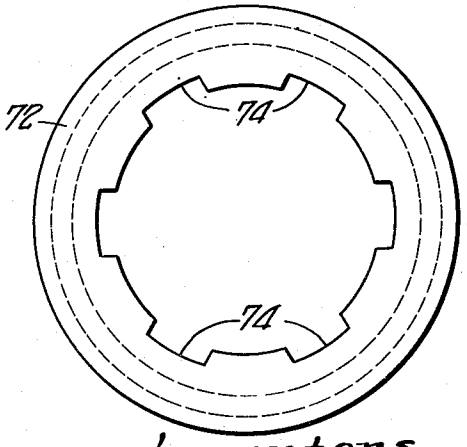


FIG. 10.



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Patented Mar. 31, 1942 2,278,109

UNITED STATES PATENT OFFICE

2,278,109

COIL SUPPORTING ARBOR

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Application July 10, 1941, Serial No. 401,874

6 Claims. (Cl. 263—47)

The present invention relates to detailed features of improvement in arbors for supporting wire bundles or coils to facilitate placing them in annealing apparatus and for handling them after annealing.

The invention will be fully apparent from the following detailed disclosure when read in connection with the accompanying drawings and will be defined with particularity in accordance with the requirements of the patent statutes in the appended claims.

In the drawings:

Figure 1 is a view showing the arbor of the present invention supporting a plurality of superposed coils in an annealing apparatus;

Figure 2 is an enlarged view of a supporting arbor constituting one embodiment of the present invention;

Figure 3 is a plan view of the upper end of the apparatus of Figure 2;

Figure 4 is an inverted plan of Figure 2;

Figure 5 is a detail section on line V—V of Figure 2;

Figure 6 is an enlarged detail of the base portion of the arbor with parts broken away and shown in section in the interest of clearness;

Figure 7 is a view partly in side elevation and partly in section of an alternative embodiment of the invention;

Figure 8 is a top plan view thereof;

Figure 9 is a horizontal section on line IX—IX of Figure 7; and

Figure 10 is a plan view of a supporting plate detachably associated with the arbor of Figure 7.

Referring first to the embodiment of the invention shown in Figures 1 to 6, inclusive, the numeral 10 represents a base casting of conventional type such as used in annealing furnaces for the treatment of coils of wire. The numeral 12 represents a hood or cover adapted to enclose a plurality of superposed coils of wire, such as indicated at 14, which are to be annealed.

The present invention relates to details of construction or design and arrangement of an arbor for positioning the superposed coils of wire. The improved arbor of Figures 2 to 6, inclusive, includes a circular base plate 16 to the underside of which there is welded or otherwise secured a plurality of sets of bars 18—19 which are arranged in pairs and which are spaced apart by inclined inner spacer members 20 and outer spacer members 22. The bars 18—19 are united to the underside of the base plate 16 by fillets of weld metal, such as indicated at 24. Thus the several pairs of bars 18—19 form spider-like feet for the arbor base plate.

Rising from the upper face of the base plate there are a plurality of bars which are preferably of T-shape in cross section. These bars are indicated at 26 and each includes outer flanges 28 which are bent to conform substantially approximately to the radius of a circle which would enclose all the uprights. The uprights being of T-shape in cross section are provided with inwardly extending webs 30.

The upper extremities of the flanges 28 of the T are arched inwardly, as indicated at 32, and the flanges at their inner extremities are pointed so that the adjacent edges of juxtaposed uprights meet on the radial lines, such as indicated at 34 in Figure 3. Similarly, the webs 30 are arched inwardly and the inner extremities of the webs are beveled so as to meet in a line corresponding to the central longitudinal axis XX of the arbor. The meeting portions of the webs and flanges 28 and 30 of the uprights are welded together at their upper contacting portions so as to thus form a rigidified skeleton-like structure. At their lower extremities the uprights are welded, as indicated at 36, to the base plate 16.

As shown in Figure 5, a transversely extending plate 38 bridges the space between two oppositely disposed T-shaped uprights. Other plates 40, 42, 44 and 46 are welded to the webs of the other T-shaped uprights and the inner ends of these plates are brought into abutment with the plate 38 and welded thereto, as shown in Figure 5. The plates 38 and the several plates 40, 42, 44 and 46 serve the double function of rigidifying the arbor structure and dividing the space surrounded by the coils 14 into a plurality of separate flue-like compartments.

Located above the base and below the lower extremity of the partition plates 38, 40, 42, 44 and 46 stiffener bars 48, 50 are provided. These bars have abutting central portions, as indicated at 52, 54 and they are welded to one another, as indicated at 56. The outer extremities of these bars are welded to the webs of the uprights, as shown. This construction serves to rigidify the base portion. At spaced intervals we also provide a series of outer reenforcing bars, such as indicated at 58 and 60, these bars serving to connect the outer flanges of the adjacent T-shaped members, as shown. A united skeleton structure is thus provided which may be made of comparatively light-weight and which yet will be possessed of sufficient strength to withstand the rigors of

rough usage to which apparatus of this type is subjected in practice.

In the normal operation of wire supporting arbors of the character described, a multiplicity of superposed coils, such as shown in Figure 1, are positioned in the annealing furnace and after annealing treatment the arbor with its load is lifted out by engaging a hook from an overhead crane with the upper extremity of the arched portion of the upright bars.

In the modification of the invention illustrated in Figures 7 to 10, inclusive, the base plate 62 has welded thereto a plurality of uprights 64 of T-shape in cross section. Located centrally of the base there is a short pipe-like section 66 and a plurality of radial bars 68 are welded at their inner ends to the pipe and at their outer ends to the webs of the upright members, thus rigidifying the structure at the base. Suitable openings 70 are formed in the base to permit the circulation of gas or heated air therethrough. A detachable coil supporting plate 72 is provided with a plurality of notches 74 which fit over the outer flanges of the upright members, this member providing an enlarged supporting surface for the bottommost coil positioned by the arbor. At a plurality of points spaced at different elevations, such as indicated at 76, there are provided reenforcing bars which span the spaces between the adjacent webs of the uprights. These reenforcing bars therefore jointly form a substantially polygonal outline.

In the embodiment of the invention illustrated, since there are six T-shaped uprights shown, the bars 76 jointly conform approximately to a hexagon. Similarly, an octagonal figure would be defined in a case where eight uprights were employed.

In the embodiment of the invention shown in Figures 7 to 10, inclusive, instead of arching over the upper extremities of the uprights and welding them directly to one another, we provide a top plate 78 to which the upper extremities of the uprights are butt welded. This top plate is formed with a central opening 80 which at the center is reenforced by a ring 82 welded thereto as shown.

A feature common to both embodiments of the invention illustrated is that the arbor comprises a base plate with a plurality of T-shaped uprights welded thereto, these uprights being braced together intermediate their ends. Such an arrangement provides a light-weight coil positioning structure of great strength which will adequately resist the stresses to which apparatus of this character is subjected.

In both embodiments of the invention described, all component parts of the arbor are made up of stock steel parts, such as rolled steel plate used in the base and rolled steel flange members, such as the T's used for the uprights and rolled steel bars used for the various reenforcements. Thus the skeleton construction can be produced economically and the parts fabricated by comparatively inexpensive welding operations.

While we have described quite precisely two alternative embodiments of the invention, it is contemplated that various modifications and substitutions of equivalents may be made by those skilled in the art without departure from the invention as defined in the appended claims.

We claim:

1. An arbor of the character described comprising a plate metal base, a plurality of flanged metal uprights rising therefrom, bracing members at different elevations joining said uprights, and means connecting the uprights together at their upper extremities.

2. An arbor of the character described comprising a flat plate metal base, a plurality of circularly arranged flanged members rising therefrom, the lower ends of said members being welded to the base, a plurality of intermediate reenforcements at spaced elevations joining the flanges of the uprights to one another, and welded joints uniting the upper extremities of said uprights.

3. An arbor of the character described comprising a flat steel base, a plurality of rolled steel structural T-bars whose lower extremities are welded thereto, the upper extremities of said T-bars connected to one another being arched radially inward and being all united to one another by welded joints substantially as described.

4. An arbor of the character described comprising a flat steel base, a plurality of rolled steel structural T-bars whose lower extremities are welded thereto, the upper extremities of said T-bars being arched radially inward and being all united to one another by welded joints substantially as described.

5. A coil supporting arbor of the character described comprising a flat metal base, radially disposed metal bars arranged in pairs welded to the underside thereof, T-shaped metallic uprights rising from the base and welded thereto, a plurality of outer reenforcements at spaced elevations joining the flanges of adjacent uprights, a plurality of upright radial division plates secured to the webs of the T-shaped members serving to rigidify the structure and define portions of a plurality of flue-like compartments.

6. A coil supporting arbor of the character described consisting of a flat steel base, radially disposed bars arranged in pairs welded to the underside thereof, T-shaped metallic uprights rising from the base and welded thereto at their lower extremities, a plurality of outer reenforcements at spaced elevations joining the flanges of adjacent uprights, a plurality of radial division members secured to the webs of the T-shaped members serving to rigidify the structure and define portions of a plurality of flue-like compartments, the upper extremities of said T-shaped uprights being arched and converging inwardly and united to one another in the region of the central axis of the arbor.

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DISCLAIMER

2,278,109.—*Ira C. Karp*, Cleveland, Ohio, and *Henry Witt Campbell*, Library, Pa. COIL SUPPORTING ARBOR. Patent dated March 31, 1942. Disclaimer filed July 8, 1943, by the inventors; the assignee, *The American Steel and Wire Company of New Jersey*, consenting.

Hereby enter this disclaimer to claim 1 of said patent.

[*Official Gazette July 27, 1943.*]