

[54] **GROUNDING CLAMPING LEVER**

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24/253

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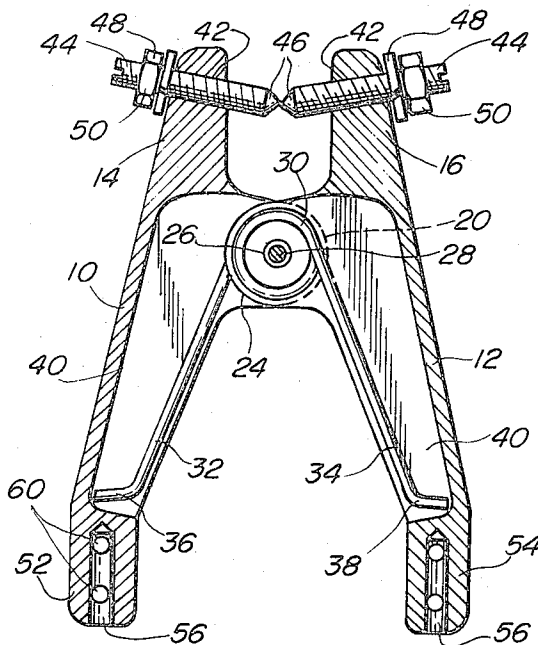
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ABSTRACT

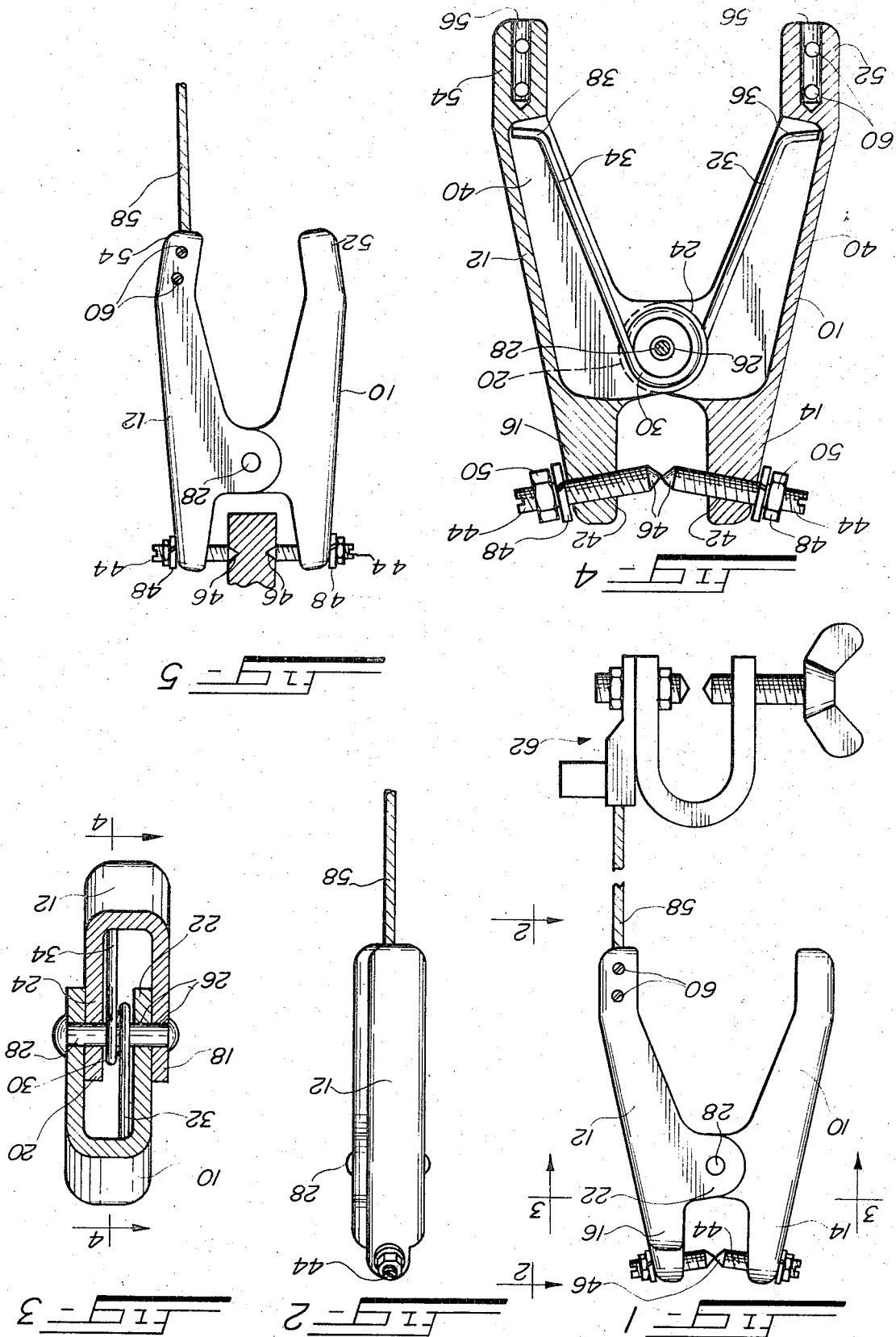
A spring loaded clamp having handle members each with integrally formed cooperating jaw members, each provided with an angularly positioned, hardened steel, pointed pin adjustable anchored in the ends of the jaws with the pin points extending inwardly and abutting each other. The two handles and jaws are identical castings to cut down costs of manufacture. Each handle member is provided with inwardly extending ears pivotally anchored together and provided with a strong torsion spring.

2 Claims, 5 Drawing Figures



3,850,490

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GROUNDING CLAMPING LEVER

BACKGROUND OF THE INVENTION

When transferring flammable liquids from one container to another, it is desirable and mandatory under government regulations to protect against static sparks, and possible flash fires, by providing means to drain electrical charges to ground. Clamping levers of the above general type have been provided with a pair of handle members each having a pair of spaced inwardly extending ears but one pair of ears is spaced apart wider on one of the handle members than on the other handle member to fit thereover and be pivotally secured together. Each handle member is provided with an integrally formed jaw through which an extending steel hardened pin is threaded with the points normally abutting each other and the pins lying on a common centerline and held in this position under the action of a spring.

When in use, with the jaws spread apart by compressing the handles to affix the pointed pins on a metal surface, the pins are no longer lying on a common centerline so that the pins oppose each other but rather each lies in an outwardly extending diagonal direction and hence does not provide the most effective grip on the metal surface to which the clamp is attached. Also, if the pointed ends are not aligned when clamping a metal surface, the levers tend to twist sideways and hence the spring action does not effectively make a solid grounding clamp.

SUMMARY OF THE INVENTION

A bonding and grounding clamp having a pair of identical handle elements and each having a pair of identical inwardly extending spaced ears, each of the ears provided with aligned apertures through which a pivot pin is inserted to anchor the handles together, a compression spring wound around the pivot pin with the legs thereof extending rearwardly and lying against the inner walls of the respective handle elements to retain the handle elements spread apart, the forward end of said handle elements forming a pair of jaws and each jaw having opposed, adjustable, inwardly extending pointed pins whereby, when the jaws are spread apart for anchorage to a metal surface for grounding purposes, the pointed pins will lie in an inwardly or coincidental direction and their points will, by the spring action, be forced through the metal surface and into the raw metal to effectively form a good bond and ground. This pin orientation is very effective in resisting accidental dislodging of the clamp from the container to which it is applied.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front elevational view of a bonding and grounding clamp of the present invention on the upper end and a hand clamp on the lower end connected together by a flexible cable;

FIG. 2 is an end elevational view taken substantially along the lines 2-2 of FIG. 1;

FIG. 3 is a cross-sectional view taken on the lines 3-3 of FIG. 1;

FIG. 4 is an enlarged vertical cross-sectional view through the device of FIG. 1; and

FIG. 5 is a front elevational view similar to FIG. 1 but showing the jaws opened and clamped to a metal surface for bonding and grounding the clamp thereto.

DETAILED DESCRIPTION OF THE DRAWINGS

The device of this invention has a pair of handle members or levers 10-12 each contoured and terminating at the upper end, as shown in the drawing, in one-half of a jaw 14-16. Each lever contains a pair of depending ears 18-20, 22-24. The ears 18-20 are spaced apart the same width as the ears 22-24 so that when the levers 10-12 are positioned together, the ears 18 and 22 will abut each other and the ears 20 and 24 will also abut each other. The ears are provided with aligned apertures 26 for the reception of a loose rivet pivot 28. The levers are preferably produced from an alloy of zinc by die casting.

A very strong compression spring 30 is very loosely wound once around the rivet pivot 28 with the legs 32-34 thereof extending downwardly and each terminates in a substantial right angle bend 36-38 whereby the ends thereof abut, respectively, against the lower end of the elongated recess 40 in the handles 10-12, all as shown in FIG. 4.

Each jaw 14-16 is provided with a threaded aperture 42 which extends diagonally downwardly and inwardly at about a 15° angle from the horizontal. Hardened set screws 44, each having a pointed end 46, are threaded into the respective apertures 42 until the pointed ends 46 abut approximately medially between the jaws 14-16.

Of course, the set screws 44 may each be set further apart or closer, with respect to the inner faces of the jaws 42, depending upon the thickness of the material to which the clamp is affixed and to assure a good grounding thereof.

The two levers 10-12 and appurtenances are generally identical, thereby decreasing costs of manufacture.

Each set screw 44 is provided with a lock washer 48 and nut 50 to fix the set screws when they are correctly positioned, see FIG. 4, whereby the set screws become immovable after setting.

One or both of the lower ends 52-54 of the handles 10-12 are provided with an endwise bore 56 into which the free end of the cable 58 is inserted and held therein by set screws 60.

As shown in FIG. 1, a hand ground clamp 62 is anchored to the other end of the cable 58. The hand ground clamp may be secured to any metal structure forming part of a building, pipe or other metal structure which will act as an electrical ground, while the clamp of the present invention may be anchored to the rim of a drum containing flammable liquid. Thus, when the clamps are appropriately anchored as aforesaid, or vice versa, any static electricity generated during the transfer of flammable liquids will be dissipated to ground.

As especially shown in FIG. 5, because of the downwardly and inwardly pointed set screws 44-46, when the handle portions of levers 10-12 are pressed towards each other, the jaws will open against the pressure of the spring 30 so that the pointed ends 46 of the set screws 44 will be able to spread apart and both lie in a substantially horizontal plane to clamp to a grounded piece of metal 70 and then, as the handles are released, the strong spring 30 will cause the pointed ends 46 of the set screws to penetrate the surface of the metal through any paint or oxides and contact bare metal to effect a good ground.

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It is to be understood that numerous parts of the invention may be altered or omitted without departing from the spirit of the invention as defined by the following claims.

I claim:

1. A grounding clamp of the class described comprising a pair of identical handle members, each handle member having a jaw member on one end and a pair of laterally and inwardly extending ears, the distance between each pair of ears being identical, one pair of said ears arranged to overlap the other pair of ears, said pairs of ears having aligned apertures, means pivotally securing said ears together, each of said handles having an elongated cut-out, a helical compression spring wound around said means interiorally of said ears and having the ends of said spring extending rearwardly in said cut-outs, the ends of said spring being bent substantially at right angles laterally outwardly with the

terminal ends of said spring abutting against the inner surface of said handle, said jaw bored and threaded downwardly and inwardly toward said pairs of ears receiving an elongated case-hardened set screw, the inward ends of said set screws being pointed and the points abutting each other when in place in said jaws, the individual centerlines of said set screws intersecting at an acute angle, whereby when said handles are compressed towards each other the set screws will tend to approach a common center line.

2. The device of claim 1 wherein the set screws are positioned in said jaws, when said device is inoperative, so that the individual center lines intersect midway between the jaws with an angle of about 15° between them and means on said set screws to prevent displacement thereof after setting.

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