April 6, 1937. W. G. KOERBER 2,076,466

SUPPLEMENTAL CONDUCTOR FOR PIPING

Filed Nov. 21, 1935

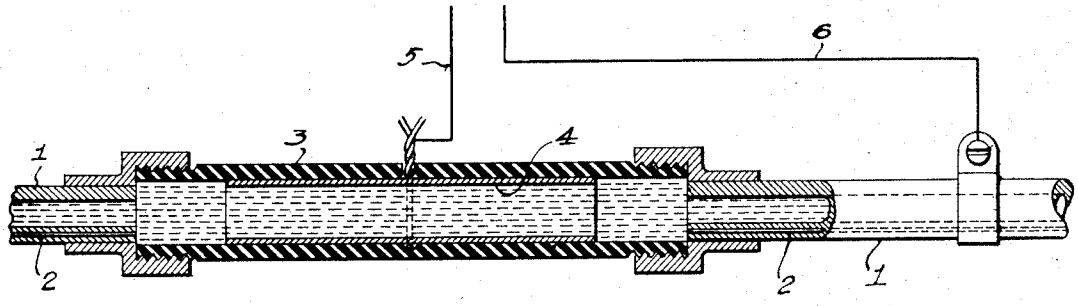

Fig. 1.

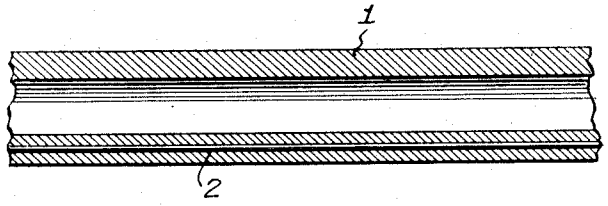

Fig. 2.

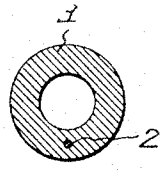

Fig. 3.

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SUPPLEMENTAL CONDUCTOR FOR PIPING

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Application November 21, 1935, Serial No. 50,825

3 Claims. (Cl. 204—26)

This invention relates to tubing for use as beer coils and is particularly adaptable for use in beer dispensing equipment as revealed and described in my co-pending application Serial No. 50,823, filed November 21, 1935.

In the above mentioned application is revealed a method and means for preserving the cleanliness of the inside of a beer delivery coil by subjecting the beer passing through the coil to a source of electric energy. According to that application, it is possible to add the parts indicated to existing apparatus and in the case of coils of substantial length, to connect the electric lead lines into the coil at a plurality of points.

It is the object of the present invention to provide a coil which has the effect of providing electric connection with the coil at an infinite number of points.

The material from which beer coils are usually made is known as block tin. This material is a conductor of electricity but, as compared to other metals such as copper and silver it is a relatively poor conductor. The object of this invention is to provide a tube of block tin and to incorporate therein a strand of some high conductive material such as silver.

Other objects and advantages will become hereinafter more fully apparent as reference is had to the accompanying drawing wherein my invention is illustrated and wherein—

Figure 1 is a longitudinal section through my improved beer coil;

Fig. 2 is an enlarged longitudinal section through a metallic part of the coil, and

Fig. 3 is a diametric section through the tube of Fig. 2.

The companion application above-identified, presents a dispensing system for beverages such as beer. In such systems, it is usual to connect the container, such as a keg, with the dispensing tap by a metallic connection which includes a coil that is generally externally cooled. The connection and coil is generally made of block tin and of comparatively thin-wall type; being of a metal that lends itself to heat and cold conduction it permits rapid cooling of the beverage while being dispensed. The connection and coil, however, has the draw-back that there is a tendency of beer content, such as yeast cells, etc., to deposit on the inner wall of the connection, and when these remain for a short period—a week, for instance—the taste of the beer changes, and it becomes less appetizing. As a result, it is the practice, to regularly remove the connection and coil with a view to cleaning the inner surface of its deposits, thus restoring the conduit to its initial condition.

Various methods have been employed with a view to avoiding these conditions, a common method being to place within the connections a pair of opposing electrodes or their equivalent, these being connected up to a source of electrical energy; when the conduit is filled with the beverage and the current applied, the circuit is completed through the beverage stream, the purpose being to render the yeast cells incapable of growth and to deposit or be otherwise eliminated, thus avoiding the necessity for cleansing the connections. This idea has been proposed in various forms and by various means. Generally the circuit is completed with the gap extending transversely of the stream, with the result that the stream is moving past a fixedly-positioned gap; if the current is of the D. C. type, the flow through gap being in one direction, while if the current is of the A. C. type, the reversals set up by the alternations tend to cause flow alternately across the gap but the reversals are with extreme rapidity, dependent upon the number of cycles found in the current. It has been proposed to locate the electrodes at opposite ends of a short section of the conduit, so that the gap extends lengthwise of the stream instead of transversely of the stream, but the distance must be short since the gap must be bridged through the content.

The system of the companion application is broadly of this latter type, viz: the use of an electric current designed to have its circuit completed through the stream itself. But instead of relying upon the presence of a gap of the types referred to, the system operates somewhat differently, in that the circuit is completed in such manner that the current passes through the stream in one direction (generally speaking) while the stream is advancing through a zonal length of travel, and then, while the stream continues its travel, the direction of current flow through the stream is reversed for a second zonal distance, so that in any given increment of the stream, it must first pass through a zone in which the current flow is generally in one direction after which it passes through a second zone in which the direction of current flow is reversed. This is literally true if current of the D. C. type is employed, and under A. C. current conditions a somewhat similar effect is produced.

In the companion application the operation is produced by dividing the connection and inserting between the metallic sections an interposed

section of insulating material, thus completing the conduit. Internally of the insulating section is mounted a tubular metallic element of good electrical conductivity, such as silver, for instance, with the element of less length than the insulating section and symmetrically disposed relative to the section length; the element is connected at about its mid-length with one side of the source of electrical energy; since the ends of the element are spaced from the adjacent ends of the metallic conduit sections, a gap status is set up with respect to the adjacent sections. The other side of the source of electrical energy is connected to such adjacent metallic sections, so that both of the latter have the same polarity at any given instant, while the tubular element is of the opposite polarity at such instant. Hence the current flow is in opposite directions relative to such mid-length position of the tubular element; since the stream flow is constant in direction, the stream content is subject to the conditions above pointed out—flow through a zone of current flow in one direction and then through a zone in which the current flow is in the opposite direction.

One of the problems in this arrangement is brought about by the fact that the material of the connection and coil—block tin—has relatively low electrical conductivity as compared with that of the silver terminal element referred to. The thin wall arrangement does not offer material difficulty for current flow transversely through the wall, but provides a serious problem when considered in the longitudinal direction of length of the wall, especially where the length to be rendered active is considerable, such as contemplated by the length of the zones to be affected is as above indicated. In the form disclosed in the companion application, this condition is met by employing a plurality of clamps secured at spaced intervals in the direction of length of each of the metallic sections; the clamps are each connected to the same side of the source of electrical energy, so that all have the same polarity at any given instant. Hence, at the points where the clamps are located the thin wall permits current flow into the stream, and since these clamps are at varying distances from the metallic element which presents the opposite polarity, varying distances are set up to be bridged by the current passing through the stream, with the result that the zonal length of the current activity in the stream becomes fairly long and ensures activity for considerable distance of the flow path of the beer.

As will be understood the spacing of the clamps tends to provide spaced points within the zone, and in addition, requires the use of a number of clamps with the necessary wiring. The present invention has for its purpose a simplified way in which these metallic sections can be made active in this way, and with the advantage of providing a multitude of points.

1 indicates a tube of metal which is a relatively poor conductor of electricity, such as tin, and 2 indicates a strand of metal which is a relatively good conductor of electricity, such as silver. The strand 2 is embedded in the wall of the tube 1. This may be suitably done by the well known extrusion process.

The tube 1 is used as a beer coil to connect a keg and spigot, as revealed in my aforementioned copending application. Interposed in the length of the tube 1 is a section 3 of fiber or other non-conductive material. Within this section 3 is a terminal 4 in substantial spaced relation with the sections of the tube 1 and connected to this terminal 4 is a source of low voltage electrical power through the lead line 5. The other electrical line 6 is connected to one or both sections of the tube 1.

The drawing presents but a portion of the connections of the system disclosed in the companion application, the showing presenting the insulating section and its metallic element connected up to the source of electrical energy, these being shown herein at 3, 4 and 5; the relation of the adjoining sections of the metallic block tin tubular portions is similar to that of the companion application, but these metallic sections each carry but one of the clamps instead of the plurality shown in the companion application. Instead of utilizing the plurality of clamps, however, the present invention substitutes the strand 2 of a high value of conductivity—such as silver, for instance, this being embedded within the wall of the sections throughout the length of the section.

Since the strand is embedded, it does not come in contact with the single clamp employed for the section, but being incorporated in the thin wall of the section, the current will readily pass through the outer portion of the wall into this conductor. And since the content of the conduit does not contact this strand, it can be understood that the strand itself acts as a distributor of current in the direction of length of the section, with each portion of the inner zone of the section at this point in the circumference providing a conducting path to the stream content; thus providing for a multitude of points instead of the spaced points provided by the clamps of the companion application.

The arrangement is of advantage in several respects. While the strand 2 is not in direct contact with the clamp, the wall does not offer a material resistance to reaching the strand, and since the wall thickness between the strand and the inner surface is also greatly reduced, the current delivered to the stream is not reduced but is actually enhanced. In addition, the delivery possible is along a continuous length instead of at spaced points; this is of value through the fact that if the increase in length of the gap becomes effective to gradually decrease the current value in the direction of the remote ends of the sections, the continuous distribution will ensure the presence of an active zone of considerable length, a condition which might render some of the remoter clamps inactive in the form shown in the companion application; in other words, the present invention will tend to automatically determine the actual length of the zones. The fact that the strand extends throughout the length of the section does not affect this condition since, as pointed out, the strand has no direct connection with either the line or the stream, so that the portion that is not active simply lies idle.

In other words, the strand 2 does not serve the function of a conductor in the usual meaning of the word in the electrical art—it serves more in the nature of a distributor of current to the low conductivity metal of the sections, so that the latter can serve as a conductor radially under conditions where such service longitudinally would be materially affected by the fact of low conductivity.

What I claim is:—

1. In beverage dispensing apparatus, wherein

the beverage is delivered through a conduit including a pair of tubular metallic sections of thin wall characteristic and insulated from each other by an interposed section of insulating material with the latter carrying an internal terminal for one side of a source of electrical energy and with the opposite side of such source extending to the metallic sections, and wherein the current path is completed through the beverage carried by the conduit, said metallic sections each comprising a tubular wall of extended length and of comparatively low electrical conductivity, and a metallic strand of comparatively high electrical conductivity embedded within and extending longitudinally of the wall and unexposed to either periphery of the wall, said strand being free from direct electrical connection with said internal terminal in an assembly of the conduit and serving as a current distributor for current applied locally to the periphery of one of said sections, whereby the current flow between the opposite sides of the source will extend between the internal terminal, the beverage content within the assembly and radially through the metallac section wall with the strand active as a distributor over an extended length of the section.

2. A section as in claim 1, characterized in that the strand and section are co-extensive as to length.

3. A section as in claim 1, characterized in that the sections are of block tin and with the strand of silver.

WILLIAM G. KOERBER.