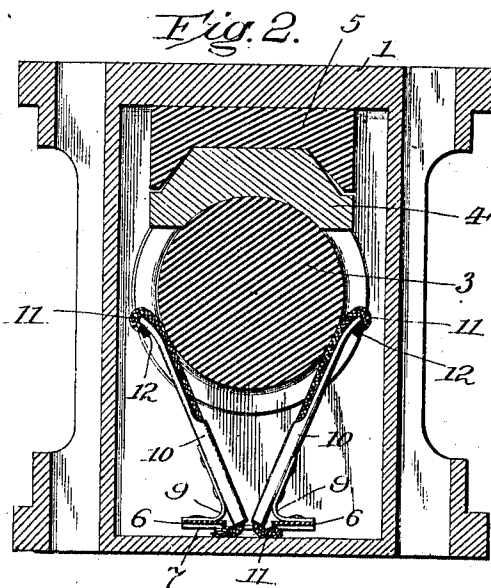
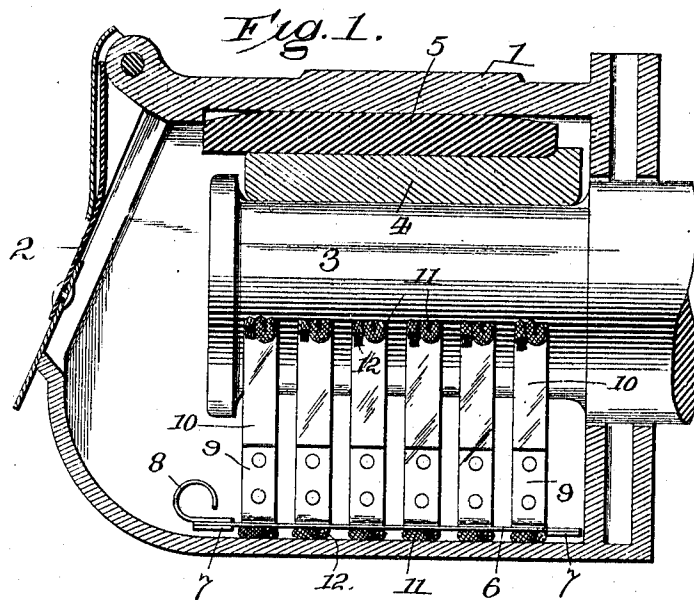


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LUBRICATOR.
APPLICATION FILED DEC. 4, 1909.

988,618.

Patented Apr. 4, 1911.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 3.

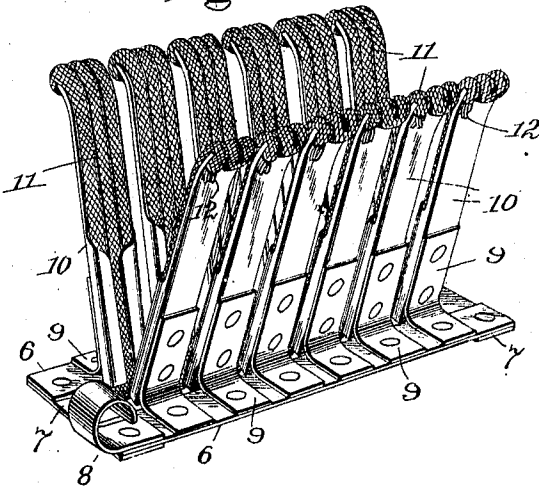


Fig. 4.

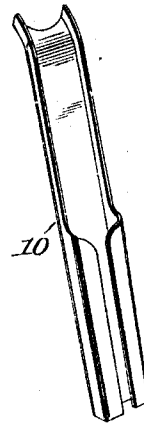


Fig. 5.

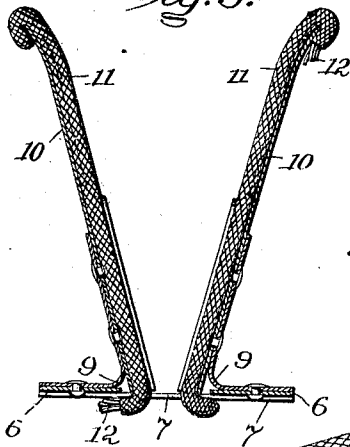


Fig. 7.

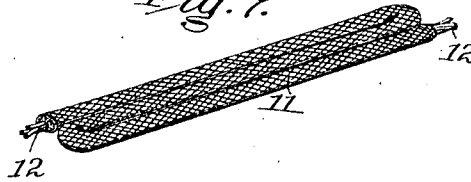
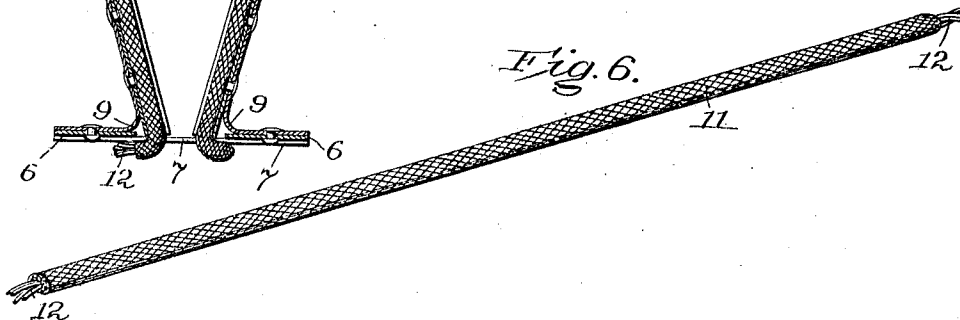


Fig. 6.



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UNITED STATES PATENT OFFICE.

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LUBRICATOR.

988,618.

Specification of Letters Patent.

Patented Apr. 4, 1911.

Application filed December 4, 1909. Serial No. 531,412.

To all whom it may concern:

Be it known that I, GEORGE J. BINGHAM, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Lubricators, of which the following is a specification.

My invention relates to lubricators, and is designed more particularly for use in car axle boxes for insuring proper and uniform supply of lubricant to the journals of car axles. It may, however, be employed in other relations, and with advantage.

The invention is in the nature of an improvement upon others heretofore made by me, of which one is set forth in Letters Patent of the United States granted to me February 5, 1901, and numbered 667,183.

The objects sought are uniformity and certainty of lubrication, economy of lubricant, convenience and facility of renewal of wearing parts, and general simplicity.

The construction is illustrated in the accompanying drawings, in which:

Figure 1 is a vertical longitudinal section of a car axle box provided with my improved device; Fig. 2, a transverse section of the same; Fig. 3, a perspective view of the lubricant supplying device removed from the box; Fig. 4, a perspective view of one of the conductor-holding fingers; Fig. 5, a sectional view of two of said fingers, their supporting springs, and a portion of the base frame; Fig. 6, a perspective view of a piece of the wire-cored conducting material; Fig. 7, a perspective view showing the same folded into form for use in connection with the supporting finger or holder.

In designing my structure I have aimed to adapt the same for ready application to, and use in, car axle boxes already in use, and to this end have so fashioned and constructed the same that it may be easily inserted into and removed from such boxes.

Referring to the drawings, 1 indicates a journal box of ordinary form and construction, having an opening in its outer end provided with a cover 2 adapted to be held by a spring bearing upon one or another flattened face to hold the cover in position to close the opening, or away from the opening, as required, to facilitate supplying the box with lubricant, or inserting or removing the attachment.

3 indicates the journal of a car axle ex-

tending into the box 1, 4 the "brass" bearing upon the journal, and 5 the usual saddle block interposed between the "brass" and the top of the journal box, all these parts being of ordinary construction and design.

The box is of sufficient depth to afford a reservoir for lubricant beneath the journal, and below the lower edge of the opening in the outer end of the box. Within this space is placed my improved device, comprising a flexible base or frame, and a series of spring-sustained fingers, each furnished with a conductor by which the lubricant is delivered to the journal. The base plate or frame is here represented as made up of flat longitudinal strips 6 and end strips 7, riveted or otherwise joined together. This frame, by reason of the resilient character of the material of which it is made, may be bent or sprung both longitudinally and transversely, and hence conveniently inserted into or removed from the journal box 1. A loop or finger-hold 8 is advisably formed at the outer end to facilitate handling the device.

Riveted or otherwise made fast to the plates 6, 6, are flat or leaf springs 9, bent into substantially L-shape, the lower or horizontal arm of each being made fast to one of the longitudinal bars or strips 6 of the base frame, and the upstanding arm of each having riveted or otherwise secured to it a finger or holder 10 of sheet metal, or other suitable material, of the general form represented in Fig. 4. As shown, these fingers consist each of a piece of thin material, which I find it convenient in practice to make of a width of about half an inch, more or less, with upturned edges or flanges extending to the upper extremities, which extremities are bent or curled slightly backward. From about the midheight of the fingers the side flanges are made of greater projection, and bent from the sides inward toward each other, so as to give a box-like lower section to the finger, as seen in Fig. 4. The lower ends of the fingers 10 extend downward to or slightly below the longitudinal strips 6, and are open, as shown in Figs. 4 and 5. Each finger 10 is armed with a conductor 11, which may conveniently be of the form shown in Fig. 7. It is produced by bending or folding upon itself a wire-cored fibrous tube sheath, or hollow cord, of the character illustrated in Fig. 6. The core 12 is preferably made of a plurality of

copper wires twisted lightly together. The wire serves a three-fold purpose, giving stiffness or support to the fibrous covering, sheath or tube, acting as a heat conductor when in position for actual use, and serving or assisting to carry lubricant from the reservoir to the journal. This last mentioned function of the wires is apparently due primarily to capillary attraction, but is probably aided by surface tension and the viscosity or cohesion of the lubricant, it being observed that the flow of lubricant upward is more rapid when the journal is rotating than when it is at rest. This seems explainable only on the theory of viscosity or cohesion of the lubricant, and the tendency of the rotating journal to draw the lubricant upward by reason of the cohesion of its particles. Whatever may be the physical cause, the action takes place as stated. The conductors 11 being carried below the fingers 10, will or may rest directly upon the bottom of the lubricant reservoir, thus utilizing all of the lubricant, and incidentally cushioning the entire lubricating device. The fibrous sheath acts as a controller or governor for the supply of lubricant, and as a holder thereof, so that when the journal starts from a state of rest it shall be supplied at once with lubricant sufficient to prevent heating or cutting. The fibrous sheath itself serves to carry up the lubricant in a measure, but does not carry the same in excess, nor permit the wires to do so. This is a matter of great practical importance, since tests and experience show that with the wires alone, as in my former patent, lubricant is carried to the journal in excess, and collecting on the lower edge of the saddle or bearing block and on the journal, it finds its way inward beyond the bearing block, and through and beyond the inner end of the journal box, finally dripping or being thrown from the axle outside of said journal box. In this way the lubricant is wasted and rapidly exhausted. The fibrous sheath or covering prevents this, and serves to govern or control the feed of the lubricant, so that the difficulty before experienced and above explained, is overcome.

By folding the single strand, tube, or cord upon itself, after the manner indicated in Fig. 7, the conductor 11 may be made of any desired length and width, and thus adapted for supporting fingers 10 of varying dimensions. It is deemed expedient to use light wires 12, which may be readily bent by the hands, since in that event the ends of the conductor 11 may be readily bent over the ends of the finger 10, and thereby caused to retain the conductor in place, yet permitting the straightening of the bent over portions, and removal of the conductor quickly, and without the aid of any implement whatever. The side flanges,

or upturned edges of the finger or holder 10, and the box-like lower portion thereof, insure retention of the conductor in proper position, and against any tendency toward lateral displacement, while the overturned ends effectually prevent longitudinal displacement, and keep the conductor taut and straight.

The attachment, comprising the base frame, the fingers or holders, and the conductors, being constructed and assembled in the manner above set forth, is introduced into the journal box by pressing apart the two series of fingers or holders 10, so as to receive between them the outer end of the journal, and the lower end of the base plate or frame is passed downward through the opening in the end of the box until it bears upon the bottom of the reservoir or chamber in said box. It is then forced backward until it finally takes a seating on the bottom of the chamber or reservoir, as indicated in Figs. 1 and 2, with the two sets of fingers bearing against opposite sides of the journal, the uncovered portions of the conductors 11 (that is, the portions above the box-like lower sections of the fingers or holders 10), making contact with the journal as shown. A supply of any suitable lubricant is then placed in the reservoir or chamber of the journal box. This may be any suitable axle grease, a heavy or viscous lubricating oil, or any other approved oil or lubricant suitable for such use, and will vary according to circumstances.

In cold climates, and particularly with certain classes of lubricants, the lubricant will often congeal or solidify, and unless provision be made for rendering it sufficiently fluid to be taken up and fed by the conductor 11, the lubrication of the journal will fail, or be inefficient. It is found in practice that by the employment of metal, and particularly of copper or other metal or alloy having a high heat conducting capacity, separated from the journal by only a thin layer of fibrous material itself in frictional contact with the journal, and the metallic member extending into the lubricant, sufficient heat may be transmitted or conducted by the metal to the lubricant into which the conductor extends, to maintain the lubricant in fluid condition, and to insure its being taken up and fed by the conductor. The character and texture of the fibrous conductor constituting the tubular sheath or covering outside the wire core, will vary somewhat according to the nature of the lubricant employed.

While it is convenient, and deemed preferable, to arrange the heat conducting member as a core within the fibrous sheath or covering, this is not essential, though it is deemed important that the two be closely associated, and preferably threaded one into or through

the other to maintain a proper relation, and to utilize the supporting property of the metal to maintain the fibrous body in proper shape.

5 It will of course be understood that the device represented in Fig. 3 may be placed in any journal box having a space suitable to receive it, the fingers or holders 10 and conductors 11 being proportioned to suit the particular box in which, and the journal with which, the device is used. The springs 9 serve to press the fingers, or the conductors 11 carried thereby, against the journal, and to maintain contact therewith, notwithstanding the considerable vibration incident to use on railway cars, and other vehicles. The conductor 11 delivers the lubricant to the surface of the journal, and becoming charged with the lubricant, holds always sufficient 20 quantity thereof to begin the lubrication of the journal the moment the latter begins to rotate. A very brief period of rotation generates sufficient warmth to insure a proper softening or melting of the lubricant through transmitted heat, in the event that it has, during a period of rest of the vehicle, become solidified or congealed, or in those cases where an oil or lubricant too thick or heavy to be taken up and fed by the conductor in its normal condition is employed. 30

The foregoing description sets forth the preferred embodiment of the invention, but it is to be understood that such variations as fall within the field of, and would naturally be made by a practical mechanic, are contemplated and within the spirit and scope of my invention. 35

There are lubricants, and particularly among the heavy or viscous oils, which in 40 their natural state or condition will not feed, or not freely feed, by a conductor of the general character here described, but which when rendered thinner or more fluid by the application of moderate heat, such as this heat transmitting conductor supplies, may be fed in adequate quantity. It will therefore be seen that these heavier lubricants, which in many cases are cheaper than the thinner or more fluid oils and lubricants, 50 may be utilized with my improved lubricator where otherwise they would be unavailable, the heat transmitted by the conductor serving sufficiently to modify their condition to cause them to feed properly. Hence in addition to insuring uniformity and certainty of lubrication, my invention further cheapens the cost of such lubrication by rendering possible the use of cheaper lubricants. There are also other crude oils 60 which are very light or of low specific gravity, and quite thin or fluid. Difficulty has been experienced in using this class of oils in lubricators for journal boxes and the like. It is found in practice that these oils are 65 very satisfactorily fed or delivered to the

journals by the lubricator herein described. The structure is hence found suitable for use with a very wide range of lubricants, light and heavy, thick or viscous, and thin or highly fluid. 70

The present application is intended to cover broadly a lubricator having a lubricant conductor provided with a heat transmitting body, whereby heat incident to friction between the journal and the conductor 75 may be transmitted to the lubricant in the containing receptacle, to insure its proper fluidity. In another application filed in my name on the 6th day of July, 1907, and renewed December 7th, 1909, under Serial No. 80 531,886, I have set forth and claimed another embodiment of the same idea, but said application is now restricted to a specific form or embodiment of the invention, and is subordinate to the claims of this application. 85

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

1. The combination with a journal box having a lubricant receptacle, and a journal, 90 of a lubricant supplying or feeding device, comprising a base or support, a series of spring-sustained fingers or holders carried by said support, and conductors bearing at their upper portions against the journal, and extending at their lower portions into the lubricant-containing chamber, said conductors comprising a fibrous absorbent body and a heat-conducting body. 95

2. In combination with a journal and a 100 journal box having a lubricant chamber or receptacle, a spring-sustained finger or holder having its lower portion extended into the lubricant-containing chamber, and its upper portion extended upward to the journal, and a lubricant conductor carried by said finger, and comprising a fibrous absorbent body and a metallic heat conductor, substantially as described. 105

3. In combination with a journal and a 110 journal box having a lubricant receptacle or chamber, a lubricant feeding device, comprising a base plate capable of flexure both longitudinally and transversely; a series of spring-sustained fingers or holders carried by said base plate; fibrous conductors carried 115 by said fingers; and heat conductors, one applied to each fibrous conductor, substantially as described.

4. In combination with a journal and a 120 journal box having a lubricant chamber or receptacle, a spring-sustained finger or holder extending from the lubricant chamber to the journal, and a lubricant conductor comprising a metallic core and a cover or sheath of fibrous material, the ends of said conductor being bent over and thereby secured upon the upper and lower ends of the finger or holder. 125

5. In a lubricating device, a lubricant con- 130

ductor consisting of a tubular fibrous sheath or cord and a contained metallic core, the compound strand being folded back and forth upon itself to produce a flat conductor, substantially as described.

6. In combination with a journal, and journal box containing a lubricant chamber or receptacle, a lubricant feeding or delivering device, comprising a base plate or frame; a series of fingers or holders 10; springs 9 connecting said fingers or holders to the base plate; and conductors 11 applied to the fingers or holders 10, and each consisting of a composite cord or strand composed of a central wire core 12 and a tubular fibrous sheath or covering therefor, folded longitudinally upon itself, and bent over the ends of the fingers or holders 10, substantially as set forth.

7. In combination with a supporting finger or holder, a lubricant conductor consisting of a metal-cored fibrous tube or sheath having its ends bent over the finger or holder, and thus serving to retain the conductor in position.

8. In a journal lubricator, the combination of a journal box; a base plate or frame, the longitudinal bars or members of which are adapted to be flexed to permit the frame to be introduced into and removed from the

journal box; and a series of yieldingly supported lubricant conductors carried by the longitudinal bars of said frame.

9. In combination with a journal and a journal box having a lubricant chamber or receptacle, a spring-sustained finger or holder having its lower portion extended into the lubricant-containing chamber and its upper portion extended toward the journal, and a lubricant conductor carried by said finger, and comprising a fibrous absorbent body and a plurality of metallic wires or strands placed in close proximity, substantially as described.

10. In a device for supplying lubricant to journals, a combined feeder and governor comprising a series of wires arranged in close proximity one to another, and a sheath or cover of fibrous material, the wires and the sheath both serving to carry lubricant upward to the journal, and the sheath serving to govern or control the feed of the lubricant effected by the wires.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE J. BINGHAM.

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