(No Model.)

J. C. KITTON.

LUBRICANT, JOURNAL BOX, AND METHODS OF MAKING.

No. 507,072. Patented Oct. 17, 1893.

Fig. 1.

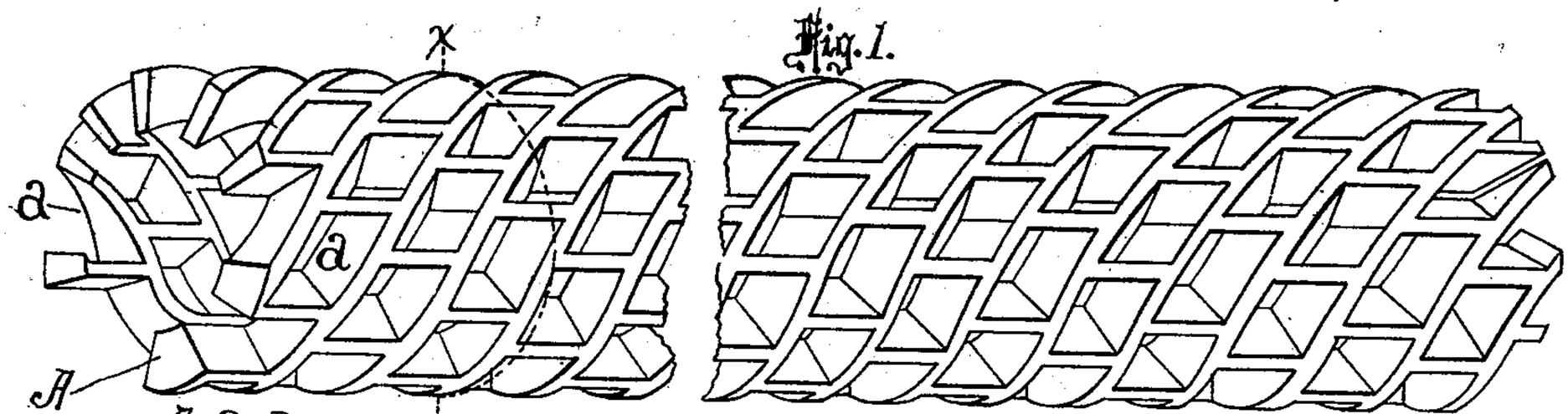


Fig. 2.

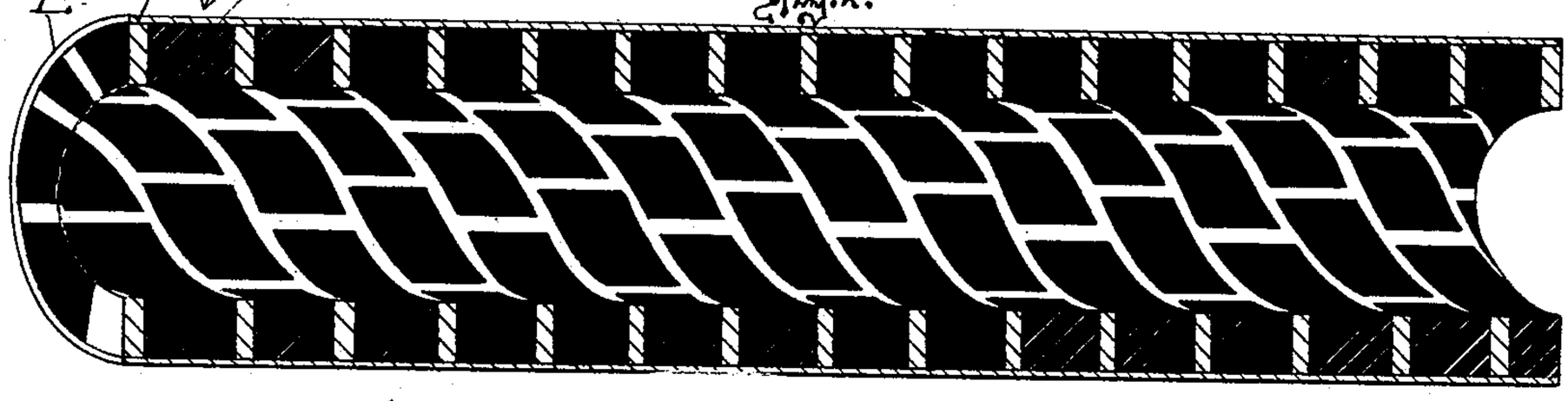


Fig. 3.

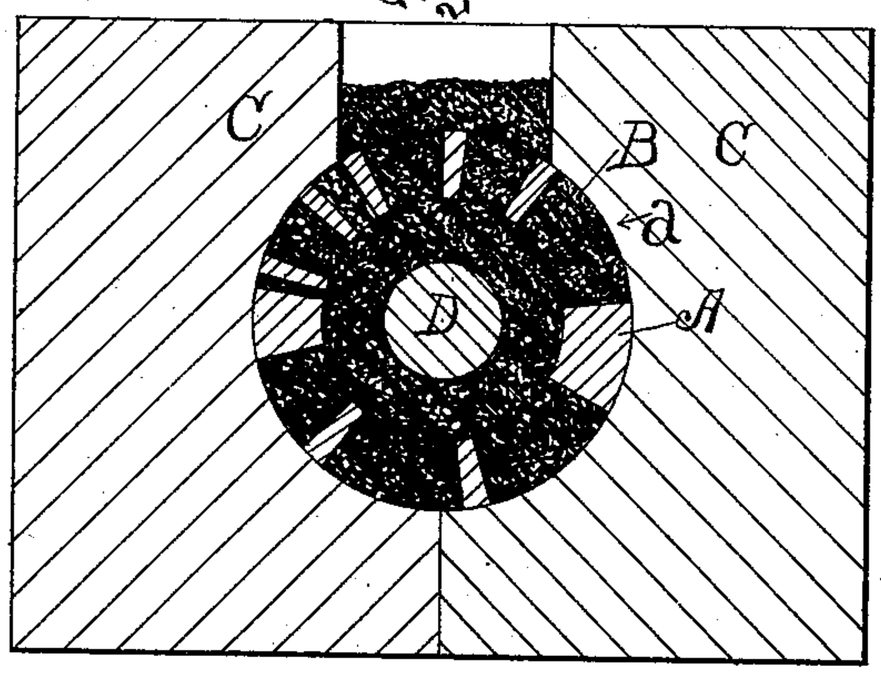


Fig. 4.

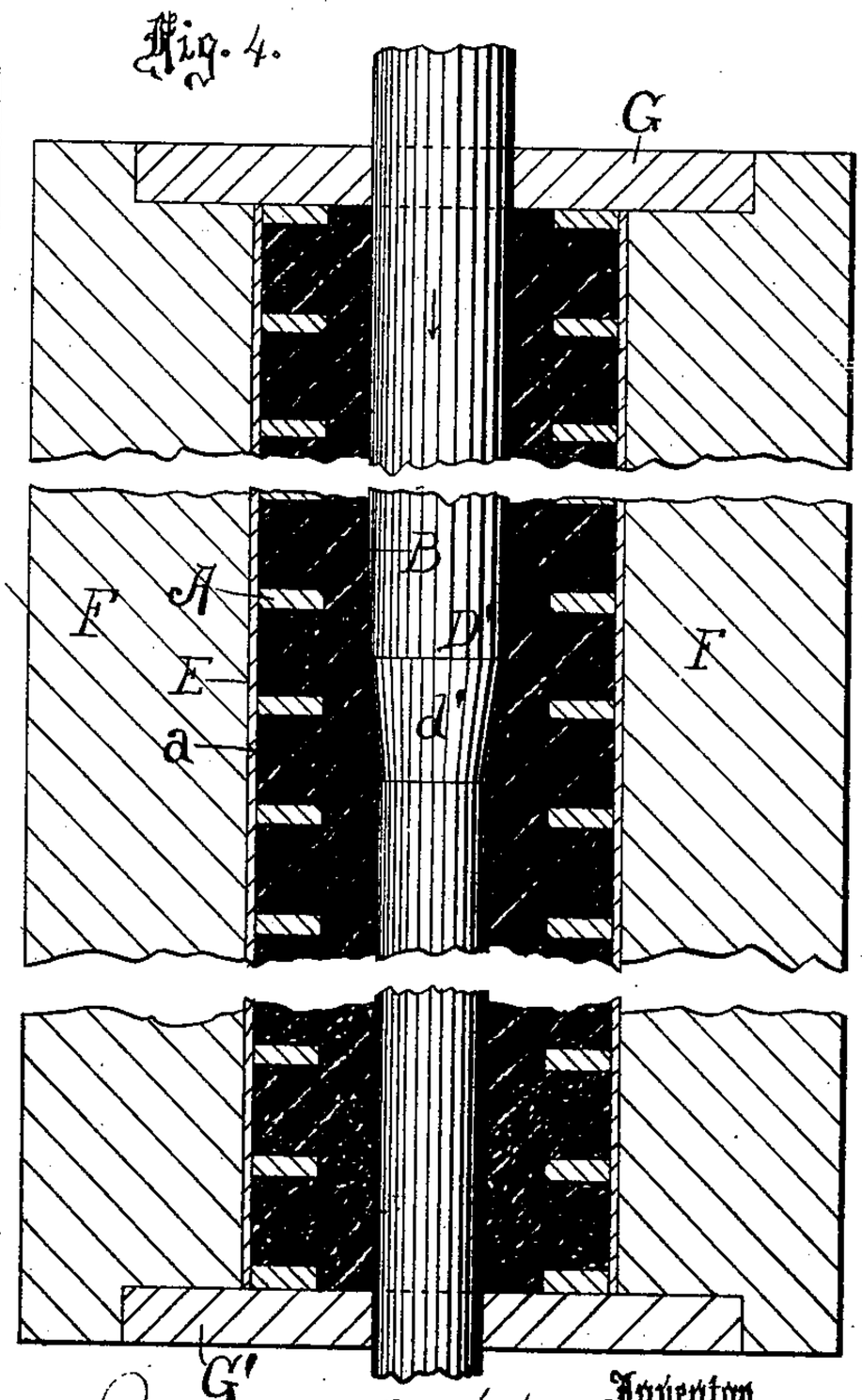
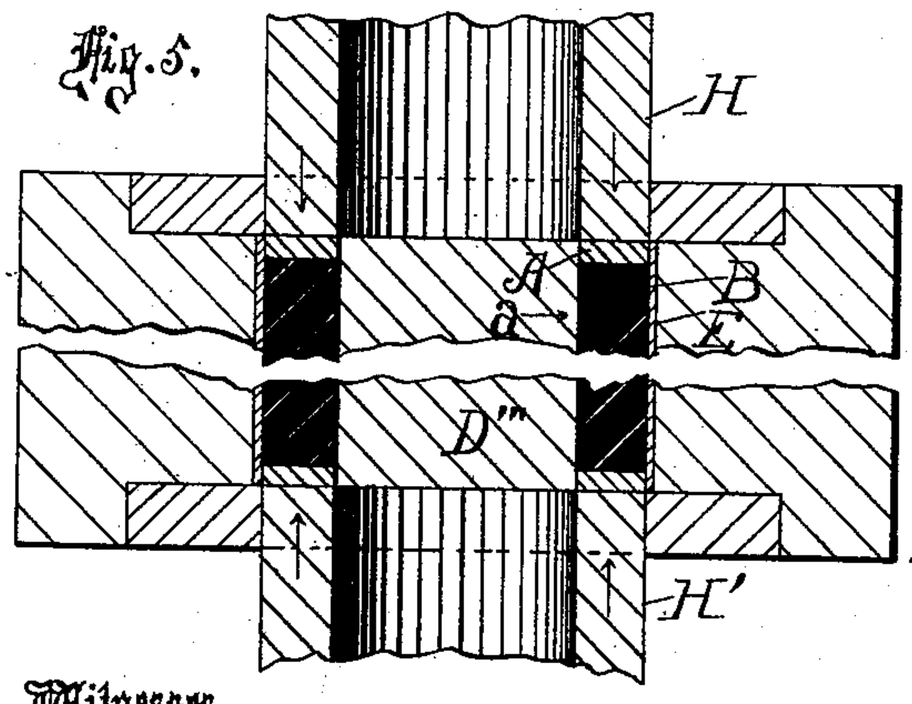


Fig. 5.



Witnesses.
M. M. Lee.
F. W. Townsend.

Inventor.
John C. Kitton
by Hazard & Townsend
his attys.

UNITED STATES PATENT OFFICE.

JOHN C. KITTON, OF LOS ANGELES, CALIFORNIA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF EIGHTY-TWO-AND-ONE-HALF ONE-HUNDREDTHS TO WALTER T. HARRIS, WILLIAM E. D. MORRISON, CHARLES W. BRYSON, JOHN K. WITHERSPOON, GEORGE H. KIMBALL, ELIAS GILMAN, SHUBRICK NORRIS, AND C. W. SMITH, OF SAME PLACE, AND GEORGE D. THOMPSON, OF SIERRA MADRE, ED. KENNEDY, OF PASADENA, AND SCHUYLER S. HAVERMALE, OF VIEJAS, CALIFORNIA.

LUBRICANT, JOURNAL-BOX, AND METHOD OF MAKING.

SPECIFICATION forming part of Letters Patent No. 507,072, dated October 17, 1893.

Application filed January 21, 1893. Serial No. 459,123. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. KITTON, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Antifriction Lubricant and Box for Carriages and other Vehicles and Method of Manufacturing the Same, of which the following is a specification.

My invention relates to that class of lubricating boxes in which a solid having lubricating qualities is compressed into perforations, interstices, or recesses formed in a metal plate.

The object of my invention is to secure improved lubrication and at the same time provide a box of sufficient strength to be a practical commercial article to be applied to vehicle wheels and which will maintain its integrity under great pressure, and which will be substantially of the same lubricating quality throughout the entire surface which engages the spindle within the box.

My invention consists in the combination of a cylindrical case or ferrule of compressible metal such as Babbitt metal, provided with numerous perforations separated only by narrow webbings of the metal comprising the ferrule, so that the ferrule is honeycombed and simply forms a frame work to receive the compound, and a lubricating compound of a compressible character filled into the interstices between the meshes of the ferrule, the ferrule and the compound being compressed together to form a box of substantially uniform density throughout. By this structure a box is formed which is of sufficient strength to withstand considerable rough usage, and is dense enough to sustain the heaviest loads, but which is practically a lubricant throughout its entire spindle engaging surface. My invention also comprises the compound which I employ in constructing this improved box. It also comprises the method I employ in producing said compound, and in manufacturing the box.

My improved lubricating compound for anti-friction lubricating boxes consists of finely powdered plumbago, asbestus, Spanish soap bark (*Quillaja saponaria*) and the commercial article known as paraffine paint (which consists essentially of maltha cut by bi-sulphide of carbon). This compound is made by first mixing the finely powdered plumbago, asbestus, and Spanish soap bark with the paraffine paint in such proportions as to form a mass of suitable consistency, then subjecting this mixture to the cutting action of a sufficient quantity of bi-sulphide of carbon to cause the whole to become of a uniform consistency throughout. The asbestus, plumbago and soap bark are in nearly equal proportions; the plumbago is slightly in excess, the asbestus next and the soap bark next, while the paint forms about one eighth of the mass before the bisulphide of carbon is added. Sufficient bisulphide of carbon is used to reduce the mass to about the consistency of olive oil. The object is to form an intimate admixture of the several ingredients. This mixture is thoroughly stirred and mixed and is then allowed to stand for about twenty-four hours. I then ignite the fumes arising from the mass, and allow them to burn, stirring the mass in order to liberate the fumes until all the fumes have burned. The resultant mass is then subjected to heavy pressure under heat, thus becoming compacted; it is then finely powdered by suitable means such as a rattler, and is then ready to be forced into the ferrule of Babbitt or other soft compressible metal and thus formed under pressure into a suitable box.

In manufacturing my improved box, I compress the compound firmly into the interstices and firmly compress both the compound and the compressible metal which forms the binding ferrule. This compression is accomplished by the means of a succession of mandrels of increasing size which are forced through the spindle hole of the box in suc-

cession until well solidified and the final compression is made endwise of the box.

The accompanying drawings illustrate my invention.

Figure 1 is a perspective view of the perforated soft metal ferrule ready to receive the compound. Fig. 2 is a longitudinal midsection of the completed box. Fig. 3 is a cross-section showing the ferrule and mandrel within the filling device which may be employed in the first step of the process of manufacturing the box after the compound has been prepared ready to be inserted into the ferrule. Fig. 4 is a vertical midsection showing the box in the process of its first compression. A series of mandrels is shown to indicate the compression by such means. Fig. 5 is a fragmentary longitudinal mid-section of the box, mandrels, &c., at the time of the final compression of the box. Arrows indicate the direction of movement of the tubular mandrels.

A indicates the ferrule, provided with perforations *a* to such an extent that the remaining metal forms thin partitions between such perforations. In practice the shell or body of the soft metal ferrule in an ordinary box is from one-quarter to five-sixteenths of an inch in thickness before compression, and when compressed, this thickness is reduced to be about three-sixteenths of an inch.

B indicates the compound.

C indicates the filling trough used in inserting the compound into the interstices.

D D′ indicate the several mandrels.

E indicates a tubular inclosing case of brass or other suitable metal into which the ferrule and its compound are compressed.

In manufacturing the box the perforated ferrule is first supplied with a mandrel of considerable less diameter than the interior opening within the ferrule. For example when the ferrule is designed to have an interior opening for the spindle one inch in diameter, the first ferrule D employed is to be half an inch in diameter. This is arranged coaxial with the ferrule, and together with the ferrule, is placed within the filling box or trough C, and the compound is inserted into the ferrule or tube A until its interior opening and all the perforations are filled and the compound is pressed therein until it packs tightly in the interior opening and in the interstices *a*. Then the ferrule and the mandrel are removed and placed within the tubular inclosing case E and the whole is then inserted into the die F, into which the case E fits. A mandrel D′ of greater diameter throughout its main body than the first mandrel D, but tapering at its insertion end *d′* to a diameter equal to the diameter of the first mandrel D, is then applied by suitable means to force the first mandrel D out of the box and to compress the compound outward into the interstices of the ferrule. Perforated dies G G′ are provided at the ends of die F to retain the compound in place, the perforations in the perforated dies being respectively equal in diameter to the mandrel to be passed therethrough. It is necessary to apply a separate set of dies for each mandrel as the work progresses. A succession of mandrels of gradually increasing diameters are forced through the compound until the same has been thoroughly compressed into the ferrule and the ferrule has also been compressed so that the compound and the metal of the ferrule approach the same density throughout. The last mandrel D‴ with which this compression is produced is allowed to remain within the box, and the entire box contained within the inclosing case E is then compressed endwise by force applied to both ends of the ferrule at the same time. When thoroughly compressed, the box is removed and is ready for use.

The object of compressing the box by pressure applied simultaneously independently to each end of the box is to overcome the tendency of the box to be compressed at one end only, since the particles, as they are forced together bind more or less between the inclosing case and the mandrel, and when the pressure is applied only at one end, this binding withstands, to a considerable extent, the force of pressure; but if the pressure is applied from each end this condensation extends from each end more nearly to the middle of the box. This end compression amounts to an inch more or less in an ordinary box, but will be greater or less according to the length of the box and the extent of condensation produced prior to the end compression.

The compound herein specified and claimed is specially adapted for the manufacture of my improved box because of its property of becoming solid and homogeneous under great pressure.

If desired to remove the coating of compound which becomes pressed against the inner face of the webs of the metal ferrule, this may be done by reaming before the final compression. As shown in Fig. 5 such coating of compound has been removed.

H, H′ indicate tubular mandrels or followers by which the end compression is produced.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The box for carriages and other vehicles set forth comprising the combination of the cylindrical case or ferrule of compressible metal such as Babbitt metal provided with numerous perforations separated only by thin webbings of the metal comprising the ferrule, and a lubricating compound of a compressible character filled into the interstices between the meshes of the ferrule, the ferrule and compound being compressed together and forming a box of substantially uniform density throughout.

2. The anti-friction box for carriages and other vehicles consisting in the combination of a cylindrical case or ferrule of compressible metal provided with numerous perfora-

tions, and a lubricating compound consisting of finely powdered plumbago, asbestus, soap bark, and paraffine paint filled into the interstices between the meshes of the ferrule; the ferrule and compound being compressed together to form a box of substantially the same density throughout.

3. The lubricating compound consisting of finely powdered plumbago, asbestus, soap bark and paraffine paint.

4. The method of manufacturing the lubricating compound set forth consisting substantially in mixing plumbago, asbestus, soap bark, and paraffine paint together in such proportions as to form a mass of suitable consistency, then subjecting the mixture to the cutting action of a sufficient quantity of bisulphide of carbon to cause the whole to become of uniform consistency throughout, then igniting the fumes arising from the mass and allowing them to burn, stirring the mass to liberate the fumes until all the fumes have been burned, then subjecting the resultant mass to heavy pressure under heat, then finely powdering the mass, then forming the same into a suitable box under pressure.

5. The method set forth of manufacturing an anti-friction self lubricating box consisting in filling the interstices of a perforated ferrule of compressible metal with a compressible lubricating compound capable of becoming solid under pressure, and then compressing the compound and metal together to form the box of a uniform density throughout.

6. The method of manufacturing anti-friction boxes consisting in filling the interstices of a perforated ferrule of compressible metal with the compressible lubricating compound capable of becoming solid under pressure, compressing the same until the metal and the compound have been compressed to near the same density, and then compressing the resultant box from each end to condense the box endwise.

JOHN C. KITTON.

Witnesses:
JAMES R. TOWNSEND,
ALFRED I. TOWNSEND.