(No Model.)

T. TRIPP.

ANTI FRICTION JOURNAL BOX.

No. 295,308. Patented Mar. 18, 1884.

Fig. 1.

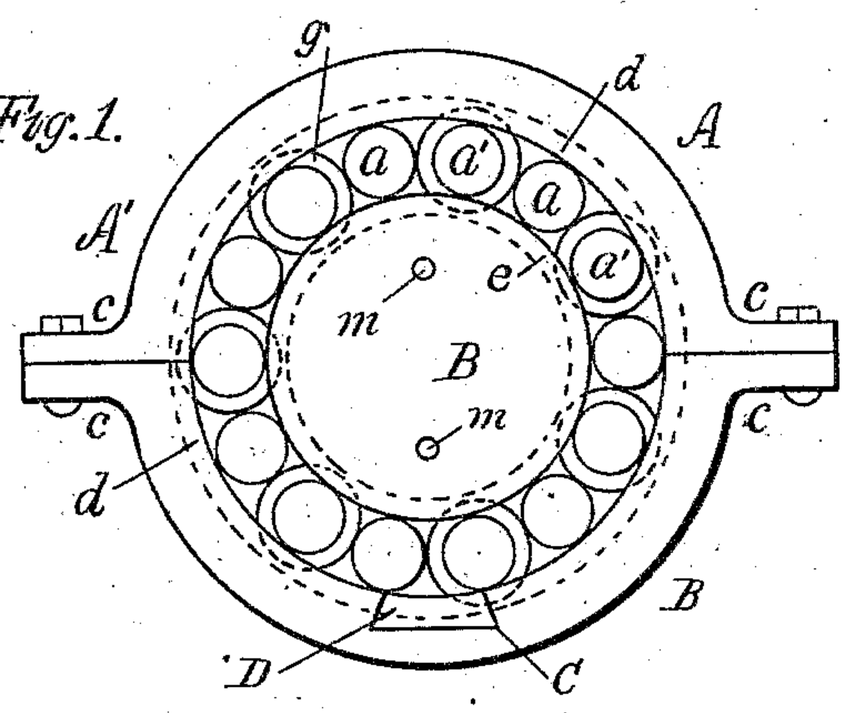
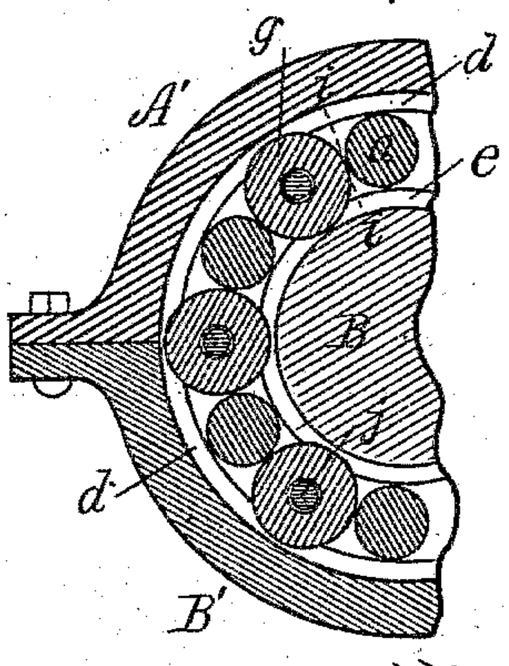


Fig. 3.
on line x.x.



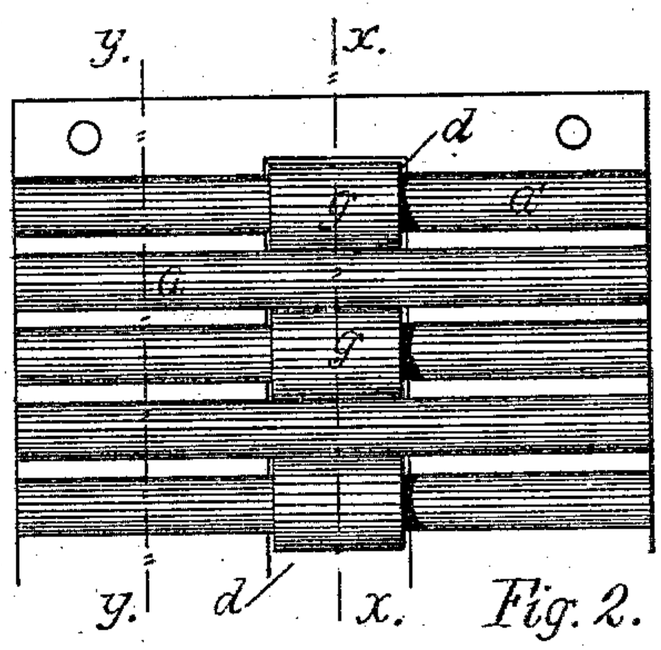
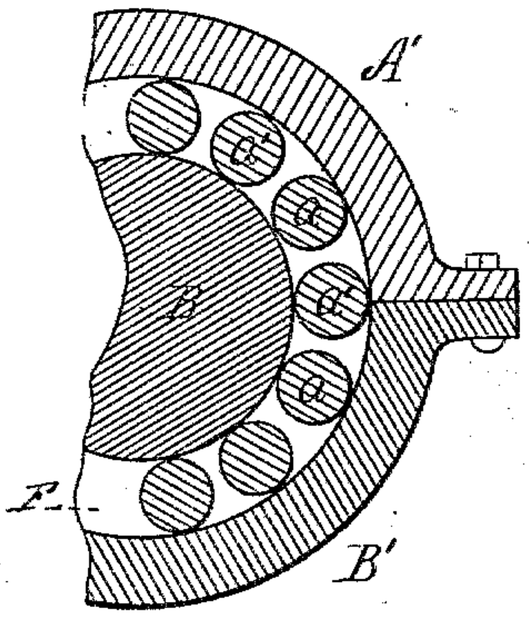


Fig. 2.

Fig. 4.
on line y.y.



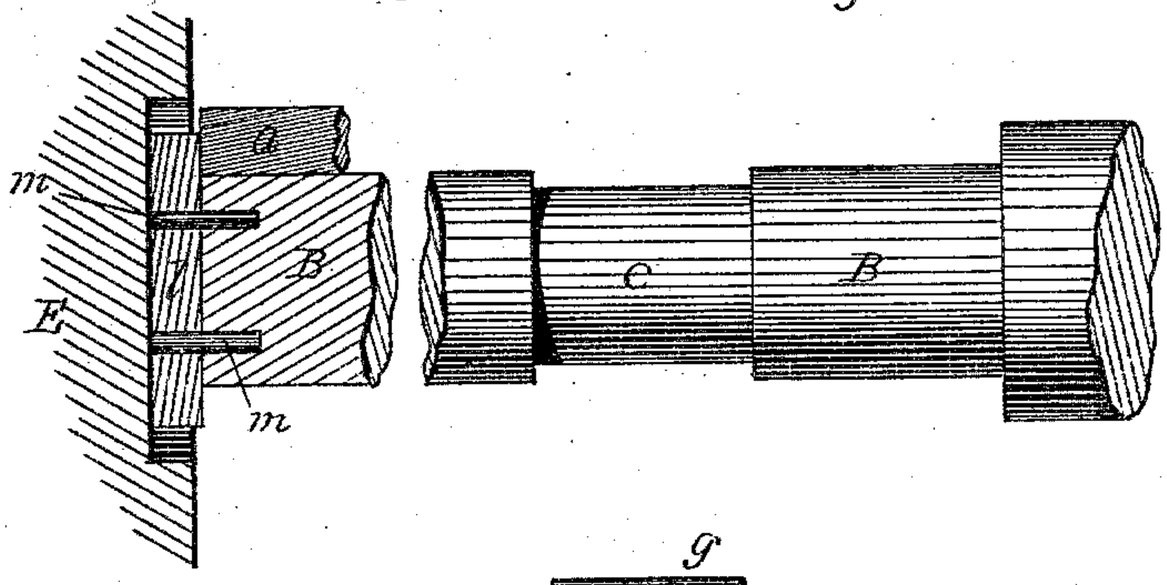


Fig. 5.

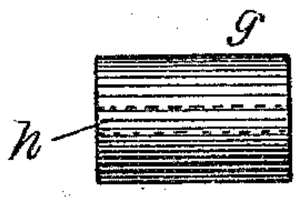


Fig. 6.

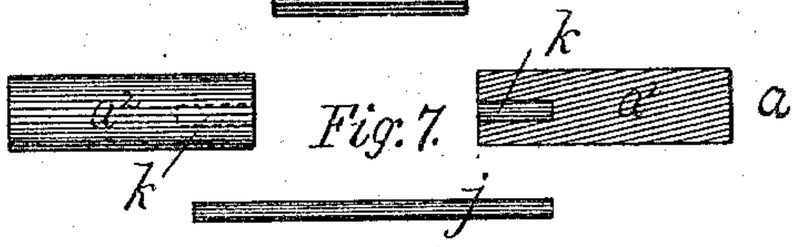


Fig. 7.

Witnesses.
H. C. Lodge.
A. F. Hayden.

Inventor.
Thomas Tripp.
F. Curtis, Atty.

UNITED STATES PATENT OFFICE.

THOMAS TRIPP, OF STOUGHTON, MASSACHUSETTS.

ANTI-FRICTION JOURNAL-BOX.

SPECIFICATION forming part of Letters Patent No. 295,308, dated March 18, 1884.

Application filed January 8, 1884. (No model.)

To all whom it may concern:

Be it known that I, THOMAS TRIPP, a citizen of the United States, residing at Stoughton, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Anti-Friction Journal-Boxes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to "anti-friction journal-boxes," so called, in which a series of rolls are introduced within the box, the peripheries of the rolls bearing against the internal periphery of the box, while the journal bears upon the rolls, and the whole moves within the box. Hitherto in journal-boxes of this class the series of rolls have been united together as a whole by means of rings, the shortest distance between any two rolls diametrically opposite constituting the diameter of the shaft upon which it is to be introduced. As the rings holding the rolls are integral, it is necessary to clear a line of shafting in order to insert one of these boxes in the middle of said shaft, and one feature of my invention is to overcome this difficulty, whereby a box of this class can be adjusted to any portion of a shaft adapted therefor without any preliminary preparation in the way off taking off pulleys, boxes, &c.

My invention consists, essentially, in having every roll in the series of rolls of the same diameter, and loose with respect to each other—that is, not united by any rings or plates with bearings therefor; secondly, in having every roll present a bearing-surface to the journal or be actively employed; thirdly, in doing away with integral rings heretofore employed, or with independent axles, to retain the individual rolls of the series in place; hence the series of rolls can be inserted one by one in any box adapted therefor, either integral or provided with a cap, without disturbing any of the other journal-boxes, pulleys, &c., on the line. I simply add an end plate in these cases to keep out dust and more securely confine the rolls.

In brief, my invention consists in a journal-box provided with a central broad annular depression, and a similar depression formed upon the journal itself and in alignment with that in the box. The diameter of the journal is somewhat smaller than the inside diameter of the box containing it, and this space is occupied by a series of independent steel rolls, all of the same diameter and bearing firmly between the inside periphery of the box and the outside periphery of the journal. Every alternate roll is subdivided and has a small steel pin fitting loosely into the two pieces composing it. To prevent friction between the rolls, I mount upon this pin a roll of a diameter not quite equal to the distance from the annular depression in the box to the annular depression in the journal to prevent any friction thereon.

The drawings accompanying this specification represent in Figure 1 an end elevation of a journal-box containing my invention. Fig. 2 represents the journal-box as developed on a horizontal plane, with the rolls placed in their proper position therein, while Figs. 3 and 4 are sections taken, respectively, on the lines *y y* and *x x* in Fig. 2. Fig. 5 is a sectional elevation of the journal and its removable plate, to be hereinafter described. Fig. 6 shows the roll for keeping the rollers in position. Fig. 7 represents a roll, which is divided, and the connecting-pin.

In these drawings, A represents a journal-box of the ordinary construction now in general use, and divided into two similar portions, A′ B′, and lips *c c c c*, which are held together by bolts. This box has a broad annular depression, *d*, of any suitable depth necessary to conform to the purpose for which it is made, and extending the entire periphery of said box. The journal shown at B, Fig. 5, is represented as having a similar broad annular depression, *e*, formed upon its periphery, this depression being in exact alignment with the depression *d* in the box—that is, both extend equal distances on either side of a line drawn at right angles to the length of the box or the axis of rotation of the journal through the centers of each.

The series of rollers *a a a′ a′* used, to overcome the friction of the journal, are shown to be uniform in diameter, and each bears on the inside periphery of the journal-box and the

external periphery of the journal, and snugly fits the space *f*, existing between said box and journal. Hence the entire series of rollers are in constant rotation and in unison with the journal while it is revolving. On the other hand it is very necessary that each of the rollers *a a*, &c., shall be separate from and act independently of each other in a certain sense, though moving in the same direction, as if their peripheries touched there would be a certain amount of slip and consequent increased friction instead of diminution of the same. Consequently it is necessary to retain these rollers a fixed distance apart. One-half the series of rollers *a a*, &c., are uniform in diameter and entire, or made in one piece, cut the requisite length from any steel rod of a diameter suitable for the box and journal to be provided therewith. To maintain these rollers at a uniform space one from the other, I introduce a short roller, *g*, which fits the annular depression *d* in the box and *e* in the journal, and whose diameter is less than the distance *i i*. (See Fig. 3.) This roller is provided with a central hole, *h*, shown by the dotted lines in Fig. 6, and this is to contain the small spindle *j* in Fig. 7. The pieces a^2 a^2 of the compound roller are provided with short holes *k k*, to receive the ends of the spindles *j*, and in making up this roller the roller *g* is slipped upon the spindle *j*, whose ends are inserted in the ends of the rollers a^2 a^2, when the whole is ready for insertion in its proper place. The spindle *j* retains the roller *g* in position, and when there is any tendency for the active rollers *a a*, &c., to move toward or away from one another, due to pressure brought upon them by the rotation of the journal, said rollers *a a* are prevented thereby and bear upon the periphery of the respective rollers *g g*, &c., adjacent to them, and which revolve with them.

The component rollers a^2 a^2 of the composite rollers *a a* are free to revolve upon the spindle *j;* hence if one end of the journal is slightly larger or smaller, the roller on that part is free to rotate faster or slower than its mate, hence there is no slipping or friction occasioned thereby, neither is there the tendency to cant the entire roller by which cutting of the journal or box is the result.

It is evident that the spindle *j* may be made to fit the holes *k k* in the rollers a^2-a^2 tightly, so that the whole will revolve as an integral roller; but I prefer the arrangement described above.

It is evident that as the spindles *j j*, &c., are loose in each part of the compound rollers *a' a'*, &c., and since the latter fit snugly between the journal and box, that the rollers *g g*, &c., are only brought into an active state when the rotation of the journal tends to thrust them from their centers; hence but a very slight strain is brought upon them, and no great wear occurs, as the weight of the car or other object resting upon the journal is taken entirely by the rollers *a a a' a'*, &c.

It is evident that when in active use the journal, especially on railway-cars, is subjected to severe end-thrusts and shocks, and unless some provision is made against it the ends of the rollers, which are revolving rapidly, are brought to bear firmly against the stationary cap or cover to the box. Consequently each and every roller so affected will be partially stopped and great friction produced, likewise a tendency to cant or cut back these rollers so affected and produce disarrangement of the entire series of rollers. To obviate this very serious and objectionable feature, I affix to the outer end of the journal a circular plate, *l*, (see Fig. 5,) and bore two or more holes in it, which are to fit corresponding studs, *m m*, inserted firmly in the outer end of such journal. This arrangement prevents said plate from slipping, and compels it to rotate at all times with the journal to which it is attached. Therefore, when end-thrusts occur the shock and friction resultant therefrom is borne by this plate *l* and its journal, and the rollers *a a a' a'* are not disturbed or disarranged in the least thereby. The plate *l* projects slightly beyond the periphery of the journal, (see Fig. 5,) and is contained within an annular recess, *n*, formed in the cup or cover E of the journal-box, the diameter of the depression being sufficient to admit of the entire series of rollers (as they rest upon the journal) within it. So, in case the plate gets worn away by continued end-thrusts, still no contact of the moving rollers and the fixed cup of the box ever occurs.

To enable my invention to be applied to an integral journal-box, I have shown in Fig. 1, upon the bottom portion of said box, which I shall imagine to be entire for the purpose of illustration, a dovetail slot, C, into which fits a corresponding-shaped key, D, this slot extending from the outer end of the journal-box into and across the annular recess *d*, formed therein, the depth of which is equal to the united depths of the recesses *d* and *e*, and of a width equal to or somewhat less than the diameter of the roller *g*.

To insert the various rollers around the journal, and thereby complete the entire anti-friction journal-box, I thrust one of the rollers, *a'*—previously made up with its rollers a^2 a^2 resting upon the bottom of the keyway C—into the box until the roller *g* is in alignment with the recesses *d e*, when it is rolled up into position and another roller, *a*, adjusted in place at the top of the journal-box, there being no difficulty in inserting the latter kind. The other rollers are then inserted alternately, *a' a*, &c., until the journal-box is filled, the key D is then driven home, the plate *l* affixed in place, the cap E put on, and the whole is ready for immediate use.

I claim—

1. In an anti-friction journal-box, the combination of the annular recessed journal-box and the annular recessed journal, with a series of rollers, which are unattached to one

another, and consequently adapted to be independently introduced and removed, substantially as stated.

2. The combination, with the journal B and journal-box A, as herein described, of a series of separate rollers, *a a'*, &c., of diameter substantially as stated.

3. In an anti-friction journal-box, A, the combination of a series of rollers, *a a a' a'*, of uniform diameter, maintained in their proper relative positions one to the other by every alternate roller *a' a'*, carrying rollers *g g*, which rotate in recesses *d e*, for the purpose hereinbefore described, and the spindle *j* connecting the parts a^2 a^2 of their rollers *a' a'*, all substantially as and for purposes set forth.

4. The combination of the journal-box A, with its cap E and keyway F, for the purpose described, with the rollers *a a'*, &c., and the journal B, provided with the plate *l*, whereby end-thrusts are prevented from affecting the series of rollers, and the latter are free to rotate with said journal, substantially as stated.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS TRIPP.

Witnesses:
H. E. LODGE,
A. F. HAYDEN.