

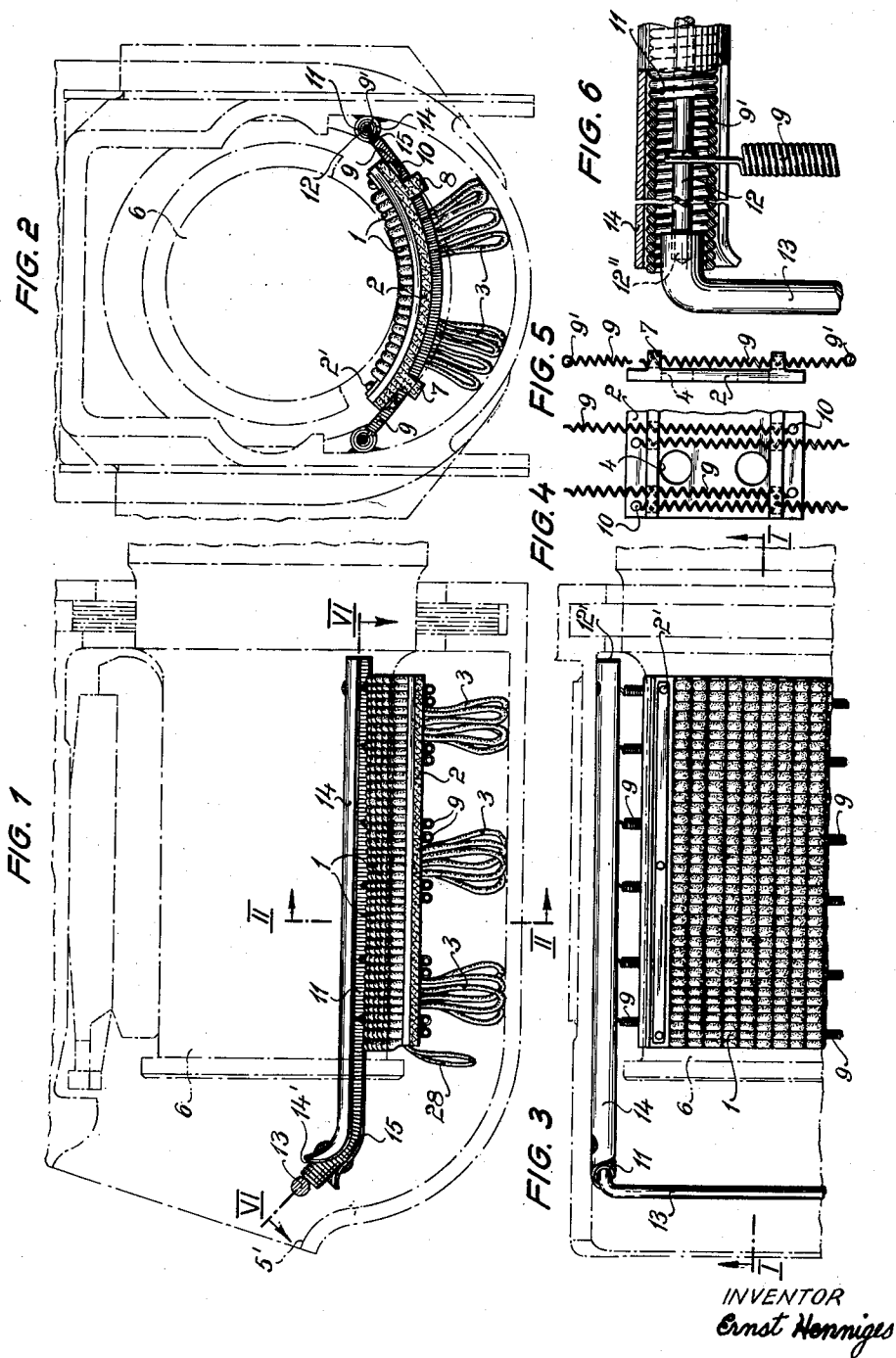
Jan. 3, 1961

E. HENNIGES
LUBRICATING PAD UNIT

2,967,076

Filed Feb. 8, 1955

2 Sheets-Sheet 1



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FIG. 7

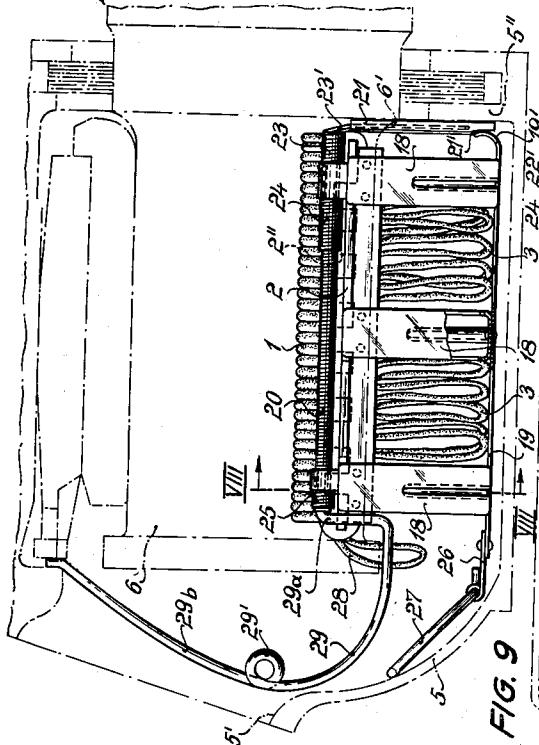
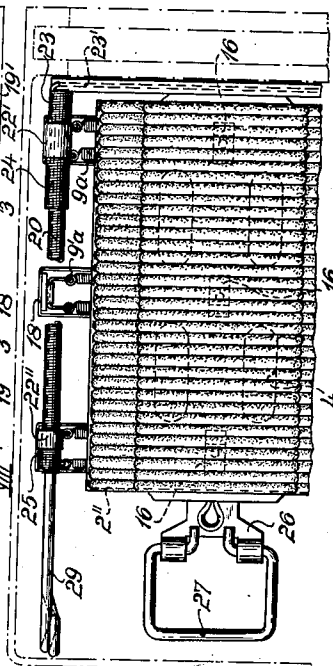


FIG. 9



INVENTOR
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FIG. 8

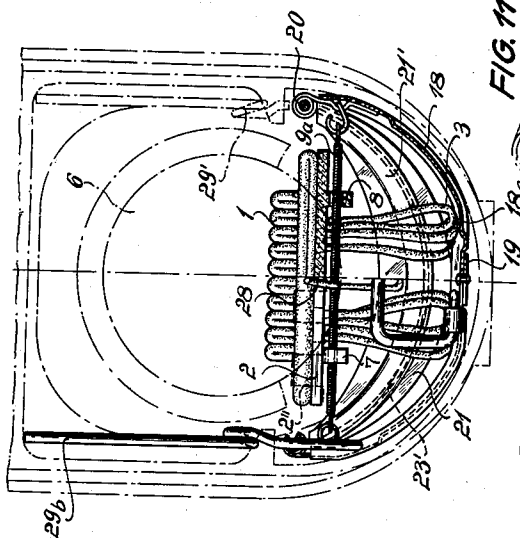


FIG. 11

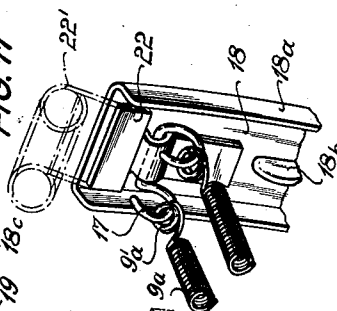
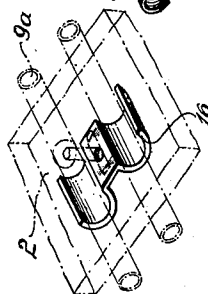


FIG. 10



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2,967,076

LUBRICATING PAD UNIT

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13 Claims. (Cl. 308—88)

The present invention relates to lubricating pad arrangements, and more particularly to a lubricating pad unit for an axle journal and constructed in such manner as to permit insertion into and removal from the casing of the axle journal.

In journal bearings for railroad cars lubricating pads are used for lubricating the axle journals. The lubricating pads consist of a deep-pile fabric and are provided with wick bundles immersed into an oil sump in the journal casing so as to supply oil to the lubricating pads in a capillary action. In the known arrangements, the lubricating pads are urged against the journals by resilient means which are fixedly mounted in the journal casings. While the known lubricating pad arrangements obtain a satisfactory lubricating action, they have the disadvantage that the assembly and removal of the lubricating pad is a difficult operation which can only be carried out in a workshop since the bearing has to be completely dismantled whenever the lubricating pad has to be repaired or replaced.

This is particularly true for certain bearing types in which the journal casing has a small opening whose lower edge is located above the oil level of the oil sump in the journal casing in order to prevent loss of oil.

It is one object of the present invention to overcome the disadvantages of the known lubricating pad arrangements, and to provide a lubricating pad arrangement permitting replacement and repair in a rapid operation.

It is another object of the present invention to provide a lubricating pad unit which can be removed from the journal casing without requiring disassembly of the journal casing.

It is a further object of the present invention to provide a replaceable lubricating pad unit for use with a journal bearing in a railroad car permitting exchanging of the lubricating pad unit while the railroad car remains in operative condition.

It is a still further object of the present invention to provide a lubricating pad unit which is flexible in longitudinal and transverse directions so as to permit insertion of the lubricating pad unit through an opening in the journal casing and through the narrow space between the journal and the casing.

It is yet an object of the present invention to support the lubricating pad on a flexible non-metallic base plate in order to exclude the possibility of a frictional engagement between a metal base plate and the journal.

With these objects in view, the present invention mainly consists in a lubricating pad unit which can be inserted through an opening in the journal casing of a railroad car axle journal, and comprises, in combination, flexible lubricating pad means, and a resilient flexible frame means supporting said pad means and being bendable in a transverse direction together with the pad means into a bent position in which the pad means is bent along the surface of the axle journal. The frame means is also bendable in longitudinal direction so as to permit insertion of the unit through an opening in a journal cas-

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ing through the narrow space between the end of the axle journal and the journal casing. When the lubricating pad unit is in its operative position in which the pad means engages the journal, the flexible frame means is preferably made rigid in longitudinal direction by suitable means so that a reliable engagement between the lubricating pad and the journal is assured.

The resilient flexible frame means according to the present invention includes a pair of resilient longitudinal frame members and a plurality of resilient transverse frame members on which the lubricating pad is supported. According to one embodiment of the present invention, the longitudinal frame members are elongated coil springs which are slidably inserted into rigid guide members secured to the journal casing so that the unit is rigid in longitudinal direction when it is in operative position.

According to another embodiment of the present invention transversely extending longitudinally spaced rigid spacing means are provided which connect the longitudinal flexible frame members to each other, and support the unit on the bottom of the journal casing. The rigid spacing means are preferably arcuate and connected by a longitudinally extending flexible resilient member which is secured to the center portions of the arcuate spacing means.

According to a preferred embodiment of the present invention a transverse end plate member is secured to the ends of the longitudinal frame members and closes the journal casing in axial direction to prevent the passage of oil out of the journal casing.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Fig. 1 is a longitudinal sectional view of one embodiment of the present invention taken on line 1—1 in Fig. 3, and showing the journal casing and the journal in dash and dot lines;

Fig. 2 is a cross sectional view taken on line 2—2 in Fig. 1;

Fig. 3 is a fragmentary plan view of the embodiment shown in Figs. 1 and 2;

Fig. 4 is a fragmentary bottom view of a coil spring supported lubricating pad;

Fig. 5 is a fragmentary end view of the detail shown in Fig. 4;

Fig. 6 is a fragmentary sectional view on an enlarged scale taken on line 6—6 of Fig. 1;

Fig. 7 is a side view of another embodiment of the present invention, the journal casing and journal being shown in dash and dot lines;

Fig. 8 is an end view of the embodiment shown in Fig. 7 partly in section, the right side of the figure being a cross sectional view taken on line 8—8 in Fig. 7;

Fig. 9 is a fragmentary plan view of the embodiment shown in Fig. 7; and

Figs. 10 and 11 are isometric views illustrating supports for springs applied in the embodiment shown in Figs. 7-9.

Referring now to the drawings, and more particularly to Figs. 1-6, the lubricating pad 1 consisting of a deep pile fabric is secured to the non-metallic, flexible base plate 2 which consists of an oil resistant material such as leather or a synthetic material having low absorption capacity. Members 1 and 2 are secured to each other by rivets 2'. A plurality of wick bundles 3 is connected to the lubricating pad 1, the wick bundles passing through openings 4 in the base plate 2 and being immersed into

the oil sump in the lower bottom part of the journal casing. It will be understood that the wicks 3 raise the oil in a capillary action from the oil sump to the lubricating pad 1 which engages the journal 6 and is bent as best seen in Fig. 2, to follow the cylindrical outline of the journal. The journal casing 5 and the axle journal 6 are well known, and since these members are not an object of the present invention they are illustrated in dash and dot lines. The journal casing is provided in a known manner with an opening 5' located above the oil level of the oil sump in the bottom portion of the journal casing 5.

The base plate 2 is provided with two longitudinal ridges 7 having transverse bores 8 which are preferably reinforced by suitable metal sleeves. Transverse flexible resilient frame members illustrated to be coil springs 9 pass through the bores 8 and engage the bottom face of the base plate 2 so as to urge the pad 1 against the downwardly facing peripheral portion of the axle journal 6. The coil springs 9 are uniformly spaced from each other in longitudinal direction of the unit which corresponds to the axial direction of the journal 6. In the embodiment illustrated in Figs. 1-5, each coil spring means includes two coil springs 9 which are secured to different longitudinal frame members 11, 12. Each coil spring 9 passes through bores 8 in the ridges 7 and is secured by rivets 10 at the inner end thereof to the bottom face of the base plate 2.

The longitudinal resilient frame members consist of coil springs 11, and flexible resilient rods 12 located in the interior of the coil springs 11 and being secured to the rear ends of the coil springs 11 by end members 12' which are preferably threaded caps. The front ends of the flexible resilient rods 12 are threaded at 12'' and are connected to each other by a rigid transverse spacing member 13 which spaces the longitudinal frame members 11, 12 from each other, and at the same time constitutes a handle at which the unit can be gripped for removal and insertion through the opening 5' in the journal casing. The outer ends of the coil springs 9 are provided with eyes 9', best seen in Fig. 6, through which the flexible rods 12 pass whereby the transverse springs 9 are supported on the longitudinal frame members 11, 12. The end portions of the springs 9 pass between adjacent windings of the springs 11. The arrangement of the transverse coil springs illustrated in Figs. 4 and 5 obtains a particularly soft resilient support of the pad means 1, 2.

It will be apparent that the above-described frame means which consists of the longitudinal resilient frame members 11, 12 and of the transverse resilient frame members 9 is flexible in longitudinal and transverse directions. Consequently, it is possible to insert the unit through the opening 5' which requires longitudinal bending of the unit during the passage of the unit through the opening 5 and into the guide members 14. The two rigid guide members 14 which in the illustrated embodiment are slotted tubular members, are secured to the wall of the journal casing 5, and the longitudinal frame members 11 are slidably inserted into the guide members 14 while the slots 15 in the same permit passing of the end portions of the transverse springs 9. The forward end 14' of the guide members 14 is flared so as to facilitate insertion of the longitudinal frame members 11.

The guide members 14 are arranged in the journal casing 5 at such height with respect to the journal 6 that the transverse frame members 9 are tensioned to press the lubricating pad 1 against the journal 6. Due to the flexibility and resiliency of the transverse frame members 9 and of the base plate 2 of the lubricating pad means 1, 2, the unit can slide over the end of the journal 6.

When it is desired to remove the unit, the transverse handle member 13 is gripped through the opening 5' in the casing and the entire unit pulled out.

Referring now to the embodiment illustrated in Figs.

7-11, a resilient frame means comprising resilient longitudinal frame members 20 and resilient transverse frame members 9a supports a lubricating pad 1 which has a flexible base plate 2. Members 1 and 2 are sewn together by a seam 2''. Elements in Figs. 7-11 which correspond to elements illustrated in Figs. 1-6 are indicated by the same reference numerals.

The transverse frame members are constituted by pairs of coil springs 9a which extend across the entire width of the base plate 2 and of the lubricating pad 1, and pass through bores 8 in ridges 7 on the base plate 2, as best seen in Fig. 8. The springs 9a are secured to the base plate 2 by clamping means 16 which press two adjacent springs 9a against the base plate 2.

Three transversely extending rigid supporting and spacing members 18 are arranged underneath the lubricating pad, and rest on the bottom of the journal casing 5. The supporting members 18 have arcuate shape and are provided with flanges 18a and with ridges 18b which increase the rigidity of the supporting members 18. Attaching members 22 are fixedly secured to the ends of the supporting members 18 and hold the hooks 17. Each spring 9a is provided with an eye 9'a which is hooked into a hook 17, as best seen in Fig. 11. The rigid supporting and spacing members 18 are connected by a longitudinally extending connecting leaf spring 19 which is riveted to the supporting members 18. Instead of one connecting leaf spring 19, two or more similar connecting means may be provided, but the connecting leaf springs should be arranged in the region of the center portion of the rigid supporting members 18 in such manner that the frame is flexible in longitudinal direction. The center portions of the arcuate supporting members 18 are flattened as best seen in Fig. 8 so that the attaching rivets and the connecting leaf spring 19 does not project from the outline of the supporting members 18 and does not interfere with the support of the same on the inner surface or the journal casing bottom 5.

The upper ends of the attaching members 22 are provided with sleeves 22' through which coil springs 20 pass. The frame consisting of the rigid members 18, the coil springs 20, the longitudinal connecting spring 19, and the transverse springs 9a is flexible in longitudinal and transverse directions and can be inserted through the opening 5' into the journal casing and through the narrow space between the end of the journal 6 and the journal casing wall 5. Due to the resiliency of the longitudinal springs 20 and 19, the frame tends to assume a straight position when placed in its operative position. In Fig. 8 the transverse springs 9a are illustrated in a straight position, but it will be understood that when the lubricating unit is inserted, the lubricating pad 1 engages the cylindrical surface of the journal 6 so that the springs 9a are curved and urge the pad against the journal 6.

The sleeves 22' of the supporting member 18 which are located remote from the openings 5', are prevented from sliding on the springs 20 by coil spring portions 23 and 24 which are screwed from both sides onto the springs 20. The coil spring portions 23 are constituted by the ends of an arcuate spring wire 23' on which a crescent-shaped end plate 21 is resiliently supported. End plate 21 has an arcuate ledge formed with a downwardly open groove in which the arcuate wire 23' is located. The end plate 21 covers the opening at the rear end of the journal casing 5 and is resiliently pressed by the spring wire 23' and by the curved end of 19' the connecting leaf spring 19 against a partitioning wall portion 5'' of the journal casing 5 and against the shoulder 6' of the journal 6. The end plate 21 prevents spilling of oil from the oil sump in the bottom portion of the casing 5 into the adjacent chamber of the casing. The front ends of the springs 20 are provided with coil spring portions 25 which are screwed on the same and limit movement of the sleeves 22'' associated with the forwardly located supporting member 18. However, the members 22'' are slidable on the springs 20 so that

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the frame can be longitudinally bent into a position in which the ends of the forwardly and rearwardly located supporting members 18 are directly adjacent.

The end plate 21 is preferably made of an oil-resistant and flexible synthetic material. Plate 21 is bounded by two arcuate edges, the inner arcuate edge extending to the journal 6 at the place in which a shoulder is formed on the same, while the outer arcuate edge of the crescent-shaped plate 21 is located opposite the inner surface of the bottom portion of the casing. A ledge 21' permits detachable attachment of the plate 21 to the spring wire 23'.

In operative position of the lubricating pad unit, the end plate 21 is pressed by the spring wire 23', by the end of leaf spring 19, and by the longitudinal springs 20 and against a shoulder 6' on the journal 6 and against the partitioning wall 5'' which separates the journal casing from the dust chamber in which a dust sealing ring is arranged in a conventional manner to prevent the entering of dust, water, and so forth into the journal casing.

The forward end of the connecting leaf spring 19 is extended and provided with two sleeves 26 to which a handle 27 is attached. The entire unit can be pulled out by means of handle 27, but in order to prevent binding of the pad 1, a flexible cord loop 28 serving as a handle is attached to the pad 1 and facilitates the manual removal of the unit.

The entire unit can be inserted through the opening 5' in a longitudinally bent position which is necessary for the passing of the unit between the end of the journal 6 and the wall of the bottom portion of the casing 5. When the unit is in operative position, as illustrated in Fig. 7, the pad 1 is transversely curved and pressed by the springs 9a against the cylindrical bearing surface of the journal 6, while the end plate member 21 is pressed against the shoulder 6' of the journal and against the partitioning wall 5'' to prevent filling of oil.

A pair of spring rods 29 of which only one is illustrated in Fig. 9, is provided for holding the unit securely in operative position. Each spring rod includes a straight portion which is inserted into the longitudinal coil springs 20 to increase the rigidity of the same. A bent portion 29a engages the forward end of each spring 20, and a curved clamping portion 29b resiliently engages a wall of the casing 5. To increase the resiliency of portion 29b, a loop 29' is provided in the same. The spring rods 29 urge the lubricating unit into the casing and the end plate 21 into sealing engagement. For removal of the unit, the curved spring portions 29b are detached, the spring rods 29 pulled out of the springs 20, whereupon the handles 28 and 27 can be used for pulling the unit in bent position out of the opening 5' of the casing 5.

It will be apparent that the insertion and removal of the lubricating pad unit according to the present invention can be carried out in a rapid and simple operation while a railroad car provided with the units according to the present invention remains in operative condition. No oil is lost during the exchange of the unit since the lower edge of the opening 5' is substantially higher than the surface level of the oil sump in the bottom portion of the casing 5. Oil cups for the oil, which are necessary in other journal casing constructions, are avoided in the construction of the present invention.

While an end plate 21 has been described only in reference to the embodiment of Figs. 7-11, it will be understood that a corresponding end plate can be provided in the embodiment of Figs. 1-6, and supported on the longitudinal springs 11.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of lubricating pad arrangements differing from the types described above.

While the invention has been illustrated and described as embodied in a lubricating pad unit including a longitudinally and transversely flexible resilient frame, it is not

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intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. Lubricating pad unit comprising, in combination, flexible lubricating pad means including a flexible base plate having longitudinal ridges formed with transverse bores; a resilient flexible frame means including a pair of resilient flexible longitudinal frame members, and a plurality of transversely extending spring means having ends connected to said longitudinal frame members, said transverse spring means passing through said bores in said longitudinal ridges of said base plate and supporting said pad means and being bendable in a transverse direction together with said pad means into a bent position in which said pad means is transversely curved for engaging the surface of an axle journal, said frame means being resiliently bendable in longitudinal direction for insertion into a journal casing; and rigid spacing means connected to said longitudinal frame members for spacing the same in transverse direction and including members adapted to be supported on the journal casing.

2. Lubricating pad unit comprising, in combination, flexible lubricating pad means including a flexible base plate having longitudinal ridges formed with transverse bores; a resilient flexible frame means including a pair of resilient flexible longitudinal frame members, and a plurality of transversely extending spring means having ends connected to said longitudinal frame members, each of said transversely extending spring means including a first coil spring having one end thereof secured to one of said longitudinal frame members, and the other end thereof secured to said base plate adjacent the other longitudinal frame member, and a second coil spring having one end thereof secured to the other of said longitudinal frame members and the other end thereof secured to said base plate adjacent said one longitudinal frame member, said transverse spring means passing through said bores in said longitudinal ridges of said base plate and supporting said pad means and being bendable in a transverse direction together with said pad means into a bent position in which said pad means is transversely curved for engaging the surface of an axle journal, said frame means being resiliently bendable in longitudinal direction for insertion into a journal casing; and rigid spacing means connected to said longitudinal frame members for spacing the same in transverse direction and including members adapted to be supported on the journal casing.

3. Lubricating pad unit comprising, in combination, flexible lubricating pad means including a flexible base plate; a resilient flexible frame means including a pair of resilient flexible longitudinal frame members, and a plurality of resilient flexible transverse frame members having ends connected to said longitudinal frame members and other ends secured to said flexible base plate, said transverse frame members supporting said pad means and being bendable in a transverse direction together with said pad means into a bent position in which said pad means is transversely curved for engaging the surface of an axle journal, said frame means being resiliently bendable in longitudinal direction for insertion into a journal casing; and spacing means including a pair of elongated rigid guide members adapted to be secured to the journal

casing and slidably receiving said longitudinal frame members.

4. Lubricating pad unit comprising, in combination, flexible lubricating pad means for a journal and including a flexible base plate; a plurality of transversely extending spring means secured to said base plate and supporting said pad means; a pair of flexible resilient longitudinal frame members each longitudinal frame member including a coil spring and a flexible rod located within said coil spring and secured to one end of the same, said flexible rods supporting the ends of said transversely extending spring means; rigid means connected to the other ends of said flexible rods of said longitudinal frame members and including a transverse handle portion spacing the same in transverse direction from each other; and a pair of elongated rigid guide members formed with longitudinal slots and adapted to be secured to a journal casing, said elongated guide members slidably receiving said longitudinal frame members with the ends of said transversely extending spring means passing through said longitudinal slots.

5. Lubricating pad unit comprising, in combination, flexible lubricating pad means for an axle journal and including a flexible base plate; a plurality of transverse spring means secured to said base plate and supporting said pad means for movement into a bent position in which said pad means is transversely curved for engaging the surface of the axle journal; a plurality of transversely extending longitudinally spaced rigid supporting members, adapted to be supported on a journal casing housing the axle journal, each supporting member supporting the ends of one of said transverse spring means; longitudinally extending resilient means connected to said supporting members; and a longitudinally extending resilient connecting means secured to said supporting members spaced substantially equal distances from the ends of the same.

6. Lubricating pad unit comprising, in combination, flexible lubricating pad means for an axle journal and including a flexible base plate; a plurality of transverse spring means secured to said base plate and supporting said pad means for movement into a bent position in which said pad means is transversely curved for engaging the surface of the axle journal; a plurality of transversely extending longitudinally spaced rigid supporting members adapted to be supported on a journal casing housing the axle journal, each supporting member supporting the ends of one of said transverse spring means; longitudinally extending coil spring means connected to said supporting members; and a longitudinally extending resilient connecting means secured to said supporting members spaced substantially equal distances from the ends of the same.

7. Lubricating pad unit for a journal casing comprising, in combination, flexible lubricating pad means including a flexible base plate; a resilient flexible frame means including a pair of resilient flexible longitudinal frame members, and a plurality of resilient flexible transverse frame members having ends connected to said longitudinal frame members, said transverse frame members supporting said pad means and being bendable in a transverse direction together with said pad means into a bent position in which said pad means is transversely curved for engaging the surface of an axle journal, said frame means being resiliently bendable in longitudinal direction for insertion into a journal casing; a transversely extending end plate member supported on said longitudinal frame members and adapted to retain a lubricant in the journal casing; and rigid spacing means connected to said longitudinal frame members for spacing the same in transverse direction and including members adapted to be supported on the journal casing.

8. Lubricating pad unit comprising, in combination, flexible lubricating pad means for an axle journal and including a flexible base plate; a plurality of transverse spring means secured to said base plate and supporting

said pad means for movement into a bent position in which said pad means is transversely curved for engaging the surface of the axle journal; a plurality of transversely extending longitudinally spaced rigid supporting members adapted to be supported on a journal casing housing the axle journal, each supporting member supporting the ends of one of said transverse spring means; a pair of longitudinally extending spring means connected to said ends of said supporting members; an arcuate spring having ends attached to one pair of ends of said pair of longitudinal spring means; and a transversely extending end plate member supported on said arcuate spring and adapted to retain a lubricant in the journal casing.

9. Lubricating pad unit comprising, in combination, flexible lubricating pad means for an axle journal and including a flexible base plate; a plurality of transverse spring means secured to said base plate and supporting said pad means for movement into a bent position in which said pad means is transversely curved for engaging the surface of the axle journal; a plurality of transversely extending longitudinally spaced rigid supporting members adapted to be supported on a journal casing housing the axle journal, each supporting member supporting the ends of one of said transverse spring means; a pair of longitudinally extending coil spring means secured to one of said supporting members; and slidably connected to at least one other of said supporting members; and arcuate spring having ends attached to one pair of ends of said longitudinally extending coil spring means; a transversely extending end plate member supported on said arcuate spring and adapted to retain a lubricant in the journal casing; and spring rod means including a straight portion located in said longitudinally extending coil spring means and a curved portion abutting against the other pair of ends of said longitudinally extending coil spring means and adapted to resiliently engage the journal casing so as to urge said longitudinally extending coil spring means and said end plate member into the journal casing.

10. An arrangement as claimed in claim 9 wherein said curved portion of said resilient rod means includes at least one loop.

11. Lubricating pad unit comprising, in combination, flexible lubricating pad means for an axle journal and including a flexible base plate; a plurality of transverse spring means secured to said base plate and supporting said pad means for movement into a bent position in which said pad means is transversely curved for engaging the surface of the axle journal; a plurality of transversely extending longitudinally spaced rigid supporting members adapted to be supported on a journal casing housing the axle journal, each supporting member supporting the ends of one of said transverse spring means; a pair of longitudinally extending coil spring means connected to the ends of said supporting members and having a pair of ends projecting beyond the same; an arcuate spring wire having coiled ends into which are screwed said pair of ends of said pair of longitudinally coil spring means, said arcuate spring wire extending downwardly from said ends thereof into the journal casing; and a transversely extending end plate member supported on said arcuate spring wire spaced in longitudinal direction from said supporting members and adapted to retain a lubricant in the journal casing.

12. In combination with a journal casing and having an opening and an axle journal, a lubricating pad unit inserted in said journal casing through said opening, said lubricating pad unit comprising flexible lubricating pad means, and a resilient flexible frame means supporting said lubricating pad means and including a pair of resilient flexible lateral axially extending tubular frame members and an end plate member engaging said journal casing and adapted to prevent spilling of oil out of said casing; a pair of spring rod means, each spring rod means having a straight portion located within one of said tubular frame members, and a curved clamping portion engaging said

journal casing and urging said lubricating pad unit into said journal casing and said end plate member into tight engagement with said journal casing; and a plurality of transversely extending longitudinally spaced rigid arcuate supporting members supported in the journal casing and having ends secured to said lateral frame members for spacing the same in transverse direction.

13. A lubricating device for use in a railway journal box having a quantity of oil disposed in the bottom thereof and a journal extending therein, comprising a quantity of wicking material adapted in use to extend from the oil in the bottom of the journal box to the journal therein, a wicking material support upon which said wicking material is operatively mounted, said support being flexible in a direction parallel to the axis of the journal during insertion in the journal box, a sleeve provided on each side of said support and disposed with the axis thereof parallel to the axis of the journal, and a pair of retainer

members, each retainer member including a first portion disposed in one of said sleeves to rigidify said support in a direction parallel to the axis of the journal and a second portion engagable in the journal box to hold said support in the bottom thereof.

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