This invention relates to an improvement in railway track joints and similar structures whereby the joints may be kept lubricated, and binding and corrosion of the various parts thereof prevented.

In the ordinary railway track structure, it is customary to secure the abutting ends of the track rails together by means of angle or fish plates which extend over the joint at each side of the adjoining track rails and are secured between the head and flange of the rail in such a way as to prevent the ends of the rails moving out of alignment. To hold the ends of the rails in the necessary vertical alignment it is essential that the fish or angle plates be tightly clamped between the head and flange of the rail, and the necessary tightening of the bolts often brings about such firm contact of the abutting surfaces of the rails and the fish plates as to prevent longitudinal movement of the rail, or of the ends of the rail at the joint, which is necessary to permit expansion and contraction of the rails under changes in temperature. This binding of the rails to the fish plates, preventing longitudinal movement of the rail, is aggravated by the corrosion of the rail and fish plates and the bolts which hold the rails and fish plates together, to such extent that after a short time in service the parts of the joint become corroded together in such a way as to produce a substantially solid connection between the ends of the various rails so that for great distances along a given section of track, the desired expansion and contraction of each individual rail is not realized and the expansion and contraction piles up at one free joint and causes bending or warping of the rail, or perhaps breakage. Another disadvantage due to the corrosion of the parts of the rail joint is that the tie bolts cannot usually be tightened up after a short time in service because of this corrosion making it necessary in tightening or repairing a track joint, to chisel the existing bolts in two and insert new bolts. Under the impact of the car wheel the steel of the fish plates rubs against the steel rail and considerable wear occurs where two metallic surfaces contact, making frequent tightening of the joint necessary.

It is one of the objects of this invention to maintain a continuous supply of oil between these two surfaces, thereby reducing the wear of the plates and reducing the necessity for tightening up the joint, while at the same time keeping the parts of the joint free for relative movement and in condition to be easily tightened.

Another object of the present invention is to eliminate these various defects and to provide a substantially permanently oiled track joint which will keep the various joints of the track oiled, and permit the desired relative movement of the parts, while still holding the abutting ends of the track rails in their desired alignment.

Another object of the invention is to provide an efficient means of keeping the track joints lubricated, which means can be manufactured and installed in each track joint at a relatively low cost.

Another object of the invention is to provide a substantially self-oiling track joint in which the passage of the wheels over the joint will cause the extrusion of a certain amount of oil from the joint packing over the metal parts of the joint, thereby preventing corrosion.

Another object of the invention is to provide a lubricating packing or pad which can be manufactured at a low cost and installed in the track joints with relatively little labor over that now required to make the track joint.

Another object of the invention is to provide a means for keeping the bolts of the track joints lubricated and to prevent corrosion thereof so as to permit tightening of the bolts when desired even after a period of use and exposure to the elements.

Various other objects and advantages of the invention will appear as the description thereof proceeds.

Referring now to the drawings, which show several possible forms of embodiment of the invention:

Fig. 1 is a sectional view through the track joint, showing my lubricating means installed therein.

Fig. 2 is an elevational view of a lubricant-holding pad for track joints.

Fig. 3 is a view of a lubricated bolt for use in conjunction with my invention.

Fig. 4 is a plan view, with parts broken away, of a track joint similar to that shown in Fig. 1.

Fig. 5 is a detail sectional view of an end-closure plate of the track joint.

Fig. 6 is a view similar to Fig. 1, showing a modified type of joint packing.
Fig. 7 is a perspective view of another form of lubricant pad for track joints.

Fig. 8 is a sectional view of the joint, showing the pads of Fig. 7 being installed therein.

Fig. 9 is a detail view of a portion of the lubricant pad of Fig. 7.

Fig. 10 is a sectional view of a track rail, showing a modified type of end closure plate for the track joint.

Attempts have been made heretofore to lubricate track joints to permit relative longitudinal movement of the parts thereof and to reduce corrosion, by squirting oil upon the track joint from cars or other equipment moving on the track rails or by hand, and by providing the rubbing faces of the fish plates against the rail with grooves, through which oil can seep into the inside of the joint. So far as I am aware, however, no attempt has heretofore been made to provide a substantially permanently-oiled and packed track joint. According to my invention the space between the fish plates and the webs of the rails is provided with an oil-impregnated packing of fibrous, wick-like, granular or other material, which will contain the oil for a comparatively long period of time, and which, due to the relative movement of the parts by the passage of the car wheels thereover, will exude oil into the various crevices and bolts of the track joint to keep the parts lubricated and free to move slightly relative to each other. It will be understood that an invention of this nature may be embodied in various types of means.

Fig. 4 shows an embodiment of the invention, in which the adjoining ends of the rails 1 and 2 are bridged by the fish plates 3 along each side of the ends of the rails, each fish plate contacting with the head and flange of the rails at the points 4 and 5. Tie bolts 6 extend through the web of the rail connecting the fish plates on the opposite sides of the joint.

According to this embodiment of my invention, the spaces which normally intervene between the fish plates and the web are filled with oil-impregnated pads 7 which may be composed of felt, cotton waste, journal-box stuffing material or any other fibrous or granular oil-retaining means. These pads are preferably formed to the approximate shape of the space between the fish plates and the web of the rail, as indicated in Fig. 2, and are provided with holes 8 through which the tie bolts 6 may extend and with end-closing plates 9 which close the ends of the spaces between the fish plates and the web of the rails to prevent the leakage of the lubricant from the joint. These end closing plates 9 may be of wood, metal, rubber, bakelite, or any other material suitable to retain the oil in the joint. The pads are preferably of a compressible nature, so as to permit them to be compressed and take more accurately the shape of the opening between the fish plates and the rail, when the fish plates are tightened on each side of the joint. These pads are preferably installed on the track when the track is laid, and the oil in the pads 7 may be renewed at intervals by pouring oil over the joint or introducing into the space occupied by the pads in any other suitable way. The tie bolts 6 in this construction are substantially always surrounded with oil, which prevents corrosion, especially of the thread portions and permits the bolt to be tightened or loosened, as desired. In order to protect the end of the bolt and secure lubrication of the threads thereof, the nut 10 for tightening is preferably closed at the end and a suitable liquid or viscous lubricant 11 is inserted in the closed end of the nut, so that upon tightening of the nut the lubricant is forced out along the threads of the bolt to lubricate the threads. A lock washer 10 prevents accidental loosening of the bolt.

It will be understood that the packing or pads 7 may be inserted in the joints in a dry condition and then impregnated with the oil by pouring or forcing oil into the packing, or the pads may be impregnated with oil before they are installed in the joint.

Fig. 4 shows a plan view of substantially the type of joint indicated in Fig. 1, certain parts of the rails and flanges being broken away, for the sake of clearness. In this embodiment of the invention, the ends of the spaces between the fish plates 3 and the rails 1 and 2, are closed by the means of an angle plate 12, Fig. 5, which provides the plug 13 projecting into the opening at the ends of the fish plates and an angle member 14 which is adapted to lie along the outer side of the fish plate and is provided with a bolt 15 for the passage of one of the tie bolts 6, which tie bolt holds the fish plates to the rail, and also the end-closure of the end of the fish plate. The closure 12 may be provided with a valve opening 16 extending through the end of the plate, providing a spring-pressed ball 17 which normally prevents the entrance of liquid into the opening between the fish plates and the rail, or the escape of liquid therefrom. A cap 18 with a bayonet lock joint normally covers the opening 16. To introduce lubricant into the joint, the cap 18 may be removed and a nozzle or a force pump installed on the projecting end of valve opening 16 and oil forced into the joint and pads 7 under pressure.

To lubricate a joint where no end plates are used a suitable wedge-shaped perforated plug may be temporarily pushed into one end of the space between the fish plates and the rail and oil forced through the perforation until the joint is properly lubricated.
The plug may then be withdrawn and moved to the next joint.

The tie upon which the ends of the track rails rest prevents or retards the escape of oil from the space between the ends of the track rails, and if desired a metal plate or chair may be provided for the ends of the rails to rest upon and to partially seal this crevice.

Fig. 6 shows a modification of the invention in which the space between the rail 1 and the fish plate 3 is packed with oil-impregnated cotton waste or journal-box stuffing material 7, which may be formless, but which, when the fish plate is tightened against the rail 1, will take the form of and substantially fill the space between the fish plate and the web of the rail. It will be understood that this type of packing, as well as the form of pad referred to in other portions of the specification, may be installed in the joints of existing trackways, either by the removal of the fish plates and the insertion of the formed pads therein, or by stuffing the oil-impregnated formless packing 7 of Fig. 6 into the space at each end of the fish plates without loosening of the fish plates and then closing the space at the ends of the fish plates by suitable closing means, such as plate 12, Fig. 5, to prevent the escape of oil from the joint.

Fig. 7 shows an embodiment of a formed oil-impregnated pad 7, which comprises an outer or covering layer of suitable flexible fabric 19, closing an oil-impregnated inner packing material 20 and providing holes 21 through which the tie bolts 6 may extend. This type of lubricating pad may be of rectangular or other easily manufactured shape, but is of such a nature that it will take the shape of the space between the fish plates 3 and the web of the rails when tightened up, as illustrated at the right of Fig. 8.

The left side of Fig. 8 shows the fish plate 3 with the pad 7 between the plate and the rail before the fish plate has been tightened up into engagement with the rail. In this embodiment of the invention, the holes 21 through the pad may be lined with a metallic eyelet 22 through which the tie bolts pass and which is perforated; as indicated, to permit the passage of oil through the eyelets to the sides of the bolts, to keep the bolts lubricated.

Fig. 10 shows an end view of the fish plates 3 which are provided with closure plates 23, secured to the ends of the fish plates by screws 24, extending into the tapped holes in the ends of the fish plates.

This type of end closure is particularly suited to installation on track joints on existing trackage where the lubricant packing may be stuffed into the joint at each end of the fish plates and the holes for screws 24 drilled and tapped and the closure plates 23 attached thereto, to prevent the escape of oil from the joints.

The invention is applicable to any type of track structure and to third rails, and in addition to the lubricating and anti-corrosion function of the packing, it deadens the sound of the cars passing over the track joints. The packing is preferably used at every joint of the track, but its use at specified intervals or on isolated joints is very beneficial in reducing rail breakages.

While the invention has been described and illustrated by means of specific embodiments thereof, it will be understood that it is my intention to broadly claim the use of a permanently or semi-permanently, lubricated track joint for railway tracks, and that many modifications and changes may be resorted to within the spirit of the invention without departing from the scope of the appended claims.

I claim:

1. The combination with a railway track joint of a fibrous packing therein adapted to receive and retain a track joint lubricant.

2. In a railway track joint, the combination of a pair of abutting track rails, fish plates extending along each side of each rail adjacent the ends, a lubricating packing between the fish plates and the rails adapted to receive and hold a track joint lubricant and means to secure the fish plates and rails together.

3. In a railway track joint, the combination of a pair of abutting track rails, fish plates extending along each side of each rail adjacent the ends, a lubricating packing between the fish plates and the rails adapted to receive and retain a track joint lubricant, means to secure the fish plates and rails together, means to close the spaces between the ends of the fish plates and the track rails, and means to permit the introduction of oil under pressure into the said spaces and preventing the escape of oil therefrom.

4. In a railway track joint, the combination of a pair of abutting track rails, fish plates extending along each side of each rail adjacent the ends, a fibrous packing between the fish plates and the rails adapted to receive and retain a track joint lubricant, means to secure the fish plates and the rails together, means to close the spaces between the ends of the fish plates and the track rails, and means to lubricate the threads of the tie bolts.

5. As an article of manufacture, a pad of approximately the size of a railway fish.
plate and holes through said pad to permit the bolts to pass therethrough, said pad being adapted to receive a track joint lubricant.

5 7. As an article of manufacture, a pad approximately the size and shape of the space between the fish plates and rails of a railway track joint, a plurality of holes through said pad to permit the passage of tie bolts therethrough and oil resistant means at the end of the pad for closing the space between the fish plates and the rails.

8. The method of preserving flexibility and preventing corrosion of a railway track joint which comprises inserting an oil-impregnated absorbent packing between the parts of the joint and permitting the movement of the parts of the joint under traffic to cause a flow of oil from said packing to the parts to be lubricated.

9. The method of preserving flexibility of movement and retarding corrosion of a railway track joint, which comprises packing the spaces between the rails and fish plates of the joint with an oil-retaining packing and closing the ends of the spaces to prevent the escaping of oil from the joint and supplying oil to said packing.

10. The method of preserving flexibility of movement and retarding corrosion of a railway track joint, which comprises placing an oil-impregnated packing in the spaces between the fish plates and the rails of a track joint, closing the ends of said spaces and periodically supplying oil to said packing.

11. The combination with a railway track joint of an absorbent material therein adapted to receive and retain a track joint lubricant.

12. In a railway track joint, the combination of a pair of abutting track rails, fish plates extending along each side of each rail adjacent the ends, tie bolts to secure the fish plates and the rails together and means to lubricate the threads of the tie bolts.

13. In a railway track joint, the combination of a pair of abutting track rails, fish plates extending along each side of each rail adjacent the ends, a lubricating packing between the fish plates and the rails, tie bolts to secure the fish plates and the rails together and a grease nut on each tie bolt to lubricate the threads thereof.

In testimony whereof I have affixed my signature to this specification.

WILLIAM H. SCHNEIDER.