

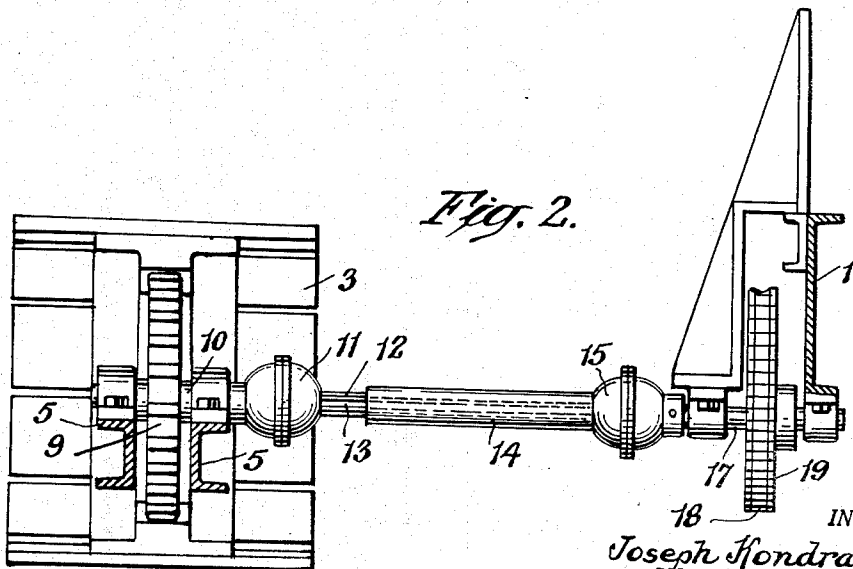
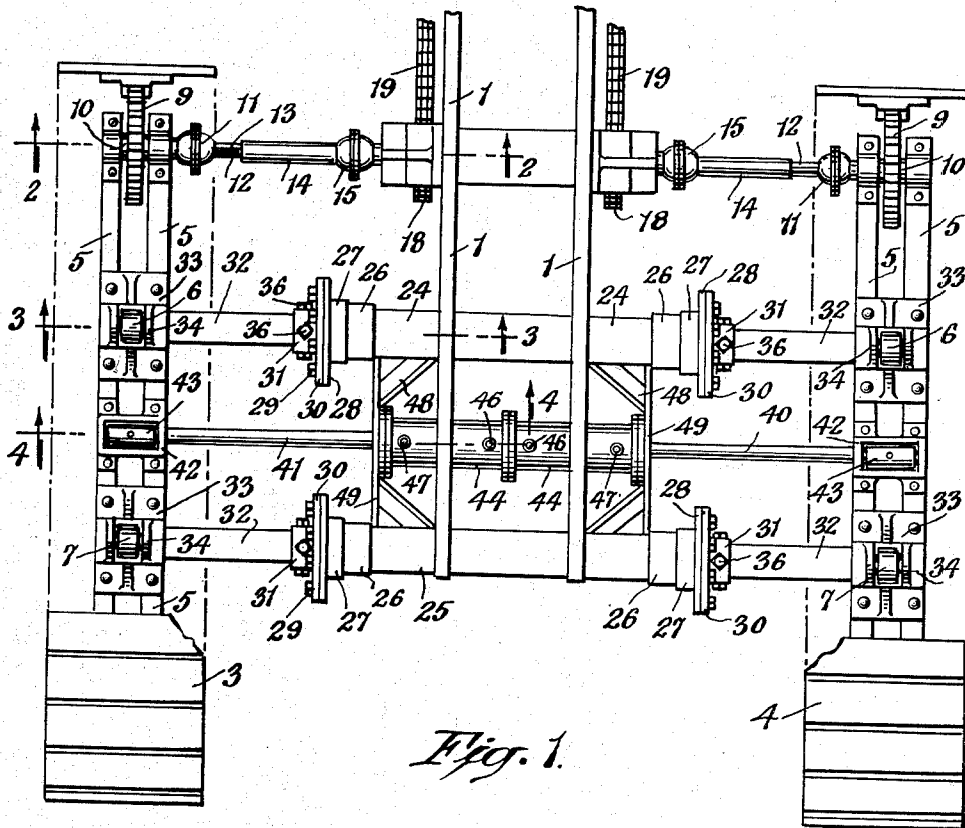
June 15, 1954

J. KONDRACKI
TRACK-ADJUSTING MEANS FOR TRENCH
DIGGERS AND SIMILAR MACHINES

2,681,231

Filed April 16, 1952

2 Sheets-Sheet 1



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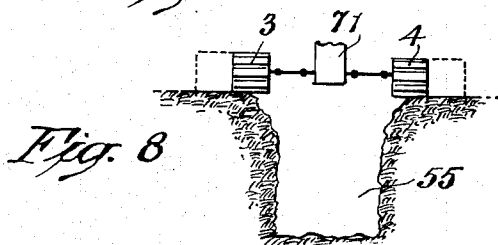
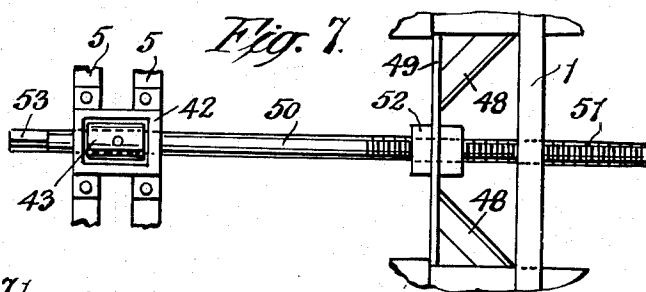
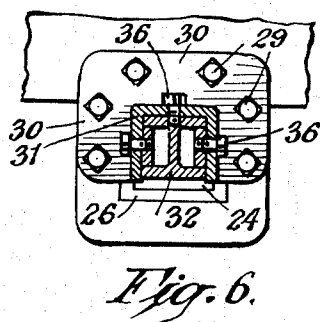
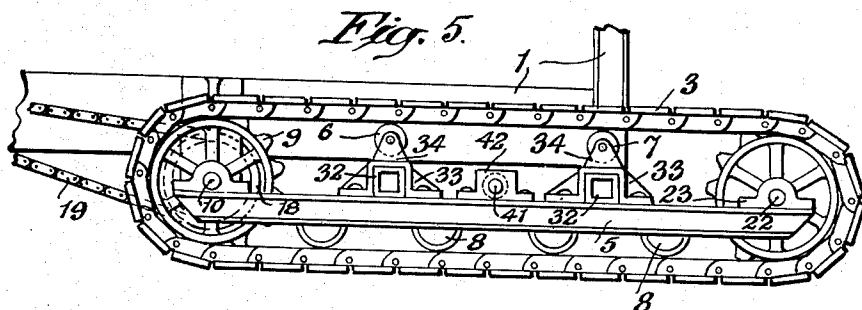
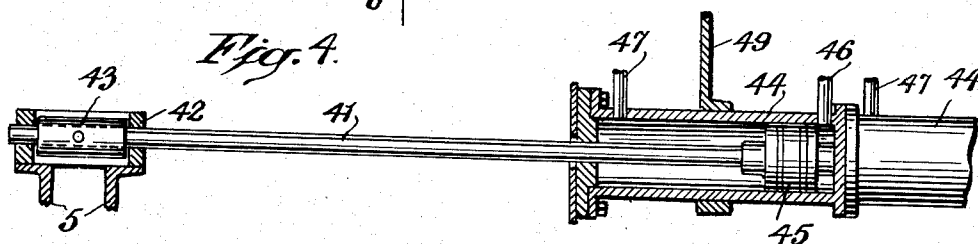
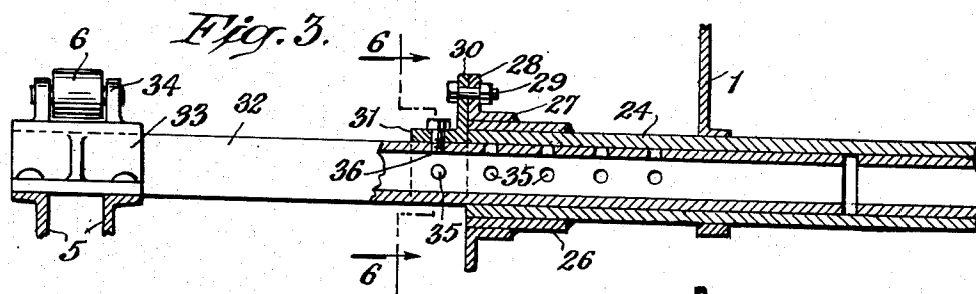
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TRACK-ADJUSTING MEANS FOR TRENCH
DIGGERS AND SIMILAR MACHINES

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7 Claims. (Cl. 280—34)

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This invention relates to trench or ditch-digging machines and to other machines of the so-called endless tread type, and one of the objects of the invention is to provide means by which the tracks or treads of a machine of this character can be adjusted to bring them either closer to one another or else to move and position the same farther apart, as required by certain ditch-digging or other excavating operations.

Under certain working conditions, and particularly when working in soft or crumbly soil, it is desirable to have the tracks or treads of the machine spaced relatively wide apart lest the edge of the ditch that is being dug shall collapse and cause the machine to sink into the ditch. There are numerous other occasions when undertaking various types of digging or excavation work when it is found desirable to have the tracks spaced as widely apart as possible, and hence some effective and easy means by which this can be done is desirable. The present invention relates to the production of such means. On the other hand, when it is necessary for the machine to traverse a road or highway, it is then desirable for the machine to have its tracks arranged relatively close together. The present invention therefore contemplates the provision of means by which the tracks may be closely spaced when necessary and more widely spaced apart when a particular use requires it.

With these objects, and other objects to be hereinafter set forth, in view, I have devised the particular arrangement of parts to be described and more particularly pointed out in the claims appended hereto.

In the accompanying drawings, wherein an illustrative embodiment of the invention is disclosed:

Fig. 1 is a top plan view of the portions of a trench or ditch digger to which the invention has been applied;

Fig. 2 is a sectional view taken substantially on the line 2—2 of Fig. 1, looking in the direction of the arrows;

Fig. 3 is a sectional view taken substantially on the line 3—3 of Fig. 1, looking in the direction of the arrows;

Fig. 4 is a sectional view taken substantially on the line 4—4 of Fig. 1, looking in the direction of the arrows;

Fig. 5 is a side elevation of the track portion of the machine;

Fig. 6 is a sectional view, taken substantially on the line 6—6 of Fig. 3, looking in the direction of the arrows;

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Fig. 7 shows a modified means by which adjustment of the track is attained; and

Fig. 8 is a diagrammatic view showing how the adjustment of the tracks is desirable under certain working conditions.

The machine to which the present invention is applied is known in the art as a trench or ditch-digger, and an example of such a machine is that known as "The Cleveland Baby Digger." This particular machine is shown herein as exemplary of the type of apparatus to which the invention may be applied, although it will be apparent to those skilled in this art that the invention may be usefully applied to many other types of digging or other machines in which treads or tracks are employed.

In the drawings a portion of the main or central frame of the machine is shown at 1, and the tracks, or so-called "crawlers" of the machine are shown respectively at 3 and 4. Each of the tracks is supported by a frame 5 having bearings 34 carrying the upper rollers 6 and 7 for the support of the upper stretch of the tread or track.

The lower rollers 8 are operative against the lower stretch of the tread or track. At one end of the tread-supporting frame 5 is a drive sprocket 9 for the tread, said sprocket being carried on a shaft 10 carrying a universal joint 11. Extending from the universal joint 11 is an inner shaft 12 provided with a keyway 13. This inner shaft is telescopically adjustable within an outer tubular shaft 14 connected to a universal joint 15, secured on a shaft 17, rotative in bearings 20 in the main frame 1, and carrying a sprocket 18. A chain 19 engages the sprocket 18, said chain being driven from the motor of the machine, not shown. As will be apparent from Fig. 1, the drive arrangement just described is located at both sides of the frame of the machine so that both tracks or treads of the machine are driven accordingly.

Each of the treads or tracks 3 and 4 extends over an idler sprocket 21 at the opposite end of the machine, which sprocket 21 is on a shaft 22 rotative in the bearing 23 on the supporting frame for the tread or track. Aside from the telescopic adjustment of the parts 12 and 14 of the drive shaft, the elements thus far described are found in machines of this kind and are not new as far as the present invention is concerned.

Fixedly secured in the main frame 1 of the machine are spaced outer axle-sections indicated respectively at 24 and 25. These axle sections, and the parts associated with each of them are similar in construction so that a description of

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one will suffice. Each of the axle sections 24 and 25 is tubular and in the form shown are substantially square in cross sectional shape, although the same might be made in other shapes. At its end, each outer axle section is reinforced by a sleeve 26 over which is fitted a boss 27 formed with a radially-extending flange 28. This arrangement provides exceptional strength and rigidity at the end of the outer axle section. Secured to the flange 28 by the bolts 29 is a channel-shaped connection member 30 which has a three-sided flange 31 (Fig. 6) embracing three sides of a hollow inner axle section 32.

The outer end of the inner axle section 32 is fastened in brackets or similar supports 33 on the tread-supporting frame 5 and on which bearings 34 for the rollers 6 and 7 are mounted. The axle section 32 is thus secured at one end to the tread or track support 5, and is of a shape to fit within the outer axle section 24 or 25 and be telescopically adjustable therein. It will be apparent that by such telescopic adjustment of the two axle parts 32 and 24, or 32 and 25, the effective length of the two fixed axles of the machine can be regulated and thus the distance between the treads or tracks of the machine arranged. To maintain the telescopic parts 32 and 24 or 32 and 25 in their desired selected telescopic relationship, the inner axle section 32 is provided with a plurality of spaced, threaded holes 35 and by aligning the required holes 35 with similar holes provided in the three-sided part 31 of the connection member 30, screws 36 can be threaded through the aligned holes and the axle sections thus rigidly connected together in any desired position of overlap and the effective length of each axle regulated.

It will be understood that both ends of the outer axle sections 24 and 25 are connected to axle sections 32, and thus both tracks may be brought toward or away from one another to thereby position them at the required distances apart.

A means for adjustably moving the tracks toward the main frame 1 is required, and for this purpose is shown the adjusting shafts 40 and 41, both of which operate similarly. At one end, each of the shafts 40 and 41 extends through a bearing bracket 42 secured on the frame member 5 and to prevent endwise displacement of the shaft out of the bracket, a sleeve 43 is secured on the shaft within the bracket. The opposite end of the shaft 41 extends into a hydraulic cylinder 44, and carries a piston 45 which is caused to be urged in one direction by the flow of hydraulic fluid under pressure through the inlet pipe 46. The piston 45 is moved in the opposite direction by the flow through the inlet pipe 47. Both pipes 45 and 47 are, of course, connected to a suitable source of hydraulic fluid supply. The cylinders 44 are mounted in the main frame of the machine in any suitable manner and are rigidly supported and braced by the frame elements 48 and 49, or otherwise securely mounted.

From the foregoing, the operation of the improved track-adjusting device will be readily understood.

When it is desired to bring one or both of the tracks or treads of the machine nearer to the main or central frame 1, or to move the track or tracks apart or farther away from the main frame, one side of the machine, including the track to be first adjusted, is elevated or jacked up, for which purpose either a manually or hydraulically-operated jack may be employed.

When the side of the machine carrying the track to be adjusted is elevated off the ground, the fastening screws 36 are removed at the ends of the two axle sections at the elevated side of the machine, thus placing the inner axle sections 32 in condition to be moved telescopically with relation to the outer axle sections 24 or 25 within which they fit. The required adjusting shaft 40 or 41 is then caused to be moved longitudinally by the hydraulic means described and this will bring the track to which the shaft 40 or 41 is connected toward or away from the main frame 1 to the required extent. The required holes 35 in the inner axle section 32 are then aligned with the holes in the part 31 and the screws 36 replaced and the adjustment for one track is completed. It will be apparent that since the drive shaft parts 12 and 13 are telescopic, the effective length of the drive shaft, composed in part of these two elements, will be automatically regulated as the track is adjusted to or from the main frame 1. After one of the tracks has been adjusted as above described, it is lowered to the ground and the other track is then jacked up and the procedure of adjusting the same is carried out as described with respect to the first track.

In describing the means for adjusting the tracks, reference has been made to the employment of hydraulically-operated means for that purpose. However, if desired, the adjusting shafts 40 and 41 might be arranged for longitudinal adjustment by manual means. In this connection, attention is directed to Fig. 7, wherein is shown an adjusting shaft 50 which is screw-threaded for a substantial portion of its length, as indicated at 51, which threaded portion is adapted for threadable engagement with a block 52 suitably mounted in the frame 1. Near the outer end, the shaft 50 is provided with the collar or sleeve rotative in the bearing 42. The end of the shaft 50 projects beyond the bearing 42 and is square or non-round in shape, as indicated at 53, to receive a ratchet wrench or other suitable tool by which the shaft may be manually rotated. It will be apparent that by rotation of the shaft 50, it will be caused to be moved longitudinally in the required direction and thus will bring one of the tracks toward or away from the center or main frame 1 of the machine as required.

The advantage of being able to adjust the tracks or treads of the machine, and thus locate them at the desired distance apart, will be seen from Fig. 6, wherein the machine is shown at 71 operating over a ditch 55, with the tracks 3 and 4 in their normally-spaced position, and as a result so close to the edges of the ditch that the possibility of the machine being deposited in the ditch is imminent. When the tracks are spaced more widely apart, as indicated in dotted lines in Fig. 6, it will be apparent that the tracks will then be supported on more solid ground with a greater factor of safety. Numerous other advantages of being able to locate the tracks at various distances apart will be apparent to those skilled in this art. On the other hand the ability to restore the tracks to their normal spacing with a minimum of effort is desirable, and that is attained by the structure described.

While I have described one embodiment of the invention in which the track-adjusting means has been applied to a certain type of ditch-digger, it will be apparent that the application of the invention need not necessarily be limited to this specific type of machine, since it can be

readily applied to other machines where the necessity exists for positioning the tracks or treads of the machine at selected distances apart. Hence, when herein referring to the machine as a trench or ditch-digger, I wish to be understood as meaning any other type of machine to which the invention is applicable and can be usefully employed.

While I have described the drive shaft as including the telescopic parts 12 and 14, it may be pointed out that this shaft need not be adjustable as to length by such telescopic parts since, if necessary, sections of shaft of different length as needed may be inserted between the two universal joints, according to the spacing of the track from the main frame. These and other modifications are contemplated as being within the scope of the claims appended hereto.

What I claim is:

1. In a trench digger or like machine, a frame, a track support, an endless track carried by the support, an axle part carried by the frame, an axle part carried by the support, the latter axle part telescopically fitting the axle part carried by the frame, means for securing together the two axle parts in a selected position of overlap, a longitudinally adjustable shaft having one end rotatively connected to the track support but not longitudinally movable relative thereto, and means independent of the axle parts by which said shaft is longitudinally moved to bring the track support toward or away from the frame and cause the axle parts to be moved to telescope to a required extent, said means including a threadable engagement between the frame and adjustable shaft, said shaft having a projecting end located at the outside of the track for tool engagement to cause rotative movement of said shaft.

2. In a trench digger or like machine, a frame, a track support, an endless track carried by said support, a hollow outer axle part carried by the frame and projecting laterally therefrom, said outer axle part being provided at its outer end with a laterally-extending flange, an inner axle part carried by the track support and adapted for telescopic adjustment within the outer axle part, a coupling member for connecting the two axle parts together in selected telescoped relation comprising a fitting adjustable on the inner axle part to any one of a number of selected positions thereon, said fitting having a flange extending at least partly around the inner axle part, means entering said flange and into the inner axle part, said fitting including a lateral flange disposed flatly against the flange on the outer axle part, and fastening elements entering the abutting flanges to attach the same together to couple the axle parts in selected telescopic relation.

3. In a trench digger or like machine, a frame, a track support, an endless track carried by the support, a non-round, hollow outer axle part carried by the frame and projecting laterally of the same, said outer axle part having a flange completely encircling it at its end and projecting laterally from it, an inner axle part of non-round cross-sectional shape telescopically fitting within the outer axle part and adjustable longitudinally therein, and a flanged member bolted to several sides of the inner axle part and having a flange disposed flatly against the flange on the outer axle part, means passing through the flanged member and entering the inner axle part to thereby attach said flanged member to said

inner axle part, said inner axle part having a plurality of holes into which said means can be selectively entered and fastening elements entering the overlying flanges and coupling the axle parts together in selected telescopic relation.

4. In a trench digger or like machine, a frame, a track support, an endless track carried by the support, an outer axle part carried by the frame and projecting laterally from the same, the track support having an inner axle part adapted for telescopic adjustment within the outer axle part, means for moving the track support to or from the frame and thereby regulating the extent of telescopic movement of the inner axle part with respect to the outer axle part, said means being located between the axles and comprising an adjusting shaft threaded adjacent one end, means on the frame for threadably engaging the threaded portion of the adjusting shaft, means on the track support for rotatively supporting an outer end portion of said adjusting shaft, said outer end portion of the adjusting shaft being located at the outer side of the track on the track support whereby said end of the shaft is available at the outside of the track for rotative adjustment of the adjusting shaft.

5. In a trench digger or like machine as described in claim 4, wherein the rotative support on the track support for the adjusting shaft consists of a bearing fixed on the track support, the adjusting shaft having a collar rotative in said bearing and maintaining the adjusting shaft against longitudinal movement relative to the track support, the projecting end of the adjusting shaft being non-round for tool engagement.

6. A trench digger or other endless-track machine comprising, a frame, tracks located at opposite sides of the frame, stationary outer axle members secured to and projecting laterally from the frame, supports for the tracks, inner axle extensions on said supports, said inner axle extensions fitting telescopically within the outer axle members on the frame, means for adjusting the inner and outer axle members to a desired extent of telescopic overlap comprising a pair of hydraulic cylinders located end-to-end and extending crosswisely of the frame, each cylinder containing a piston having a rod extending from it, the rod being connected to one of the track supports, the pistons being independently operable to cause movement of one or the other of the track supports to or from the frame.

7. A trench digger or other endless-tread machine comprising, a frame, tracks at the opposite sides of the frame, stationary outer axle members secured to and projecting laterally from the frame, said outer axle members being hollow for at least a portion of their length, supports for the tracks, inner axle extensions on the supports, said inner axle extensions fitting telescopically within the outer axle members on the frame, means for fixing the axle extensions in an selected position of telescopic overlap with the outer axle members to thereby regulate the distance between the track supports and the frame, said means including a collar fitted on each of the outer axle members, a collar fitted on each of the inner axle extensions and adjustable thereon to any one of a number of selected positions, the collars on the inner axle extensions having radial flanges disposed in contact with radial flanges on the collars of the outer axle members, and bolts extending through the radial flanges of the several contacting collars, an adjustable shaft extending between the frame and each

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track support, and means operative at the outside of the tracks for shifting said shaft longitudinally to thereby move the track support to or from the frame.

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