

Oct. 30, 1934.

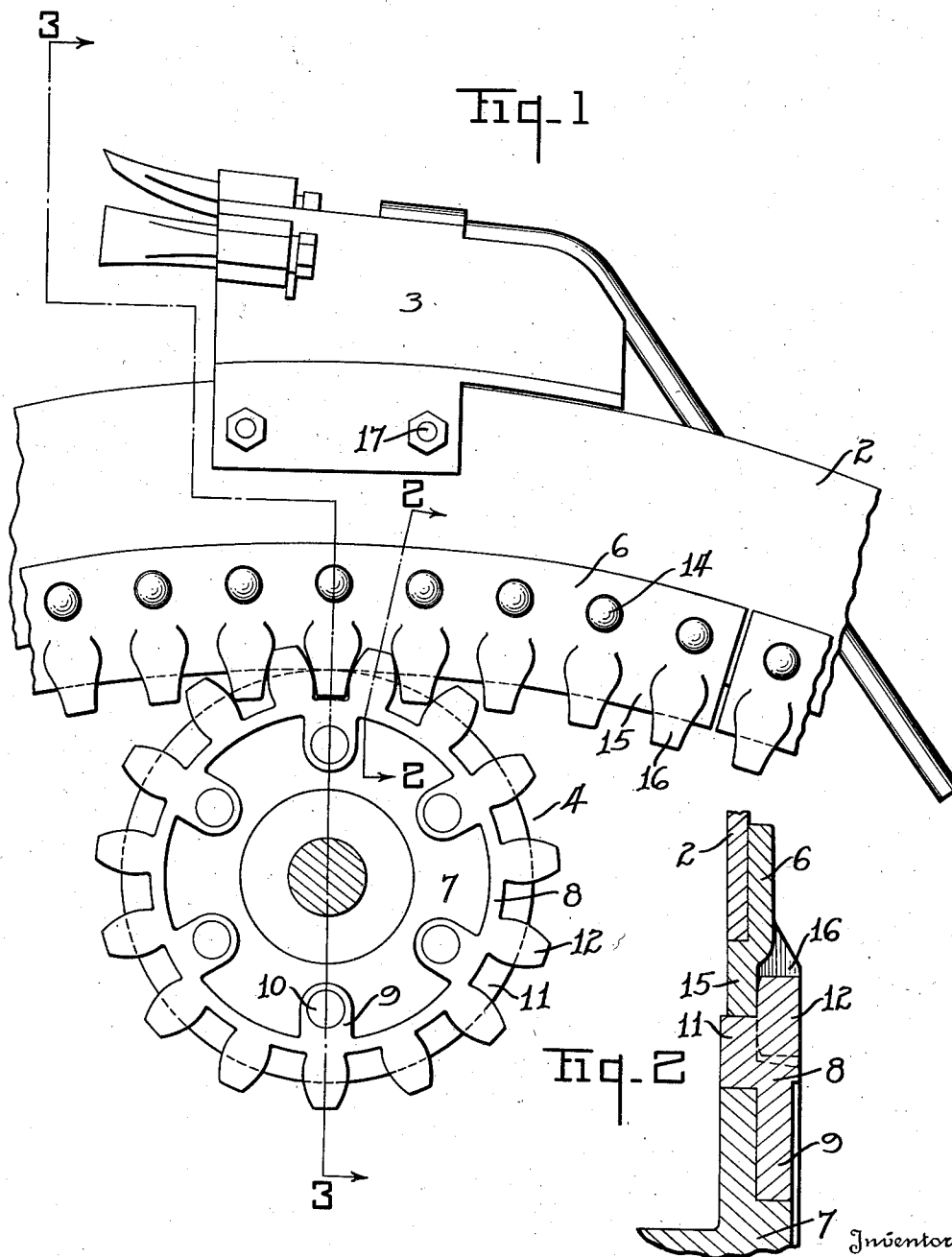
C. F. YOCUM

1,978,732

TRENCHING MACHINE

Filed Jan. 13, 1934

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Fig. 3

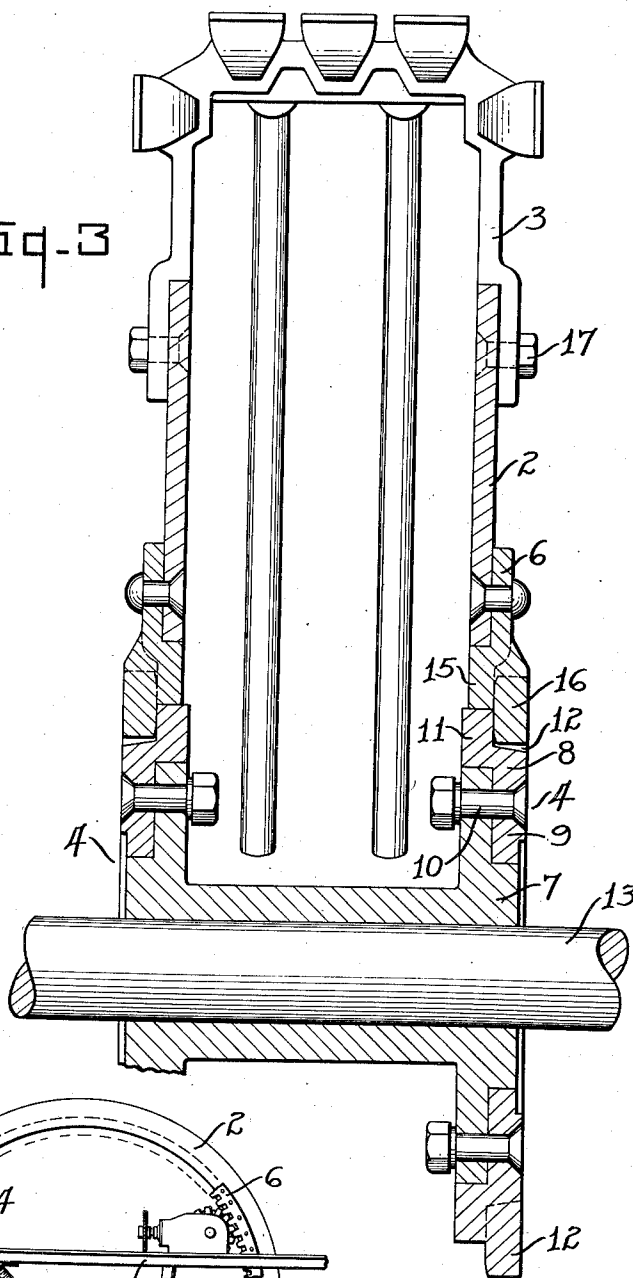
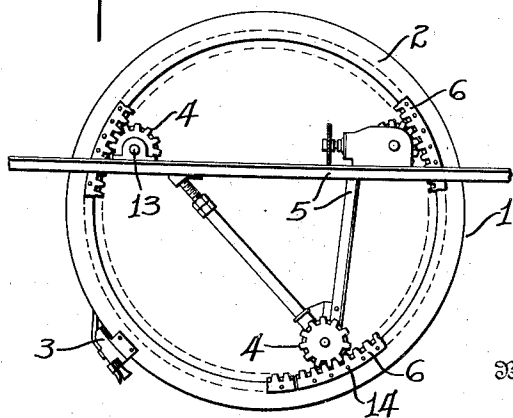


Fig. 4



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UNITED STATES PATENT OFFICE

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TRENCHING MACHINE

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Application January 13, 1934, Serial No. 706,446

2 Claims. (Cl. 37—91)

This invention relates to trenching machines of the digging wheel type, and particularly to the driving and mounting means for the digging wheel thereof.

5 The object of the invention is the provision of an improved mounting means for the digging wheels of machines of the type described, which means may, in part, form a portion of the wheel driving means and is adapted to reinforce the rim members of the wheel against spreading due to wedging of rocks or material therebetween or between the sides of the attached buckets, and also against relative inward movements occasioned by external pressure.

15 Further objects and advantages of the invention will be apparent from the following detailed description and from the accompanying drawings, in which—

20 Figure 1 is a fragmentary side elevation of a wheel embodying the invention, together with a driving or guiding member in connection therewith; Figs. 2 and 3 are enlarged sections on the lines 2—2 and 3—3, respectively, in Fig. 1, and Fig. 4 is a diagrammatical side elevation of a digging wheel and mounting therefor embodying the invention.

25 Referring to the drawings, 1 (Fig. 4) designates a digging wheel of a trench excavating machine, which wheel is composed of two laterally spaced annular rim members 2 connected together at their outer edges by a series of buckets 3 equidistantly spaced around the wheel, as well understood in the art, but only one of which is shown. The wheel is mounted on and guided in its rotary digging movements by a plurality of pairs of wheel-like members 4, in the present instance three in number, and these are carried by a framework 5, as is common in machines of this character. The members 4 comprise two sets, one for each rim member 2.

30 One pair of wheel members 4 constitutes a part of the driving means for the digging wheel and are, therefore, of spur-gear form to mesh with respective internal gears 6 attached to the inner edges of the rim members 2. It is also preferable to have the members of each of the other pairs of spur-gear form. The invention resides in the connection between the members 4 and rim gears 6, and it will be understood that a description of the connection of one pair of members 4 with the wheel rims applies to all.

35 Each member 4, in the present instance, comprises a hub or body portion 7 and a rim portion 8, the latter seating on the periphery of the hub portion and having ears 9 lapping the outer

side of the hub portion and preferably mounted in recesses provided therein, and secured thereto by bolts, rivets or other suitable fastening means 10. The rim portion 8 is provided at its inner side with an annular rolling part 11 and at its outer side with radially projecting teeth 12 of customary spur-tooth form. The periphery of the rolling portion 11 is of true circular form and coincides with the pitch circle of the teeth 12. It is thus apparent that the addendum portions of the teeth project beyond the periphery of the portion 11. In the case of the pair of members 4 which constitute a part of the driving means for the digging wheel, the hub portions 7 are connected together preferably by an integral sleeve construction, as shown in Fig. 3, and are mounted on a drive shaft 13 to which power for driving the digging wheel may be communicated in any suitable manner, as well understood in the art.

Each internal gear 6, one of which is mounted on each rim 2 of the digging wheel for convenience of manufacture and mounting or replacement, is composed of a plurality of segments secured to the respective rim 2 by rivets or other suitable fastening means 14. Each segment comprises a portion which laps, in the present instance, the outer side of the respective rim 2 and has its inner edge portion, with respect to the axis of the wheel, extending within and shouldered against the inner edge of the rim 2 and cooperating with the corresponding portion of the other segment, to form, in the plane of said rim, an annular rolling portion 15, which registers with and rides on the rolling portion 11 of the respective wheel member 4 of the several pairs. The gear segments, at the outer side of the rolling portion 15, are provided with an annular set of gear teeth 16, which project inwardly beyond the rolling portions 15 at the outer sides of the annular wheel portions 11 and in proper intermeshing engagement with the teeth 12 of the members 4.

It is apparent that the teeth 12 of the wheel members 4 have their addendum portions disposed at the outer sides of the rolling portions 15 of the gear 6, so that any pressure against the inner sides of the rim members 2 of the digging wheel, tending to spread such members apart, will be opposed by the coaction of the rolling portions 15 of the internal gears with the teeth 12 of the guide members 4; also that the teeth 16 of the rim gears are disposed at the outer sides of the respective rolling portions 11 of the gears 4, so that any pressure against the outer sides of the rim members 2 tending to collapse them will

be effectively opposed. In this manner, the members 4 of the different pairs cooperate with the buckets 3 to prevent either spreading or inward distortion of the rim members of the digging wheel which is an important feature in machines of this type. In order that the buckets 3 may perform their function in this respect, it has been customary to cast the body portions of the buckets in a single piece with the inner edges of their sides lapping the outer sides of the rim members 2 and rigidly attached thereto by bolts 17 or other suitable means. It has been found, in practice, however, that the inner edge portions of the rim members 2 are frequently sprung both inward and outward during an operation of the machine, and it is to overcome this and to prevent the repairs, inconvenience and labor incident thereto that the present manner of interengaging of the members 4 and internal gear 6 of the digging wheel has been devised.

I wish it understood that my invention is not limited to any specific construction, arrangement or form of the parts, as it is capable of numerous changes without departing from the spirit of the claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent, is:

1. In a wheel-type excavator, in combination,

a digging wheel having laterally spaced rim members carrying buckets at their outer edges, an internal gear carried by each gear member at its inner edge, a spur-gear for each rim member having its teeth meshing with those of the respective internal gear, each of said meshing gears having a portion in side coaction with the teeth of the other gear whereby the gear teeth and said portions cooperate to prevent both inward and outward distortion of the inner edge portions of the rim members, and mounting means for the spur-gear.

2. In a wheel-type excavator, in combination, a digging wheel having laterally spaced rim members and having buckets carried by and connecting the outer edges of said members, an internal gear carried by each rim member at its inner edge concentric to its axis, a plurality of pairs of spur-gears forming two sets of gears with each set disposed within and in mesh with the respective internal gear of the digging wheel, said intermeshing gears having parts in continuous rolling wheel guiding coaction substantially at the pitch circles thereof and the teeth of each gear lapping the outer side of the rolling portion of the other coacting gear to resist both inward and outward relative movements of the rim members.

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