

(No Model.)

2 Sheets—Sheet 1.

W. F. RHODES & C. CROUSE.  
EXCAVATOR.

No. 547,030.

Patented Oct. 1, 1895.

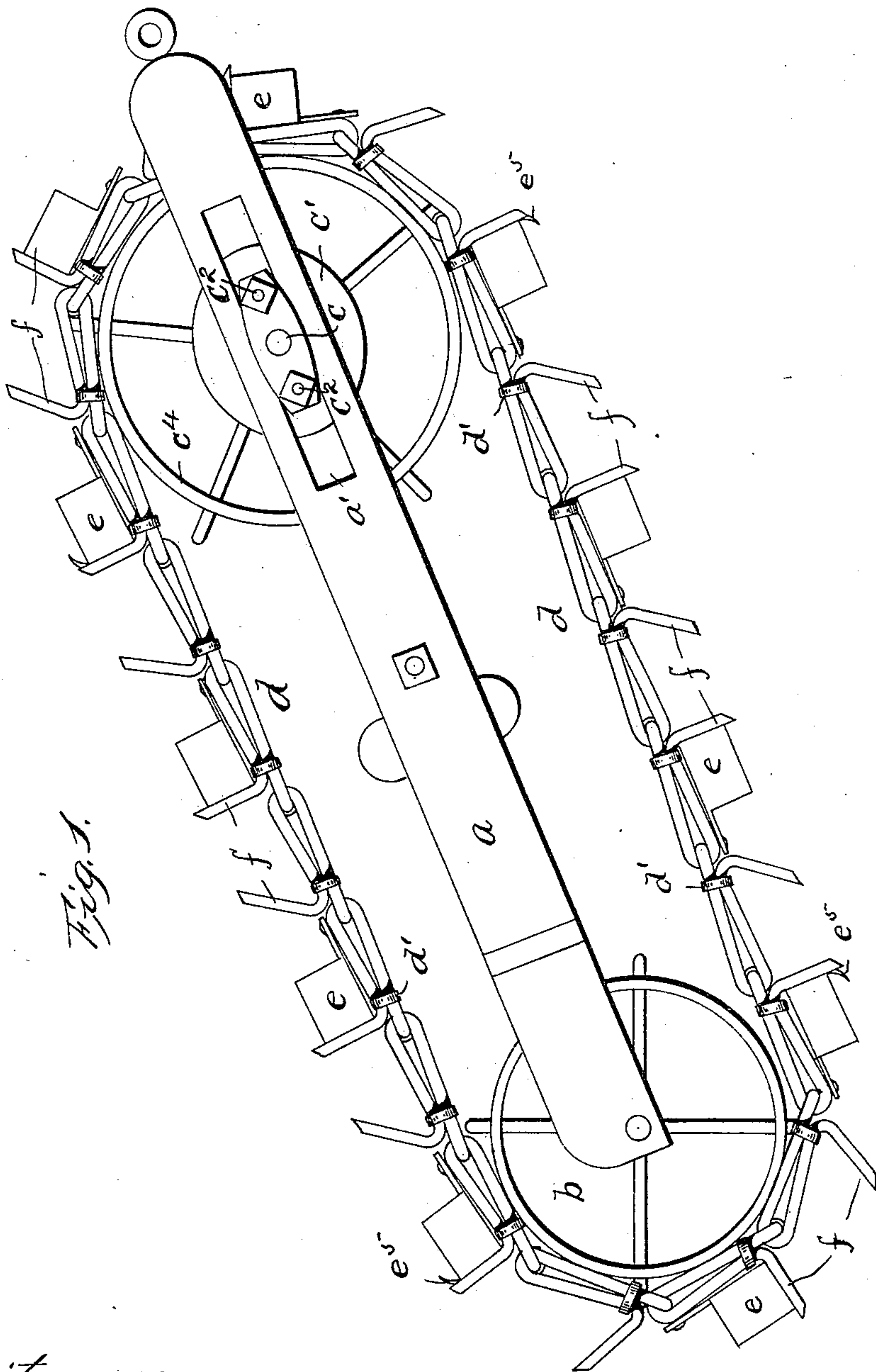


Fig. 1.

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Hubert E. Peck

Inventors  
W. F. Rhodes and Casper Crouse  
per *C. C. Duff*  
Attorney

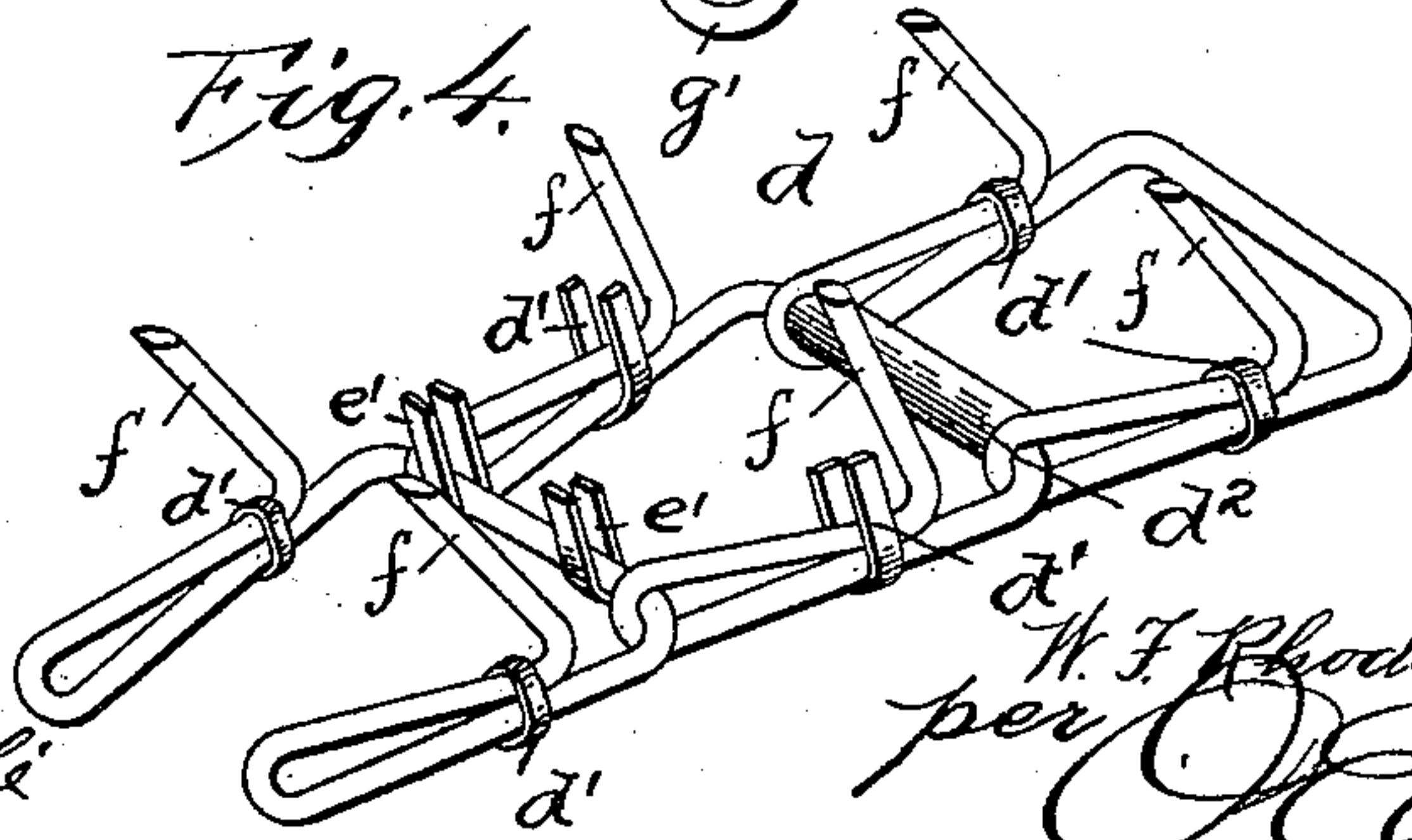
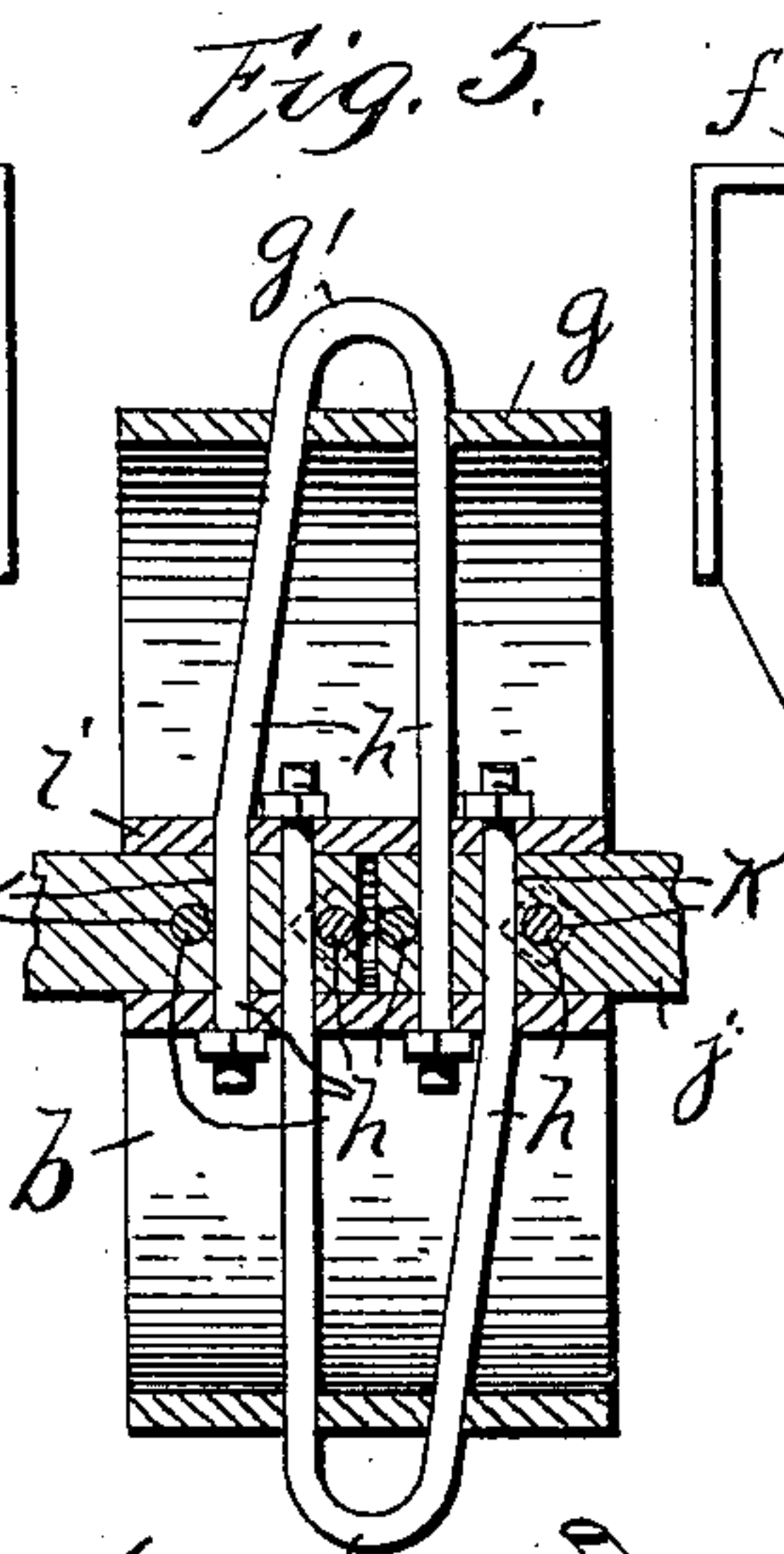
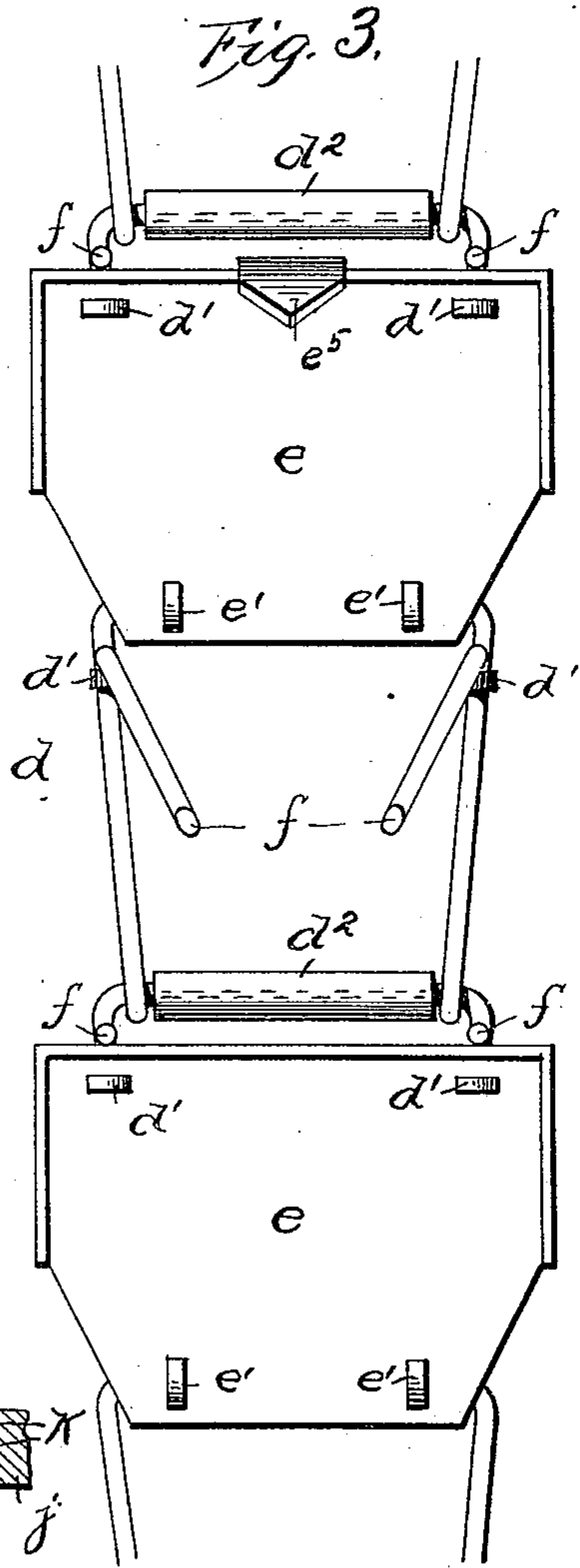
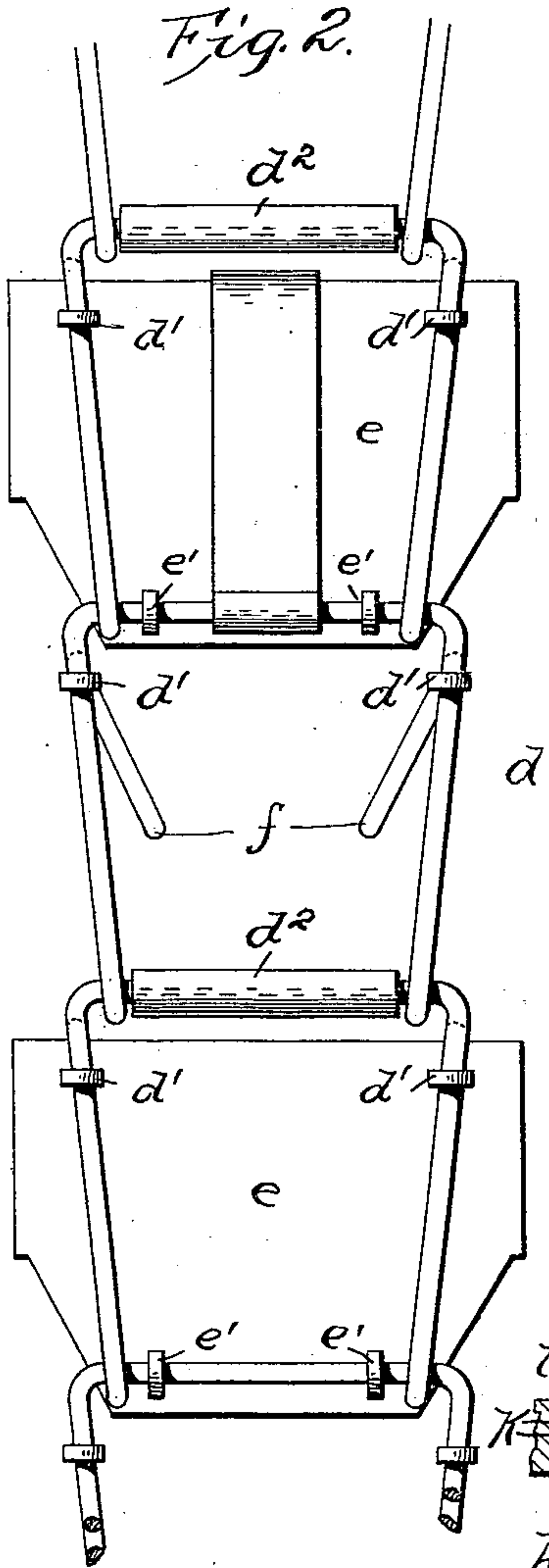
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2 Sheets—Sheet 2.

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EXCAVATOR.

No. 547,030.

Patented Oct. 1, 1895.



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# UNITED STATES PATENT OFFICE.

WILLIAM F. RHODES AND CASPER CROUSE, OF GRAND JUNCTION, MICHIGAN.

## EXCAVATOR.

SPECIFICATION forming part of Letters Patent No. 547,030, dated October 1, 1895.

Application filed March 19, 1895. Serial No. 542,401. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM F. RHODES and CASPER CROUSE, of Grand Junction, in the county of Van Buren and State of Michigan, have invented certain new and useful Improvements in Excavators; and we do hereby declare that the following is a full, clear, and exact description of the invention, which 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 the letters of reference marked thereon, which form part of this specification.

This invention relates to certain improvements in excavators.

The object of the invention is to provide an improved construction of excavator whereby the earth can be quickly and easily loosened and removed and which is particularly adapted for excavating trenches or the like for laying piping or forming conduits.

A further object of the invention is to provide an excavator having a flexible endless carrier provided with buckets and digging knives or projections arranged to loosen the earth in advance of and at the rear edge of each bucket.

A further object of the invention is to provide an excavator having its endless carrier provided with buckets and formed of links having projecting teeth or digging devices.

A further object of the invention is to provide an improved construction of sprocket-wheel wherein the spokes of the pulley are continued or extend through the rim thereof to form the sprockets.

A further object of the invention is to improve certain details in constructions and arrangements of parts whereby a highly-efficient and durable and effective excavating device is produced.

The invention consists in certain novel features of construction and in combinations of parts, more fully and particularly described hereinafter, and pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a side elevation of the rim or boom carrying the endless carrier provided with buckets. Fig. 2 is a detail perspective view of several of the links of the endless carrier with the bucket thereon, looking toward the under side of the bucket from the rear end

thereof. Fig. 3 is a detail perspective of several of the links, showing the bucket thereon, looking at the bucket from the front upper side thereof. Fig. 4 is a detail perspective of two of the links without the buckets and fastening means, to show the peculiar manner of bending and forming the links. Fig. 5 is a cross-sectional view through one of the pulleys, showing the manner of conducting the same.

In the drawings, *a* is the swinging or adjustable arm, boom, or frame pivotally joined to a movable carriage or truck, (not here shown,) usually provided with turning means for the endless excavating-carrier sustained by said arm or boom. This boom is usually formed of two parallel beams or bars, in the lower ends of which the pulley *b* is mounted, so as to extend forwardly beyond the same. The upper ends of these beams are longitudinally slotted at *a'*, and the sliding bearings *c'* are arranged therein with plates fitting opposite sides of each beam and clamping-bolts *c''*, so that the bearing can be adjustable longitudinally of the beams and clamped in the desired position.

*c* is the drive-shaft extending through said bearing and provided at its outer end with the driving-pulley *c'* within the beam *a* with the driving sprocket-pulley *c''*.

*d* is the endless carrier, traveling on and driven by said pulleys and provided with the buckets *e*. This endless carrier is composed of loosely-joined links. Each link is preferably bent from a single rod of metal or heavy wire, so as to be essentially U-shaped in form, with its legs doubled backwardly, so as to embrace the end cross-bar of the next succeeding link. The legs are doubled back almost, if not quite, over a full length of the link to the ends thereof, which extend outwardly or laterally, as shown, and sharpened to form a digging or excavating point or implement *f*. The clips or other securing means *d'* can be employed to firmly secure the doubled portions of the links together. The cross-bars of the links, each link having a cross-bar at its rear end, while its front end loosely embraces the cross-bar of the link in front, each provided with rollers *d''* to reduce friction and wear.

Each bucket is preferably bent from sheet-



metal or the like, with bottom rear ends and forwardly-extending sides. The front edges of the sides and bottom can be sharpened, if desired, to form cutting-edges.

5 Every alternate link is here shown provided with a bucket. The bucket is formed to fit on the link, with its rear end resting against the digging arms or points extended outwardly from the rear end of the link, and the  
10 bucket is secured to the link by suitable clips  $e'$  or any other suitable means or devices.

It should be observed that the digging points or ends of the endless carrier project beyond and outside of the path in which the  
15 buckets travel, and that the digging-point, immediately in front of the open end of which the buckets are bent and inclined toward each other, so as to dig and loosen the earth immediately in front of the bucket, while the  
20 digging-point of the links to which the buckets are secured and against which the rear ends of the buckets rest and by which they are braced, preferably extend outwardly within the sides of the buckets, so as to move in  
25 different planes from the digging-point in front of the buckets, whereby the earth is thoroughly loosened and broken open, so as to fill each bucket as it moves outwardly and upwardly.

30 If desired, the buckets can be provided with forwardly-inclined central cutting or digging knives  $e^5$  at their rear edges.

Each pulley preferably has a wide flat rim  $g$ , preferably of greater width than the width  
35 of the endless carrier. The spokes  $h$  are formed by several U-shaped rods or pieces, extending inwardly through holes in the rim so that the outer curved ends of these pieces form the sprocket  $g'$ , and the legs of the pieces  
40 extend inwardly and radially through the hub  $i$  of the pulley and are suitably secured by nuts or other means, as shown. The hub of each pulley is preferably formed of a tube or cylinder having radial holes for the spokes,  
45 and the journals  $j$  are inserted in the ends of the hub and are preferably provided with transverse holes  $k$ , through which said spokes pass, whereby the journals are rigidly locked in position to the hubs. A most durable, simple, and effective sprocket-pulley is thus  
50 formed.

This device can be very advantageously employed in digging trenches in city streets or elsewhere and for laying sewer, water, or  
55 other pipes, or laying conduits. The frame or boom carrying the carrier and pulleys can be suitably braced by cross-pieces or otherwise rigidly and strongly constructed.

60 It is evident that various changes might be made in the forms, arrangements, and constructions of the parts described without departing from the spirit and scope of our invention. Hence we do not wish to limit ourselves to the exact construction herein set

forth, but consider ourselves entitled to all 65 such changes as fall within the spirit and scope of our invention.

Having thus fully described our invention, what we claim to be new, and desire to secure by Letters Patent of the United States, is— 70

1. In an excavator, an endless carrier comprising loosely joined links, each link formed with outwardly projecting digging ends and every alternate link provided with buckets.

2. In an excavator, an endless carrier comprising loosely joined links, each link formed U-shaped with its ends doubled back to loosely embrace the cross bar of the preceding link, and with the extremity turned outwardly to form digging fingers, and buckets. 80

3. An excavator having the endless carrier formed to loosely joined links, each link formed of a single rod bent U-shaped and doubled backwardly with its ends turned outwardly to form digging fingers, and the buckets, each bucket secured to its link with its rear end resting against the digging fingers of its link, each projected outwardly beyond the same, substantially as described. 85

4. In an excavator an endless carrier having 90 a bucket provided with a digging point or finger at its rear end and projecting outwardly therefrom.

5. A sprocket pulley having a rim and a hub, and the spokes projected outwardly 95 through the rim to form the sprockets, substantially as described.

6. A sprocket pulley having a rim, a hub, and the spokes, each spoke formed of a U-shaped piece passed through the rim and secured in the hub and projecting beyond the rim to form the sprocket, substantially as described. 100

7. A sprocket pulley having a rim, a hollow hub, the journals inserted in the ends of the hub, and the U-shaped piece passed through the rim and through the hub and journals and secured so as to form sprockets, spokes, and secure the journals. 105

8. An endless conveyer formed of loosely 110 joined links with the ends thereof turned outwardly to form digging fingers, substantially as described.

9. An endless conveyer having the out-turned fingers, and the buckets secured on 115 some of the links with their rear ends bearing against and braced by the fingers of the links carrying the buckets, substantially as described.

In testimony that we claim the foregoing as 120 our own we affix our signatures in presence of two witnesses.

WILLIAM F. RHODES.  
CASPER CROUSE.

Witnesses:

EDSON D. ROGERS,  
DEWEY ROGERS.