

(No Model.)

J. W. ZEIS.  
DITCHING MACHINE.

No. 317,481.

Patented May 5, 1885.

Fig. 1.

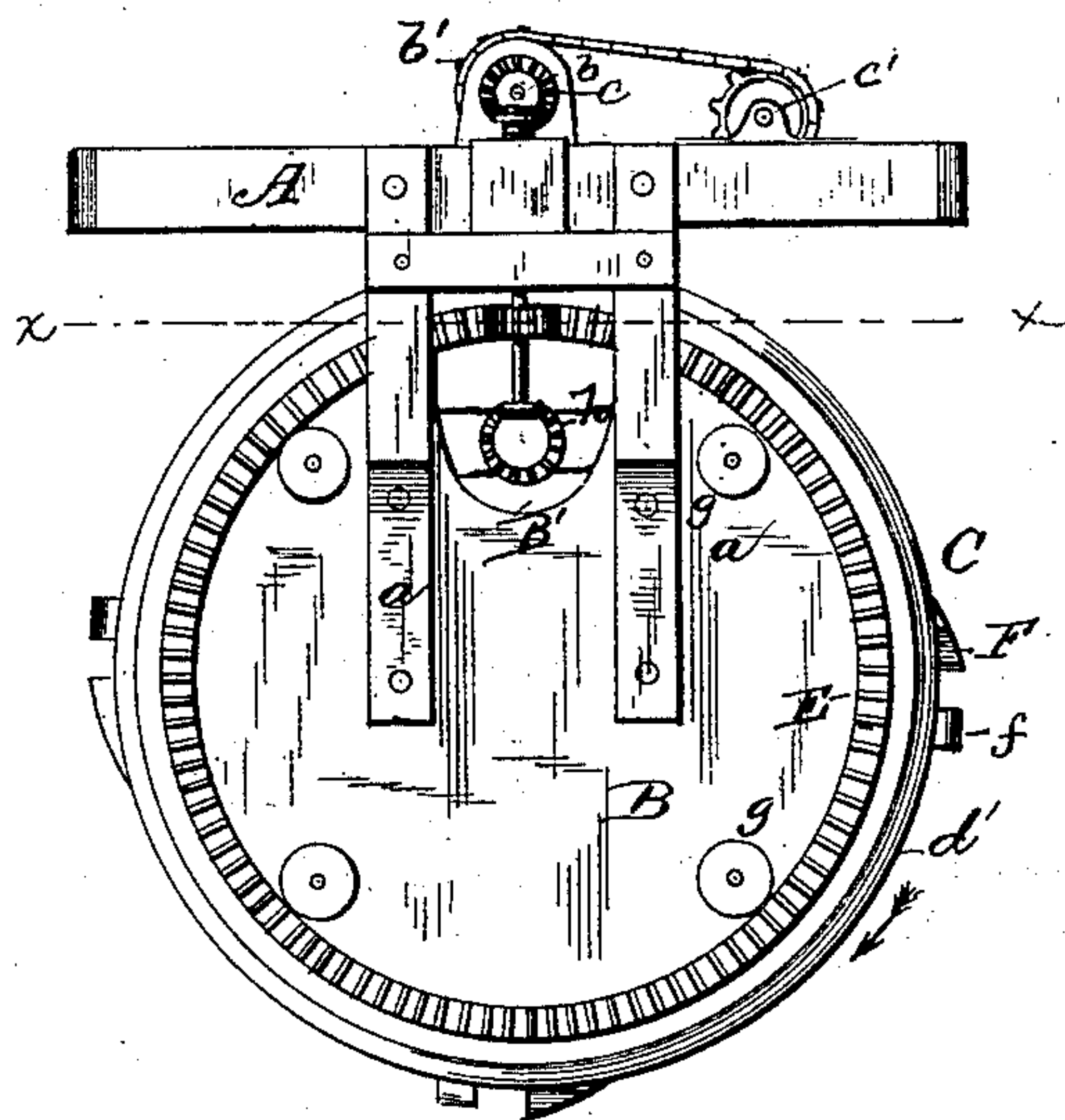


Fig. 2.

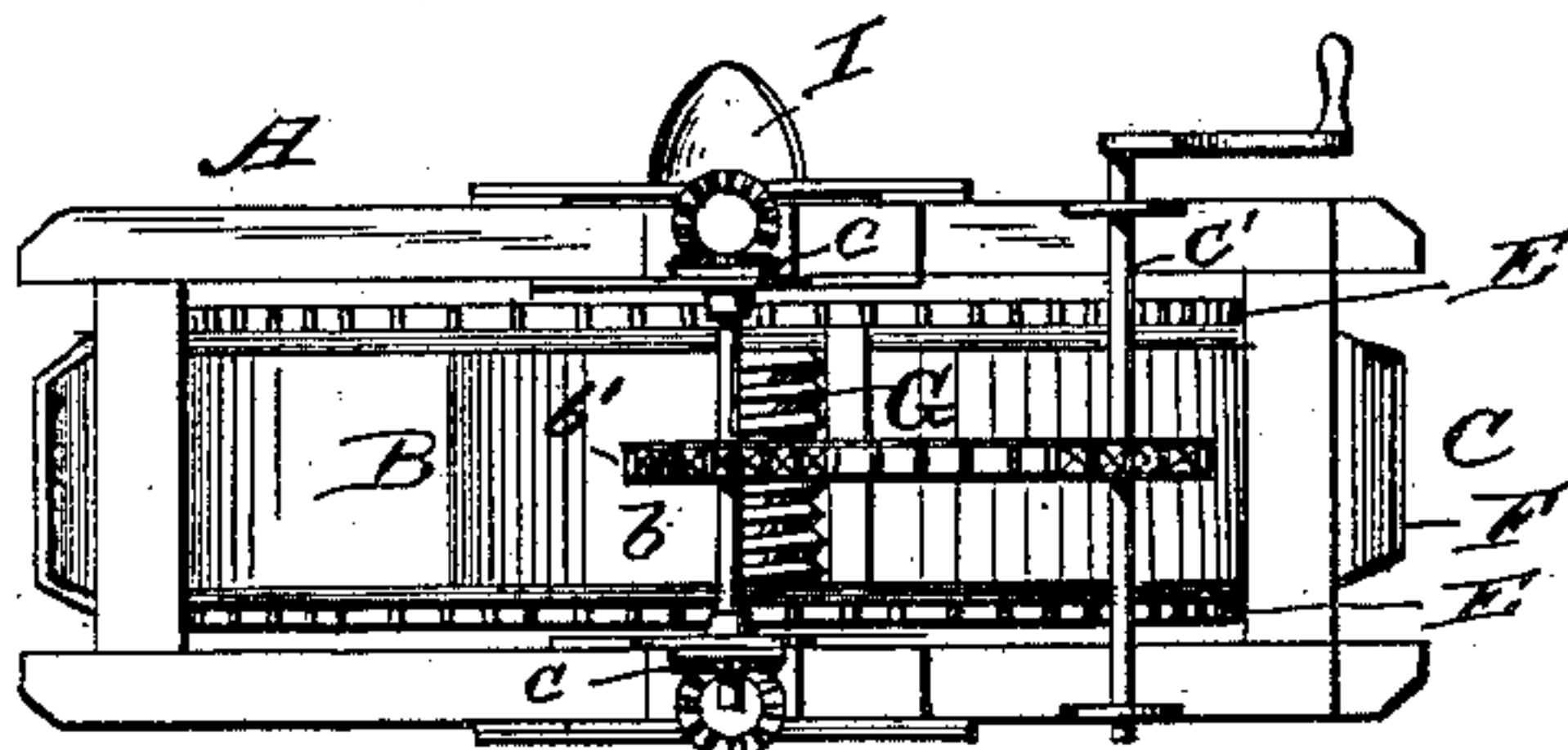


Fig. 3.

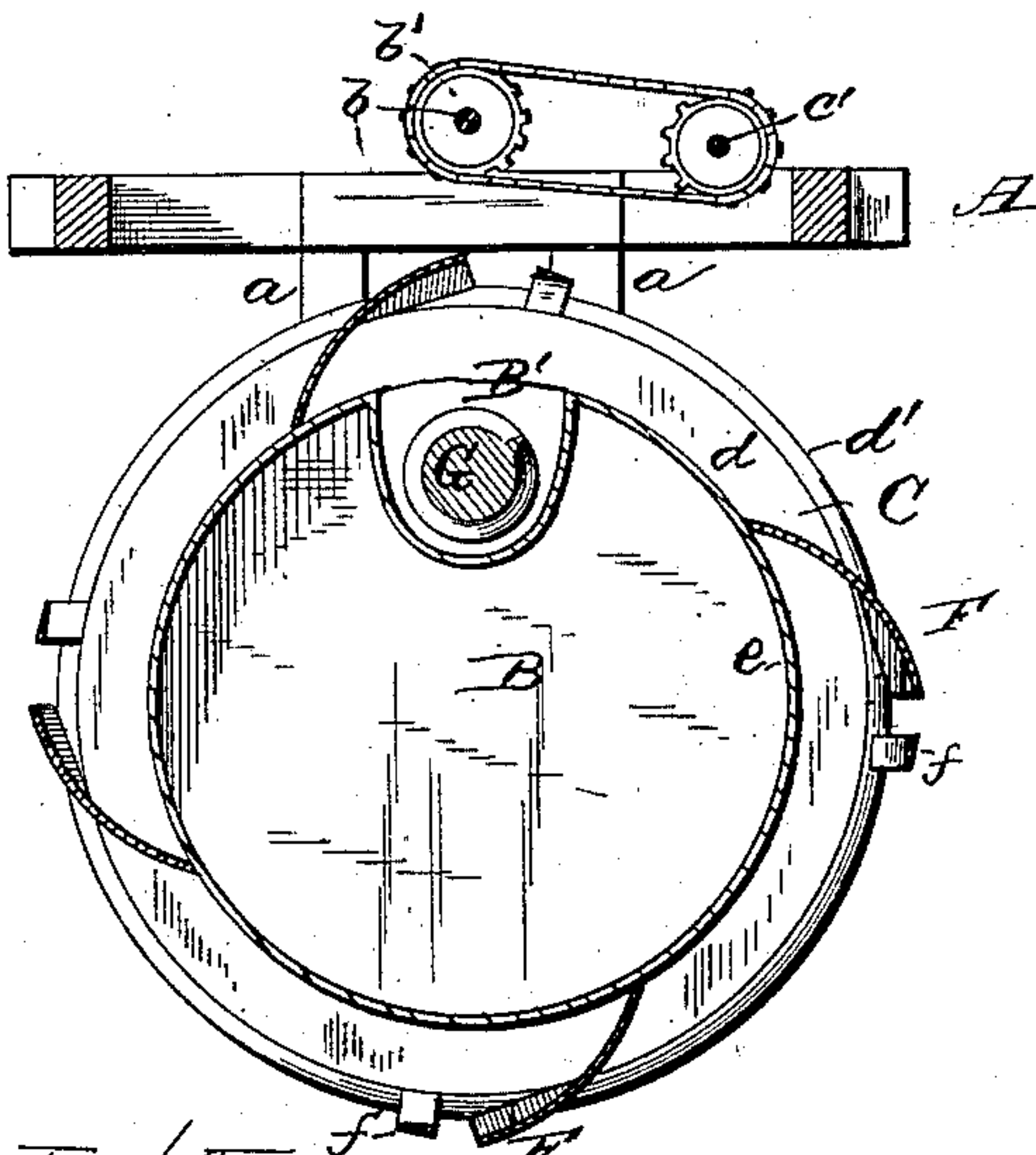
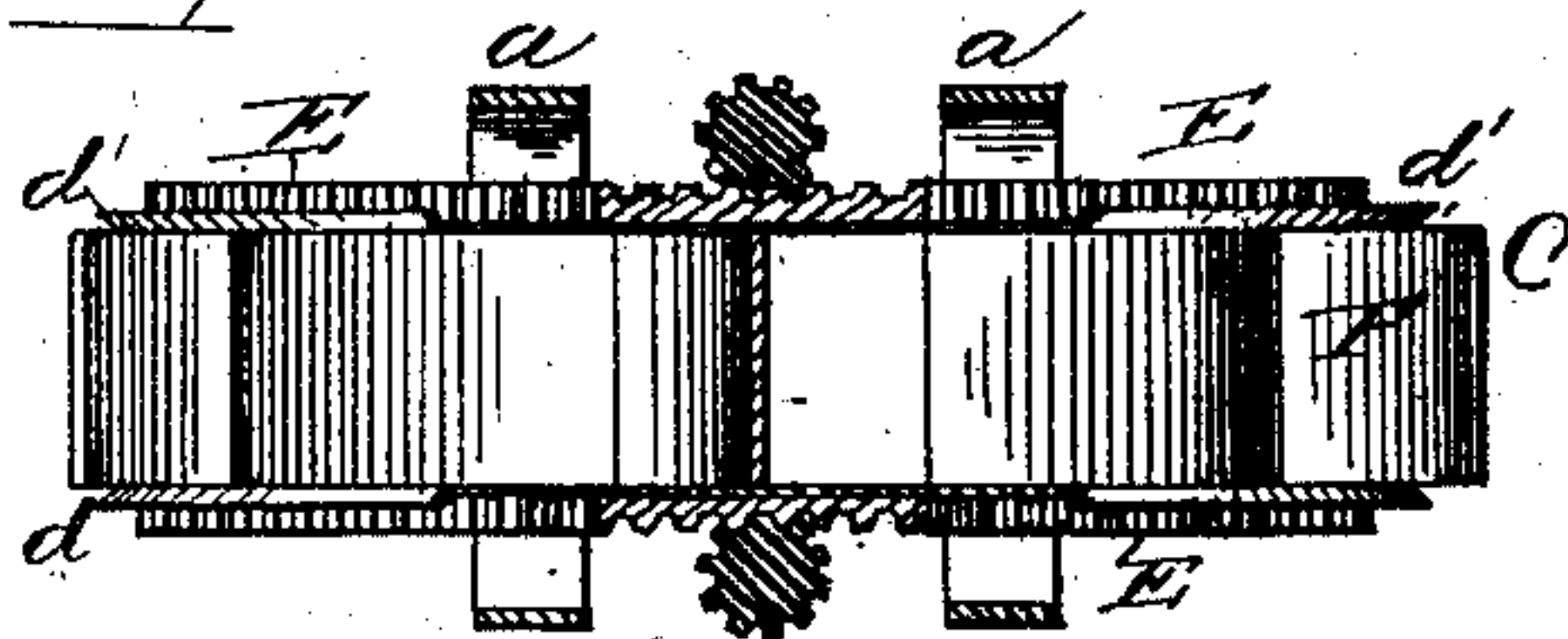


Fig. 4.



WITNESSES  
F. L. O'Rand  
E. W. Johnson

John W. Zeis  
INVENTOR  
Attorney



# UNITED STATES PATENT OFFICE.

JOHN W. ZEIS, OF TIFFIN, OHIO.

## DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 317,481, dated May 5, 1885.

Application filed September 18, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. ZEIS, a citizen of the United States of America, residing at Tiffin, in the county of Seneca and State of Ohio, have invented certain new and useful Improvements in Ditching-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as 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 letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to certain new and useful improvements in ditching-machines; and, consists in the construction and combination of the parts, as will be more fully set forth, and specifically pointed out in the claims.

In the accompanying drawings, which illustrate my invention, Figure 1 is a side view. Fig. 2 is a plan view. Fig. 3 is a sectional view; and Fig. 4 is also a sectional view taken through the line *xx* of Fig. 1.

My invention relates to that class of ditching-machines which employ a rotary-digger, which is mounted upon suitable carrying-wheels or other structure, and my apparatus is adapted to be used either for submarine excavations or surface excavations, as making ditches.

In the first instance, my apparatus is mounted upon suitable floats, and is provided with means for vertically adjusting the same and moving it from place to place, while, when the apparatus is adapted to be used upon land, as making ditches, the supporting frame is mounted upon wheels.

In the accompanying drawings, which illustrate my invention, A represents a suitable rectangular frame, which is rigidly secured by means of uprights *a* to the stationary drum B. This frame A is provided centrally with a transverse shaft, *b*, which carries at its outer ends pinions *c*, which intermesh with pinions secured upon vertical shafts, which shafts pass through the side pieces of the frame A. The shaft *b* is also provided centrally with a sprocket-wheel, *b'*, over which passes a chain, which is actuated by a similar sprocket-wheel upon a transverse shaft, *c'*, to which power is applied for operating the excavating-wheel. The drum B has a recess, B', formed at its upper portion,

and this drum and frame A are rigidly connected to each other by the standards *a*.

Encircling the drum B is the excavating-wheel C, which consists of two side rims, *d*, the outer edges of which are flared outwardly, as shown at *d'*. The inner edges of these rims fit snugly upon the outer edges of the drum B, the circumference of which is covered with a plate or sheet of metal, as shown at *e*. The rims *d* are connected to each other by cutters *f* and scoops or shovels F, the outer edges of said scoops and shovels projecting beyond the rims *b*. The scoops F are curved so that their inner edge will lie adjacent to the circumference of the drum B.

Attached rigidly to the outer sides of the rims *d* are curved racks E, engaging pinions on the vertical shafts, the inner edges of said curved racks bearing upon anti-friction rollers *g*, permanently attached to the drum B.

Within the recessed portion B', in the upper portion of the drum, is secured a screw-carrier, G, one end of which is provided with a pinion, *h*, which meshes with a pinion on the end of one of the vertical shafts secured to the frame A, and the recess B' is provided at its end opposite the end having the pinion *h* with a delivery-spout, I.

The operation of my invention is as follows: When the apparatus is placed in position for excavating, power is applied to the shaft *c'* so as to rotate the same, which motion is imparted to the shaft *b*, the pinions thereon turning the excavating-wheel C, as well as the screw-carrier G, thus causing the shovels to enter the ground and be filled with earth, after which the earth is carried upward and dropped in the recess B', after which it is carried by the screw-conveyer out of the spout I to any convenient receptacle.

It will be seen from the foregoing that the operation of excavating is carried on continuously, and that the surface of the drum forms a portion or back of the shovels, so that the earth will be dropped upon the conveyer without the intervention of trip-levers or other similar mechanism.

I claim—

1. The combination, in a ditching-machine, of a supporting-frame, carrying-wheels therefor, located at each side, stationary drum supported below said frame, a peripheral band



embracing said drum, and provided with scoops or shovels, said peripheral band provided at its side with an annular series of teeth and a shaft depending from said supporting-frame, and provided with a wheel meshing with said teeth, and operating mechanism, substantially as described, located on said supporting-frame for driving said vertical shaft, as and for the purpose specified.

10 2. The combination, in an excavating apparatus, of the supporting-frame having carrying-wheels located at each side, a stationary drum supported beneath said frame and provided with a recessed portion at its upper side, an  
15 annular band embracing said drum and provided with a series of scoops or buckets, an annular series of teeth located on the side of said annular band, a vertical shaft having a gear-wheel meshing with said teeth, a device,  
20 substantially as described, located on the supporting-frame for driving said vertical shaft, a transverse conveyer located in the recess in the upper portion of the stationary drum for conveying away dirt accumulating therein, as  
25 and for the purpose specified.

3. In combination with a stationary drum, B, recessed transversely at its upper side, a rotary excavator encircling said drum and provided with shovels, the inner portions of which bear upon the drum, and a carrier for removing the earth from the recess in the drum, substantially as shown, and for the purpose set forth. 30

4. In combination with a stationary drum, B, recessed transversely at its upper side, a frame, A, carrying operating mechanism attached rigidly thereto, and excavating means attached to the drum so as to rotate about the same and deposit the earth removed thereby in the recess in the drum, from which it is conveyed by a screw-carrier, the parts being adapted to be operated substantially as shown, and for the purpose set forth. 35 40

In testimony whereof I affix my signature in presence of two witnesses. 45

JNO. W. ZEIS.

Witnesses:

THOMAS J. KINTZ,  
HARRY TAGGART.