

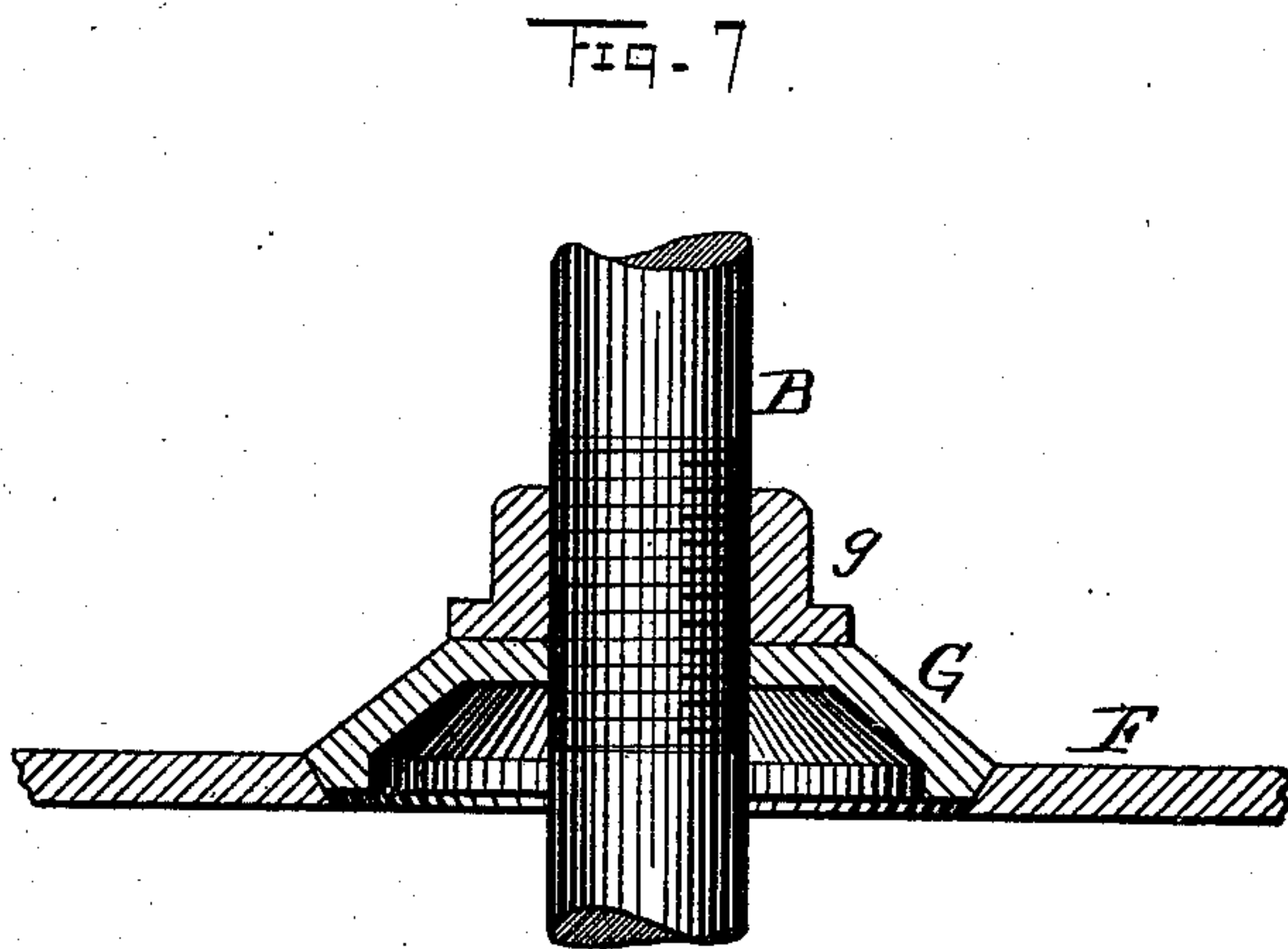
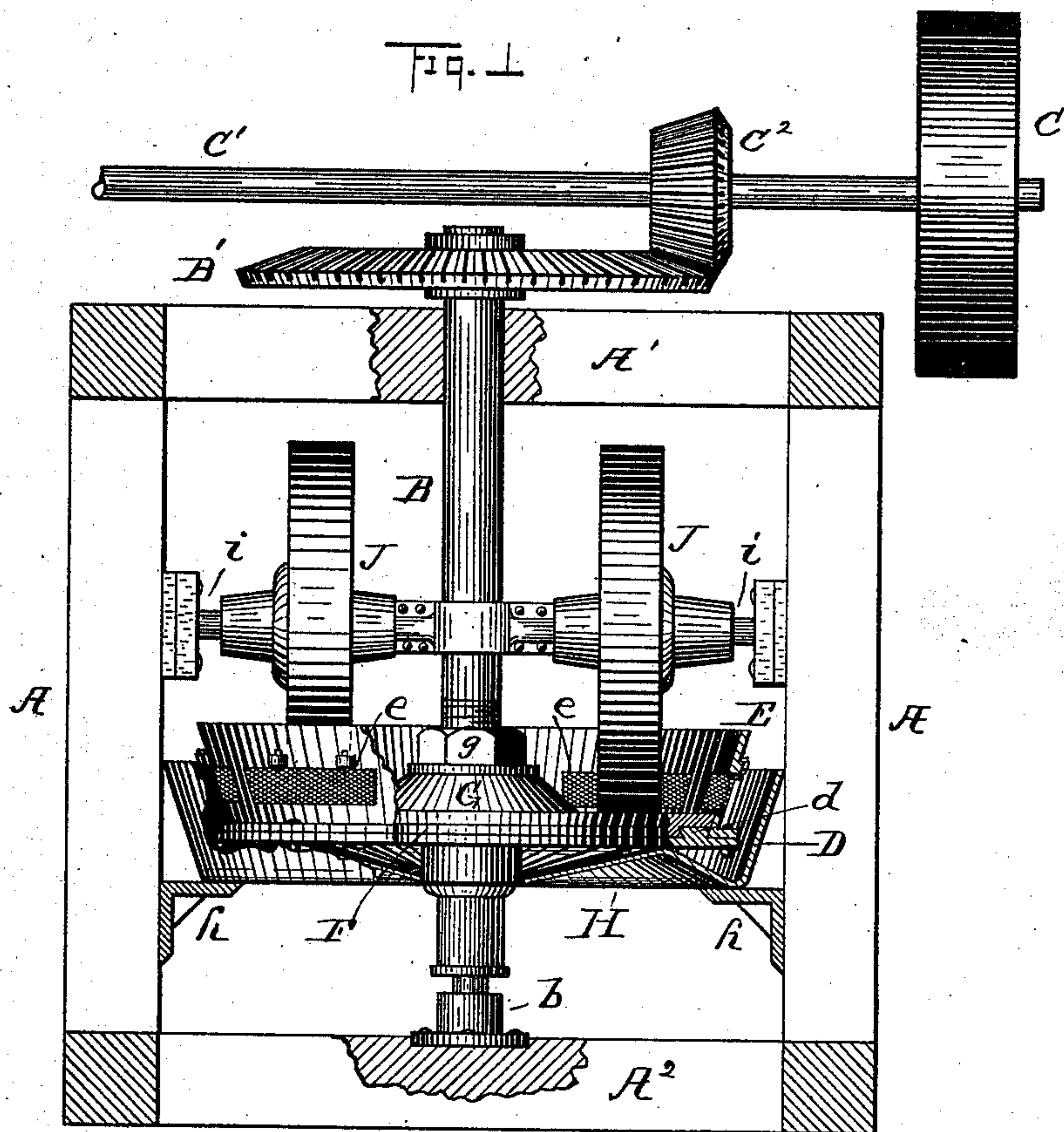
(No Model.)

3 Sheets—Sheet 1.

J. A. & C. W. VAUGHN.
ORE CRUSHER.

No. 412,568.

Patented Oct. 8, 1889.



Witnesses

O. S. Dowie.

C. E. Humphrey.

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(No Model.)

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Fig. 2

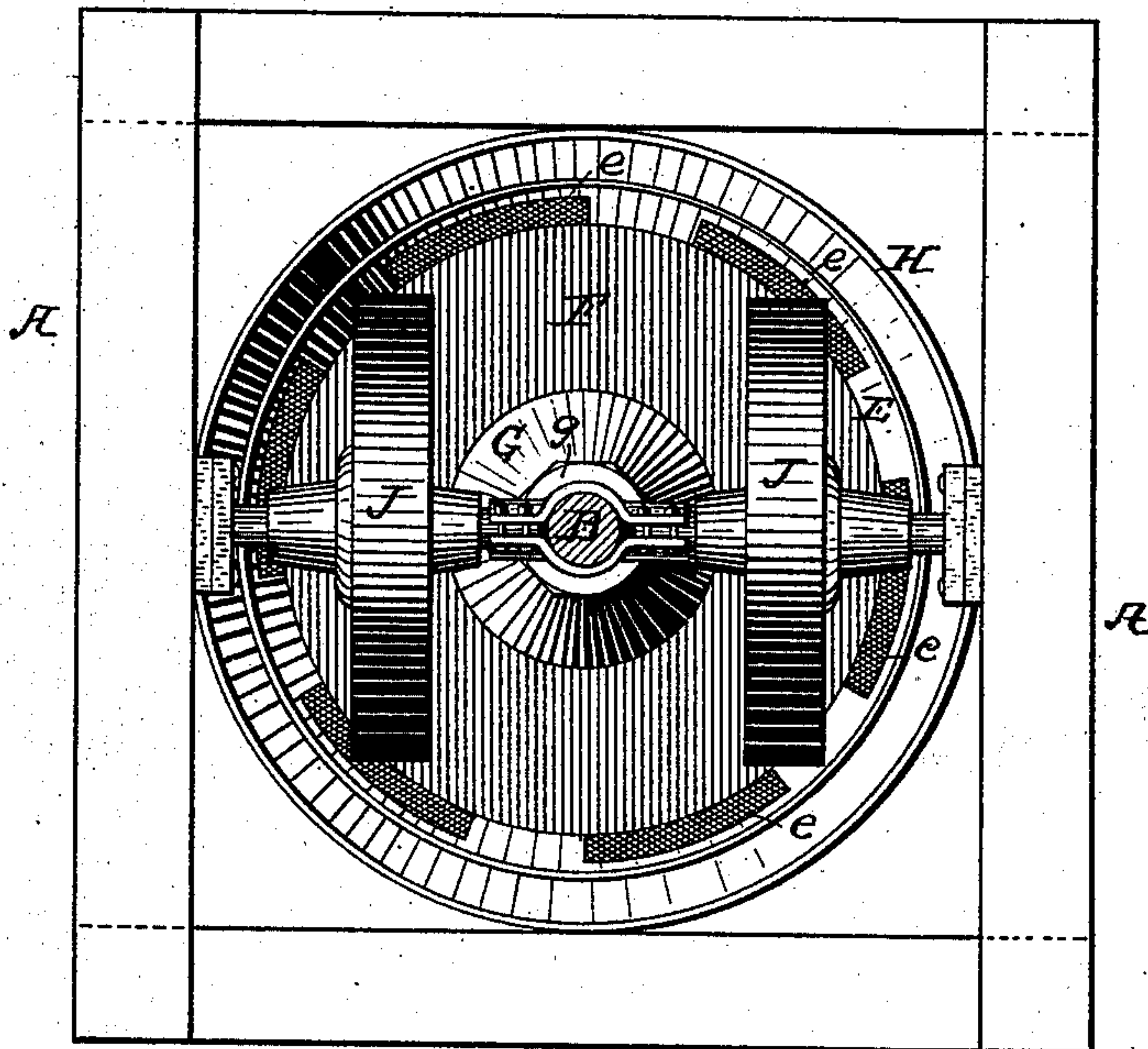
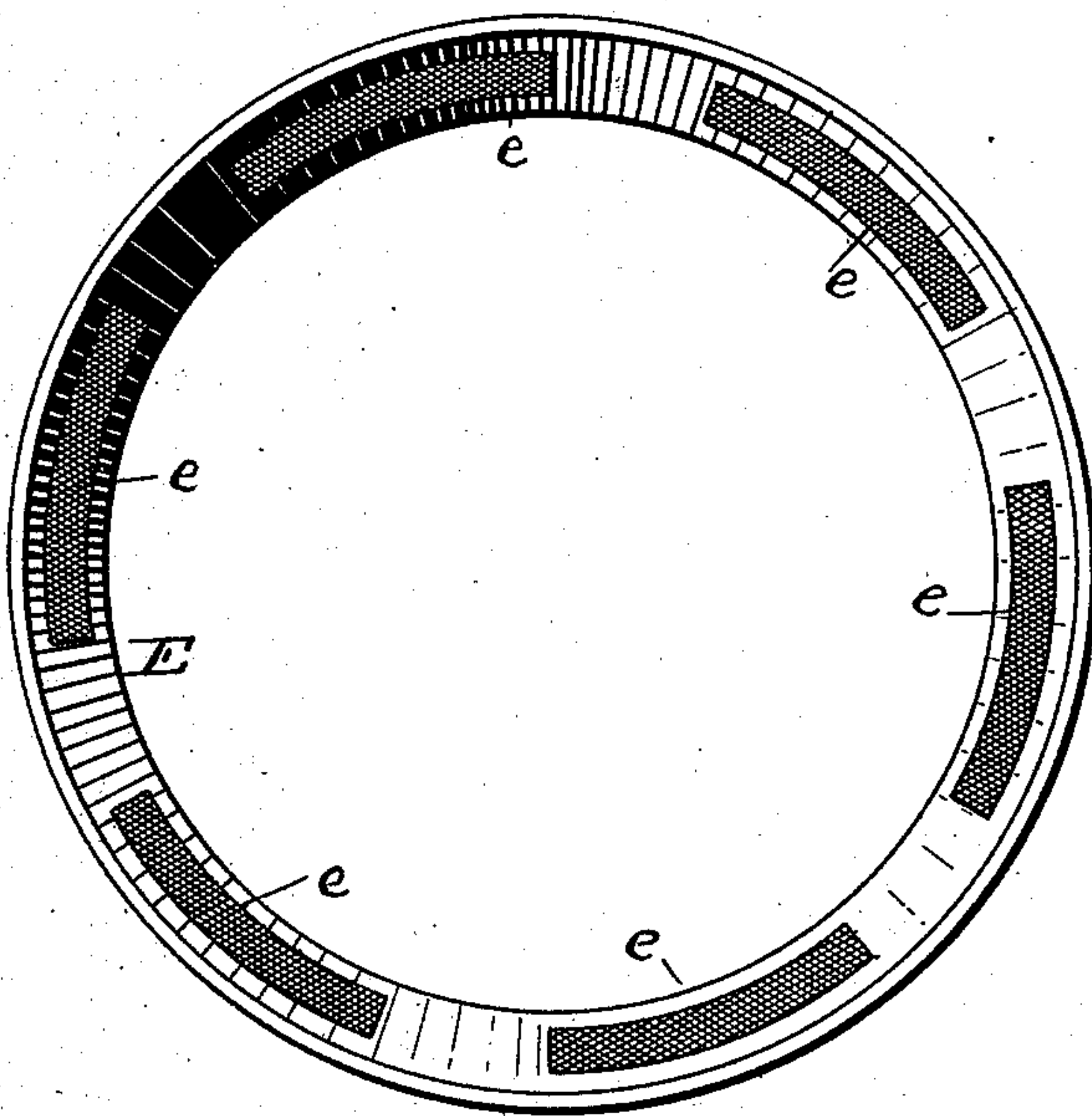


Fig. 4



Witnesses

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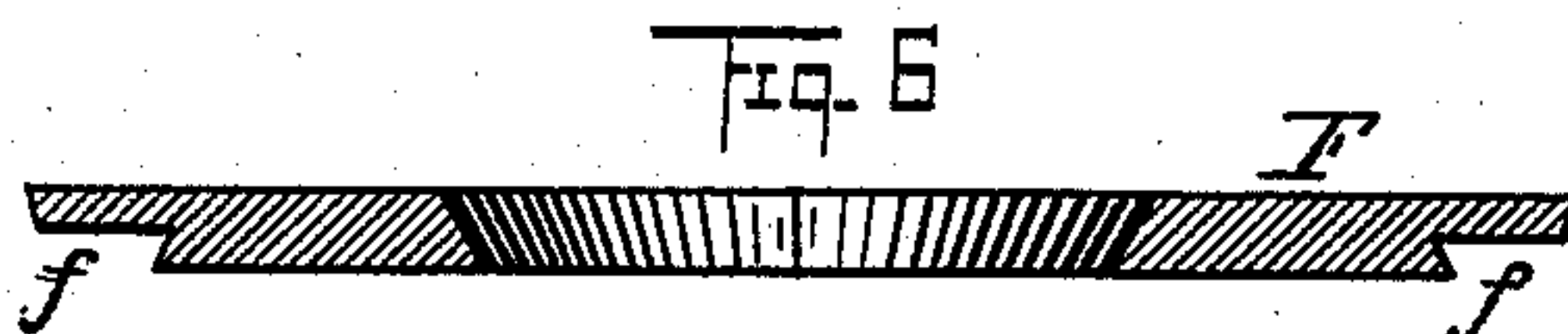
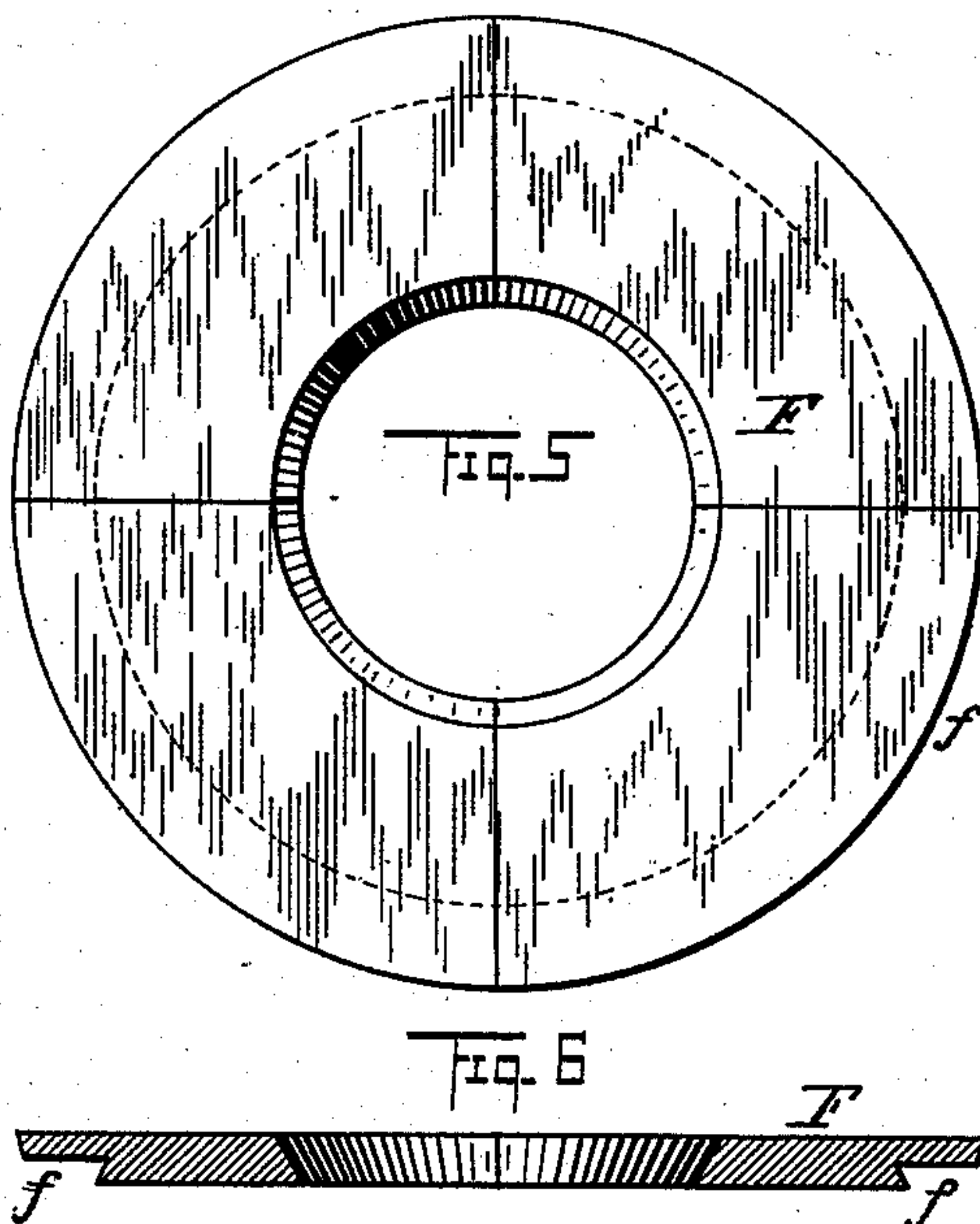
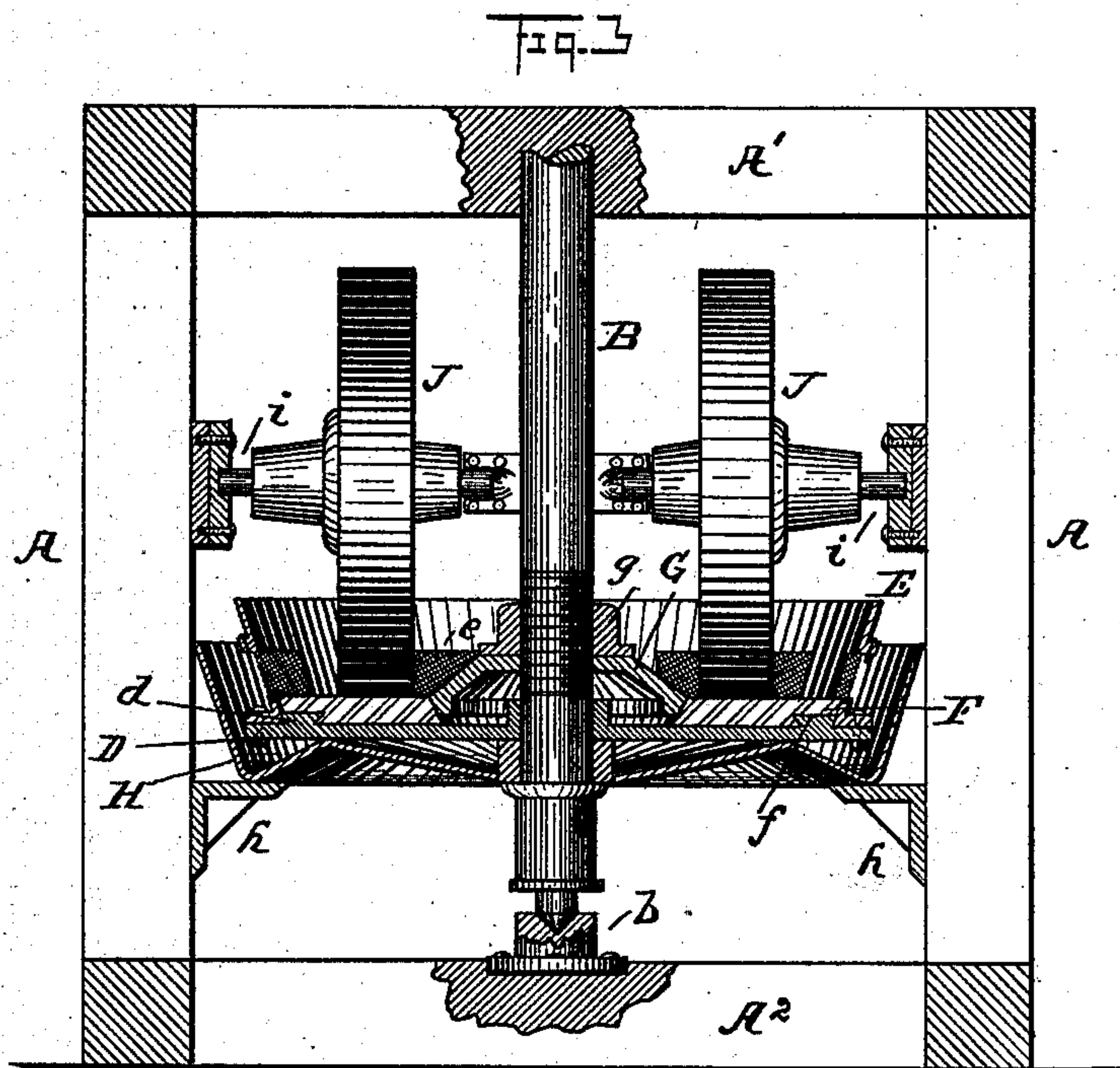
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UNITED STATES PATENT OFFICE.

JAMES A. VAUGHN AND CALVIN W. VAUGHN, OF CUYAHOGA FALLS, OHIO,
ASSIGNORS TO TURNER, VAUGHN & TAYLOR, OF SAME PLACE.

ORE-CRUSHER.

SPECIFICATION forming part of Letters Patent No. 412,568, dated October 8, 1889.

Application filed July 5, 1889. Serial No. 316,618. (No model.)

To all whom it may concern:

Be it known that we, JAMES A. VAUGHN and CALVIN W. VAUGHN, citizens of the United States, residing at Cuyahoga Falls, in the county of Summit and State of Ohio, have invented a certain new and useful Ore-Crusher, of which the following is a specification.

Our invention relates to improvements in machinery for crushing ores, to permit the metals contained therein to be separated, and has especial reference to that class of machines in which the ore is crushed in an annular bed or mortar by vertically-revolving wheels.

The objects of our invention are to provide a removable bed-plate for the mortar, with devices by which it can be removed and replaced; to secure a tight joint about its central connection with the driving-shaft, and thereby prevent the escape of the crushed ore; to provide an improved pan to receive the crushed ore or "pulp," and, generally, to simplify the construction and increase the efficiency of the machine.

To this end our invention consists of the peculiar and novel construction and arrangement of the different parts hereinafter described, and then specifically pointed out in the claims, reference being had to the accompanying drawings, which constitute a part of this specification.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is an elevation of our improved ore-crusher with portions of the frame, filtering-rim, and pan cut away to better exhibit the construction; Fig. 2, a plan of the machine from beneath the upper beam of the frame; Fig. 3, an elevation, with the filtering-rim, bed, and pan in central vertical section; Fig. 4, a plan, enlarged, of the filtering-rim; Fig. 5, a plan, enlarged, of the bed; Fig. 6, a vertical central section of the bed enlarged; and Fig. 7, a vertical central section of the bed, further enlarged, with the central shaft and fastening devices.

Referring to the accompanying drawings, A is a frame, usually of heavy beams of wood, in which is a vertical shaft B, journaled at

the top in a cross-beam A', with its lower end resting in a step *b* in a corresponding cross-beam A².

The shaft B is revolved by means of the pulley C on the shaft C' (the supports of which it has not been thought necessary to show) through the gear-wheels C² B'. Attached to the shaft B and arranged to revolve with it is a horizontal disk D, having in its upper face and near its outer edge a dove-tailed projection or ridge *d*, concentric with said disk. Attached to the disk D, outside of the ridge *d*, and compressed against its outer face, is a conical rim E, having side openings *e*, guarded by wire screens to filter the pulp and permit the escape of the finer particles of crushed ore and retain the coarser. Inside of the rim E and resting on the disk D is the removable bed F, which consists of a metallic disk or plate, preferably constructed in sections, as shown in Fig. 5, having a rabbet or groove *f* in its outer lower face to fit the inner face of the ridge *d*, and with an inner opening having inwardly-sloping edges to receive the retaining device hereinafter described.

Above the bed F and surrounding the shaft B is a conical sleeve G, having its outer edge adapted to fit the inner beveled edge of the bed F, against which it is retained and pressed by a nut *g*, which meshes in screw-threads on the shaft B. By this peculiar construction a tight joint is secured between the inner and outer edges of the bed F with the sleeve G and rim E, respectively, and the bed F readily removed and replaced when desired.

Located concentrically beneath the disk D and rim E is a circular pan H, which rests on brackets *h*, attached to the frame A, and through an opening in the center of which the shaft B passes. The diameter of this pan exceeds that of the disk D, and in configuration its outer edge slopes down and inward substantially parallel with the sides of the rim E until about perpendicularly below the edge of the disk D, whence it rises conically toward its center nearly to the disk D, and again descends toward its center, thus leaving an annular channel below the edge of the disk D and rim E, into which the finer par-

tibles of ore or pulp escaping through the screen-openings *e* fall and are retained until removed in any desired manner.

Resting on the bed *F* are two wheels *J J*,
5 mounted and arranged to revolve vertically as the bed turns on shafts *i i*, journaled in the frame *A*. These shafts are arranged to have a slight vertical movement, to permit the wheels to rise and fall in particles of ore,
10 and the wheels may be fixed to the shafts *i i*, and the latter arranged to turn in bearings in the frame; or the shafts may be fixed and the wheels free to revolve thereon.

In operation the disk, bed, and rim are re-
15 volved with and by the shaft *B*, the pan and shafts of the wheels remaining stationary, and the wheels, rotated by friction with the moving bed, crush and pulverize the ore placed thereon, which as it becomes of sufficient
20 fineness escapes through the screens over the openings in the rim and falls into the annular channel of the pan.

It is not essential that the construction be of the exact relative dimensions or angles
25 shown in the drawings, as these may be modified as the nature of the work to be performed may require, or experience may dictate, the

novel features of our invention which we claim being—

1. In a mill of the class designated, the com- 30
bination of the disk, with its annular ridge, the removable bed arranged to rest against said ridge, the conical sleeve arranged to meet the inner edge of said bed, and means, as a nut, to force said sleeve against said bed, 35
all constructed and arranged substantially as shown, and for the purpose specified.

2. In a mill of the kind designated, the combination, with the revoluble grinding-bed and rim having side openings, of a pan dis- 40
posed beneath said bed and rim, having upwardly-sloping center and sides forming an annular channel to receive the material which escapes through said openings, all constructed and arranged substantially as shown and de- 45
scribed.

In testimony that we claim the above we hereunto set our hands.

JAMES A. VAUGHN.
CALVIN W. VAUGHN.

In presence of—
GEO. W. RICE,
C. P. HUMPHREY.