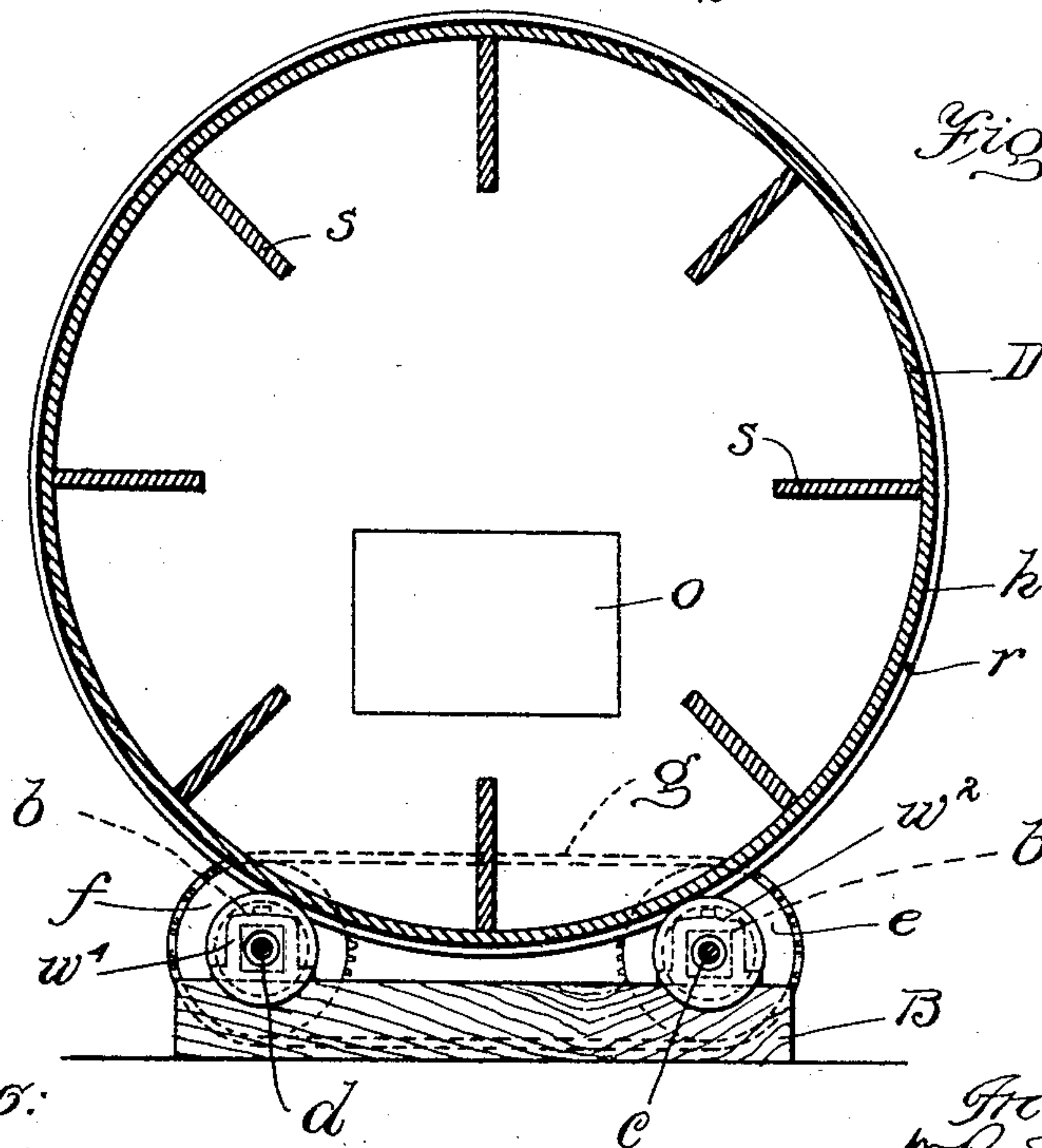
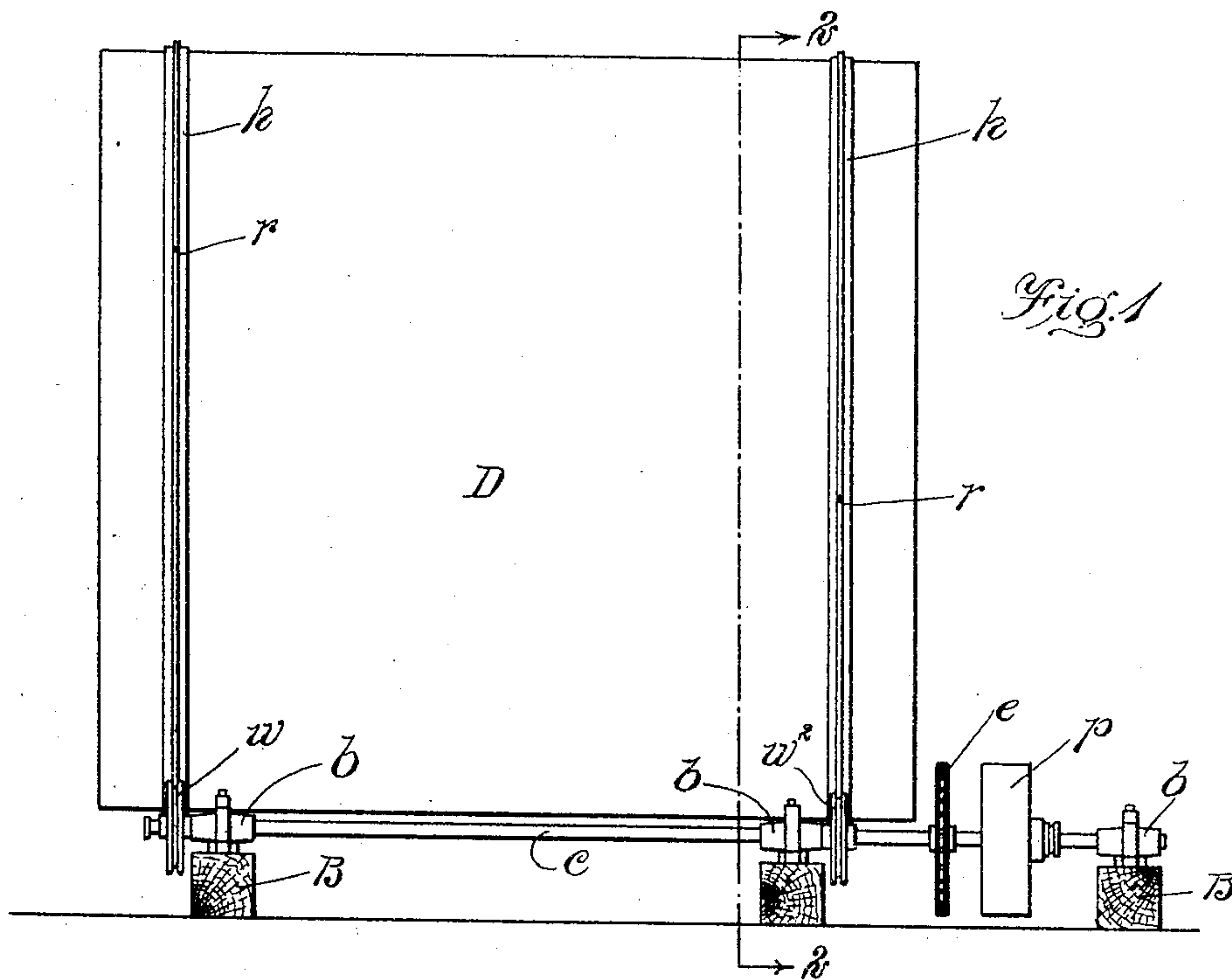


No. 779,746.

PATENTED JAN. 10, 1905.

W. R. SMITH.  
TUMBLING DRUM.  
APPLICATION FILED SEPT. 13, 1904.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 4

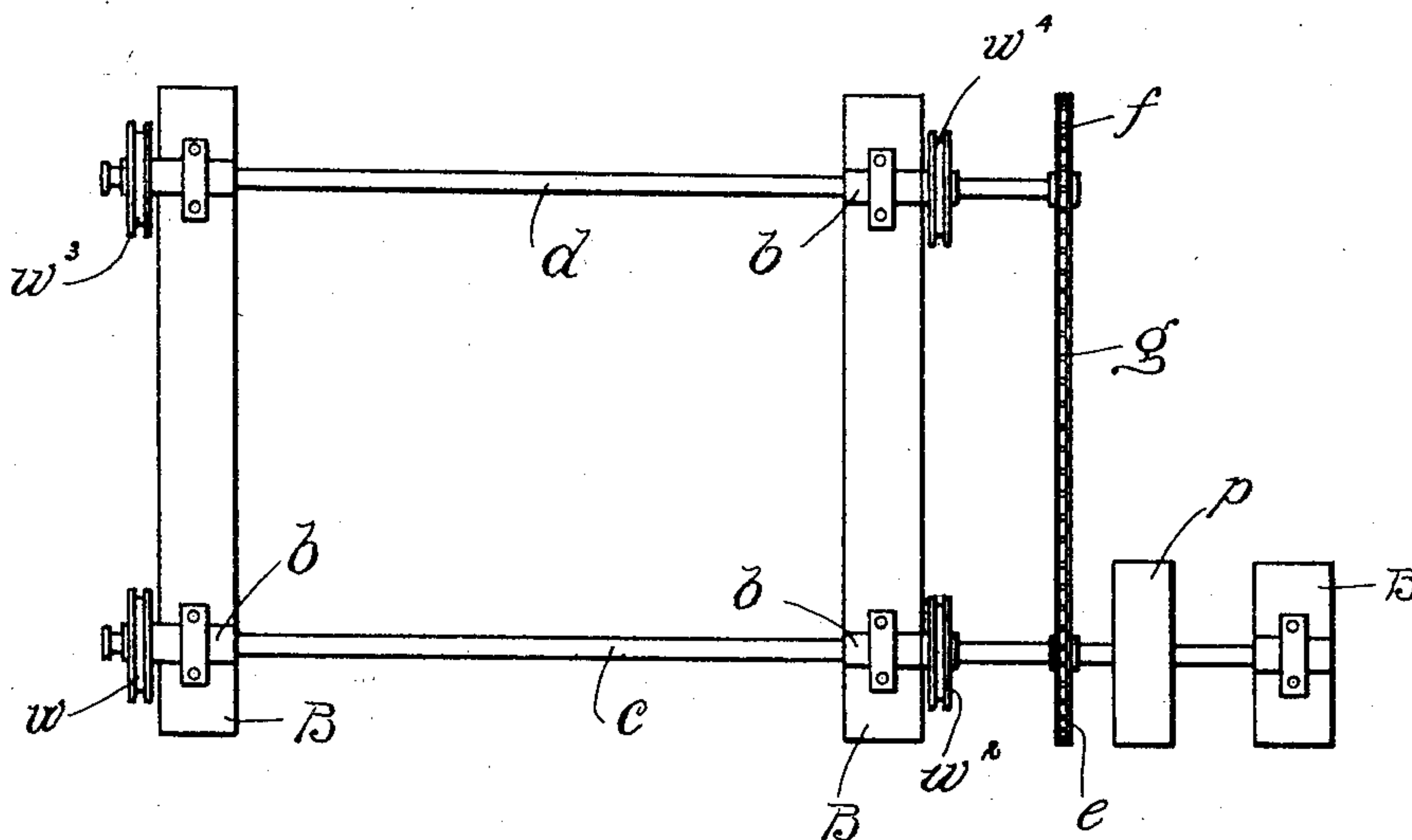
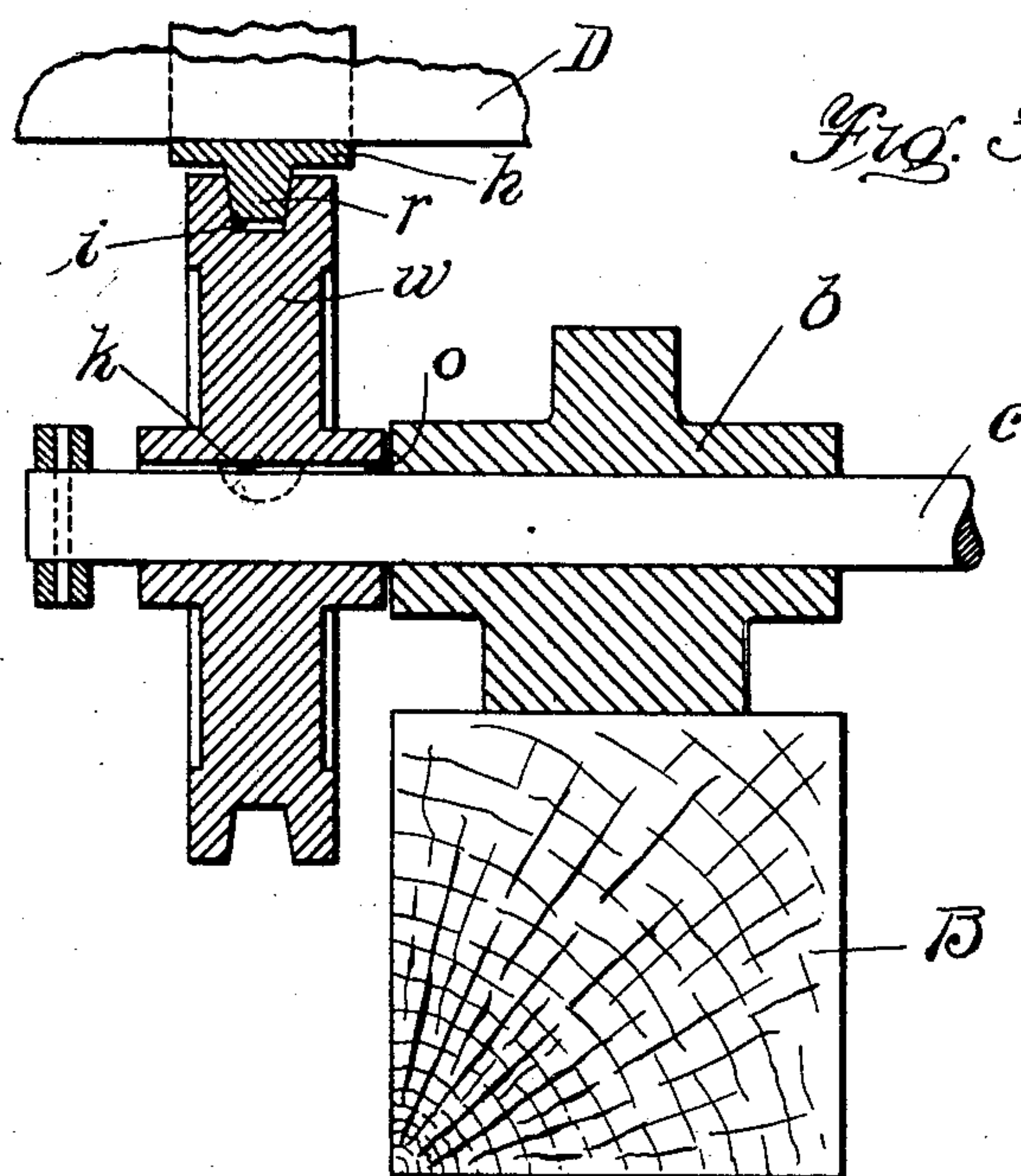


Fig. 3



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# UNITED STATES PATENT OFFICE.

WILLIAM R. SMITH, OF BUFFALO, NEW YORK, ASSIGNOR TO BUFFALO LEATHER COMPANY, OF BUFFALO, NEW YORK, A CORPORATION OF WEST VIRGINIA.

## TUMBLING-DRUM.

SPECIFICATION forming part of Letters Patent No. 779,746, dated January 10, 1905.

Application filed September 13, 1904. Serial No. 224,257.

*To all whom it may concern:*

Be it known that I, WILLIAM R. SMITH, of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Tumbling-Drums, of which the following is a specification.

The present invention relates to tumbling-drums used in treating hides and leather for performing the processes of chrome-tannage, coloring, washing, milling, &c., of the leather, and has for its object to provide a novel construction of drum and operating mechanism therefor in which the advantages of automatic compensation for the swelling and shrinkage of the wood of the drum, freedom from obstruction of the ends of the drum, noiseless operation, and other advantages hereinafter described may be obtained.

The invention consists in the improvements which I will now proceed to describe and claim.

In the drawings forming a part of this specification, Figure 1 represents a side elevation of a device embodying my invention. Fig. 2 represents a cross-section on the line 2 2 of Fig. 1. Fig. 3 represents an enlarged sectional view of a portion of the driving mechanism. Fig. 4 represents a plan view of the support with the drum removed therefrom.

Similar reference characters represent similar parts on all the figures.

D represents a drum in which the hides or leather-stock to be treated are put, together with the solutions to be used in the processes of chrome-tannage, coloring, washing, milling, &c., for which this apparatus is adapted. The drum is of general cylindrical shape and is constructed very much in the manner of an ordinary barrel, the sides of staves and the ends of flat planks secured in substantially the same way as are barrel-heads. This structure is different from the ordinary structure of drums of this character, in which the ends are braced by complicated framing, and is of material advantage, as the ends are left unobstructed, and thereby free access is afforded to the door *a* in one of them, through which the material is put into and removed from the

drum. To the inside walls of the drum are secured a number of radial shelves *s*, which act during the rotation of the drum to manipulate and knead the stock and subject it in the most thorough manner possible to the action of the solution. The parts of the drum are bound tightly together by hoops or bands *h*, as are the parts of barrels and tanks, two such hoops, one at each end of the drum, being here shown. The hoops or bands are each provided with a projecting rib *r*, which extends longitudinally about the hoop and is formed with converging sides, giving the rib a truncated V or wedge shape in cross-section. The ribs constitute rails or tracks by which rotation may be imparted to the drum through means to be described and being connected to the hoops form therewith combined retaining-hoops and tracks.

Supported to rotate in bearings *b*, mounted on a bed-frame *B*, are shafts *c d*, on which are mounted wheels *w w<sup>2</sup> w<sup>3</sup> w<sup>4</sup>*, the wheels *w w<sup>2</sup>* being on the shaft *c* and *w<sup>3</sup> w<sup>4</sup>* on shaft *d*. Sprocket-wheels *e f* are mounted on the shafts *c d*, respectively, and are connected by a chain *g* passing over them. A clutch-pulley *p*, mounted on the shaft *c*, receives motion by belt from a suitable source of power and when thrown into operative connection with the shaft *c* causes the shafts and wheels to rotate at a uniform speed, the wheels being connected to the shafts, so as to turn with them. Each of the wheels is provided with a groove *i*, formed with outwardly-flaring sides, and the drum is placed upon the wheels with the ribs *r* extending into the grooves. As the whole weight of the drum rests on the wheels, the ribs are pressed with considerable force into the grooves and are caused to wedge tightly against the side walls of the grooves, which are formed with substantially the same inclination as the sides of the V-shaped ribs, causing a strong frictional engagement between the wheels and ribs. As shown in Fig. 3, the outer faces of the ribs do not extend quite to the bottoms of the grooves of the wheels; but the entire contact is between the sides of the ribs and grooves. By means of the frictional engagement of the ribs and wheels rotation of the wheels causes



the drum to revolve, and thereby agitate the stock and agents for acting upon it contained therein. As the drum is made of wood and liquid matter is contained in it, the absorption of the liquid by the wood causes swelling of the wood, and consequent elongation of the drum, while, on the other hand, drying of the wood after removal of the liquid causes the wood to shrink and the drum to shorten, with the result that the distance between the tracks carried by the drum is caused to vary, being at some times greater than at others. Again, when the drum is allowed to remain stationary for any length of time with liquid in its lower portion the drying of the upper part of the drum while the bottom remains damp causes an unequal shrinkage of the drum, with the result that the tracks are thrown out of parallelism, some parts of the tracks being drawn nearer together than others. This unequal separation of the tracks would throw them out of line with the driving-wheels and cause trouble, either by breaking some part or stopping the machine, if some provision were not made for automatically compensating for the distortion of the tracks due to swelling and shrinking of the drum and keeping the driving-wheels always in line with them. For this purpose I mount one or both of the wheels carried by each of the shafts so that it will be free to move laterally on the shaft in the direction of the axis of the shaft, while being still compelled to rotate therewith. The structure by which this result is accomplished is illustrated in Fig. 3, which shows one end of the shaft *c* and the wheel *w* carried thereby. The shaft has set into it a key *k*, which projects into a keyway *o* in the bore of the wheel. The parts are constructed with a loose fit, so that the wheel can slide along the shaft; but the key prevents its turning thereon. Thus when the track which engages the wheel *w* is moved to one side or the other it carries the wheel with it, and they are therefore caused to remain in operative driving contact at all times, thereby insuring smoothness and certainty of operation. All of the wheels may be thus slidably connected to the shafts; but I find it preferable to mount the wheels *w*<sup>2</sup> *w*<sup>1</sup>, which are on the right-hand ends of the shafts, as seen in Fig. 1, with a fixed connection, while the wheels on the other ends are mounted with the above-described adjustable connection, as this arrangement fully accomplishes the object for which it is designed and also retains the drum in a definite position.

By means of the arrangement of drum relative to its operating mechanism and the structure of the driving-gear described a powerful frictional hold is secured on the tracks by the wheels, due to the wedging action of the tracks in the wheel-grooves under the weight of the drum, giving a very effective traction, which can be increased or diminished by mounting

the wheel-shafts at a greater or less distance apart, and also by the arrangement of the wheels shiftable along the shafts, together with the particular structure of tracks and wheels, a drive for the drum is provided which is noiseless, always smooth-running, and certain in operation in spite of variations in the distance between the tracks.

What I claim, and desire to secure by Letters Patent, is—

1. In a leather-treating apparatus, a drum, and mechanism for rotating said drum, automatically shiftable to maintain said rotating mechanism in operative connection with said drum, and to compensate for the distortion caused by swelling and shrinking of said drum.

2. In a leather-treating apparatus, a drum, a band surrounding said drum, and means movable in the direction of the axis of the drum in frictional engagement with said band for rotating said drum.

3. In a leather-treating apparatus, a drum, a combined retaining hoop and track connected to the drum, and rotary means movable in the direction of the axis of the drum engaging said track for rotating said drum.

4. In a leather-treating apparatus, a drum, bands surrounding said drum, longitudinal ribs formed with convergently-inclined sides on said bands, grooved wheels engaging the sides of said ribs, and means for rotating said wheels.

5. In a leather-treating apparatus, a drum, bands surrounding said drum, longitudinal ribs having convergently-inclined sides mounted on said bands, grooved wheels movable in the direction of the length of the drum engaging the sides of said ribs, and means for rotating said wheels.

6. A leather-treating apparatus comprising wheels having peripheral grooves, a drum provided with projecting ribs or tracks having inclined sides supported on said wheels with the aforesaid ribs projecting into the grooves of the wheels, the sides of the ribs engaging the sides of the groove, and means for rotating the wheels.

7. A leather-treating apparatus comprising a drum, projecting circumferential ribs or tracks having inclined sides secured to said drum, wheels having peripheral grooves formed with outwardly-sloping side walls, and means for rotating said wheels in unison, the parts being arranged with the drum resting on and supported by said wheels with the ribs or tracks on the drum projecting into the grooves of the wheels, the sides of the ribs in contact with the side walls of the grooves, whereby the wheels are caused to frictionally engage the ribs for communicating rotary motion from said wheels to said drum.

8. A leather-treating machine comprising a drum, circumferential track members connected to said drum near the ends thereof, a plurality of shafts, wheels mounted on said



shafts for motion longitudinally thereof and connected to rotate therewith, interengaging portions on said track members and wheels, and means for rotating the shafts and thereby the wheels and drum, the wheels shifting longitudinally of the shaft to compensate for variations in the distance between the track members.

9. A leather-treating machine comprising a drum, track members connected to said drum near opposite ends thereof, members engaging said track members for rotating the same, said last-mentioned members being mounted with provision for lateral motion, whereby said members remain always in engagement with the track members, regardless of variations in the distance between the track members.

10. In a machine of the character specified, a drum, track members V-shaped in cross-section secured to said drum, driving members having correspondingly-V-shaped grooves located adjacent to the drum, the track members projecting into the grooves and their sides bearing against the side walls of the grooves, whereby frictional engagement is obtained between the track and driving members, and means for moving said driving members.

11. In a machine of the character specified, a drum, a support therefor comprising wheels

provided with peripheral grooves having diverging sides, hoops on said drum provided with projecting ribs, V-shaped in section, in wedging engagement with the sides of the grooves, rotatable shafts, connections between said wheels and shafts for communicating rotary motion of the shafts to the wheels, and means for rotating the shafts.

12. In a machine of the character specified, a drum, track members having convergently-inclined sides secured to said drum and extending around the same, and supporting and driving means for the drum comprising wheels having peripheral grooves formed with sides inclined to correspond with the inclination of the sides of the tracks, shafts on which the wheels are mounted, and means for rotating said shafts, the drum being placed on the wheels with its track members projecting partially into the peripheral grooves and their sides in engagement with the sides of the grooves, the wheels being connected to the shafts to rotate therewith and certain of them being movable longitudinally of the shafts.

In testimony whereof I have affixed my signature in presence of two witnesses.

WILLIAM R. SMITH.

Witnesses:

DANIEL W. ALLEN,  
J. E. VOORHIS.