No. 772,639. PATENTED OCT. 18, 1904.

J. N. WRIGHT.

HOISTING ENGINE.

APPLICATION FILED APR. 19, 1904.

NO MODEL. 6 SHEETS—SHEET 1.

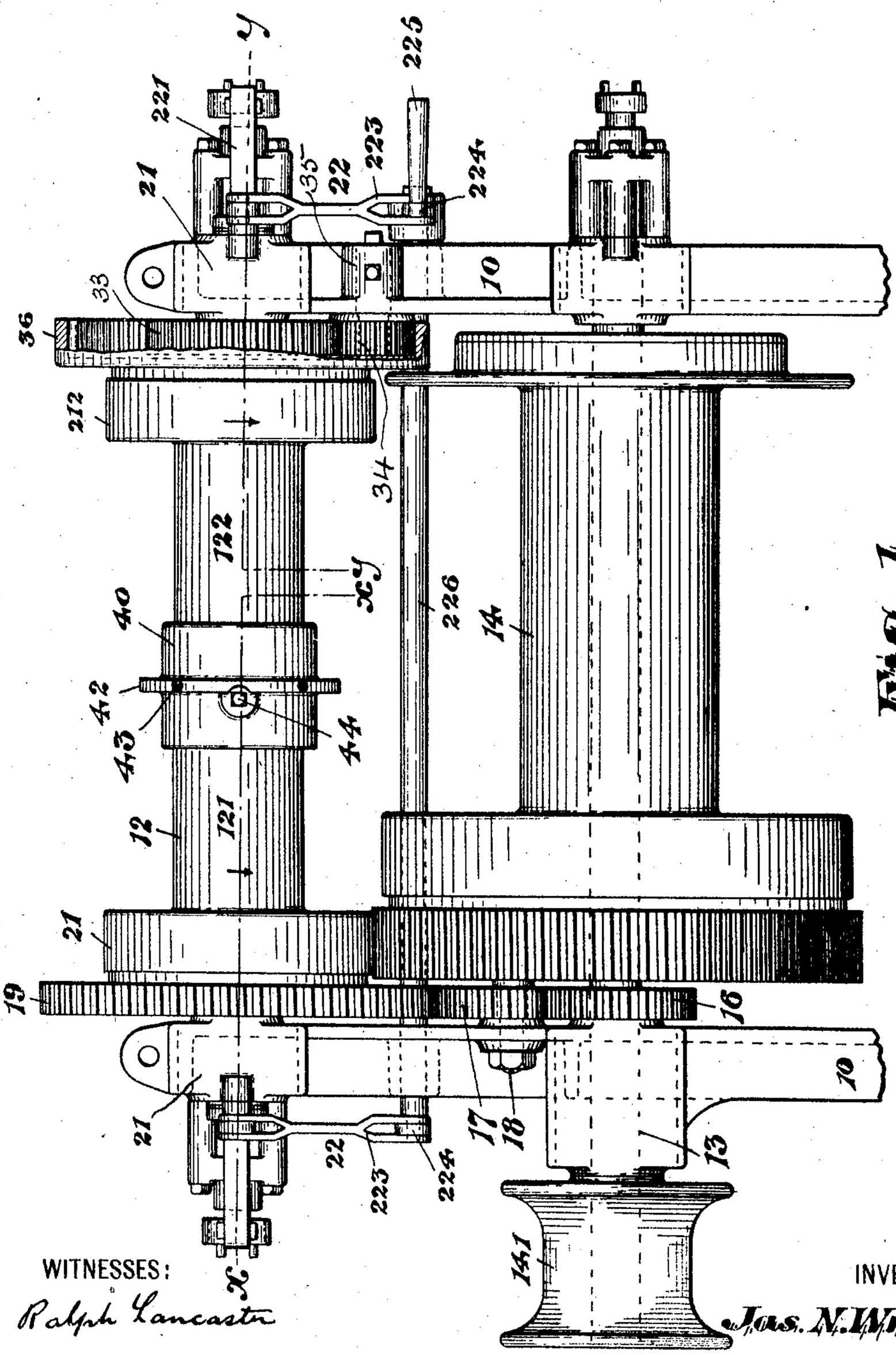

Fig. 1.

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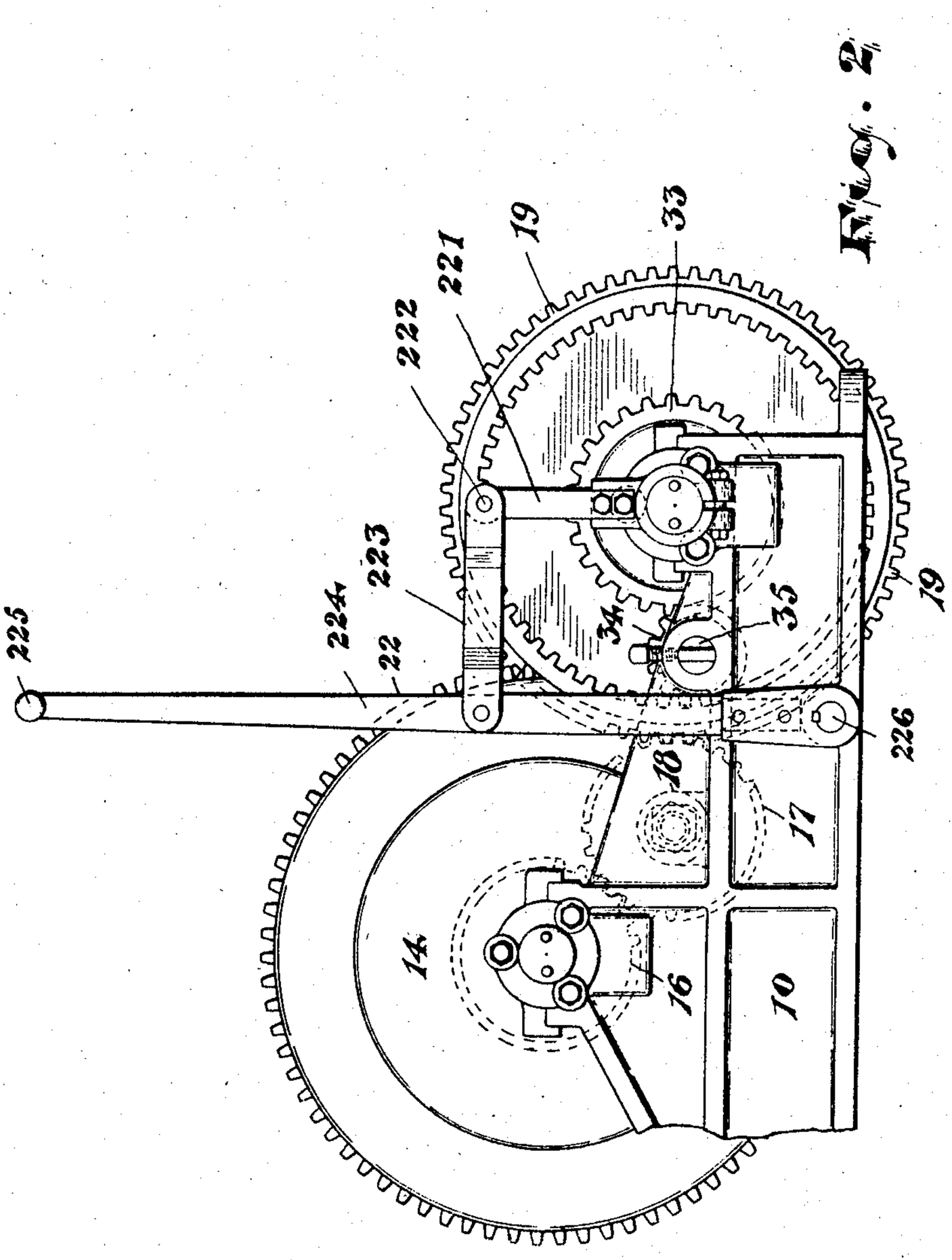
NO MODEL. 6 SHEETS—SHEET 2.

Fig. 2.



WITNESSES:

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NO MODEL. 6 SHEETS—SHEET 3.

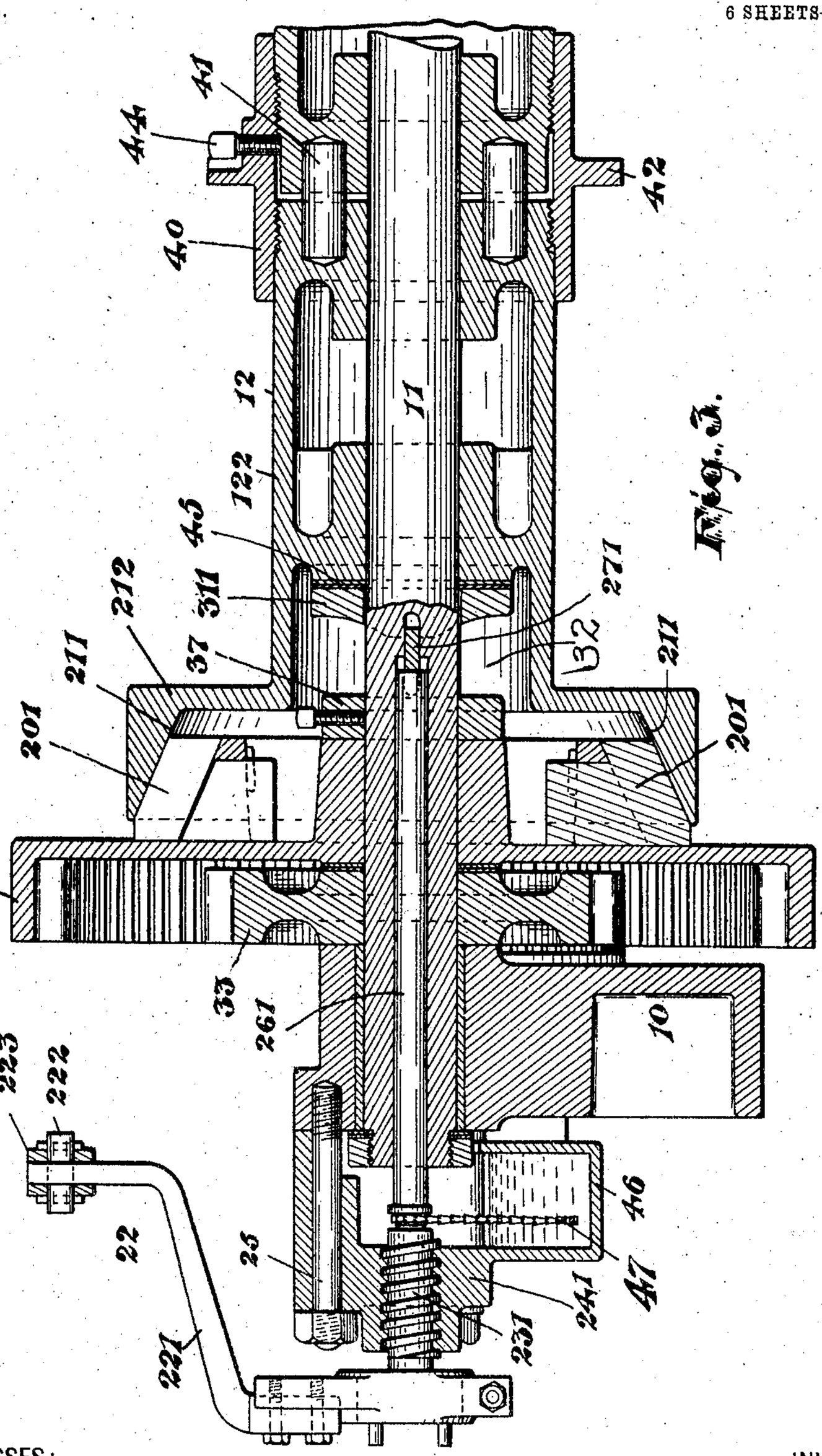

Fig. 3.

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NO MODEL. 6 SHEETS—SHEET 4.

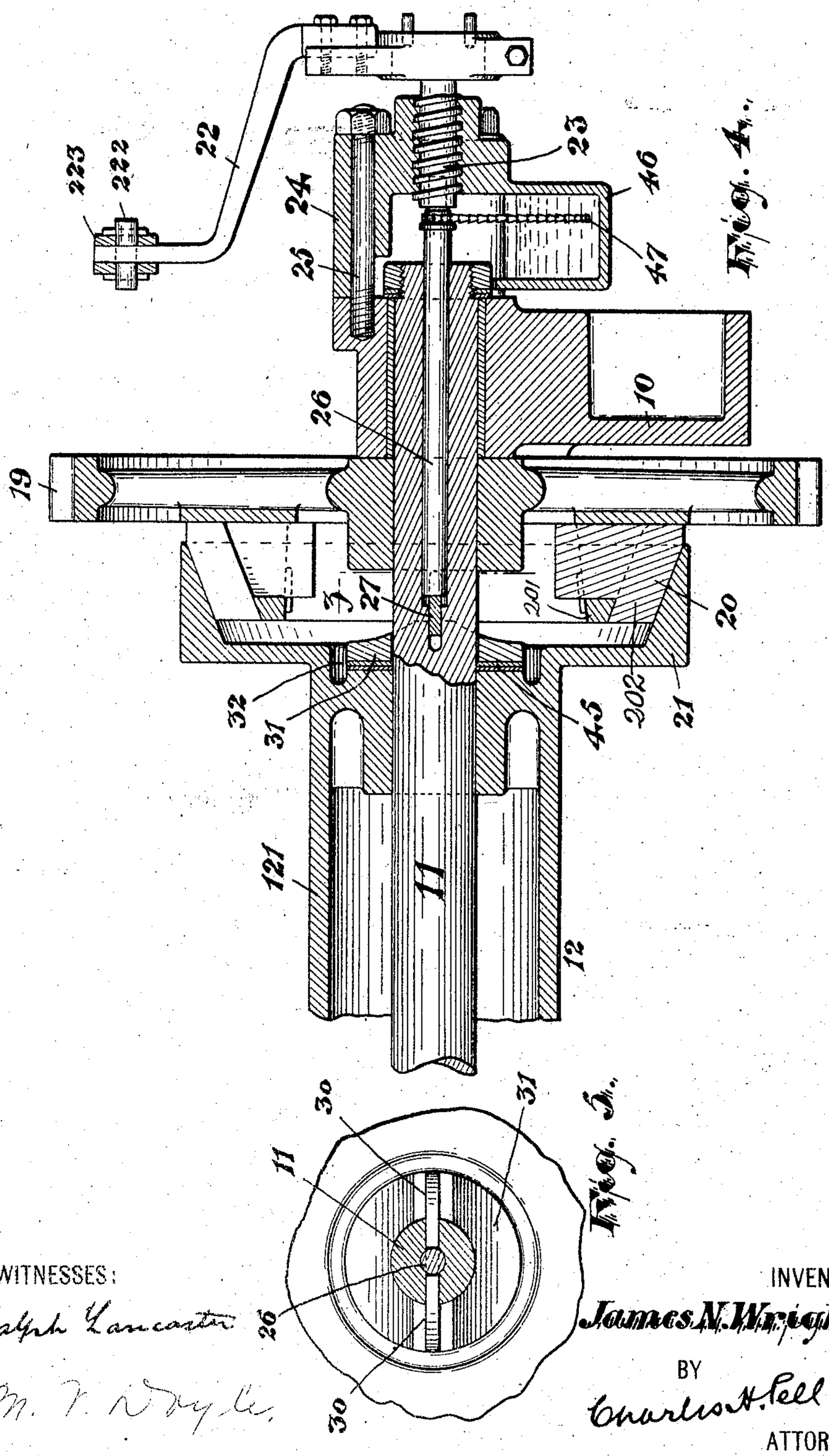

Fig. 4.

Fig. 5.

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NO MODEL. 6 SHEETS—SHEET 5.

Fig. 7.

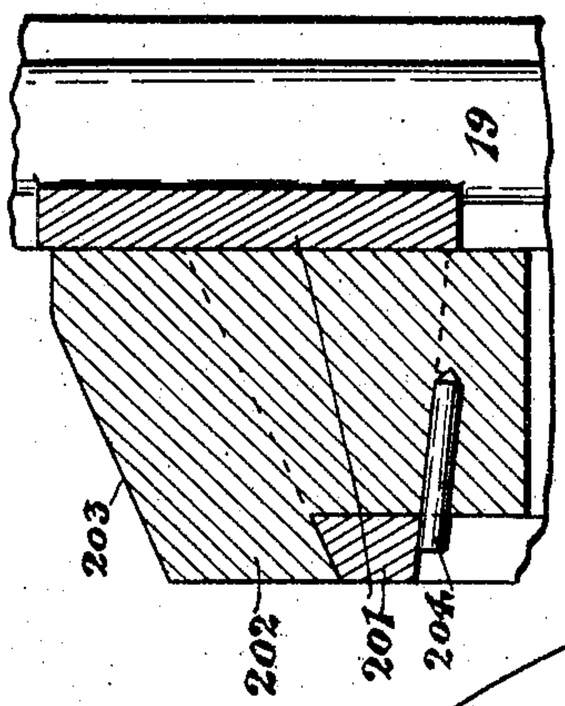


Fig. 8.

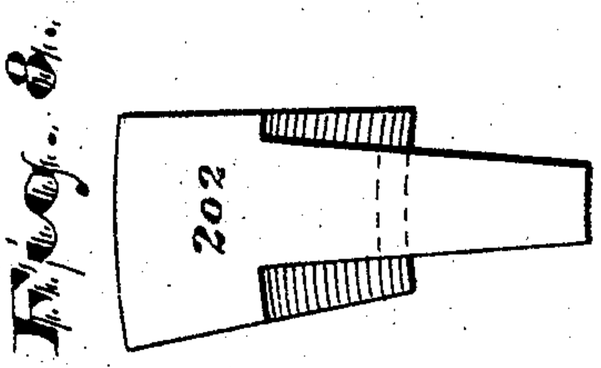
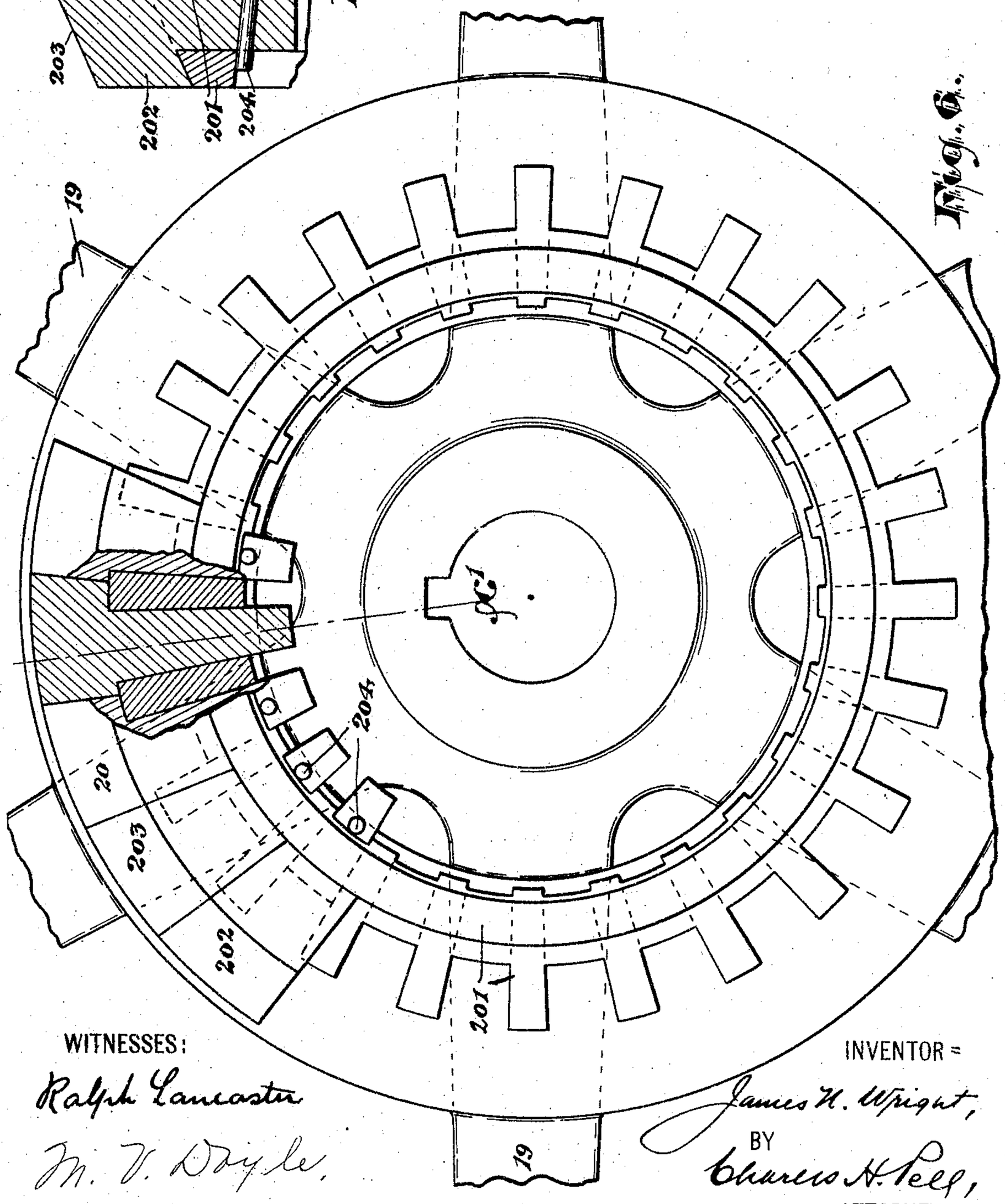


Fig. 6.



WITNESSES:

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HOISTING ENGINE.

APPLICATION FILED APR. 19, 1904.

NO MODEL. 6 SHEETS—SHEET 6.

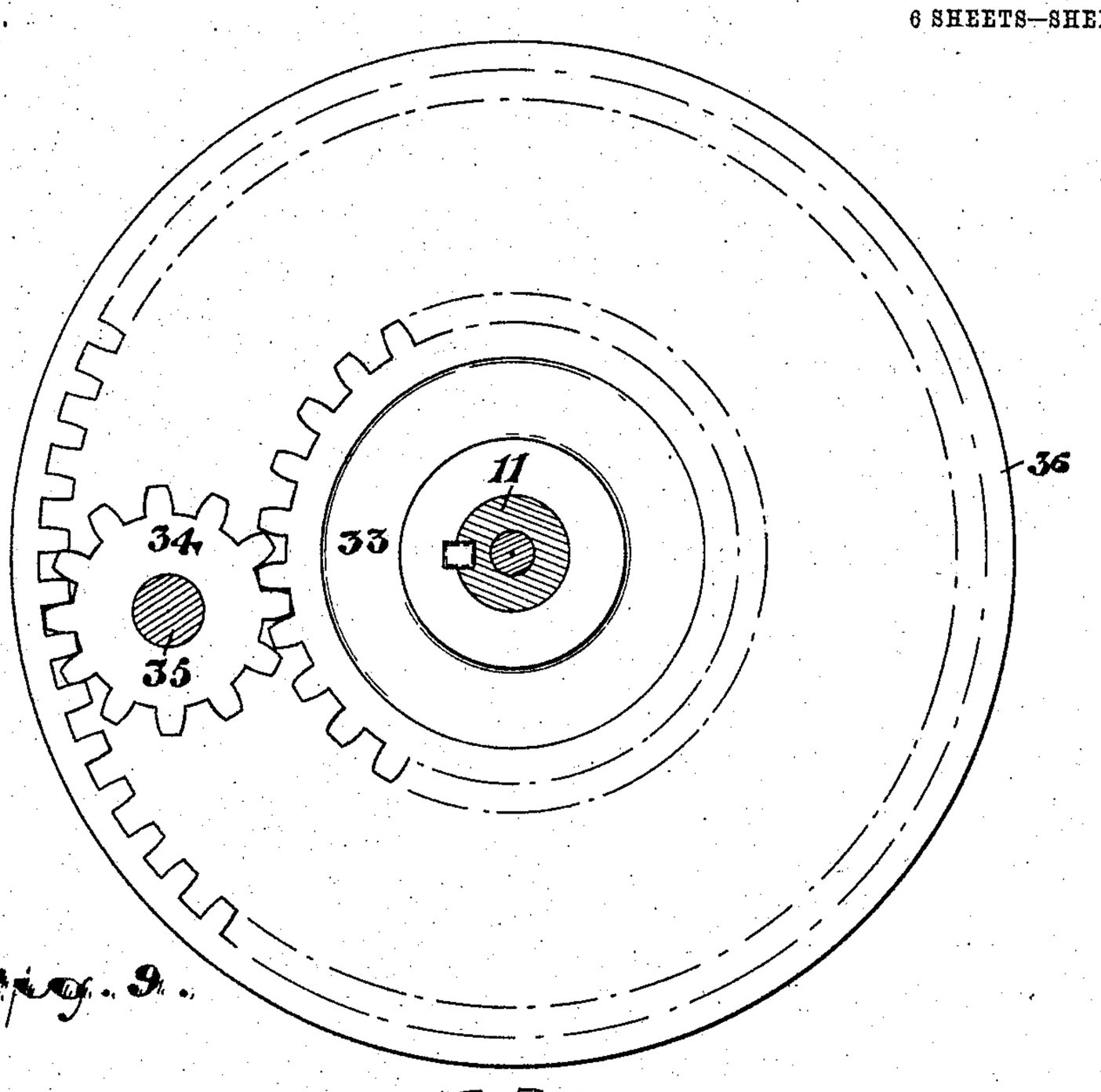

Fig. 9.

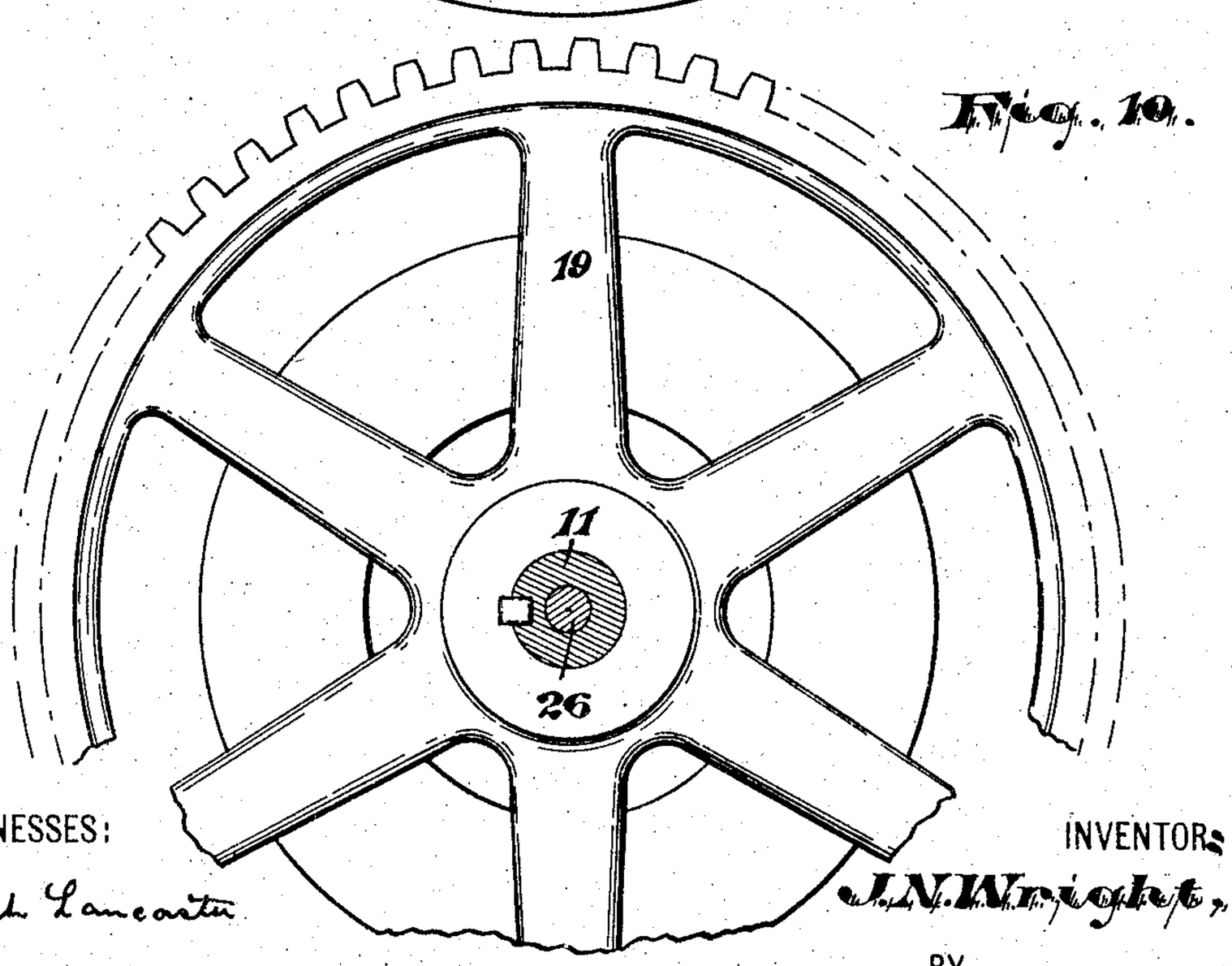

Fig. 10.

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No. 772,639. Patented October 18, 1904.

UNITED STATES PATENT OFFICE.

JAMES N. WRIGHT, OF NEWARK, NEW JERSEY, ASSIGNOR TO JOSEPH S. MUNDY, OF NEWARK, NEW JERSEY.

HOISTING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 772,639, dated October 18, 1904.

Application filed April 19, 1904. Serial No. 203,841. (No model.)

To all whom it may concern:

Be it known that I, JAMES N. WRIGHT, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Hoisting-Engines; 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 numerals of reference marked thereon, which form a part of this specification.

The objects of this invention are to secure a more steady and positive action in winding the mast-turning rope connecting the mast of a derrick with a hoisting-engine and to more effectually prevent the jerking movement now common when the drum of the hoisting-engine is started, whereby the said rope is sometimes ruptured, to secure a more durable and efficient winding device for the mast-rope, and to secure other advantages and results, some of which may be referred to hereinafter in connection with the description of the working parts.

The invention consists in the improved hoisting-engine and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth, and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like numerals of reference indicate corresponding parts in each of the several figures, Figure 1 is a plan of a portion of a hoisting-engine having my improvements. The steam-producing or other motive devices and the immediate connections therewith for transmitting power are not shown, being of any ordinary construction. Fig. 2 is a side elevation of the parts shown in Fig. 1. Fig. 3 is a section taken through line *x* of Fig. 1, and Fig. 4 is a section taken through line *y* of the same figure, Figs. 3 and 4 being on an enlarged scale and showing clearly the more important novel features of the invention. Fig. 5 is a section taken through line *z* of Fig. 4. Fig. 6 is an enlarged detail elevation, partly in section, of a portion of a certain friction wheel or clutch member which will be hereinafter more fully described. Fig. 7 is a detail section of the same, taken at line *x'*, and Fig. 8 is a detail view of a removable friction-block employed in connection with the said friction wheel or clutch member. Figs. 9 and 10 are detail side views of certain gear-wheels or pulleys and their connections, showing said gear-wheels secured to the shaft by which they are carried.

In said drawings, 10 indicates the frame of the engine, in which frame the shaft 11 for the drum 12, with which the mast-rope is connected, has its bearings near the end of said frame. Back from the end of said frame and the bearings for the shaft 11 are other bearings for the shaft 13 for one of the drums or cylinders 14 for the hoisting-rope, the last said cylinder being of any usual construction.

The drum or cylinder 14 and winch 141 are operated with the shaft 13 by power transmitted thereto by any suitable means common in the art, and the movements of the said parts are controlled by common means.

My invention relates more particularly to the novel construction of the drum 12 for controlling the mast and turning the same in either direction and their operating and controlling means.

In connection with the shaft 13 or other suitable motor-shaft is arranged a toothed wheel or pulley 16, which meshes with an intermediate gear-wheel or pulley 17, having its bearings at 18 on the frame of the machine. This said intermediate gear-wheel or pulley 17 in turn meshes with a large gear-wheel or pulley 19, keyed or otherwise fixed upon the shaft 11. Thus rotary motion and power are transmitted from the source of power to said shaft 11, which latter is caused to operate continuously in one direction of rotation. The said toothed gear-wheel 19, fixed to the shaft 11, is on its inner side provided with a friction-cone 20, adapted to engage the flange 21 of a section 121 of the slidable mast-rope drum 12, the said flange 21 being hollowed at its outer side, or side toward the wheel 19, and having the walls of its chamber reversely conical to enter into frictional con-

tact with the said cone 20. Thus when the drum 12 is moved longitudinally on the shaft 11 toward or into contact with the cone 20 the said drum will rotate with the wheel 19, as will be obvious.

The drum-section 121 is moved longitudinally on said shaft 11 by means of connected levers 22, arranged at opposite sides of the frame 10, in connection with screw-threaded shafts 23 231 in brackets 24 241, fastened to the bed or frame 10, by means of bolts 25, at points on said frame adjacent to the extremities of the shaft 11, the said brackets extending in alinement with said shaft 11 considerably beyond said shaft 11 and in alinement with the axis of the said shaft 11, providing threaded perforations in which the screw-shafts 23 and 231 have their bearings. The two screw-shafts disposed beyond the opposite ends of the shaft 11 and in axial alinement with said shaft 11 are threaded alike and when they are moved together by means of the connected compound levers one follows the other, one screw-shaft moving toward the shaft 11, while the other moves away therefrom, and the movements being of uniform extent.

The opposite ends of the shaft 11 are bored out at the longitudinal axes thereof, and within the borings are arranged longitudinally-slidable key-shafts 26 261, which extend from transverse slots through said shaft 11 outward a little beyond the extremities of said shaft 11 into contact with the inner ends of the screw-shafts 23 231, the shafts 26 261 fitting neatly the axial chambers prepared therefor, so as to secure a smooth and positive sliding movement.

At the inner ends of the sliding shafts 26 261 the same engage the transverse keys 27 271 in the transverse slots above referred to. Said keys have a limited sliding movement lengthwise of the shaft 11, and, extending laterally through said slots from the shaft, they enter slots 30, Fig. 5, of pressure-plates 31 311, arranged loosely around the shaft 11 at the opposite extremities of the body of the mast-rope-drum sections 121 122, the latter being preferably chambered or recessed, as at 32, to receive said pressure-plates 31 311 and preferably intermediate friction plates or washers 45, of hardened steel, by means of which increased durability is gained.

At or near the end of the shaft 11 opposite that having the gear-wheel 19 is fixed a small cog-wheel 33, which rotates with said shaft 11 and meshes with a pinion 34 on a short shaft 35 of the frame 10. Said pinion 34 in turn engages the internal teeth of a large gear-wheel 36, loosely arranged on the shaft 11 at the end of the drum 12 at the end opposite that having the flange 21, but held from longitudinal displacement on said shaft by a collar 37, set upon said shaft 11 by a set-screw or otherwise. The inner side of the internally-toothed wheel 36 is provided with a friction-cone 201, opposed to the friction-cone 20, and this in turn is engaged by the reverse-cone 211 in the flange 212 of the drum member or section 122.

As before intimated, the drum 12 is in two sections 121 122. These are connected at a point about midway between the flanged opposite ends of the drum by a collar 40, the inner ends of the said drum-sections being threaded and the said collar being provided with right and left hand female screw-threads to engage the same, the said inner ends of the sections being preferably of solid metal, the said sections being preferably castings, and to prevent independence of rotation the said solid ends are held together by dowel-pins 41, Fig. 3. The said dowel-pins, while fitting their holes or recesses in the solid castings, neatly permit of the longitudinal adjustment hereinafter referred to. The said collar 40 is flanged, as at 42, at the center of its outer periphery, the said flange being recessed, as at 43, or made angular to enable a suitable wrench or other implement to be employed when turning the said flange. Upon turning the said collar the sections 121 122 of the drum are either brought toward one another or separated, and thus adjusted to more exactly and properly secure the desired frictional contact of the cones and to take up or make provision for any wear that may result from continued service.

When the desired adjustment is obtained, the collar is readily seated in its relation to the drum 12 by means of a set-screw 44 or in any other suitable manner.

The connected compound levers 22, by means of which the opposite screw-shafts 23 231 are simultaneously moved longitudinally in the same direction, are shown in Figs. 1 and 2 more clearly, in which the said screw-shafts 23 231 are shown to be provided with arms 221, which at their projecting extremities are pivoted, as at 222, to connecting-rods 223, which in turn are pivoted to levers 224, one of which is provided with a handle 225. The said levers 224 extend downward to a shaft 226, which latter extends across the machine, as shown in Fig. 1, the two levers 224 being keyed upon said shaft 226, and thereby compelling the said levers on opposite sides to move simultaneously and together. The distances between the pivots or centers of action of the two sets of levers being uniform, the uniformly-threaded screw-shafts are caused to turn uniformly, and thereby the desired uniformity of longitudinal movement of the screw-shafts is secured on opposite sides or ends of the shaft 11.

By turning the lever 224 by means of the handle 225, and consequently turning the screw-shafts in their threaded brackets, the longitudinal key-operating shafts 26 261 are operated simultaneously, the one screw-shaft following the other, so that as one screw-shaft

and its key-operating shaft and key move away from the mast-rope-operating drum 12, and thus releases the frictional pressure-plate contiguous thereto, the other screw-shaft, key-shaft, and key press the other pressure-plate, bringing the last said pressure-plate against the end of the drum-section contiguous thereto and forcing the same longitudinally and reversing the frictional contact of the drum to secure the desired reverse rotation.

By the construction described I secure the reverse movements of the drum 12, and I secure a release of the mast-rope drum from its cones by a positive action and without the employment of springs, and thus avoid the objections incident to the use of said springs.

It will be understood that the mast-rope is attached to opposite ends of the drum 12, so that the rope will wind on said drum at one end and unwind at the opposite end.

In connection with the brackets 24 and 241 I employ oil-wells 46 and means, such as a chain 47, for raising the lubricant from the said well to the shafts.

The wheels 19 and 36 on their inner sides are provided with lateral frames 201, in which an annular series of segmental blocks 202, preferably of wood, are seated, said blocks being inclined at the upper inner surface 203, so as to form the cone. Said blocks are held in their places by pins 204 or other suitable means.

In operating the device constructed in accordance with the foregoing description, the parts being shown in the relation partly shown in Fig. 4, by operating the compound levers 22 and turning the screw 23 inward against the shaft 26, the latter pressing on the key 27 forces the pressure-plate 31 against the end of the drum 12, causing said drum to move longitudinally on its shaft 11 into contact with the cone 201. Simultaneous with this movement the opposite levers 22, the screw 231, shaft 261, key 271, and plate 311 move away from the drum to permit such longitudinal movement of the drum. A reverse movement of the levers 22 effect a reverse movement of the said parts.

Having thus described the invention, what I claim as new is—

1. The improved hoisting-engine, in which is combined with the bed or frame and the hoisting apparatus, a mast-rope drum and drum-shifting means comprising connected compound levers at opposite sides of said frame, and plates stationed at opposite ends of said drum, and means operated simultaneously by said connected levers and adapted to press one of said plates against the drum and release the other of said plates from said drum, substantially as set forth.

2. The improved hoisting-engine, in which is combined with the bed or frame and the hoisting apparatus, a mast-rope drum and frictional motive devices stationed at opposite ends of said drums and rotating in opposite directions and drum-sliding means comprising pressure-plates stationed at opposite ends of said drum, one plate being adapted to press the drum against one frictional device and the other plate being adapted to press the drum against the other frictional device, and connected means for simultaneously releasing one plate and pressing the other against the drum substantially as set forth.

3. In a hoisting-engine, the combination with the axially-bored-out shaft and drum slidably arranged on said shaft a gear-wheel fixed on said shaft and having a frictional surface adapted to be engaged by said drum, a pressure-plate adapted to engage the end of the drum, a key adapted to engage said pressure-plate, a shaft arranged in the boring of the first said shaft, a screw-shaft arranged in axial alinement with and at the outer end of the last said shaft and adapted to press said shaft inward and in turn press the key and pressure-plate against the drum and to press said drum out of frictional relation to the gear-wheel, substantially as set forth.

4. In a hoisting-engine, the combination with a frame, and a shaft having bearings in said frame and longitudinally bored out at the axial center of its opposite ends, gear-wheels arranged at opposite ends of said shaft, one being fast and the other loose on said shaft and each having conical friction-surfaces, a drum loose on said shaft and having flanges at opposite ends with reversely-conical surfaces, shafts arranged in the opposite borings of the first-mentioned shaft, keys transversely disposed with relation to said shafts and engaged by the last said shafts, pressure-plates arranged at the opposite ends of the drum, and engaged by the keys to press said drum longitudinally on its shaft, and screws adapted to press the parts longitudinally with respect to the first-mentioned shaft to effect a frictional engagement of the drum with one or the other of the conical surfaces of the gear-wheel substantially as set forth.

5. In a hoisting-engine, the combination with a frame and a shaft having bearings in said frame and longitudinally bored out at the axial center of its opposite ends, gear-wheels arranged at opposite ends of said shaft, one being fast and the other loose on said shaft and each having conical friction-surfaces, means for securing reverse movements of said gear-wheels, a drum loose on said shaft and having flanges at opposite ends with reversely-conical surfaces, shafts arranged in the opposite borings of the first-mentioned shaft, keys transversely disposed with relation to said shafts and engaged by the last said shafts, pressure-plates arranged at the opposite ends of the drum, and engaged by the keys to press said drum longitudinally on its shafts, and screws adapted to press the parts

longitudinally with respect to the first-mentioned shaft to effect a frictional engagement of the drum with one or the other of the conical surfaces of the gear-wheels, substantially as set forth.

6. In a hoisting-engine, the combination with a frame and a shaft having bearings in said frame and longitudinally bored out at the axial center of its opposite ends, gear-wheels arranged at opposite ends of said shaft, one being fast and the other loose on said shaft and each having conical friction-surfaces, means for securing reverse movements of said gear-wheels, a drum loose on said shaft and having flanges at opposite end with reversely-conical surfaces, shafts arranged in the opposite borings of the first-mentioned shaft, keys transversely disposed with relation to said shafts and engaged by the last said shafts, pressure-plates arranged at the opposite ends of the drum, and engaged by the keys to press said drum longitudinally on its shaft, and screws adapted to press the parts longitudinally with respect to the first-mentioned shaft to effect a frictional engagement of the drum with one or the other of the conical surfaces of the gear-wheels, connected levers being arranged in connection with the frame and said screws and adapted to be operated simultaneously to operate said screws simultaneously in the same direction, substantially as set forth.

7. In a hoisting-engine, the combination with the bored-out shaft, having a loose drum thereon and also having thereon a loose gear-wheel with internal teeth, a small gear-wheel fixed on said shaft and an intermediate pinion meshing with said small gear-wheel and internal teeth, a second shaft arranged in the boring of the first, a transverse key slidable longitudinally with respect to the first said shaft, a pressure-plate operated by the key and adapted to engage the drum and means for operating the second shaft, key and pressure-plate to throw the drum from clutched relation to the loose gear-wheel, substantially as set forth.

8. In a hoisting-engine, the combination with the frame and shaft, and means for operating the latter, of friction-surfaces rotating in opposite directions near opposite ends of said shaft, means for securing the reverse movements, a loose drum arranged on said shaft between said surfaces, said drum being in sections, one adjustable with reference to the other, and means for moving the said drum oppositely on said shaft to and from frictional relation with said surfaces, substantially as set forth.

9. In a hoisting-engine, the combination with the frame and shaft and means for operating the latter, of friction-surfaces rotating in opposite directions near opposite ends of said shaft, means for securing the reverse movements, a loose drum arranged on said shaft between said surfaces, said drum being in threaded sections connected by a right and left hand threaded collar and having dowel-pins extending from one into the other section to prevent independent turning and means for moving said drum, substantially as set forth.

10. In a hoisting-engine, the combination with the frame and shaft and means for operating the latter, of friction-surfaces rotating in opposite directions near opposite ends of said shaft, means for securing the reverse movements, a loose drum arranged on said shaft between said surfaces, said drum being in threaded sections solid at their contiguous or adjacent ends and having dowel-pins set therein, a threaded collar having means enabling it to be turned to adjust the sections in relation to the other, and having a set-screw for fixing the sections in relation one to the other, and means for moving said drum, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 31st day of March, 1904.

JAMES N. WRIGHT.

Witnesses:

CHARLES H. PELL,

M. V. DOYLE.