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J. E. JONES.  
SHAFT SUPPORTING AND OPERATING MECHANISM.

APPLICATION FILED MAR. 19, 1904.

NO MODEL.

2 SHEETS—SHEET 1.

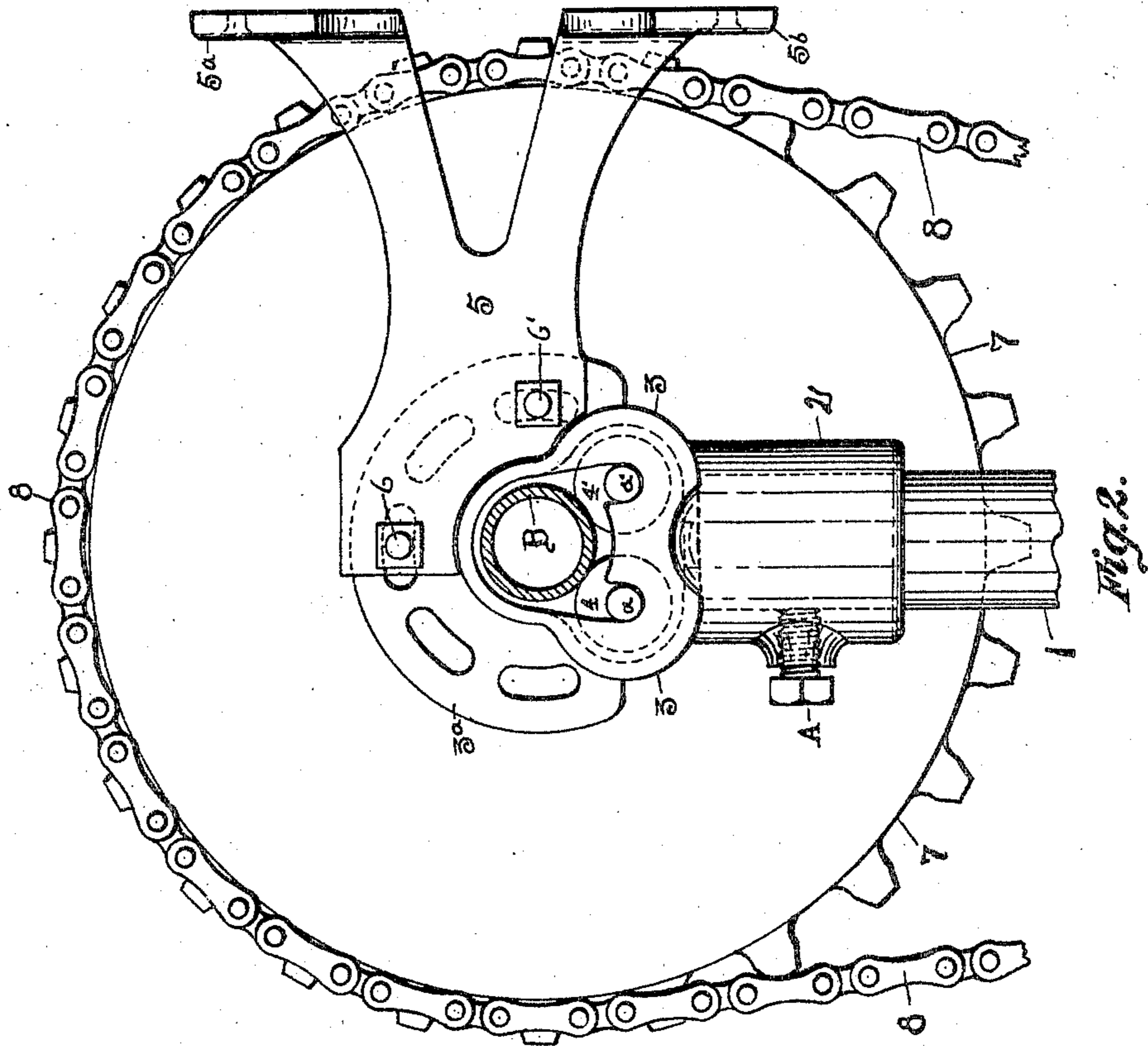


Fig. 2.

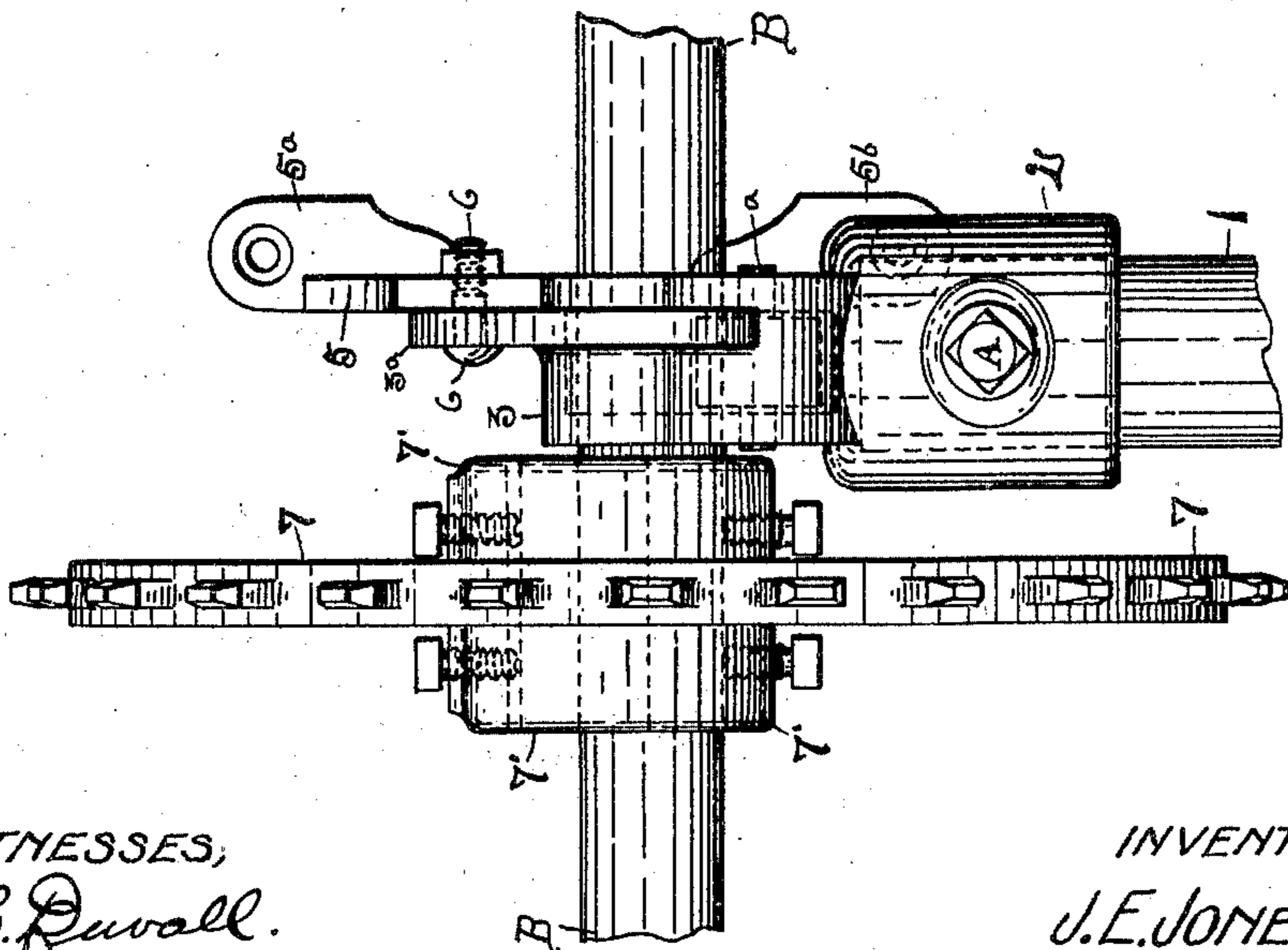


Fig. 1.

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## SHAFT SUPPORTING AND OPERATING MECHANISM.

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NO MODEL.

2 SHEETS—SHEET 2.

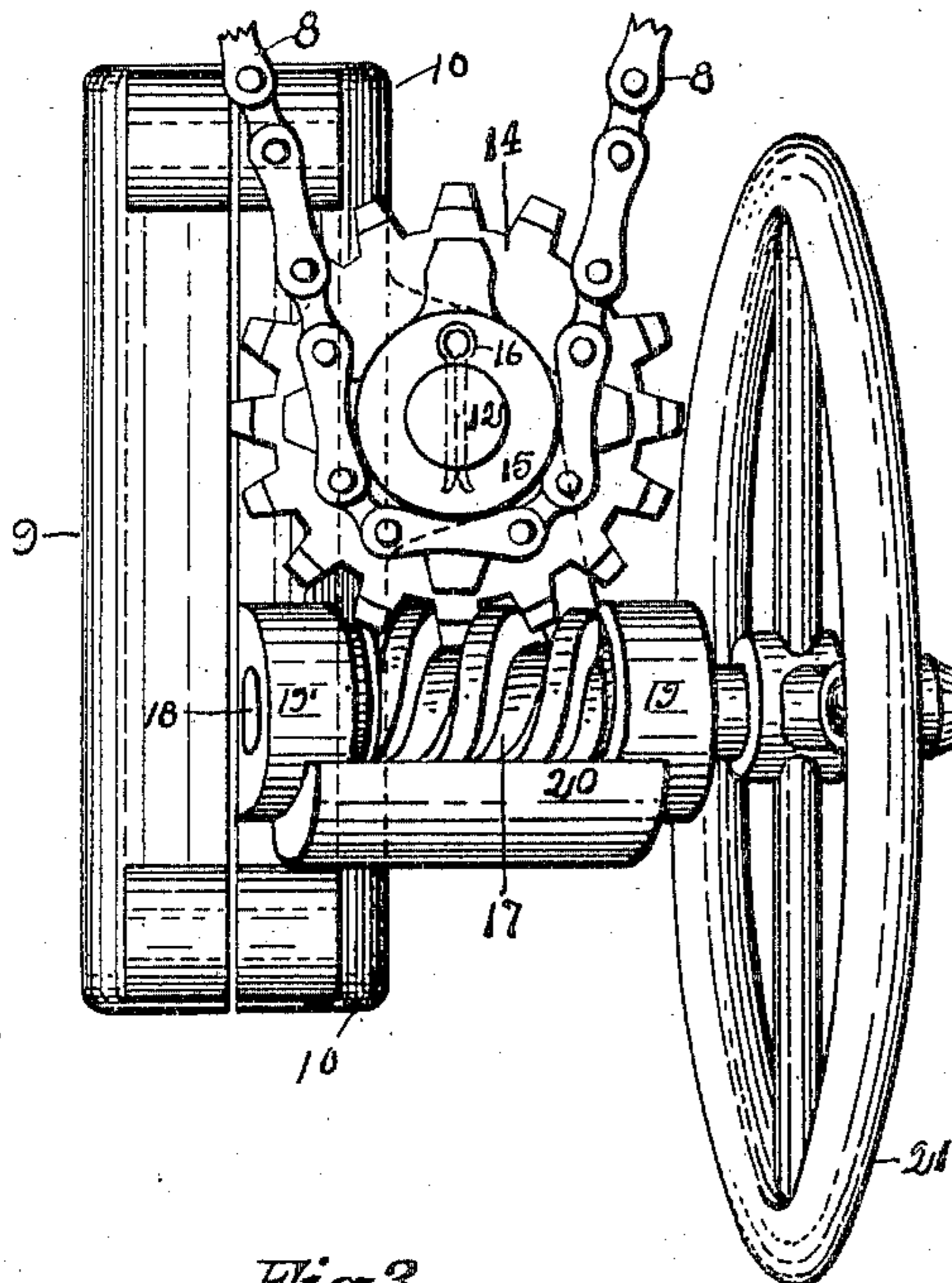


Fig. 3.

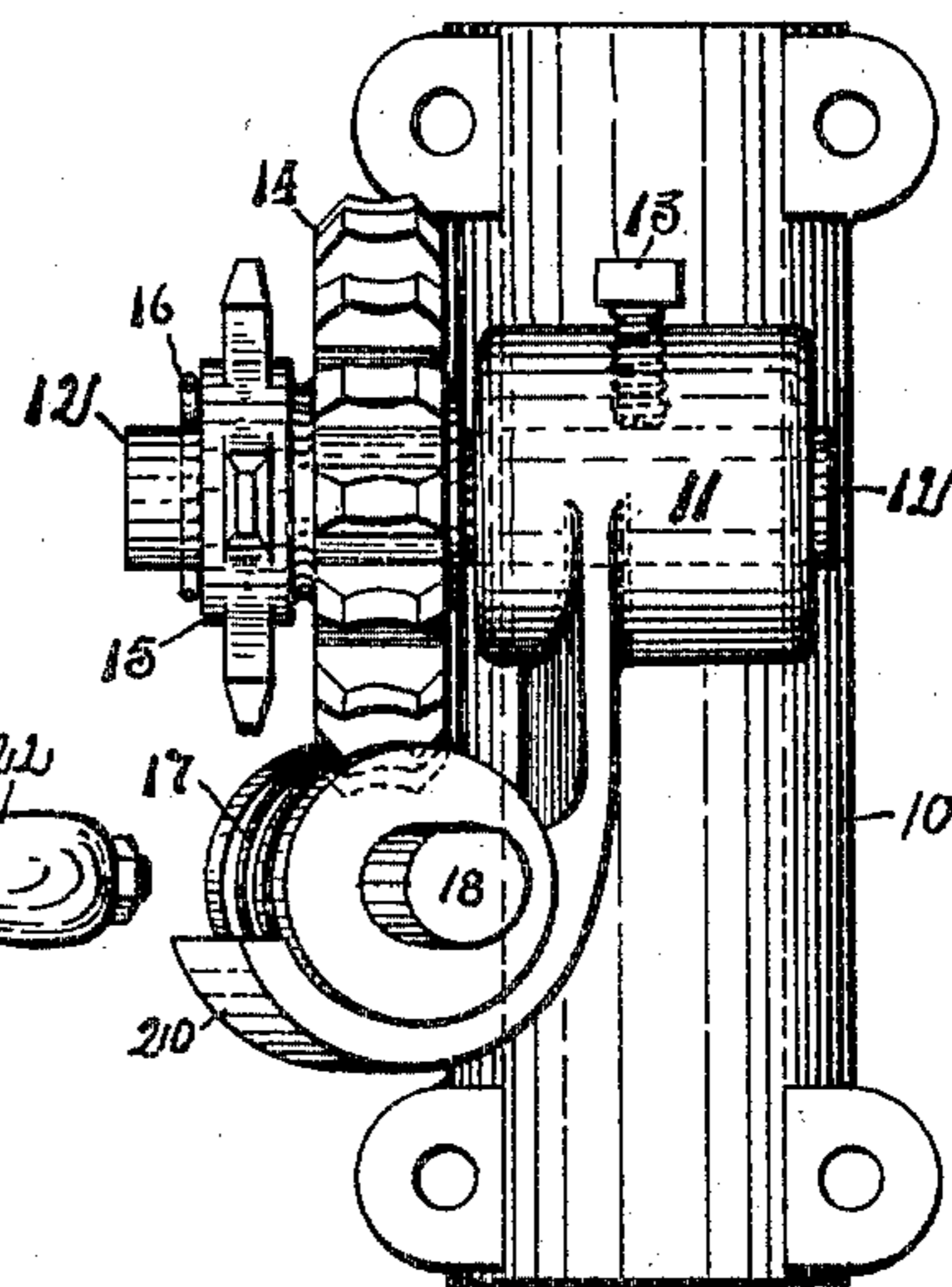


Fig. 4.

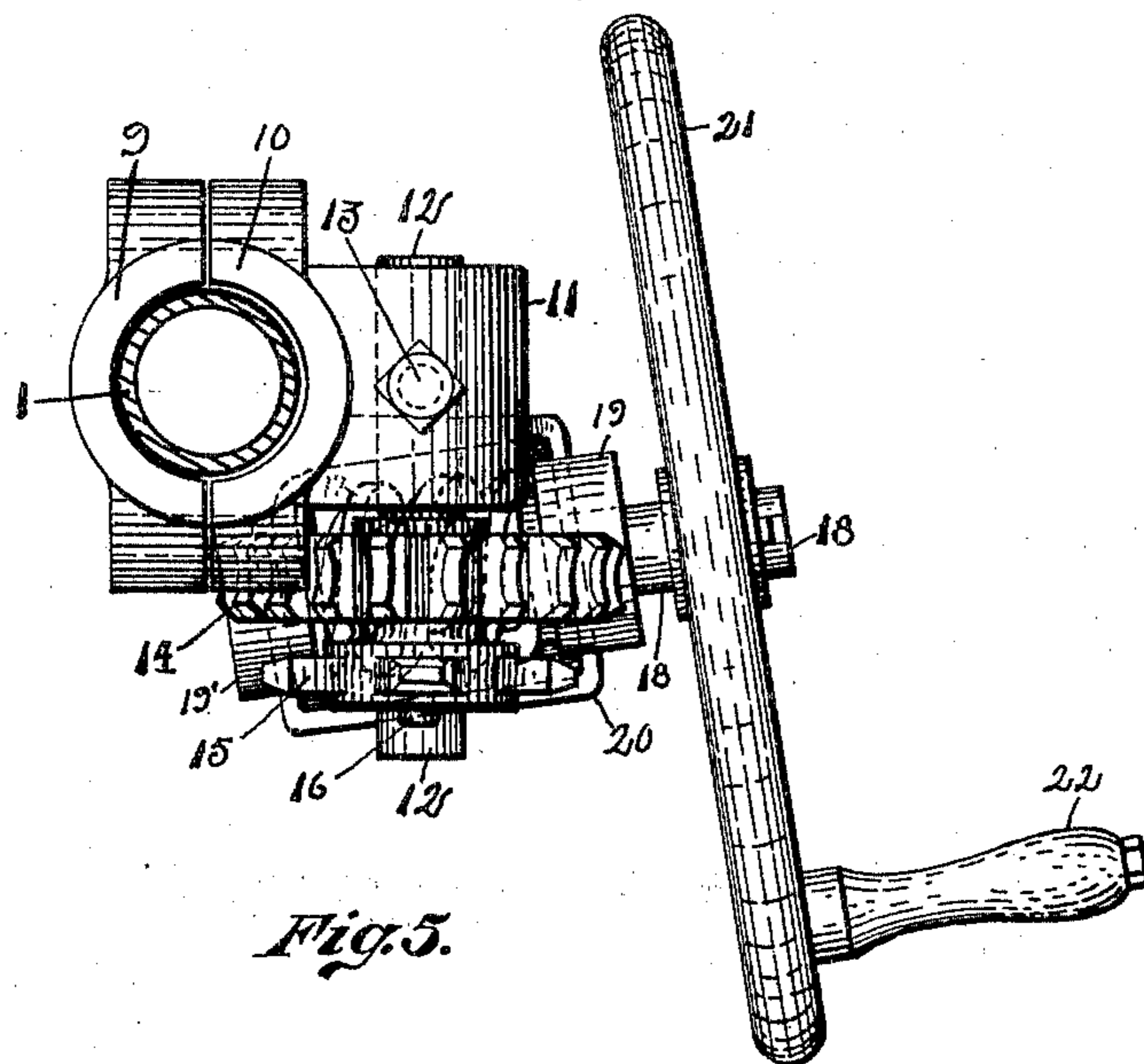


Fig. 5.

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## UNITED STATES PATENT OFFICE.

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## SHAFT SUPPORTING AND OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 776,517, dated December 6, 1904.

Application filed March 19, 1904. Serial No. 199,015. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES E. JONES, a citizen of the United States, and a resident of the city of Richmond, in the county of Wayne, and in the State of Indiana, (whose post-office address is Richmond, Indiana,) have invented a new and useful Shaft Supporting and Operating Mechanism, of which the following is a specification, which when taken in connection with the accompanying drawings, forming a part thereof, is sufficiently clear and concise as to enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to new mechanical movements and devices and the assembling thereof into a new construction which I denominate a "shaft supporting and operating mechanism," but which, as will be clearly manifest, is applicable also to other purposes.

This invention has for its object, broadly speaking, the provision of a combination of mechanical elements so constructed as to produce the highest degree of mechanical efficiency and ease of operation when employed in the various capacities for which they are applicable.

A particular object in view in the devising of my present invention is to provide means for intermittently rotating a shaft or the like in order to accomplish some specific result—as, for instance, the opening and closing of skylights, windows, doors, &c., which are positioned above or out of reach of a person having charge thereof.

Another object is the provision of an arrangement of the class stated composed of interdependent and coöperating elements so arranged and combined as to produce more rapidly and easily the work it is intended to perform and at the same time providing an arrangement composed of a minimum of mechanical parts which will be neat, artistic, and attractive in appearance, compact and symmetrical in proportions, strong and durable in construction, positive in action, and capable of a wide scope of usefulness and efficiency, and all that at a material reduction in the number of parts that have heretofore been em-

ployed to accomplish substantially the same results.

Another object is to provide a new article of manufacture, a shaft supporting and operating mechanism which can be manufactured, sold, and positioned at a comparatively low price.

Other particular objects and specific advantages of my invention will appear from an inspection of the accompanying drawings, will be developed in the course of the ensuing specification, and will be set forth in the claims hereunto appended.

My invention consists, primarily, in a shaft supporting and operating mechanism embodying in its composition new and useful features, details of construction, new mechanical movements, and relative disposition of the several elements, substantially as particularly described elsewhere in this specification and in the legitimate combinations herein set forth.

One manner of carrying out this invention and that which in practice has been found to be the most desirable and efficient is illustrated in the accompanying drawings, which graphically exhibit the essential parts, and in which—

Figure 1 is an elevation of the upper mechanism of the invention; and Fig. 2 is an elevation of the same parts as Fig. 1, but taken at right angles thereto. Fig. 3 is an elevation of the lower mechanism of the invention. Fig. 4 is an elevation of substantially the same parts as that in Fig. 3, except the fly-wheel, but is taken at right angles thereto; and Fig. 5 is a top plan of the parts shown in Fig. 3 and some of the parts shown in Fig. 4.

Similar characters refer to and indicate like parts throughout the several views of the drawings.

With all of the above-named views in mind I will now take up the description of my invention in concrete detail, which I will refer to and describe as briefly and compactly as I may.

In the drawings the numeral 1 denotes the main post or support for the various parts, which post should be secured at its lower end in any preferred manner and which I prefer

to form of a suitable length of material, such as a metal tubing. Secured to and over the upper end of the post 1 is a cap 2, which may be securely attached to the post 1, as shown, by means of a set-screw A, in order to prevent said cap from turning or becoming disengaged. Integral with the cap 2 and extending upward centrally therefrom is the hanger 3, whose periphery is substantially cardioid in section at right angles to the shaft and through the central portion of which is a space to receive the shaft B, which shaft rests revolvably on the two antifriction-rollers 4 4. Said rollers have each a central pivotal shaft, as *a a*, therethrough, respectively, or pivots integral with the respective rollers may be employed, and the pivots of said rollers are provided with suitable bearings in the hanger 3, as shown in Fig. 2. Bearings similar to or identical with the above may be employed for the shaft B at various points along its length, or said shaft may be otherwise supported at other points, as desired. Integral with one end of and extending above and on each side the hanger 3 is a flange 3<sup>a</sup>, forming a segmental face at right angles to and concentric with the shaft B, and through said flange, equidistant from the center, are a plurality of elongated apertures, as shown in Fig. 2. In Fig. 2 appears a bracket 5, having a pair of feet 5<sup>a</sup> 5<sup>b</sup> at right angles to and integral with the bracket and with screw-apertures formed through said feet, as shown. The inner portion of said bracket corresponds in contour with and is adapted to contact with the face of the flange 3<sup>a</sup>, as shown, and has two or more apertures therethrough in alignment with the said apertures in the said flange 3<sup>a</sup>, whereby it may be adjustably secured to the face of said flange by means of the bolts 6 6', as shown.

By means of the above-described construction it will be seen that the bracket 5 may be secured to a vertical stationary object, while the post 1 may be disposed at an angle; but more particularly the post 1 may be positioned vertical, while the bracket 5 may be secured to some object which is disposed at an angle to the post.

The numeral 7 denotes a relatively large sprocket-wheel having integral therewith the hub 7', secured to the shaft B near the said hanger 3, as shown in Fig. 1, and the numeral 8 denotes a sprocket-chain adapted to pass over the periphery of the wheel 7, as shown in Fig. 2.

Referring now more particularly to Figs. 3, 4, and 5, the numeral 9 denotes the negative and 10 the positive member of the post-clamp. Longitudinally through this clamp is an opening of slightly less diameter when the members are united than that of the post 1, to which they are adapted to be attached at any desired point. The said members of the clamp have an equal number of ears ex-

tending out on a line with the center of the clamp, the ears of one portion corresponding with and coinciding with the ears of the other portion of the clamp and with aligned bolt-holes formed through said ears, whereby the members of the clamp may be tightly clutched around the post 1 at the point desired. Integral with the member 10 is an outwardly-projecting hanger 11, having an aperture therethrough at right angles to the post 1, forming a bearing and support for the shaft 12, which shaft projects some distance outward at one end, as shown. The shaft 12 may be secured at the desired point by means of the set-screw 13, which latter is threaded into the hanger 11, as shown, whereby its point is adapted to be contacted with the shaft 12 to securely hold the latter as desired. The numeral 14 denotes a worm gear-wheel having leaves around its periphery, which leaves are truncated and disposed in an axial direction and are formed with concave faces, as shown.

The numeral 15 denotes the small sprocket-wheel, having in this instance but four sprockets, an equal distance apart, formed on its periphery. The worm gear-wheel 14 and the sprocket-wheel 15 are disposed side by side concentrically and are integrally connected by a web, and an aperture is formed therethrough to receive the shaft 12, on which said parts are revolvably mounted. Through the outer portion of the shaft 12 is formed a keyhole to receive the spring-key 16, by which said wheels are held to their place on the shaft 12, as shown. The sprocket-chain 8 is positioned in connection with the sprocket-wheel 15, as shown in Fig. 3.

The numeral 17 denotes a spiral worm-gear drum whose threads are adapted to mesh with the leaves of the wheel 14, immediately below which it is located horizontally and is disposed at an angle with reference to the wheel 14, said angle corresponding to the angular disposition of the threads of the worm-gear 17. Centrally and longitudinally through the worm-gear 17 is secured the axle 18, which projects at either end therebeyond. The said worm-gear 17 is revolvably mounted by means of the two ears 19 and 19', which ears are integral with the member 10 and which are united by the worm-gear trough 20. Said ears have aligned apertures to receive the respective end portions of the axle 18, and on the extreme outer projecting end of the axle 18 is mounted the hand-gear or fly-wheel 21, which wheel has an outwardly-extending hand-grip 22 near its periphery, whereby said wheel may be revolved manually.

It will now be noticed that an arm or arms (not shown) may be attached to the shaft B at the desired point or points to accomplish the desired work and then the sprocket-wheels 7 and 15 being in alinement they may be connected by the sprocket-chain 8, as before indicated. It will now be seen that by turning

the wheel 21 the axle 18 will be revolved, carrying revolubly the worm-gear 17, and in turn the said worm-gear will cause the sprocket-wheel 15 to revolve at right angles thereto, which will cause the sprocket-chain 8 to revolve the sprocket-wheel 7, while the latter will in turn revolve the shaft B to cause the arms which may be attached thereto to accomplish the desideratum. By reason of its importance in this construction, as well as to its novelty and importance when used in connection with other constructions, I desire to accentuate the fact that by reason of the inclination of the worm-gear 17 greater ease of operation is obtained and less frictional wear is encountered than would otherwise be the case if arranged in the usual manner.

It will be observed that the post 1 may in some instances be entirely dispensed with, in which instance the hanger 3 may be attached to some upper stationary point, while the member 9 of the clamp may be discarded and the member 10 of the clamp may be bolted to some lower object, and whereby the sprocket-wheels 7 and 15 may be connected by the chain 8 and the other parts may be operated as above described.

From the above description, taken in connection with the accompanying drawings, it will be seen that I have produced an improved mechanism of the class stated which will accomplish the objects heretofore stated in this specification.

While I have illustrated and described the best means now known to me for carrying out my invention, I desire it to be fully understood that I do not restrict myself to the exact details of construction shown and described or to the particular objects stated, but hold that any slight changes or variations in the structural features as would suggest themselves to the ordinary mechanic would clearly fall within the limits and scope of my invention.

Having now shown and described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A mechanism of the character described, having in combination, a supporting-post, a hanger secured on the upper portion of said post and having a flange extending out therefrom, a shaft revolubly mounted in said hanger, a pair of antifriction-rollers mounted in said hanger on which said shaft revolves, a bracket adapted to be adjustably connected to the flange of said hanger, means for attaching said bracket to some object which object may be at any one of various inclinations, a sprocket-wheel secured to said shaft near said hanger, a smaller sprocket-wheel carried by the lower portion of said post, and a sprocket-chain connecting said sprocket-wheels, all substantially as shown and described.

2. A mechanism of the character described having in combination a supporting-post, a

hanger mounted in the upper end of said post, a shaft carried by said hanger, an operating mechanism carried by the lower portion of said post and consisting of a clamp surrounding the post with a pair of ears extending out from said clamp, a hanger integral with and extending out from said clamp, a permanent shaft, an integrally-united worm-wheel and a sprocket-wheel mounted on said permanent shaft, a spiral worm carried below said permanent shaft and disposed at an angle with reference thereto and with its threads meshing with the leaves of said worm-wheel, an axle mounted in the ears of said clamp on which axle said worm is secured, an oil-containing trough in which said worm revolves, and a hand-wheel mounted on one end of said axle, all substantially as shown and described.

3. A mechanism of the character described having in combination, a horizontal shaft; a vertical post; a hanger mounted on the upper end of said post; a sprocket-wheel secured to said shaft near said post; means for connecting said hanger to some stationary object which may be at any one of various angles; a small sprocket-wheel and a gear-wheel integrally united and a permanent axle near the lower portion of said part, upon which said small sprocket-wheel and gear-wheel are revolubly mounted; a horizontal worm disposed at an angle with reference to and located immediately below said gear-wheel; and a hand-wheel for revolving said worm; all substantially as shown and described for the purposes set forth.

4. A mechanism of the character described having in combination a supporting-post, a hanger mounted on the upper end of said post, a shaft carried by said hanger, a sprocket-wheel secured to said shaft, an operating mechanism carried by the lower portion of said post and consisting of, a fixed horizontal axle, a spiral gear-wheel mounted on said axle and having leaves around its periphery which leaves are truncated and disposed in an axial direction and having concave faces, a sprocket-wheel mounted on said axle and formed integral with said gear-wheel, a spiral gear having threads adapted to mesh with the leaves of said gear-wheel, means for mounting said spiral gear at an angle with reference to the plane of said gear-wheel, means for revolving said spiral gear whereby the gear-wheel is revolved at right angles thereto, and a sprocket-chain connecting said sprocket-wheels, all substantially as shown and described.

5. A mechanism of the class described comprising in combination, a vertical supporting-post, a horizontal shaft carried by said post, a sprocket-wheel secured to the shaft, a second sprocket-wheel mounted below the first-named sprocket-wheel and carried by said post, a worm-gear for operating the lower sprocket-wheel, a sprocket-chain connecting said sprocket-wheels, and a hand-wheel for actuat-

ing said worm-gear to revolve said sprocket-wheels in order to rotate said shaft, all substantially as shown and described.

6. A shaft supporting and operating mechanism having in combination a shaft, a post, a hanger secured on the upper end of the post, means for revolubly mounting said shaft in said hanger, means for securing said hanger to a stationary object which may be at any one of various inclinations, a sprocket-wheel secured to said shaft near said hanger, an operating-gear secured near the lower part of said post, said operating-gear consisting essentially of a one-piece sprocket-wheel and a

gear-wheel, an axle on which said sprocket and gear wheel are mounted, a spiral worm disposed at an angle and meshing with said gear-wheel, means for revolving said worm, and a sprocket-chain connecting said sprocket-wheels, all substantially as shown and described.

In testimony whereof I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

JAMES E. JONES.

Witnesses:

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R. E. RANDLE.