

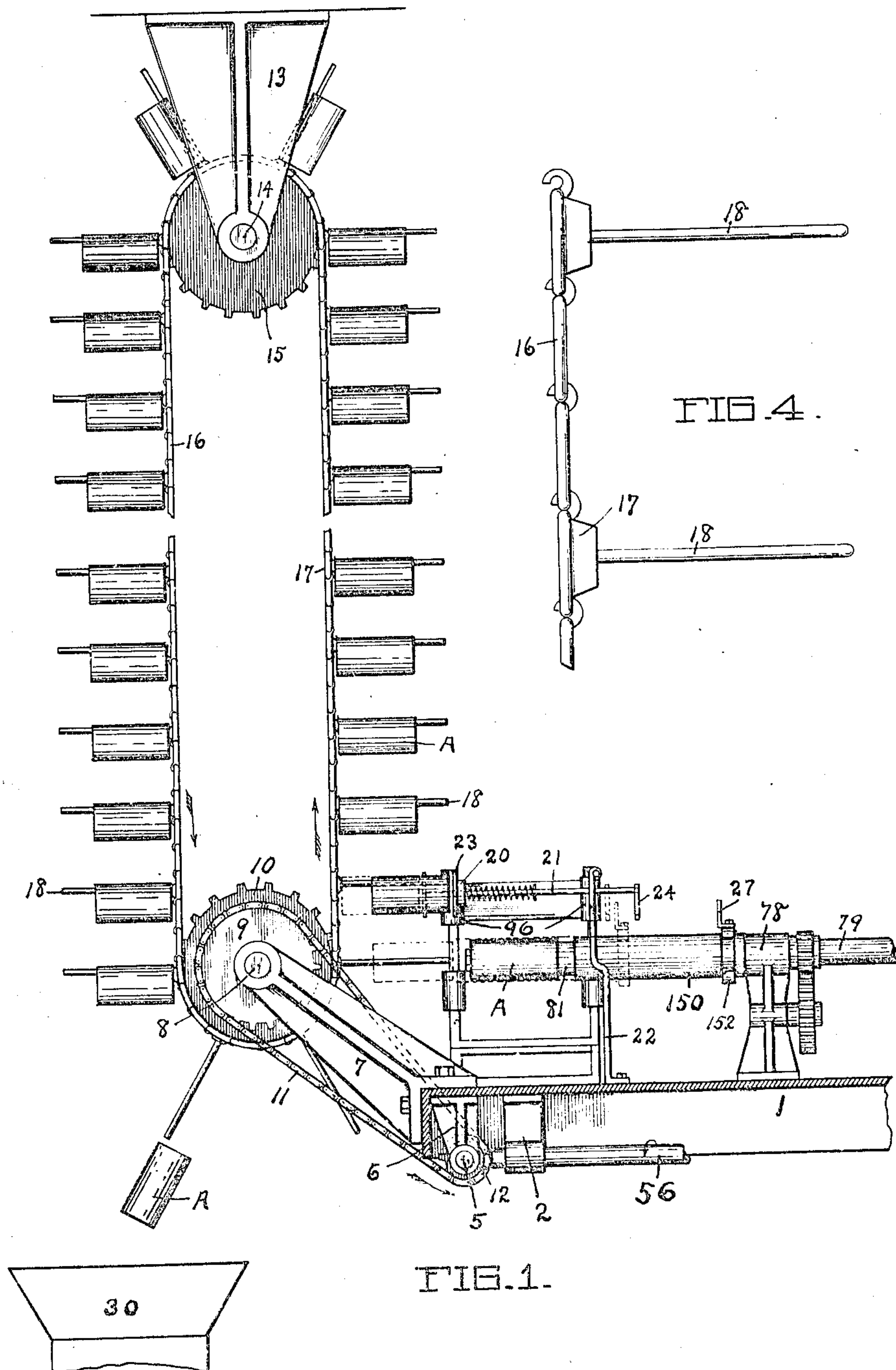
J. R. HARBECK.  
TUBE DRYING APPARATUS.

APPLICATION FILED OCT. 23, 1907. RENEWED DEC. 23, 1908.

Patented Feb. 23, 1909.

2 SHEETS—SHEET 1.

913,285.



Witnesses:

*William F. Hewitt*  
*E. M. Brown.*

By his Attorney

*J. R. Harbeck.* Inventor  
*Edward M. Pagelsen.*

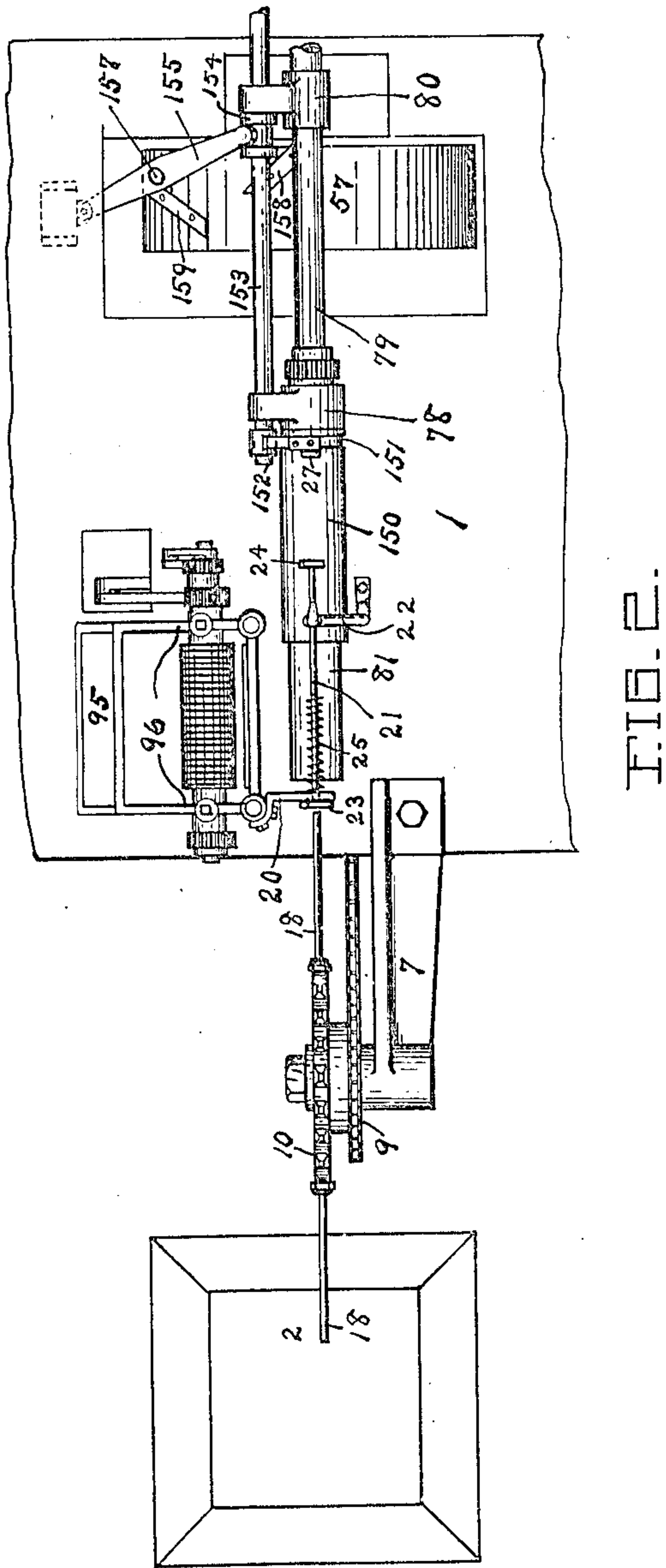
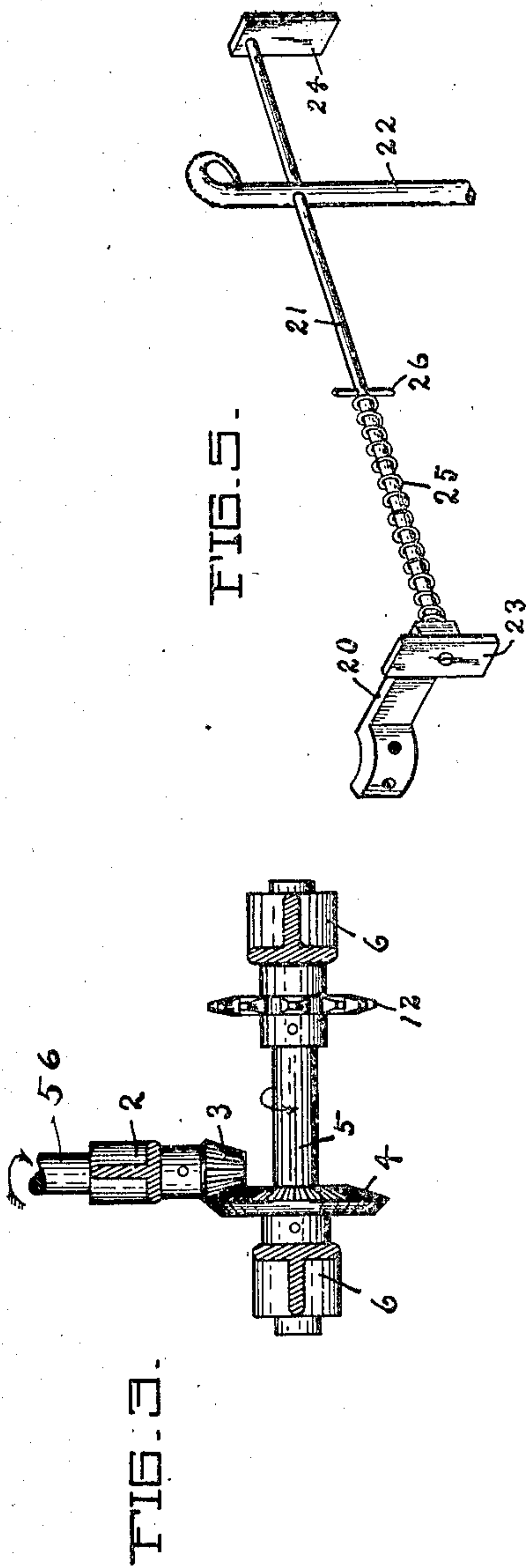
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# UNITED STATES PATENT OFFICE.

JERVIS R. HARBECK, OF DETROIT, MICHIGAN, ASSIGNOR TO KEMIWELED CAN COMPANY,  
OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

## TUBE-DRYING APPARATUS.

No. 913,285.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed October 23, 1907, Serial No. 398,757. Renewed December 23, 1908. Serial No. 469,011.

*To all whom it may concern:*

Be it known that I, JERVIS R. HARBECK, a citizen of the United States, and residing at Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Tube-Drying Apparatus, of which the following is a specification.

My invention relates to means for drying tubes formed from fibrous material by winding the same on a mandrel, and the object of this improvement is to provide a simple and effective drying apparatus for tubes, wherein means are provided to receive each individual tube as it is formed, carrying it away from the machine, and then deposit it in any desired receptacle.

My invention consists in an endless conveyer belt or chain having outwardly projecting pins properly spaced, which pins are adapted to receive the tubes, the apparatus being so installed that at each operation of the tube machine, a carrying pin will be in such position to receive each completed tube at its discharge from the machine.

In the accompanying drawings, Figure 1 is an elevation of my tube drying apparatus. Fig. 2 is a plan of a portion of the tube machine and the driving mechanism. Fig. 3 is a detail of the driving mechanism. Fig. 4 is a detail of the conveyer chain. Fig. 5 is a detail of the auxiliary tube pushing mechanism.

Similar reference characters refer to like parts throughout the several views.

This drying mechanism is shown in connection with the tube machine illustrated in my Patent No. 862,390, dated August 6th, 1907. The parts of the patented machine shown in the drawings comprise a table 1 upon which are mounted two bearings 78 and 80, in which is revoluble a hollow shaft 79, upon the end of which is secured the mandrel 81 upon which the tubes are wound. Slidable on this mandrel and shaft is a sleeve 150 provided with a circumferential groove 151, in which groove the fork 152 engages. Slidable in the bearings 78 and 80 is a rod 153 one end of which carries the fork 152 and which also is provided with a collar 154. A lever 155 is carried by the table and its upper end fits in a groove in this collar 154. A pin 157 projecting downward from this lever is adapted to be engaged by the cams 158 and 159 secured to the drum 57. This drum makes one revolution for

each tube formed on the machine, and therefore at each revolution of the drum a tube is ejected from the machine by sliding it off the mandrel 81 through the action of the sleeve 150 and the fork 152. Secured to the bed 1 is an inclined base 95, on which are mounted the side plates 96. Further description will be found in the patent above cited.

The main driving shaft 56 of the tube machine is extended and given an additional bearing 2, and it has mounted on its end a pinion 3 which meshes with the gear 4 mounted on the shaft 5. This shaft is revoluble in the bearings 6 secured to the lower side of the table 1. A bracket 7 projecting from the table carries a shaft 8 at its outer end on which are revoluble the sprocket wheels 9 and 10, which wheels are secured together. Sprocket chain 11 connects the wheel 9 to the sprocket wheel 12 on the shaft 5.

Secured to the ceiling or any other convenient support is a bracket 13 which carries a shaft 14 upon which is journaled a sprocket wheel 15. A sprocket chain comprising plain links 16 and carrier links 17 passes around the sprocket wheels 10 and 15. The carrier links are each provided with a projecting pin 18 which is adapted to receive the tube.

As explained in the patent cited, a frame is mounted on the bed 1, and comprises the side plates 96, which form the bearings for the feed rolls. Secured to one of these side plates is a bracket 20 provided with an aperture in which the rod 21 is slidable. Secured to the bed 1 is an upright rod or frame 22 which has an aperture at its upper end for the rod 21. The rod carries a plate 23 at its outer end and a second plate 24 at its inner end. A spring 25 between the bracket 20 and the pin 26 normally holds the rod in its retracted position. A finger 27 secured to the fork 152 is adapted to operate this rod.

The operation of this mechanism is as follows. The proportions of the pinion 3, the gearing 4 and the sprocket wheels 9, 10, and 12 are such that the conveyer chain will travel the distance between two adjacent pins 18 at each forming of the tube. The parts are so positioned that a pin 18 will be opposite the end of the mandrel 81 as a tube A is being pushed off



the mandrel through the action of the sleeve 150. The distance between the adjacent pins 18 is such that at the time a tube A is slipped off the mandrel, the pin which carries the tube made just before, will be above the top of the plate 23. As it is undesirable that the action of the sleeve 150 should be greater than absolutely necessary, the distance the just finished tube is slipped onto a pin 18 is less than is desirable. The rod 21 is therefore mounted in the bracket 20 and frame 22 so that the plate 23 will give the tube an additional movement, pushing it entirely onto the pin 18, which is accomplished by the finger 27 contacting with the plate 24 on the end of the rod 21. After the tubes have traveled up around the wheel 15 and then back down to the wheel 10 they will have become sufficiently dry and slip off into the receptacle 30.

Having now explained my improvements

what I claim as my invention and desire to secure by Letters Patent is:—

In a tube drying apparatus for tube machines, the combination of a conveyer chain, wheels therefor and mechanism to drive the wheels, certain of the links of the chain being provided with tube engaging pins so constructed and arranged as to receive the tubes as they are formed, means on the tube machine to discharge the tubes therefrom and place them on the pins, and independent mechanism actuated by the tube discharging means of the tube machine, for properly positioning the tubes on the pins.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

JERVIS R. HARBECK.

Witnesses:

ELIZABETH M. BROWN,  
EDWARD N. PAGELSEN.