

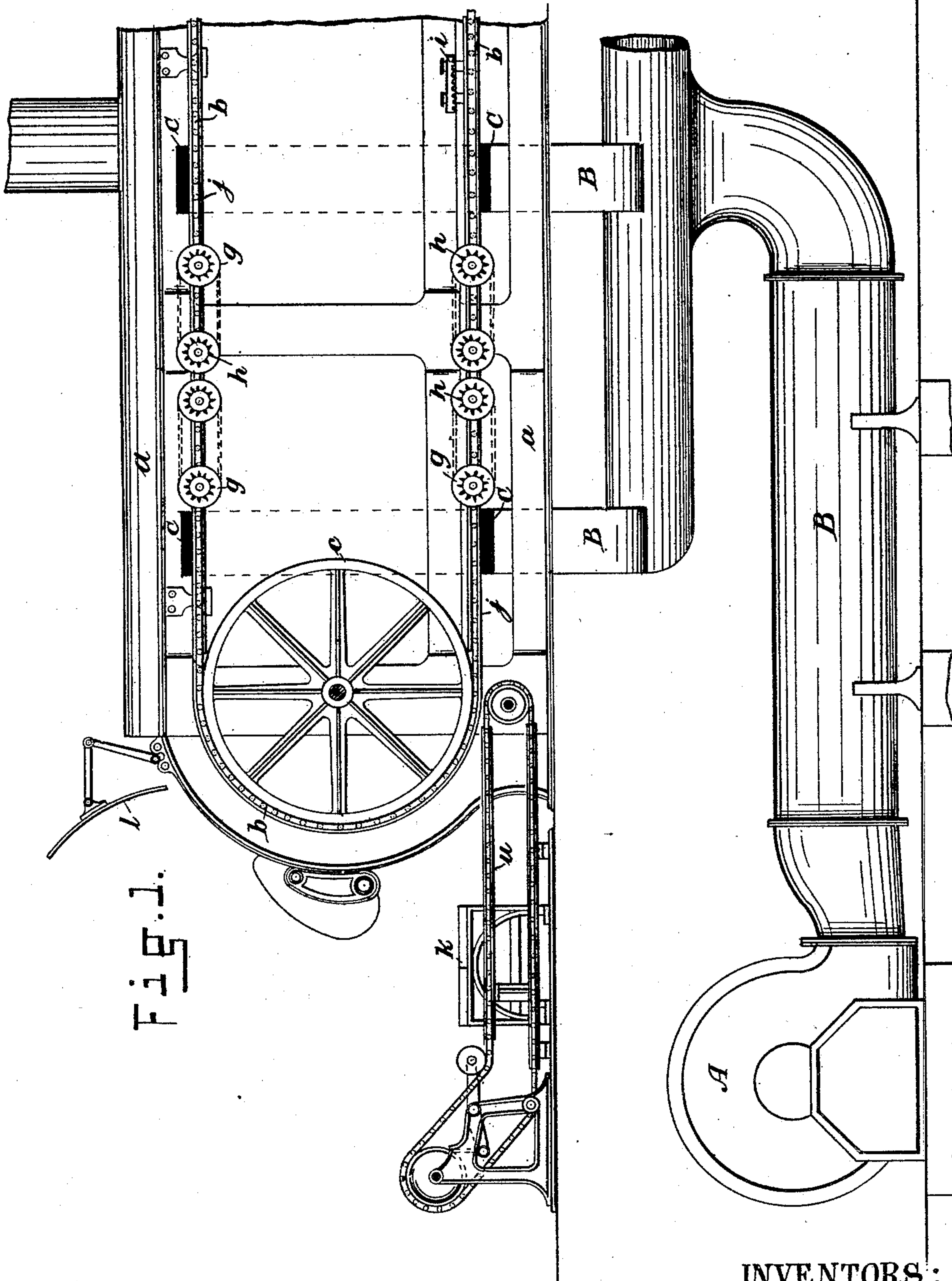
(No Model.)

5 Sheets—Sheet 1.

J. B. & E. WHITELEY.  
MACHINERY FOR DRYING YARN IN HANKS.

No. 465,086.

Patented Dec. 15, 1891.



WITNESSES:

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*Mrs. F. Bates*  
*F. Aslopkins*

**INVENTORS:**

J. B. Whiteley, and E. Whiteley:  
by Herbert W. Jenner. Attorney

(No Model.)

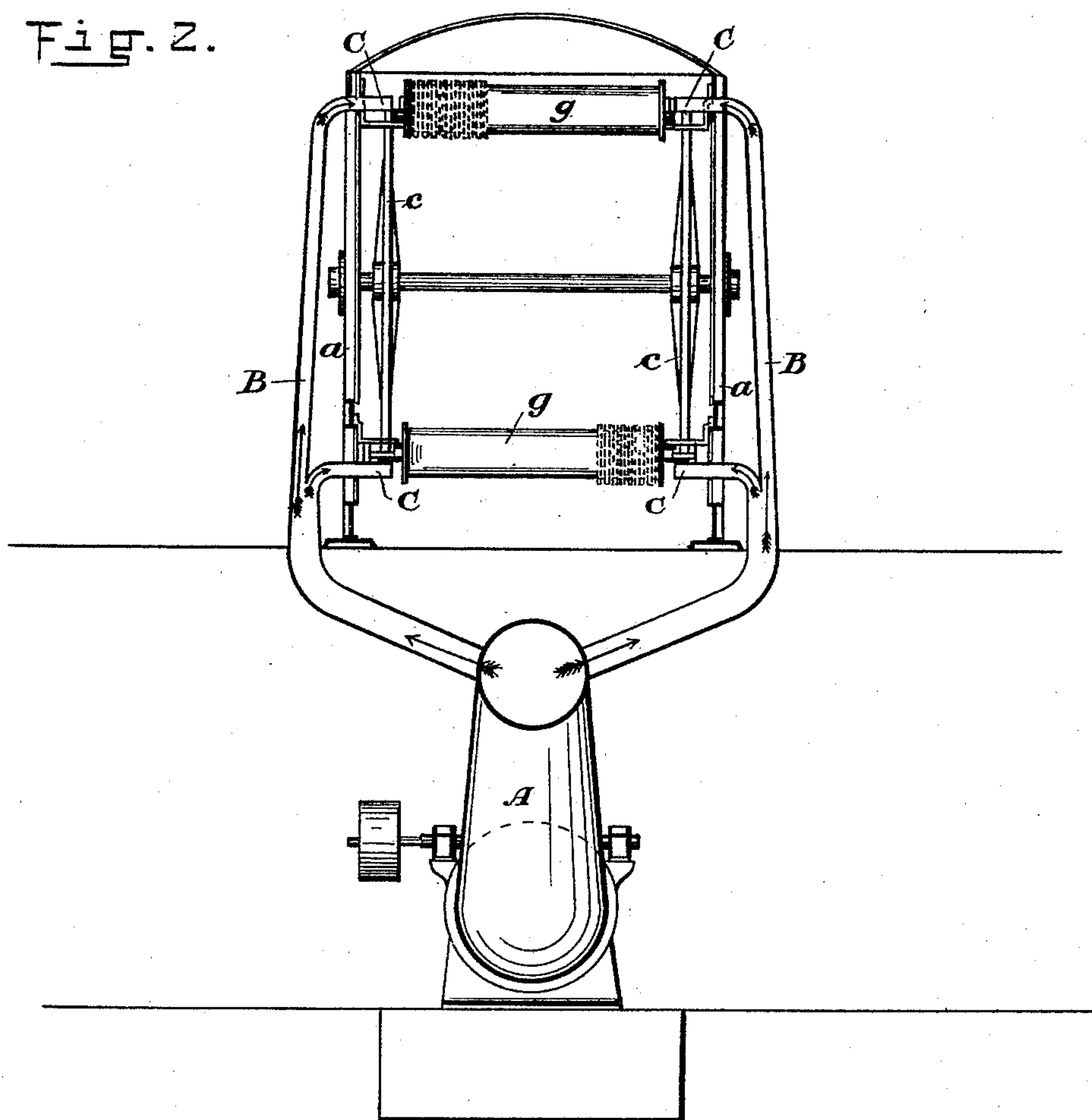
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Fig. 2.



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(No Model.)

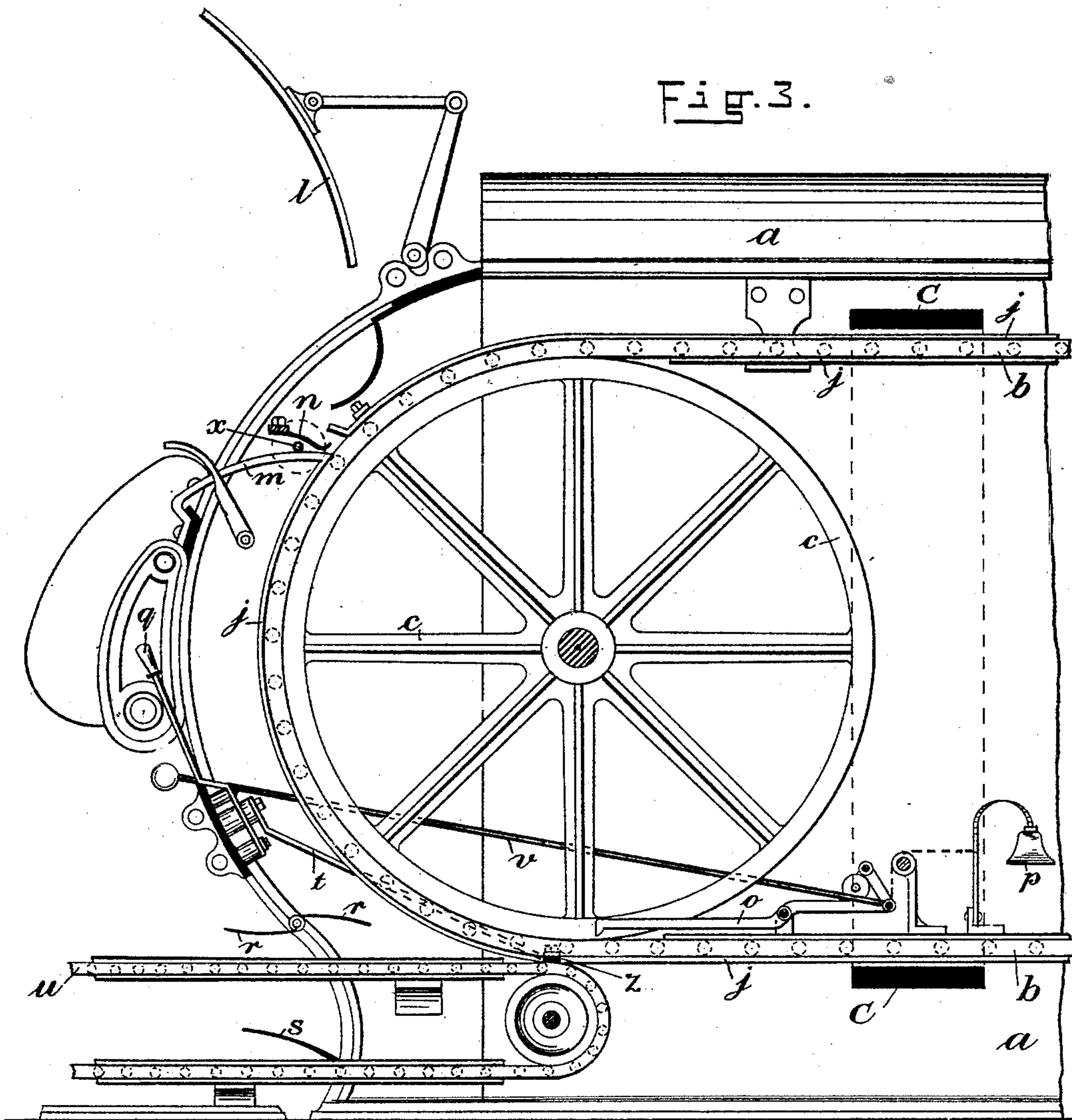
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Fig. 3.



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Fig. 4.

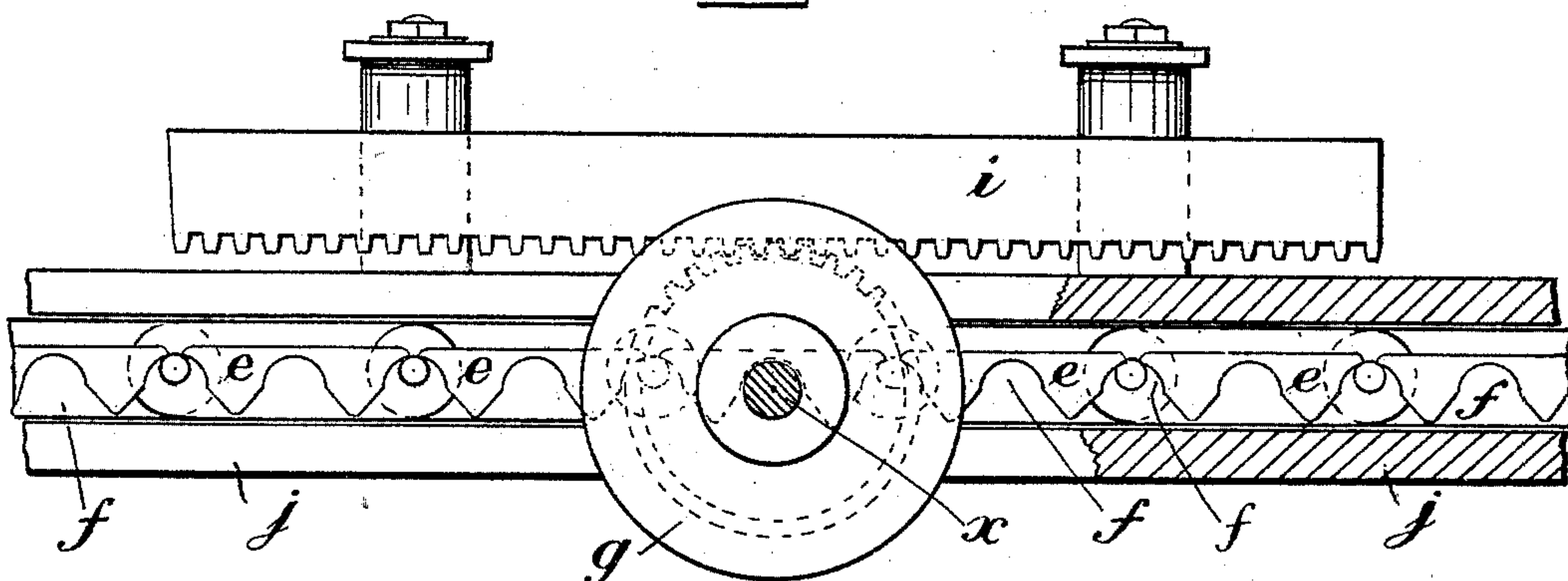


Fig. 4<sup>a</sup>.

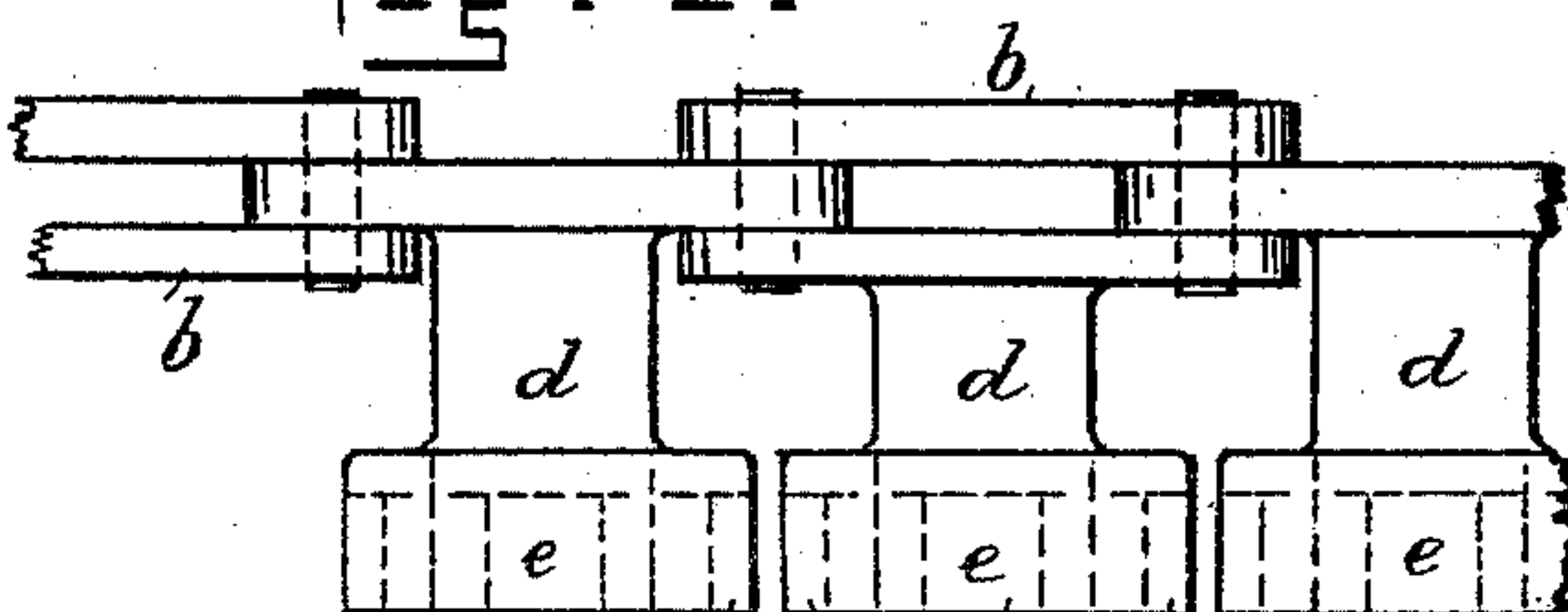
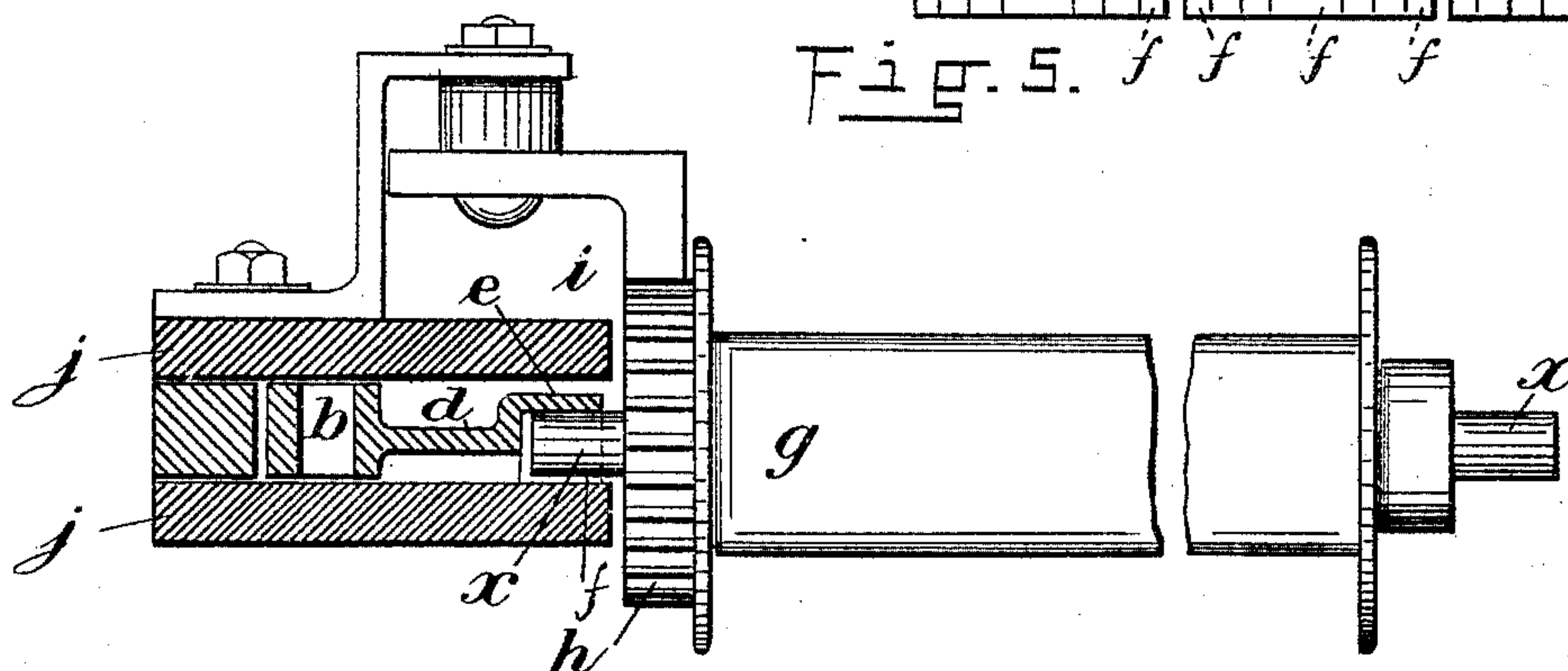


Fig. 5.



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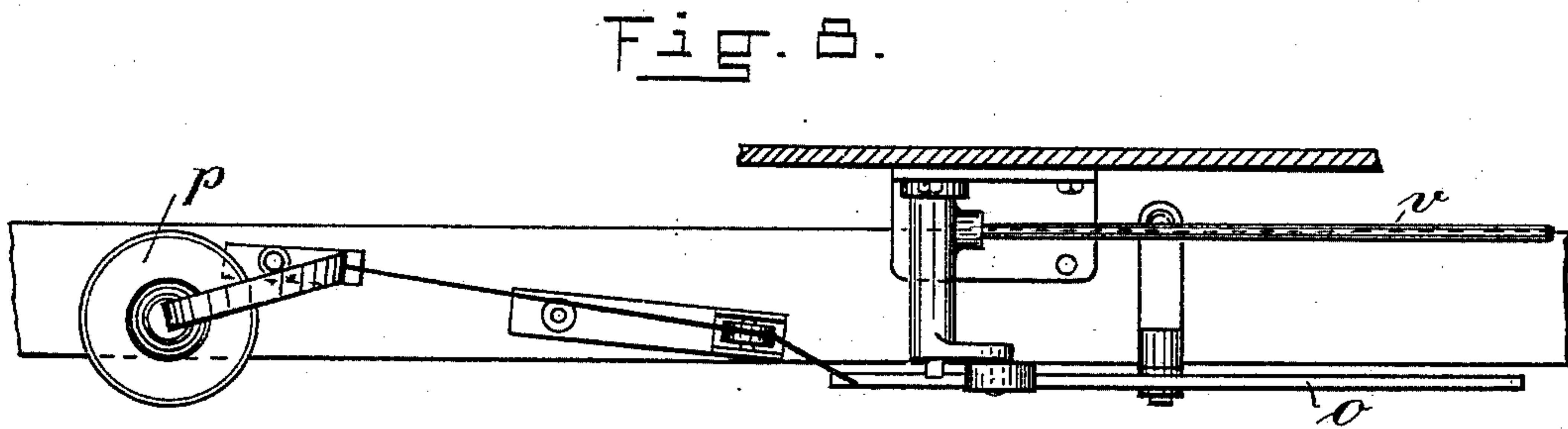
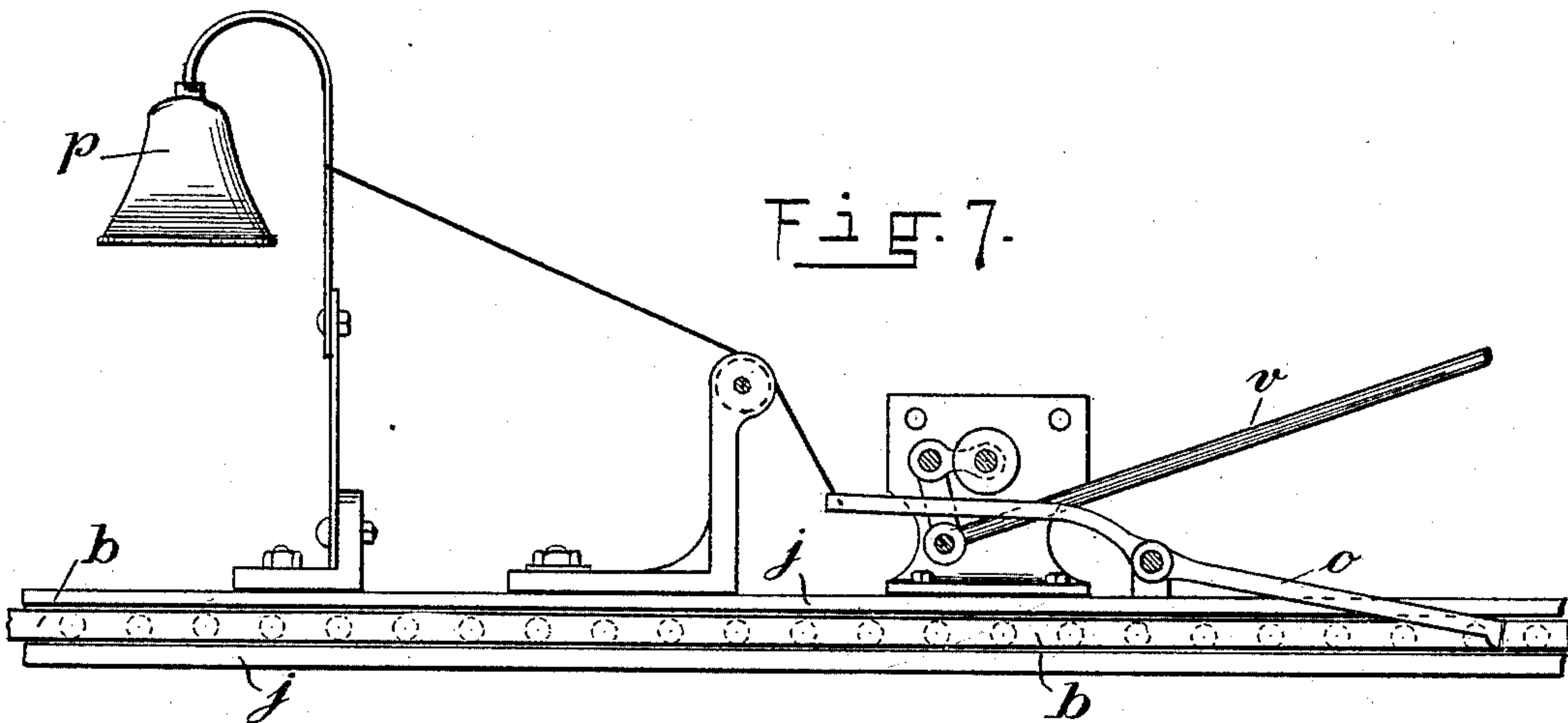
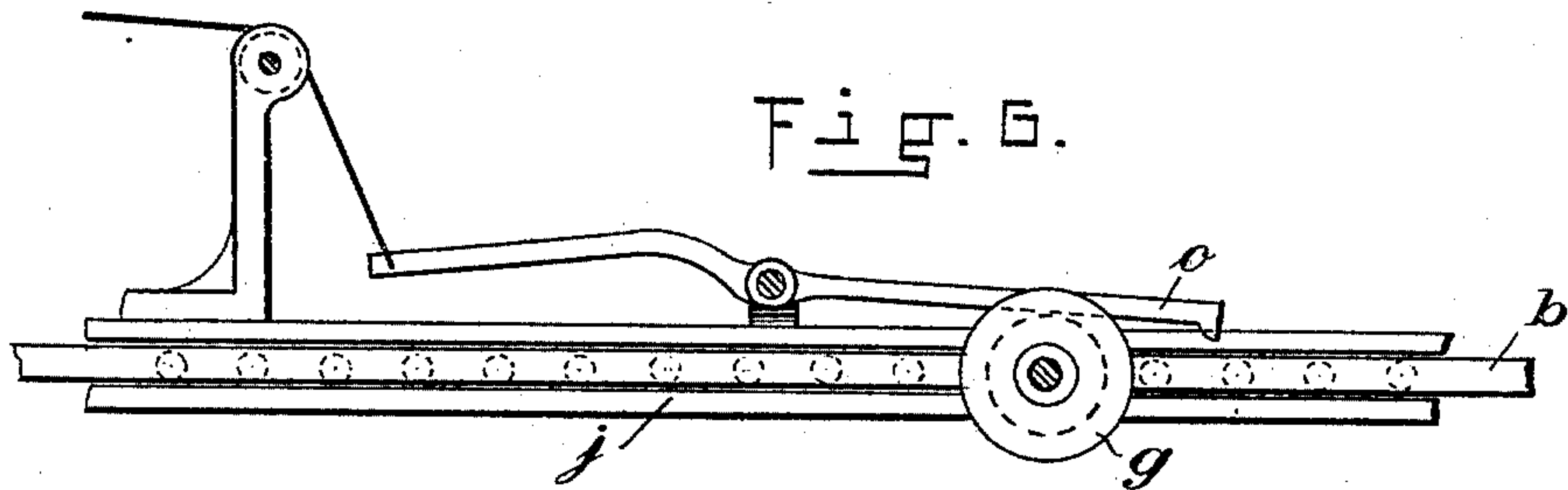
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5 Sheets—Sheet 5.

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# UNITED STATES PATENT OFFICE.

JOE BOOTH WHITELEY AND EDWARD WHITELEY, OF HUDDERSFIELD,  
ENGLAND.

## MACHINERY FOR DRYING YARN IN HANKS.

SPECIFICATION forming part of Letters Patent No. 465,086, dated December 15, 1891.

Application filed May 25, 1891. Serial No. 393,971. (No model.) Patented in England July 22, 1889, No. 11,635.

*To all whom it may concern:*

Be it known that we, JOE BOOTH WHITELEY and EDWARD WHITELEY, both subjects of the Queen of Great Britain, and residents of Huddersfield, Yorkshire, England, have invented certain new and useful Improvements in Machinery for Drying Hanks of Yarn in a Distended State; and we 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.

A patent for this invention has been obtained in England, No. 11,635, dated July 22, 1889.

The object of our invention is to construct a machine for the purpose of drying hanks of yarn after being dyed or washed and scoured.

In constructing a machine according to our invention we mount upon suitable frame-work an endless chain passing around suitable drums or wheels which have rotary motion imparted to them for the purpose of causing the endless chain to travel. The endless chains are made with grooves or recesses for receiving the axles of rollers, which rollers carry the hanks in a distended state. As the endless chains travel along, the hanks are carried with them; but in order that the hanks may revolve, in addition to being carried along by the endless chains, the axle of the rollers carrying the hanks is provided with a pinion-wheel in gear with one or more stationary racks, which give a rotary motion to the said axles and to the hanks. By employing grooved or slotted parts with the endless chain the axles or rollers carrying the hanks can be easily fixed in their places and removed again while the chain is traveling, and as the grooved parts are arranged close together side by side hanks of various lengths may be conveniently operated upon, and they can also be placed in the machine in a more or less distended state, according to requirements. A blast of hot or cold air is blown by a fan through the machine, and as the hanks are arranged in a single layer the hot or cold air is free to impinge on every part of each hank. A curved bar is arranged at each side of the feeding end of the machine, upon which the pivots of

the hank-carrying rollers may rest, and as the endless chains are moving the operative drops the pivots into the lugs carried by the chains, a flat spring being employed at that point to prevent the pivots rising from their positions, and also insuring that the said pivots get into their proper places. We place a bell within the machine at the delivery end thereof so arranged that when the roller of the first hank reaches a lever it is operated thereby and rings the bell, which informs the operative of the whereabouts of the first hank, whereupon he operates a lever and opens the outlet-doors, and simultaneously therewith the lever removes a portion of the sustaining bar or bearer which supports the pivots of the hank-carrying rollers on their return journey through the machine. Consequently as soon as the traveling chains bring the pivot to this part the rollers drop into the lugs of another endless chain, which carries the dried hanks out of the machine, where they are ready to be removed.

In order that our invention may be better understood, we will now make reference to the annexed sheet of drawings illustrative thereof, wherein—

Figure 1 is a longitudinal section of a machine for drying hanks of yarn constructed according to our invention. Fig. 2 is a cross-section of same, and Fig. 3 is an enlarged section of the feeding end of the machine. Figs. 4, 4<sup>a</sup>, and 5 are respectively a side view, plan, and cross-section of the chain and the parts connected to it. Figs. 6, 7, and 8 are two side views and a plan of the devices for ringing the bell.

*a* represents the frame-work of the machine carrying chain-wheels *c*, of which there are two, one at each end of the machine, around which wheels *c* are passed two endless chains *b*. The endless chain which is shown on a larger scale in Figs. 4, 4<sup>a</sup>, 5, and 6 is composed of links riveted or otherwise fastened together, and projecting from the side of each link is a bracket *d*, carrying a projection or lugs *e* with grooved or hollow parts *f*. The grooves or hollow places *f*, made in the parts *e*, are for the purpose of receiving the pivots *x* of the bobbins or rollers *g*, as shown at Figs. 4 and 5. The hanks of yarn to be dried are passed



over and carried by two of the rollers or bobbins *g*, as shown clearly in Figs. 1 and 2, the pivots or axles *x* of such said bobbins being placed in the hollow or groove *f*, and as these  
 5 grooves are arranged closely together it follows that they can be used for holding hanks of different lengths and also that the said hanks may be more or less distended or stretched between the two bobbins by the use  
 10 of the said grooves.

Rotary motion is communicated to the chain-wheel *c*, and consequently to the endless chains *b*, by means of any ordinary form of mechanism, as will be well understood. Consequently the hanks will be caused to travel  
 15 through the machine; but in addition to the hanks of yarn being made to travel, as already described, it is our intention to cause the bobbins carrying the hanks to have rotary motion, so as to make the hanks move  
 20 over the said bobbins, whereby the yarn is continually changing its position, permitting the heated air introduced to the machine to freely impinge against every portion of the  
 25 said yarn.

Rotary motion is imparted to the bobbins carrying the hanks by means of pinion-wheels *h*, fixed on the end of each bobbin, such said pinions being in gear with stationary racks  
 30 *i*, as shown clearly in Figs. 4 and 5; but any other equivalent driving devices of approved construction may be used.

In order to prevent the axles of the rollers *g* from falling out of their positions when  
 35 traveling around the curves of the chain-wheels, and also when traveling on the under side of the machine, or from getting displaced from the hollows *f* by other causes, we cause the chain *b* to travel between two plates  
 40 *j*, placed all around the chain, which will prevent the axles leaving their positions when traveling. The hanks which have been dyed or washed and scoured and require to be dried are placed (over two bobbins, as already de-  
 45 scribed) upon the table *k* at the feeding end of the machine, and in order to place them in their positions onto the traveling chains the door *l* is opened by suitable means to permit of the workman introducing the bobbins  
 50 and hanks into the machine and placing the axles in the grooves, as already specified, and this can be done while the endless chains are traveling; but to insure its being easily done a curved bar *m* (see Fig. 3) is placed at each  
 55 side of the feeding end of the machine, upon which the pivots of the hank-carrying rollers are made to rest, and are slid over the inclined bars *m* until the pivots *x* arrive at the hollow places *f*, into which they drop. A flat steel  
 60 spring *n*, employed at that particular point, prevents the pivots rising from their positions in the lugs *e*. When the hanks have traveled once through the machine and are returning to the lower part of the feeding end thereof, the end of the bobbin carrying the said hanks travels under the lever *o*, (see Fig. 3, also ele-  
 vations in detail, Figs. 6 and 7, and plan view,

Fig. 8,) whereby one end of said lever is elevated and the other end depressed, causing the chain or cord attached thereto to ring the  
 70 bell *p*, which signifies to the workman that the first hank introduced into the machine has arrived at the outlet end, whereupon he operates the lever *q* in such a way as to open the doors *r* and *s*, and simultaneously with  
 75 the movement of the lever *q* the rod *t* moves away a portion *z* of the sustaining bar or plate *j*, which supports the pivots of the hank-carrying rollers. Consequently the rollers with the hanks upon them drop into hollow places  
 80 *f*, formed in lugs *e*, in another endless chain *u*, which carries the dried hanks out of the machine, the rollers carrying the hanks dropping in succession one after another, the hanks being fed into the machine at the top  
 85 and taken out underneath, and this goes on while the endless chain is traveling. After the bell *p* has been once rung to inform the workman of the whereabouts of the first hank, the lever *o* is operated by long rod *v*, so as to  
 90 place it beyond the reach of the bobbin and to stop the continual ringing of the bell, which would happen as each bobbin reached the said lever, but which continual ringing of the bell is not required.  
 95

To facilitate the drying of the hanks, we employ a fan *A* for blowing a blast of heated air into the machine, the said air being conducted thereto by pipes *B*, arranged at each  
 100 side of the machine, passing out at the aperture *C*, and entering the space between the hanks, both on the upper and under side of the endless chain, whereby the hanks are quickly dried and left in a soft and unfelted condition.  
 105

The machine is inclosed in sheet-iron or wood casing, and may be made any convenient length, and, if necessary, the hanks may pass through the machine more than once and hot or cold air may be blown or drawn  
 110 through the machine for drying purposes.

We claim as our invention—

1. In a machine for drying hanks of yarn, the combination, with the revoluble chain-wheels, of the endless chains passing over  
 115 the said wheels and the revolving rollers carried along by the chains and arranged in pairs, one pair to each series of hanks of yarn, and adapted to support the said hanks in line with the chains, whereby the yarn may  
 120 be exposed to the action of the current of air, substantially as set forth.

2. In a machine for drying hanks of yarn, the combination, with the endless traveling chains provided with laterally-projecting lugs  
 125 having recesses *f* at their ends and centers, of the guide-plates for the chains, the rollers journaled in the said lugs and provided with toothed wheels, and the stationary racks for revolving the rollers, substantially as and for  
 130 the purpose set forth.

3. In a machine for drying hanks of yarn, the combination, with the endless chains and the rollers for supporting and carrying the



hanks, of an alarm-bell and a trip-lever for ringing the bell automatically when certain of the rollers approach the discharge-opening of the machine, substantially as set forth.

5 4. In a machine for drying hanks of yarn, the combination, with the horizontally-arranged endless chains, and the rollers for supporting and carrying the hanks, of the second endless chains at the lower part of the machine, and the guide-plates for the chains provided with a removable portion *z*, permitting the rollers to be delivered automatically to the said second chain, substantially as and for the purpose set forth.

15 5. In a machine for drying hanks of yarn, the combination, with the horizontally-arranged endless chains, and the rollers for

supporting and carrying the hanks, of the second endless chains projecting from the machine, the guide-plates for the chains provided with the removable portion *z* at the lower front part of the machine, the doors *r* and *s* in front of the said part *z*, and a lever for opening the doors and moving aside the said portion *z* simultaneously, substantially as and for the purpose set forth. 20 25

In testimony whereof we affix our signatures in presence of two witnesses.

JOE BOOTH WHITELEY.

EDWARD WHITELEY.

Witnesses:

ARTHUR B. CROSSLEY,

THOMAS A. BARRON,

*Both of Market Place, Huddersfield.*