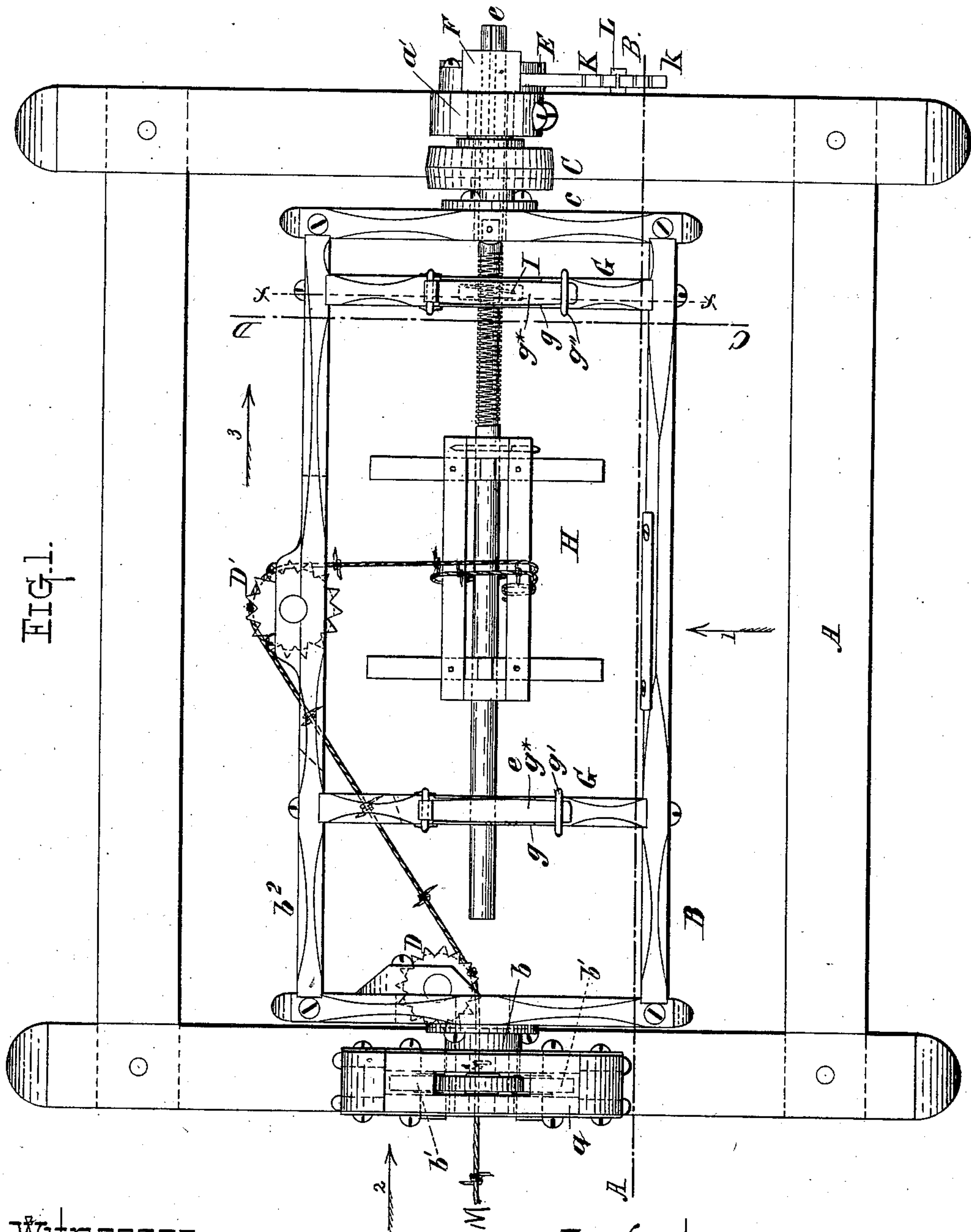


J. AYRES & A. C. DECKER.

# WIRE TWISTING MACHINE.

No. 294,748.

Patented Mar. 4, 1884.



Witnesses =

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Jno. C. MacGregor,

Inventors

*James Ayres and  
Alexander C Decker*

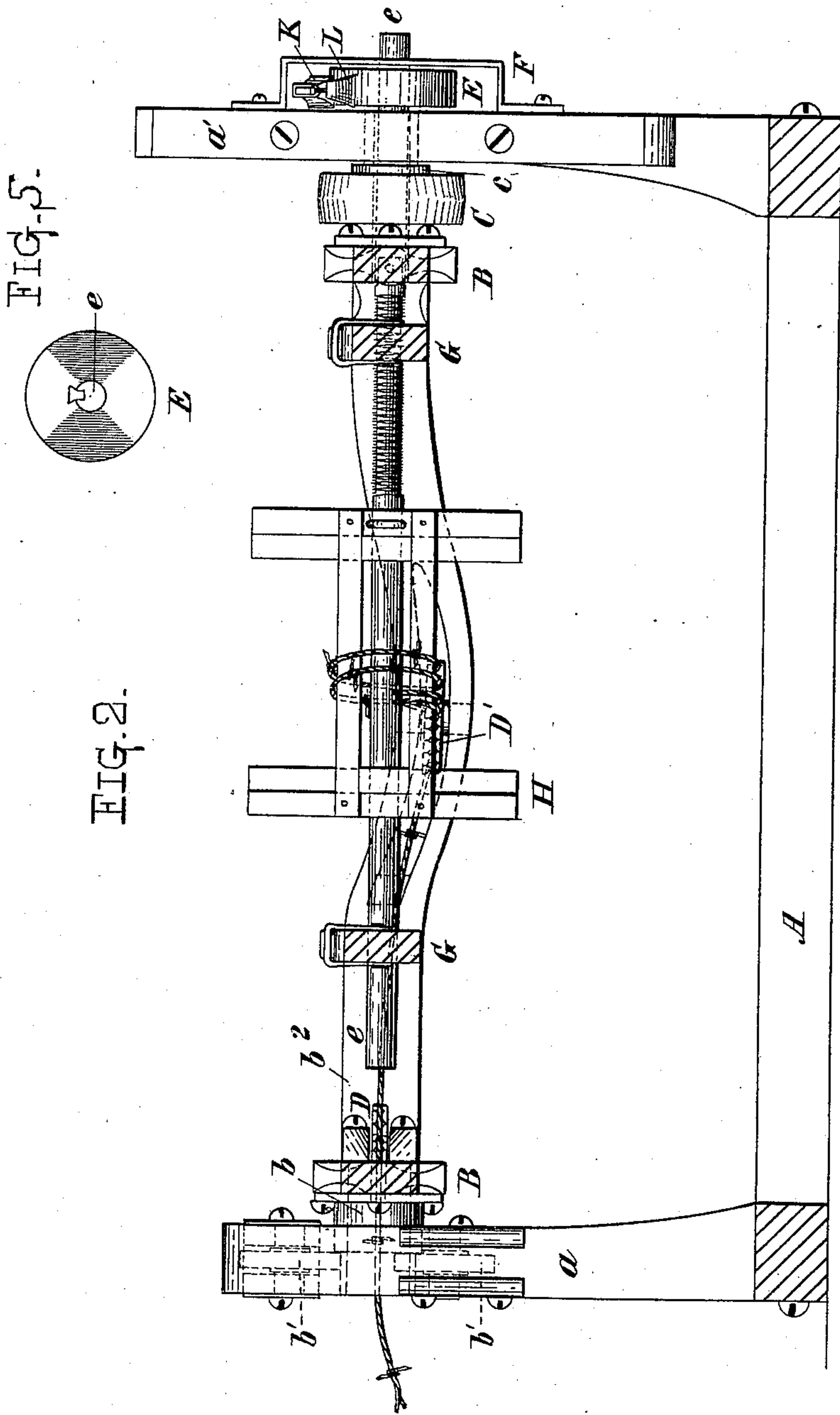
By *James H. Thacher*  
Attorneys

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By *Coburn & Machin*  
Attorneys

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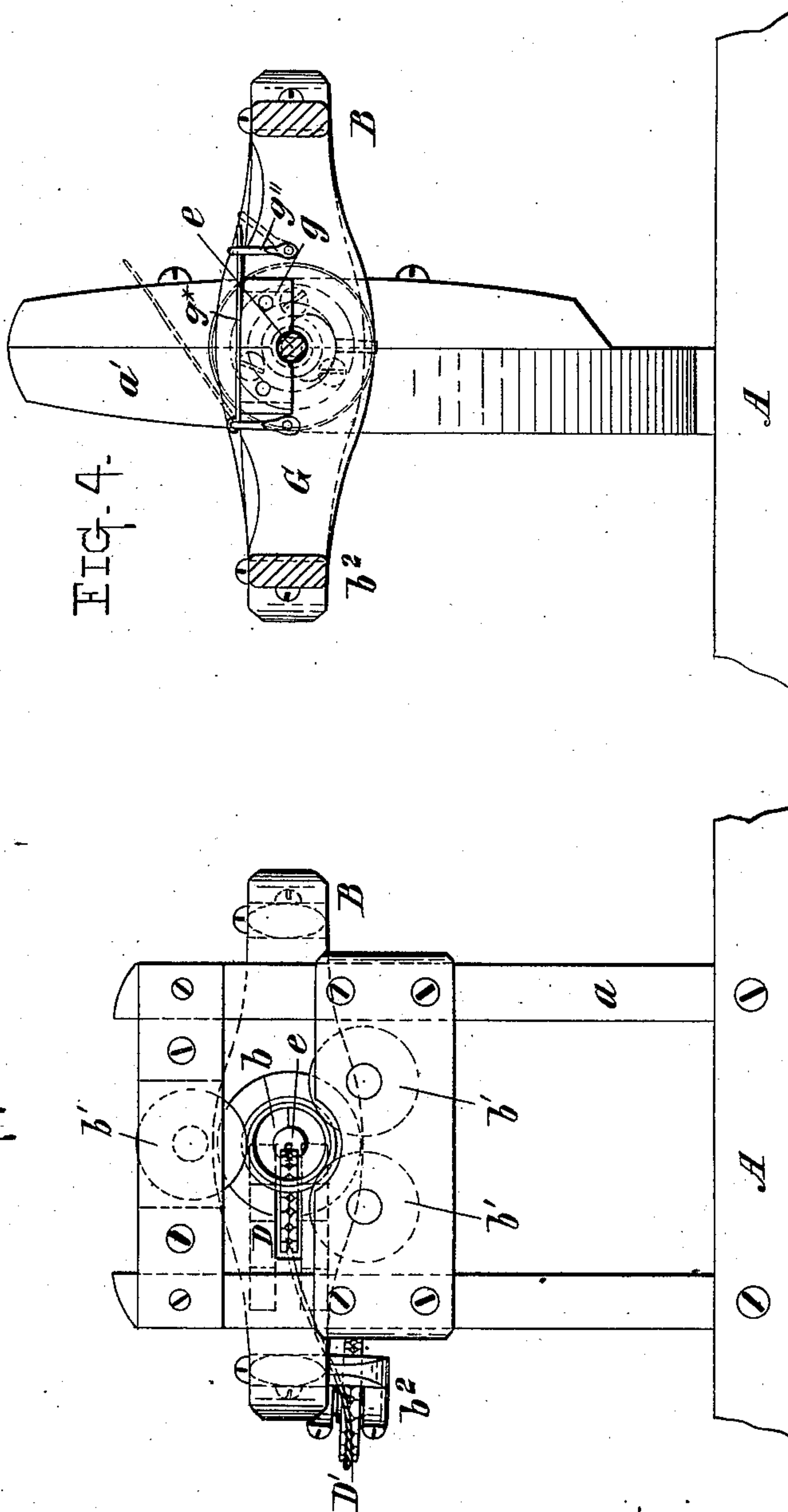


FIG. 4.

FIG. 5.

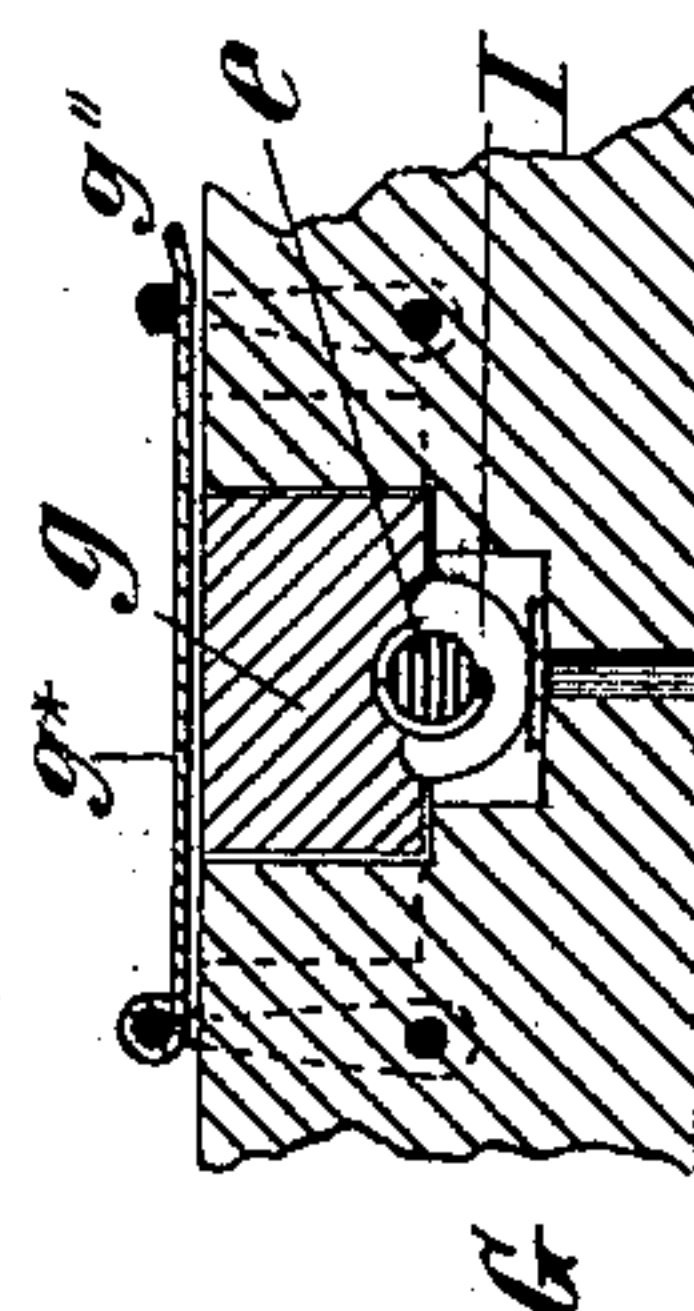
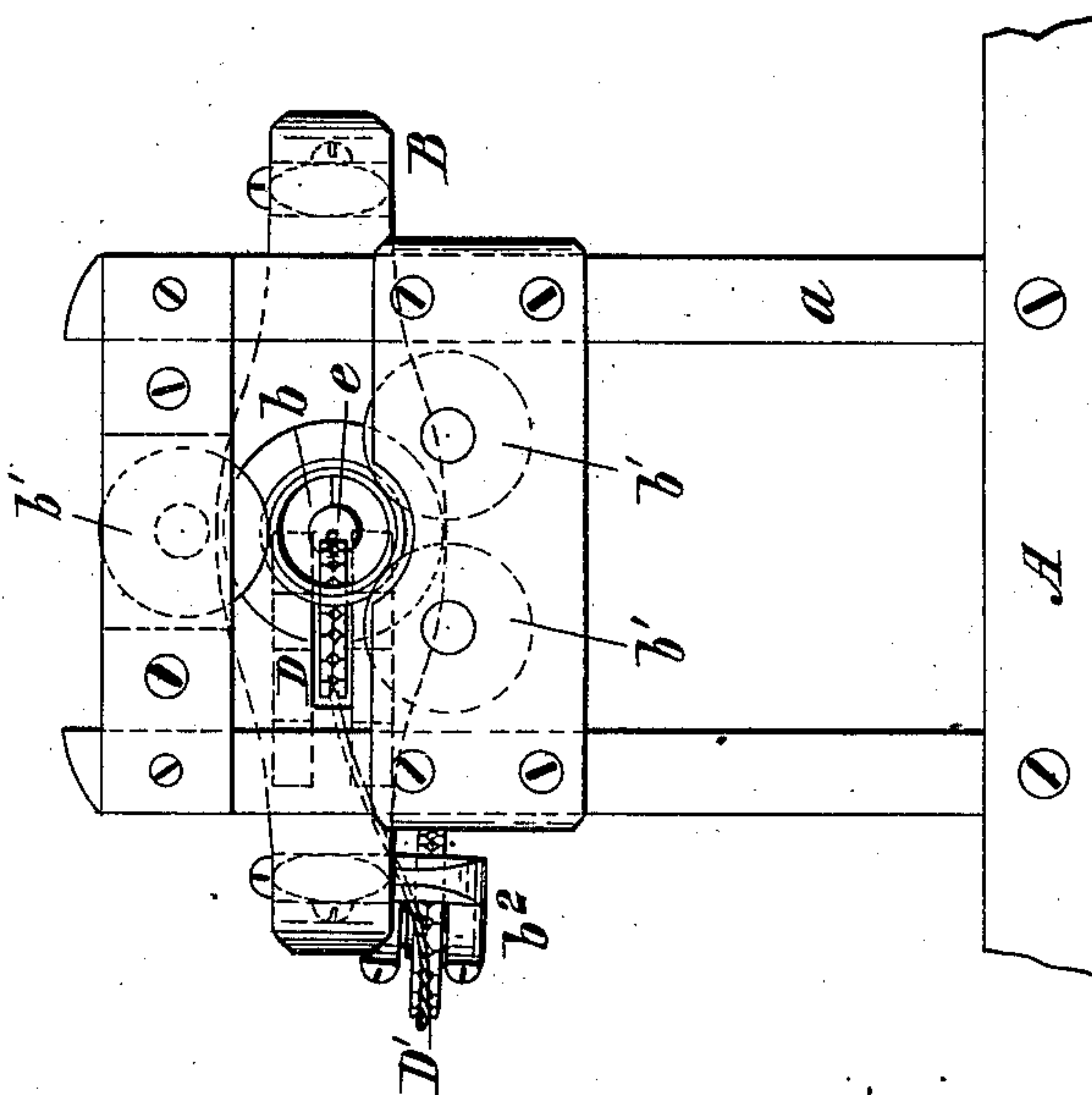


FIG. 6

Witnesses=

*W. C. Corlies*

*Jno. C. MacGregor,*

Inventors

James Ayres and  
Alexander C Decker

By *Osborn & Thacher*  
Attorneys



# UNITED STATES PATENT OFFICE.

JAMES AYRES AND ALEXANDER C. DECKER, OF BUSHNELL, ILLINOIS,  
ASSIGNORS TO WASHBURN & MOEN MANUFACTURING COMPANY, OF  
WORCESTER, MASSACHUSETTS.

## WIRE-TWISTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 294,748, dated March 4, 1884.

Application filed June 14, 1879.

*To all whom it may concern:*

Be it known that we, JAMES AYRES and ALEXANDER C. DECKER, of Bushnell, in the county of McDonough and State of Illinois, have invented certain new and useful Improvements in Wire-Twisting Machines, which are fully described in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a plan view of a machine embodying our improvements; Fig. 2, a longitudinal section of the same, taken on the line A B, Fig. 1, looking in the direction of arrow 1; Fig. 3, an end elevation, looking in the direction of arrow 2; Fig. 4, a transverse section taken on the line C D, Fig. 1, looking in the direction of arrow 3; Fig. 5, an end elevation of the reel-shaft and the pulley on the end thereof; and Fig. 6, a detail transverse section on an enlarged scale, taken on the line *x x*, Fig. 1.

Our invention relates to machines for twisting together two or more strands of wire to form a cable, and is designed especially to make a twisted barb-fence wire.

The invention consists in special mechanism and combinations of devices, all of which will be hereinafter fully described, and definitely pointed out in the claims.

In the drawings, A represents the main or supporting frame, which consists of a rectangular base and upright standards *a a'* at the respective ends thereof. A rectangular frame, B, is provided at one end with a large tubular journal, *b*, which is supported in the upright frame *a*, being mounted on small wheels *b'*, which constitute a well-known anti-friction bearing. At the other end of this frame is a band-pulley, C, and hollow shaft *e*, which is attached to the frame B, and is mounted in suitable bearings in the upright standard *a'*. An opening is made in the end of the frame B, next to the tubular journal *b*, corresponding to the opening in the journal itself, and just inside thereof a rag-wheel, D, is mounted loosely on the inner side of the end piece of the frame, being arranged a little at one side of the tubular opening, but so that its teeth on the inside will be on a line with the central

line of said opening, as shown in Fig. 1 of the drawings. The rag-wheel is thus arranged tangentially to the axis of the journal. The side bar, *b<sup>2</sup>*, of the frame B, on the same side of the bearings of the latter as the rag-wheel D, is also provided with a similar rag-wheel, D', which is mounted loosely in a slot in the said side bar. This side bar is curved side-wise slightly at its central portion, where the slot is made, within which the wheel is mounted, so as to carry the slot a little to one side of the central line, and thus bring the rag-wheel D', which is opposite the reel, into a different radial plane from that in which the rag-wheel D at the journal is placed. The object of this arrangement is to bring the wire properly to the reel, as will be explained below. The wire passes directly from the rag-wheel D to the rag-wheel D'.

A pulley, E, is secured to a shaft, *e*, by spline and groove, as shown in Fig. 5 of the drawings, and the shaft is passed through the tubular shaft *c*, having the bearing of its outer end in a suitable supporting-bracket, F, on the standard *a'*, the pulley E being arranged inside of the bracket. The shaft *e* passes through the end piece of the frame B, next to the pulley C, and nearly the entire length of the said frame, having bearings in two cross-bars, G, of said frame B inside of the end pieces. The reel H is mounted on this shaft *e* about centrally of the frame B, and to provide for the removal of the reel when full and its replacement by another, the shaft *e* is sectional, being provided with a joint just inside of the end piece of the frame B. This joint may be an ordinary slip-joint, the two pieces being secured together by a pin, or any other suitable means may be used which will enable the shaft to be readily disconnected. The upper portions, *g*, of the bearings of shaft *e* in the cross-pieces G fit in recesses in said cross-pieces, and are retained therein by the hinged straps *g\**, the ends of which fit under the loops *g''*. By turning the loops aside, as shown in dotted lines, Fig. 4, the straps can be raised, so as to allow the removal of the bearing-blocks *g*, and also permit the section of the shaft *e* in the frame B to be removed when



disconnected, as stated above. The shaft *e*, at the pulley end of the frame, is also provided with a double screw-thread—that is, a combined right and left thread—and in the cross-piece *G* on the opposite side of the shaft *e* from the hinged bearing-block, is arranged a forked switch, *I*, which embraces the threaded portion of the shaft, and is designed to enter the screw-threads. This switch is pivoted in the cross-piece so as to turn in one direction or the other, for the purpose of changing from one thread to the other at the respective ends of the threaded portion of the shaft. Now, it is evident that if the shaft *E* is held stationary, while the frame *B* is rotated, or if the shaft is rotated, but more rapidly or slowly than the frame *B*, the shaft will be caused to travel back and forth in the frame, carrying the reel with it, the spline and groove attachment of the shaft and its pulley permitting this movement. The change from one thread to the other on the shaft is effected automatically on each end of the travel, the threads running into each other at each end, so that the continued rotation of the frame about the shaft turns the switch from the end of one thread into the beginning of the other in a manner which is well known, the switch turning on its pivot to permit this change. A brake-lever, *K*, is pivoted to the standard *a'* just above the pulley *E* in such a position that it will rest upon the pulley, the free end projecting out at one side of the standard and provided with a series of notches, *k*. A weight, *L*, is hung upon this end of the brake-lever, and may be adjusted from one notch to another thereon, according as more or less power is required to brake the reel-shaft and retard its rotation with the revolving frame.

The operation of this machine is as follows: The strands of wire *M*, one of which may be provided with barbs, are led in through the tubular journal *b* around the rag-wheel *D*, and thence around the rag-wheel *D'* and in to the reel *H*, which is directly opposite the wheel *D'*, the ends being temporarily fastened to the reel. The revolution of the frame *B* is then commenced by means of the band-pulley *C*, the reel-shaft being at the same time held back by the brake-lever or rotated with a differential movement, as described above. It is evident that this revolution of the frame *B* will at once twist the strands of wire together and wind the twisted cable upon the reel, which is caused to travel back and forth, as described, so that the twisted wire is laid

evenly thereon. The rag-wheels accommodate the barbs on the wire, so that they cause no obstruction to the proper feeding of the latter.

It is evident that the strain upon the reel tending to cause it to rotate will be greater as it fills up with wire; and hence more power is required at the brake to prevent this rotation. To accomplish this and always hold the reel steady, the weight *L* is adjusted on the lever *K* from one notch to another, being set outward as the reel fills. When the reel is filled, the machine is stopped, the frame-section of the reel-shaft taken out, as above described, and the full reel exchanged for an empty one, when the shaft is replaced and the operation continued.

In some of its mechanical details this machine may be changed without changing the principle of operation, and we do not wish to be understood as limiting ourselves to the precise construction and arrangements of all of the devices herein shown and described.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The revolving frame *B*, provided with a tubular journal, *b*, at one end, and hollow journal *c* and band-pulley *C* at the other, and rag-wheels *D D'*, relatively arranged as described, in combination with the sectional longitudinally-movable reel-shaft *e*, about which the reel rotates, and actuating mechanism, substantially as and for the purposes set forth.

2. The combination, with frame *B* and sectional shaft *e*, of removable bearing-pieces *g*, substantially as and for the purposes set forth.

3. The combination, with the revolving frame, sectional reel-shaft and reel, of the cross-pieces having bearings for the removable portion of said shaft, which supports the reel and the removable bearing-blocks, substantially as described.

4. The combination, with the revolving frame, the threaded reel-shaft, the cross-pieces, the means for controlling the rotation of the reel-shaft, and the switch engaging in the thread of said shaft, of the removable bearing-blocks arranged on the opposite side of the shaft from said switch, substantially as described.

JAMES AYRES.  
ALEXANDER C. DECKER.

Witnesses:

JOSEPH B. McCONNELL,  
GEORGE W. FOX.