

May 9, 1933.

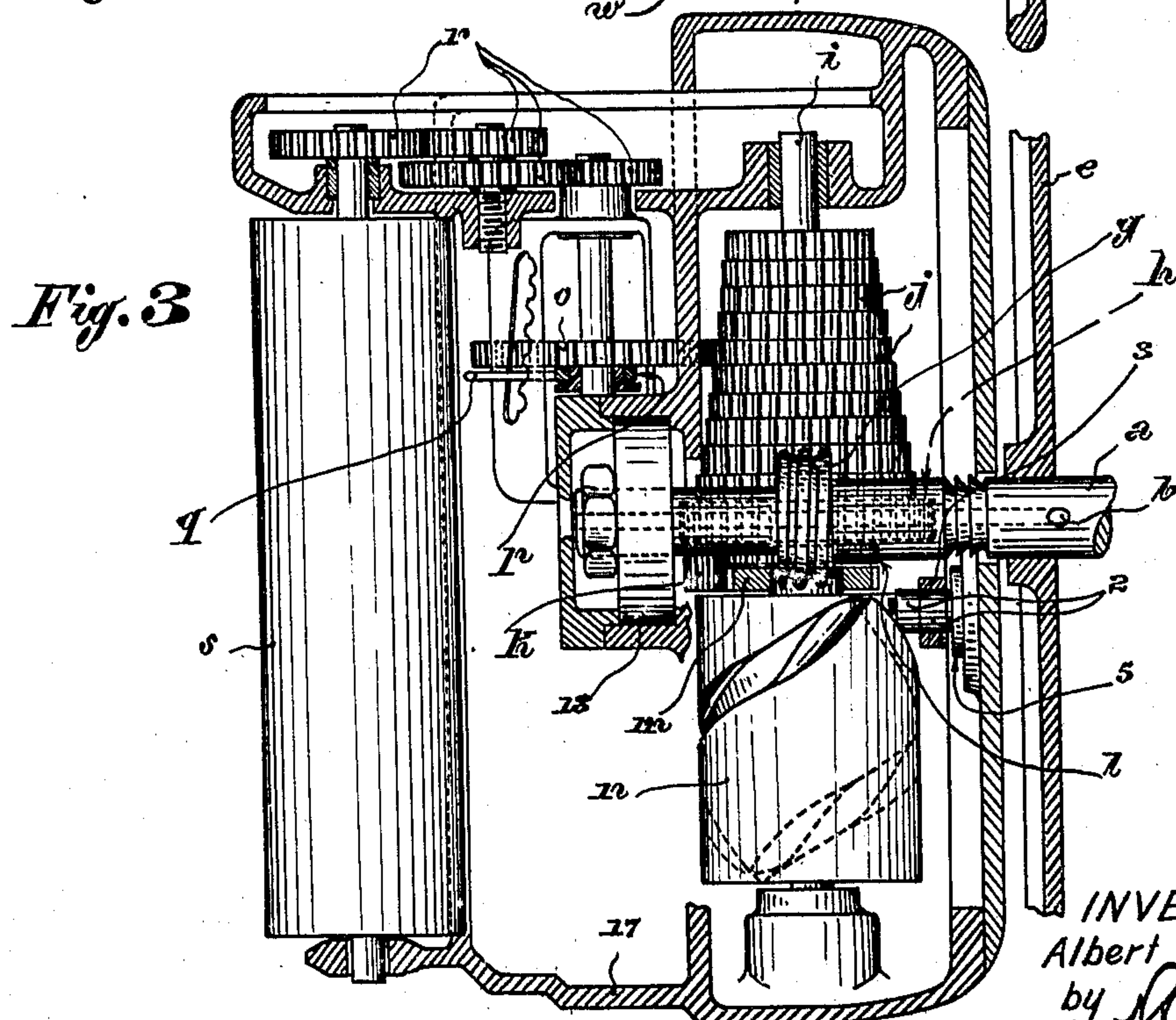
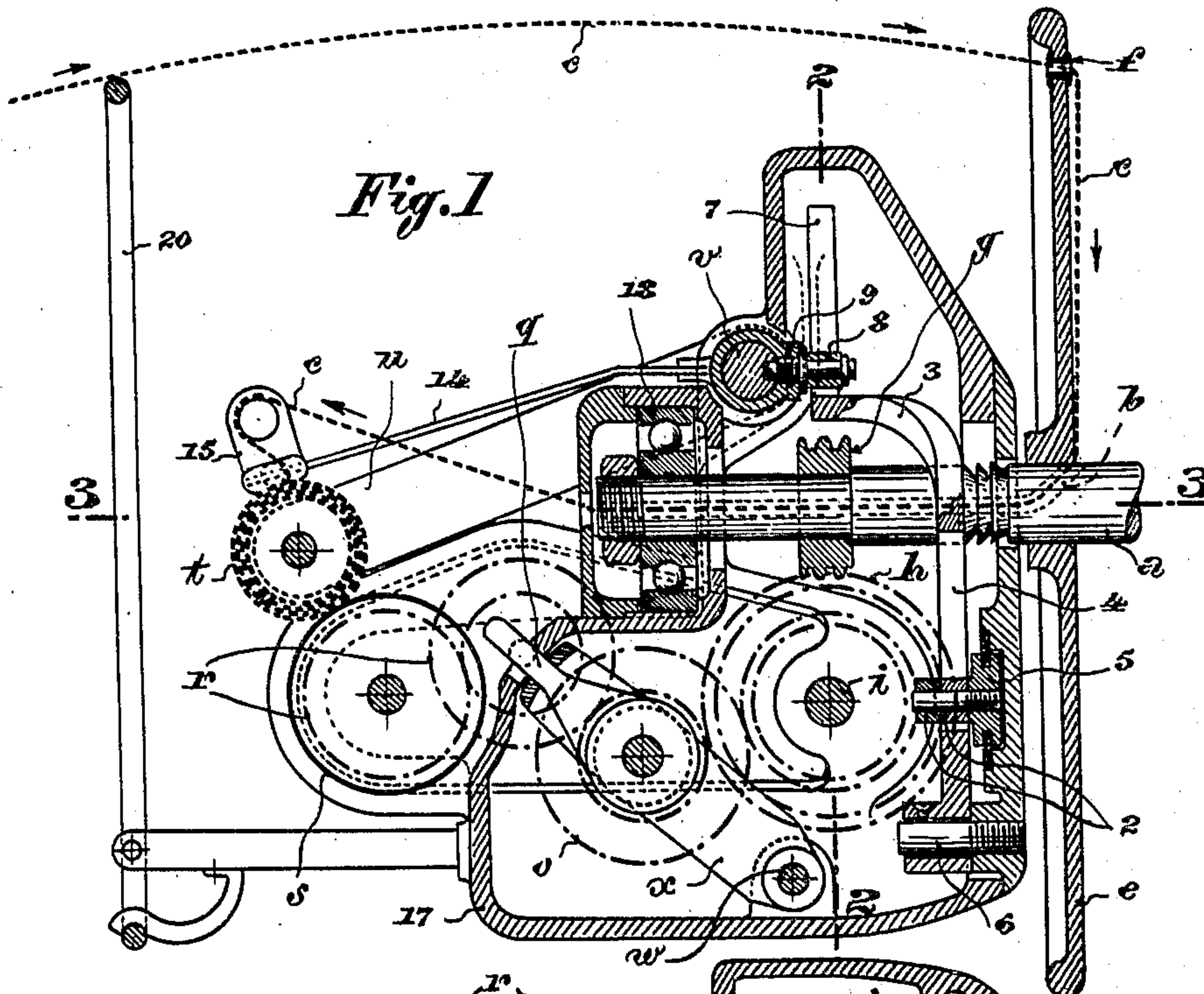
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1,907,530

DOUBLE TWIST FLYER SPINNING MACHINE

Filed April 2, 1930

3 Sheets-Sheet 1



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Fig. 2

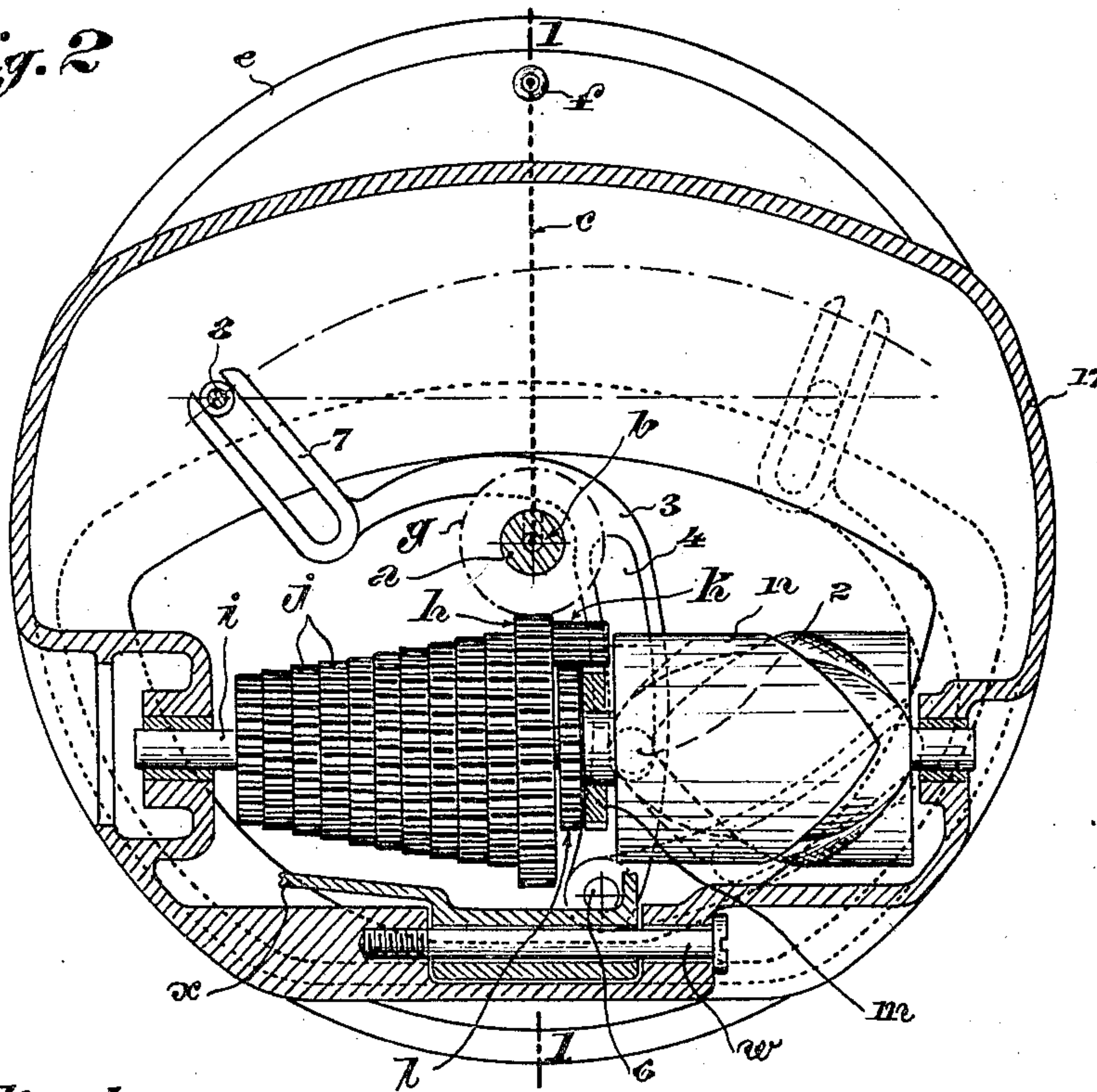
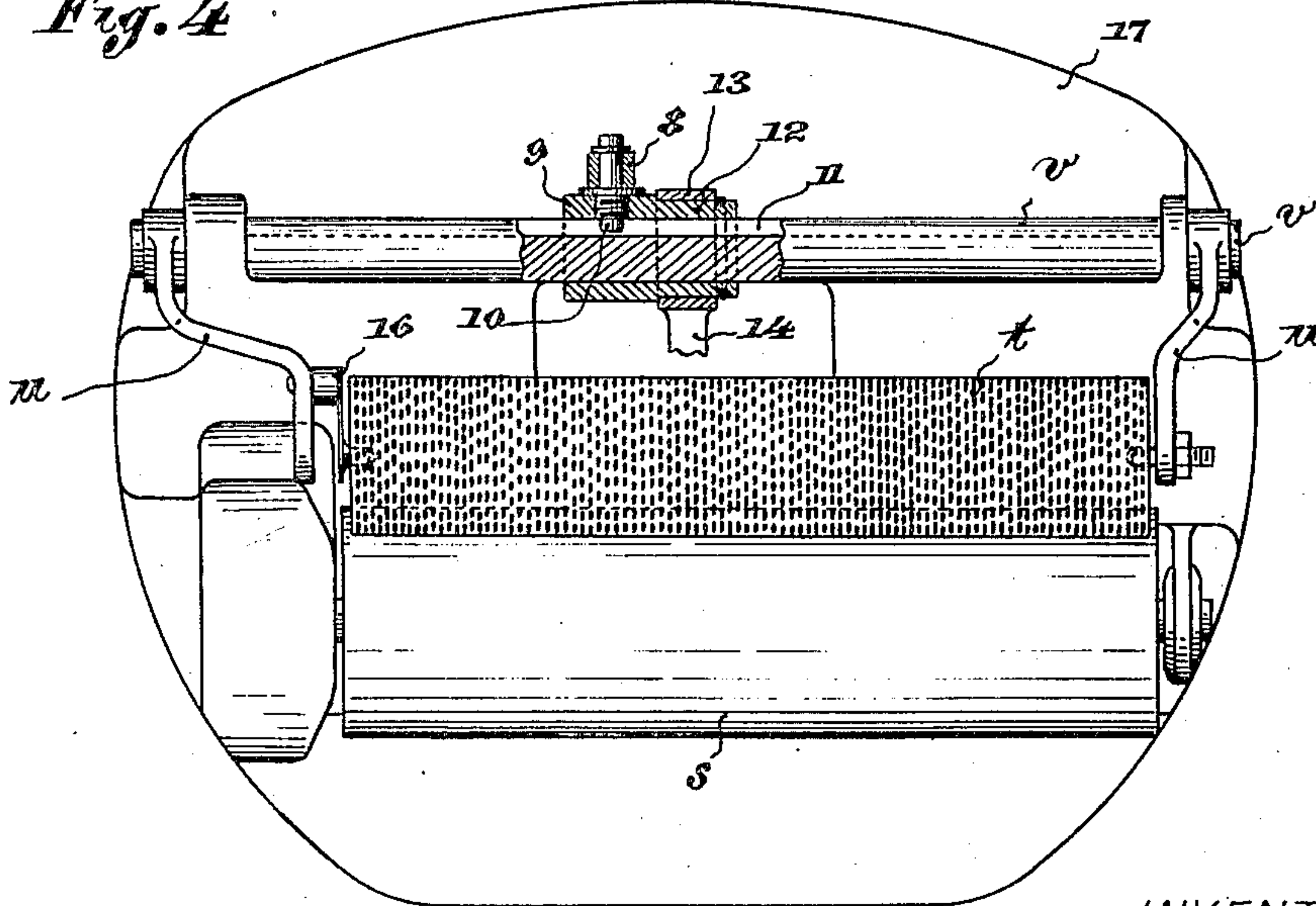


Fig. 4



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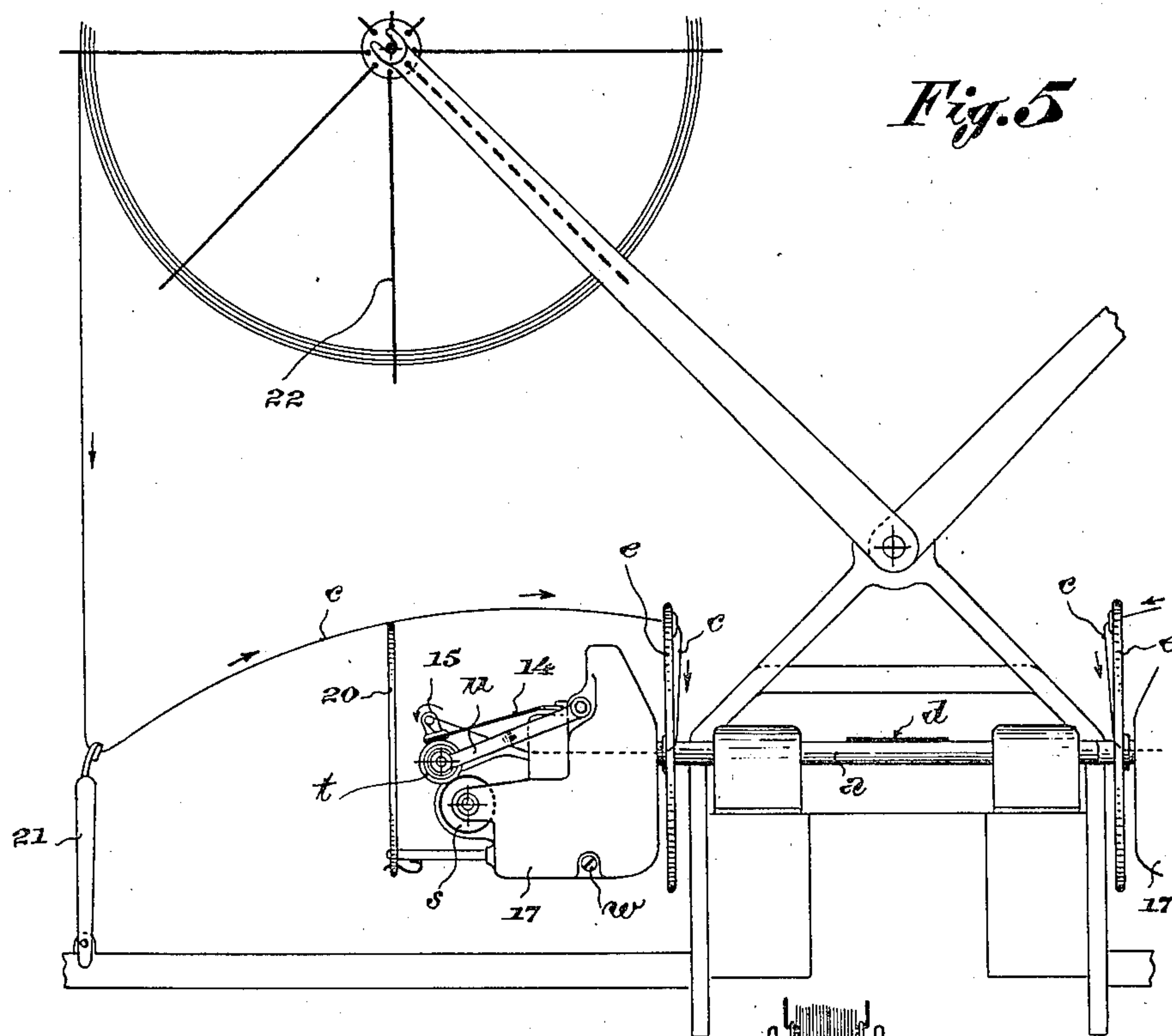


Fig. 5

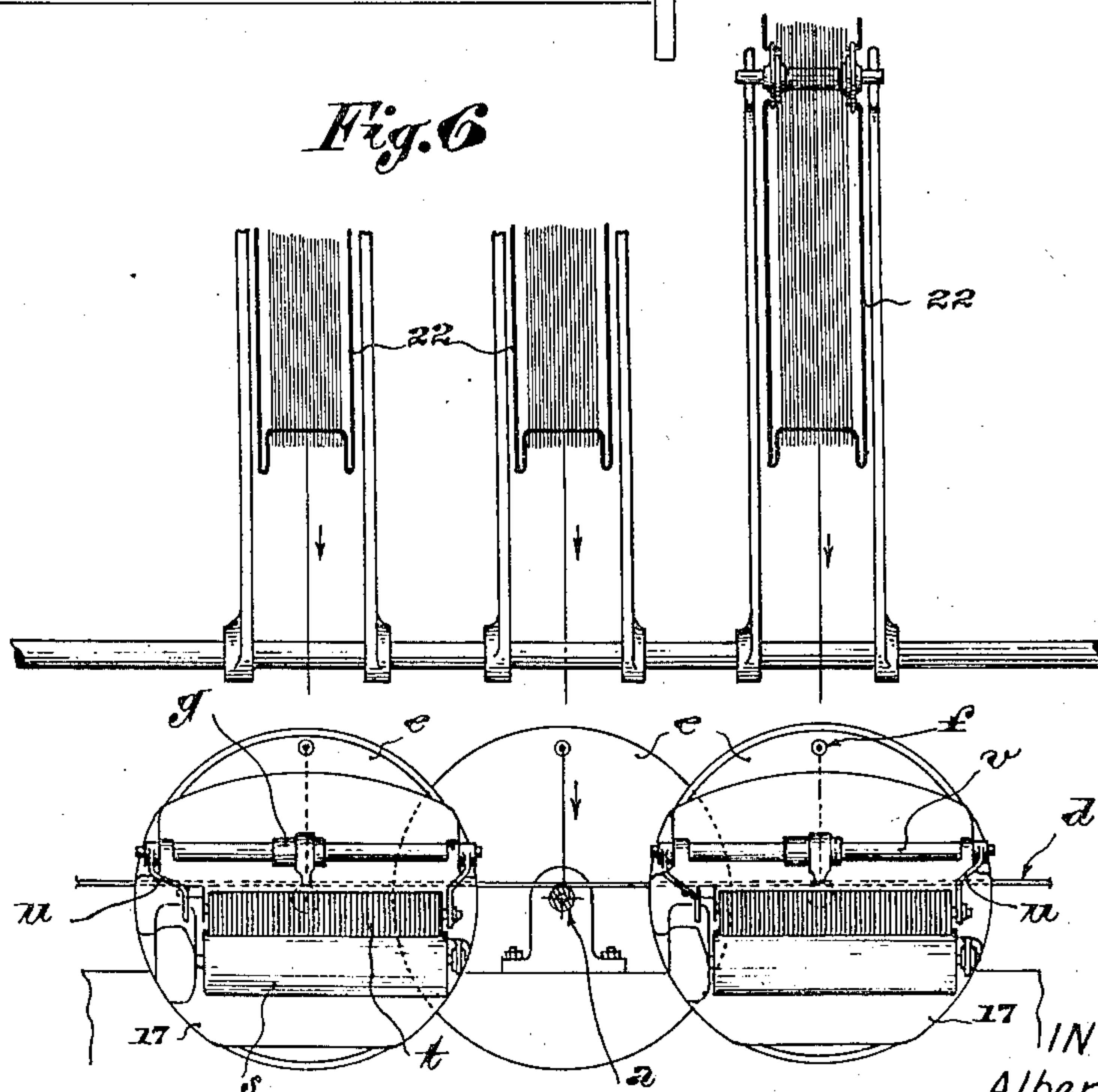


Fig. 6

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UNITED STATES PATENT OFFICE

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DOUBLE TWIST FLYER SPINNING MACHINE

Application filed April 2, 1930, Serial No. 440,999, and in France June 20, 1929.

The present invention relates to improvements in a double twist flyer spinning machine of the type in which the winding of the spun or thrown thread forms a balloon around the feeding or drawing mechanism of the thread.

Said improvements allow amongst other advantages:

A much larger production due to the fact, on the one hand, that the double twist occurs during the spinning operation and, on the other hand, to an increase in the angular speed of the flyer;

A constant tension of the yarn or yarns to be spun owing to the operation of unwinding;

Of obtaining the direct transformation of a reel of raw silk in yarn spun on pirns, doing thus away with the operations of unwinding, reeling and pirning;

The easy and direct manufacture of doubled yarns and fancy threads;

Of obtaining a constant ratio between the angular speeds of the spindle and of the winding bobbin, thus doing away with what is called a "slack twist".

According to the invention the driving mechanisms of both the winding bobbin and the thread guide is loosely mounted on the spindle, inside the balloon formed by the winding of the thread and is held in stable equilibrium by its own weight by having its center of gravity below the axis of the spindle.

The invention relates more particularly to a spinning machine of the above stated type, in which the winding bobbin for the thread is positively driven by the spindle itself through the intermediary of a reduction gear and in which a cam and slide device is used for transforming the rotating movement of the spindle into the reciprocating straight movement of the thread guide.

The invention will be understood with ref-

erence to the following description and the accompanying drawings in which,

Figs. 1 and 2 are longitudinal and transverse sections made on line 1—1 of Fig. 2 and line 2—2 of Fig. 1, respectively.

Fig. 3 is a horizontal section made on line 3—3 of Fig. 1.

Fig. 4 is a front elevation showing in section a detail of the thread guide.

Figs. 5 and 6 are two views showing respectively in side and front elevation the whole of the machine.

On the spindle *a*, into the centre of which passes through an axial hole *b*, the thread or yarn *c* to be thrown or spun and which is driven for example by an endless belt *d* (Fig. 5), is keyed a circular disc *e* pierced at *f* on its periphery and a worm *g*. This latter meshes with a worm wheel *h*, which is loosely mounted on a stationary shaft *i* and is integral with a stepped cone *j* on its other side, said worm wheel *h* carries near its periphery a stud on which rotates freely a small satellite pinion or follower *k*. This latter meshes simultaneously and constantly with two gear wheels having an unequal number of teeth; one tooth *l* is keyed on the stationary shaft *i* and the other tooth *m* is coupled to a cam *n* having a symmetrical profile and is freely mounted with said cam on the shaft *i*.

From the stepped cone *j* the movement is transmitted by a pinion *o* mounted on a bracket *x* pivoted at *w* and operated by a form *p* and crank *q* to a reducing gear *r* controlling the rotation of a drum *s*. Said latter drives by friction the bobbin *t* or the like on to which the spun thread *c* is to be wound. Said bobbin *t* is carried between the free ends of two pivoting arms or brackets *u*, carried by a short shaft *v*.

By altering the position of the traveller pinion *o* on the stepped cone *j* or by changing the ratio of the gears *r*, any desired speed of rotation of the bobbin with respect to the

angular speed of the spindle α can be obtained.

The cam n drives through rollers 2, mounted on a slide 5 sliding in a straight guide, a lever 3 provided with a curvilinear groove 4. Said lever 3 is pivoted at 6 on one side and terminates by a form 8 on the other side. This latter drives by means of a roller 8 a sleeve 9, which, owing to a projection 10 can only be displaced parallel to itself without rotating on the shaft v , grooved at 11. This sleeve 9 is prolonged by a hub 12 on which is frictionally mounted a collar 13 prolonged by an arm 14, carrying at its free end the thread guide 15.

The bobbin t is held in position between the ends of the arms u by a spring 16.

All the aforesaid apparatus is enclosed inside a casing 17 mounted in ball bearings 18 on the end of the spindle α and held in stable equilibrium by its weight, its centre of gravity being located below the axes of the spindle α .

On starting up the spinning or throwing, the thread to be spun coming from a reel or bobbin 22 (Fig. 5) passes through a hook 21 and is prevented from coming in contact with the frame 17 by a ring 20, before the centrifugal force has caused the formation of the balloon. The profile of this latter may be altered by advancing or withdrawing the aforesaid hook 21. Thus from the hook 21 to the winding bobbin t , two twists in the same direction are imparted to the thread, which gives the same result as if one twist in opposite direction were imparted at each end of the thread.

It will be easily understood that the direction of travel of the thread can be reversed by placing the non-twisted yarn at t inside the balloon.

The twist may be applied in either left or right directions according to the direction of rotation of the spindle α and of the direction of travel of the yarn through the thread guide 15.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

A double twist flyer spinning machine of the character described, including the combination, with driving and spinning mechanism including a bobbin upon which the thread is wound, having a horizontal axis, of a horizontally disposed drive shaft for said mechanism transversely arranged with respect to the axis of said bobbin, a gear casing enclosing said mechanism, having the center of gravity thereof disposed below the drive shaft and pendently mounted upon said shaft so as to oscillate thereon in floating condition during rotation of the shaft, a disk rigid with said shaft so as to rotate therewith having a thread aperture adjacent to the periphery in order to form a balloon about a hori-

zontal axis during rotation which envelopes said gear casing and the mechanism, and means for guiding the thread from said disk through said mechanism to said bobbin, including an axial channel in said shaft opening toward said bobbin at one end and terminating at the other end in a lateral opening in the shaft adjacent to said disk, and a thread guiding device associated with said mechanism horizontally movable in parallelism with the axis of said bobbin and adapted to receive the thread from the open end of said shaft and pass said thread to said bobbin.

In witness whereof I affix my signature.

ALBERT FÉRIER.