

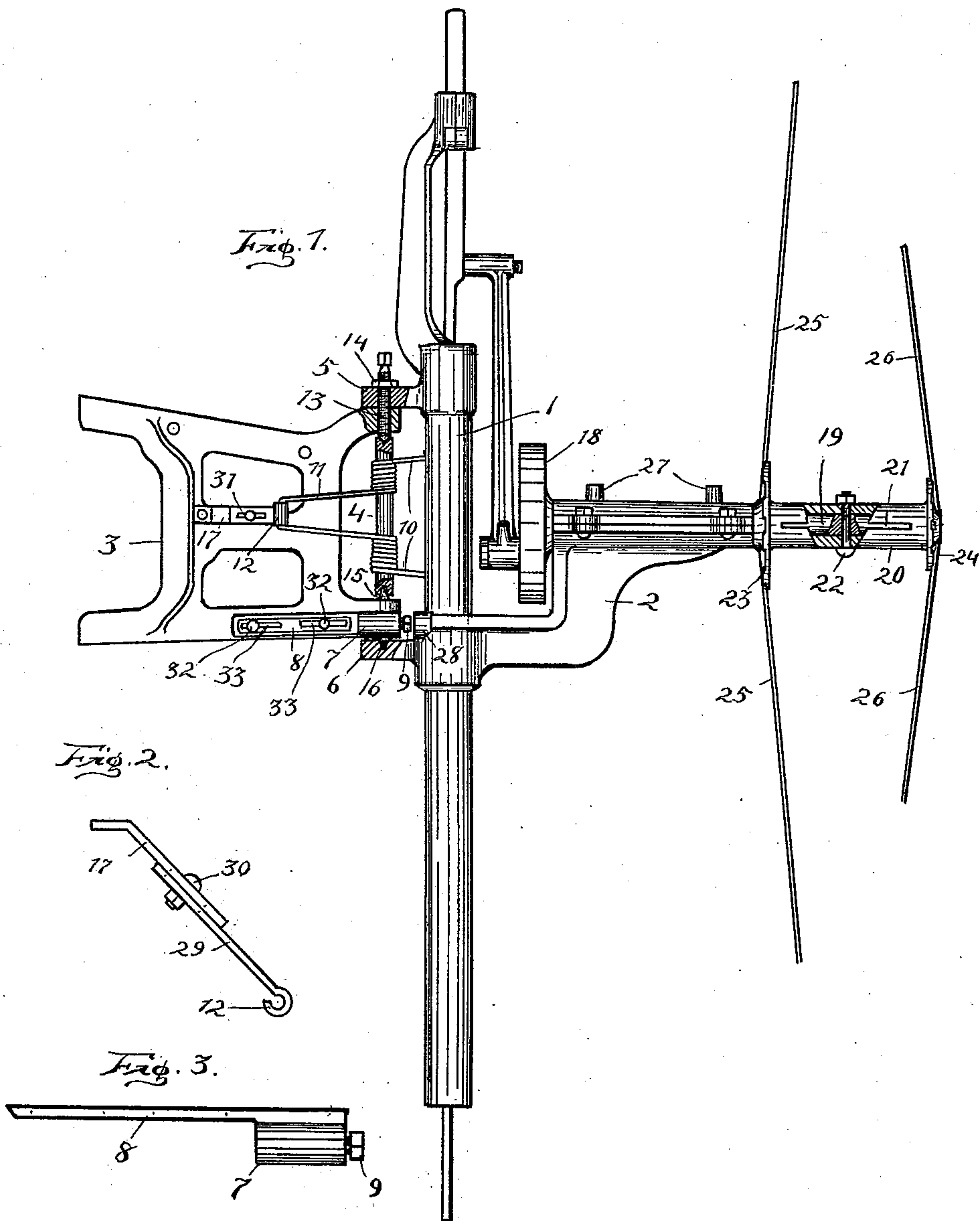
(No Model.)

3 Sheets—Sheet 1.

E. J. SCHROCK.  
WINDMILL.

No. 549,749.

Patented Nov. 12, 1895.



**WITNESSES:**

Eli J. Schrock INVENTOR

Walter G. Burns  
George E. Johnson

BY *Chapin & Denny*  
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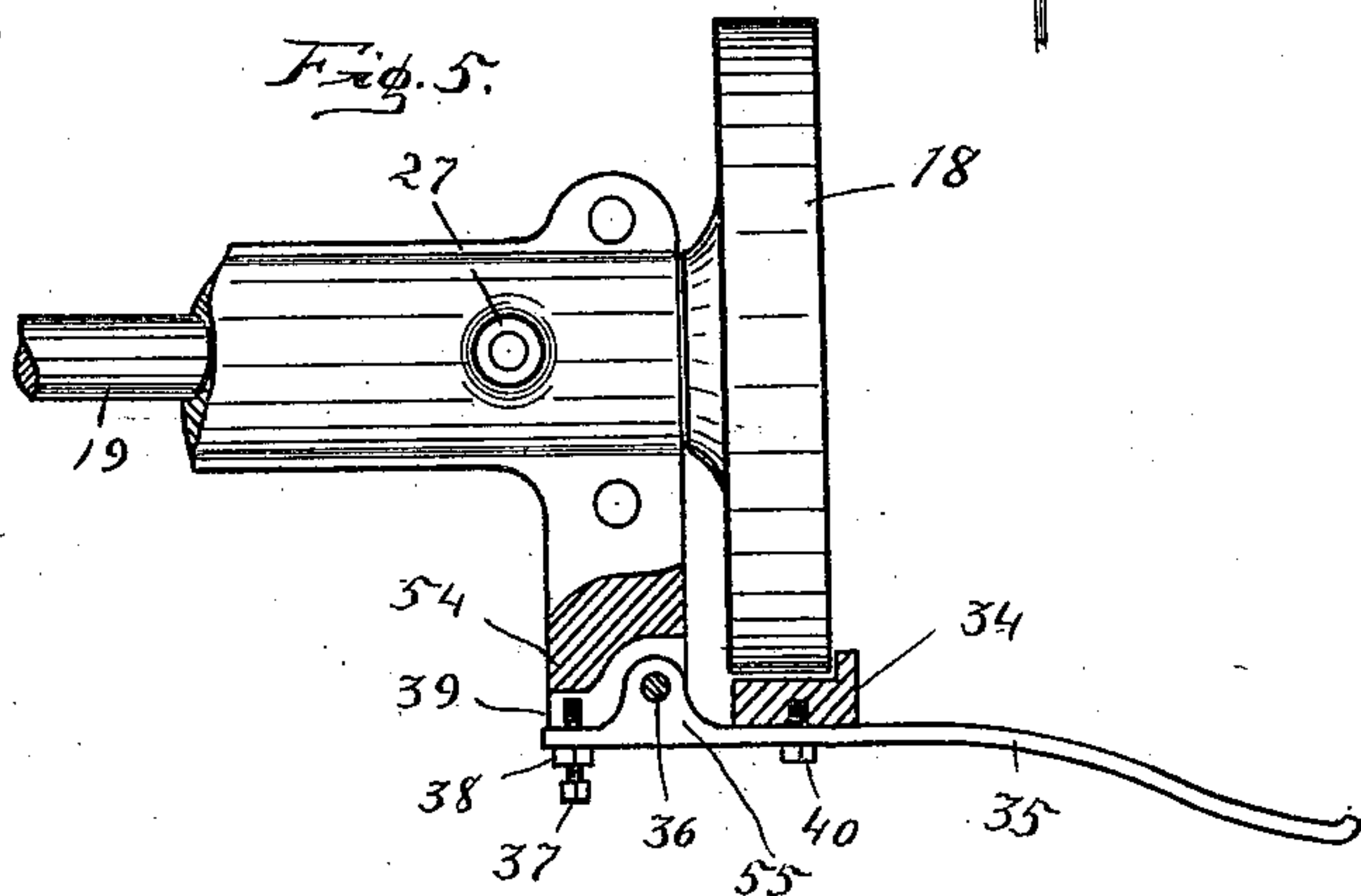
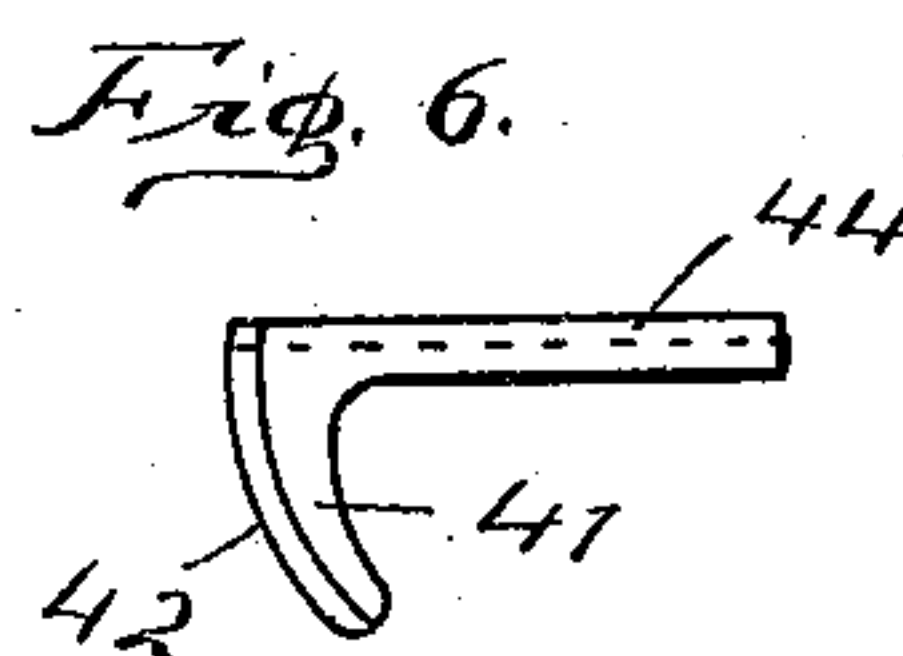
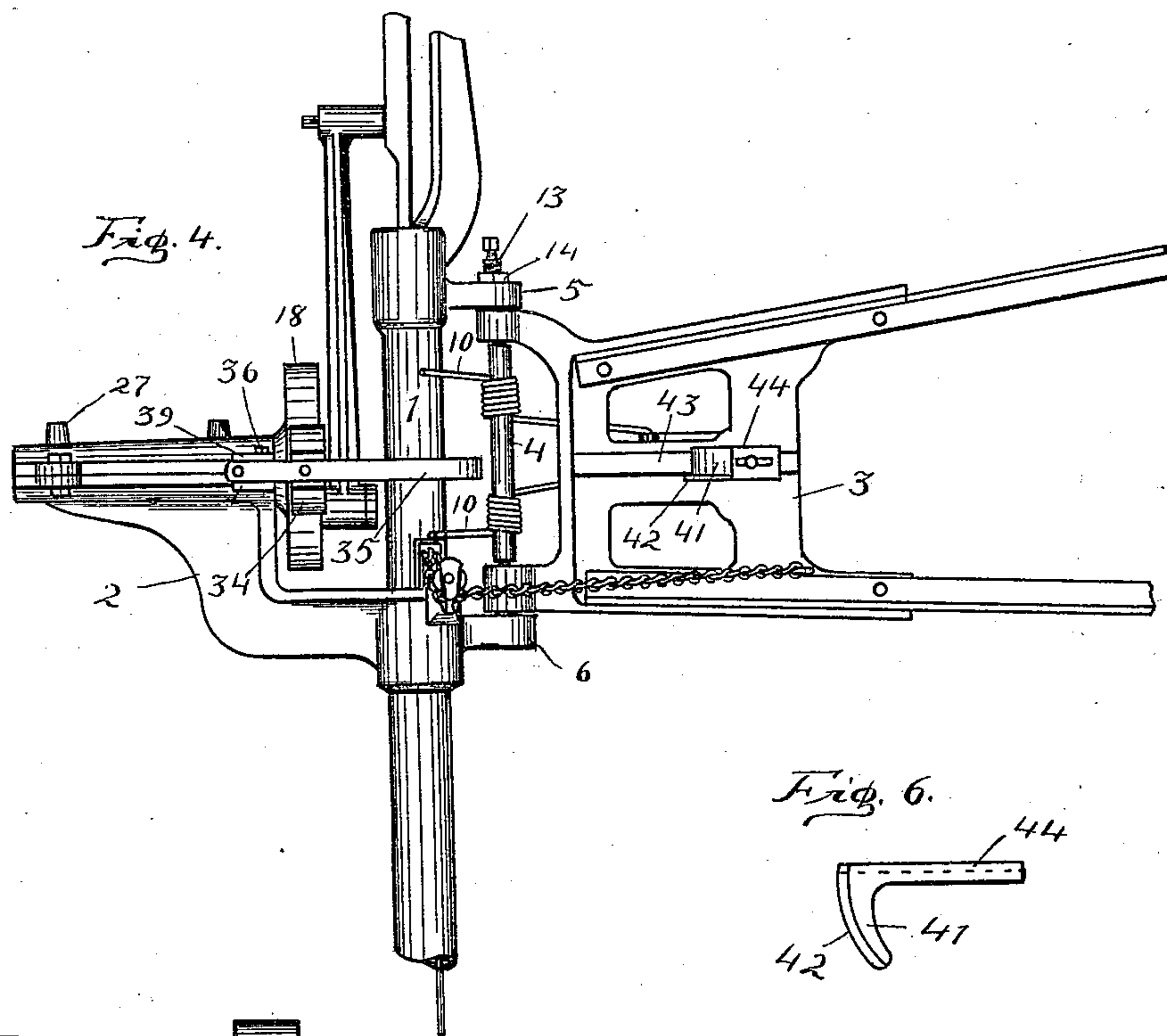
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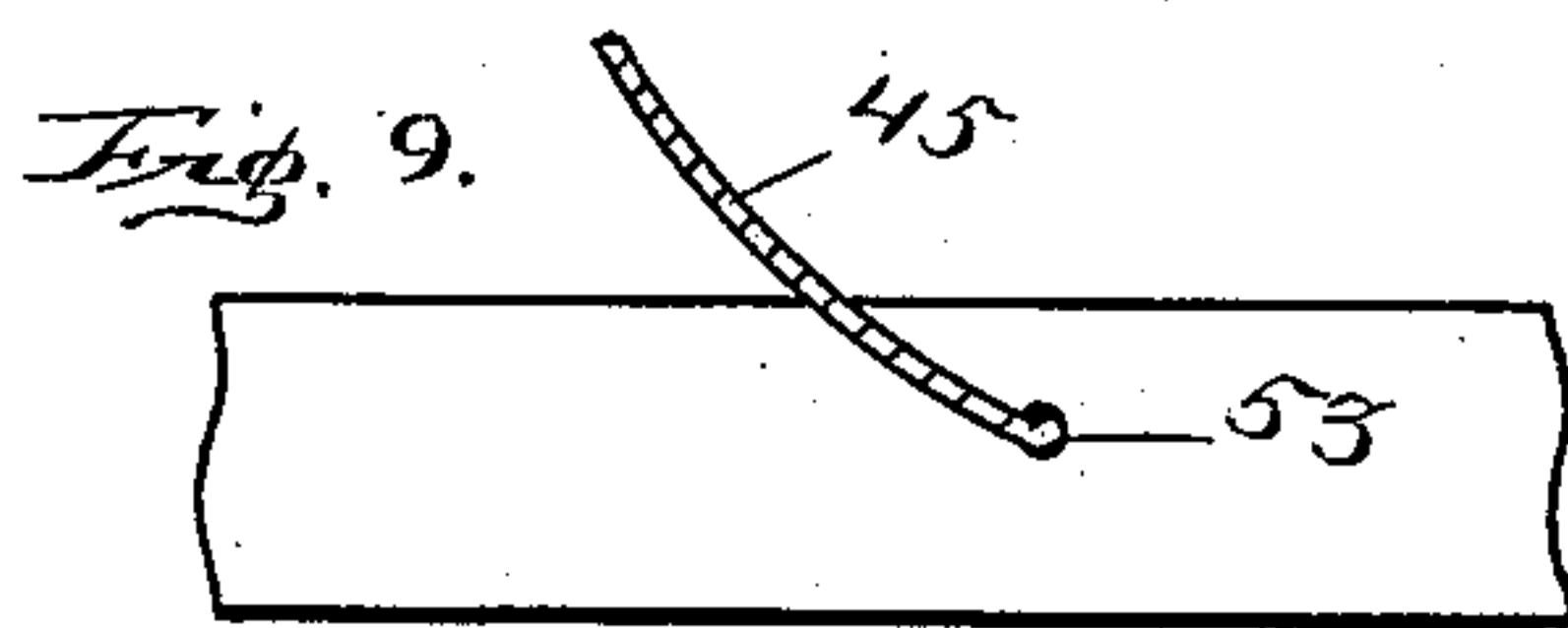
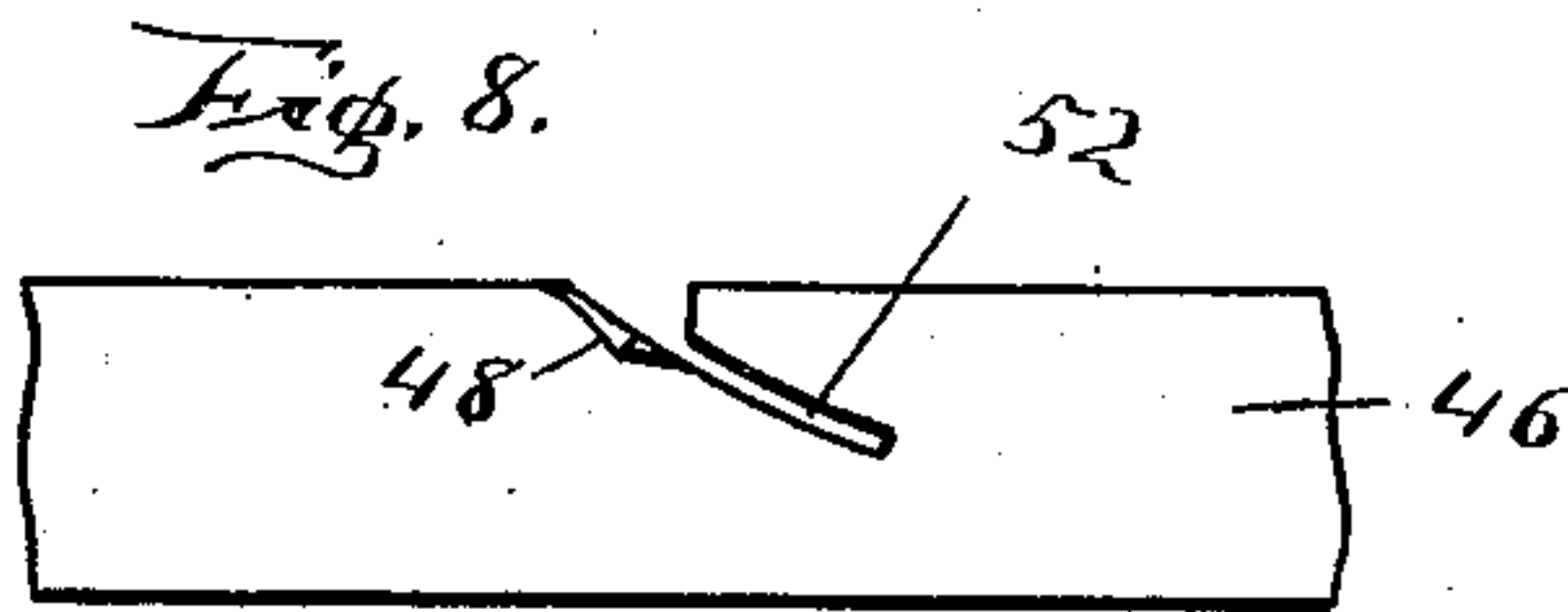
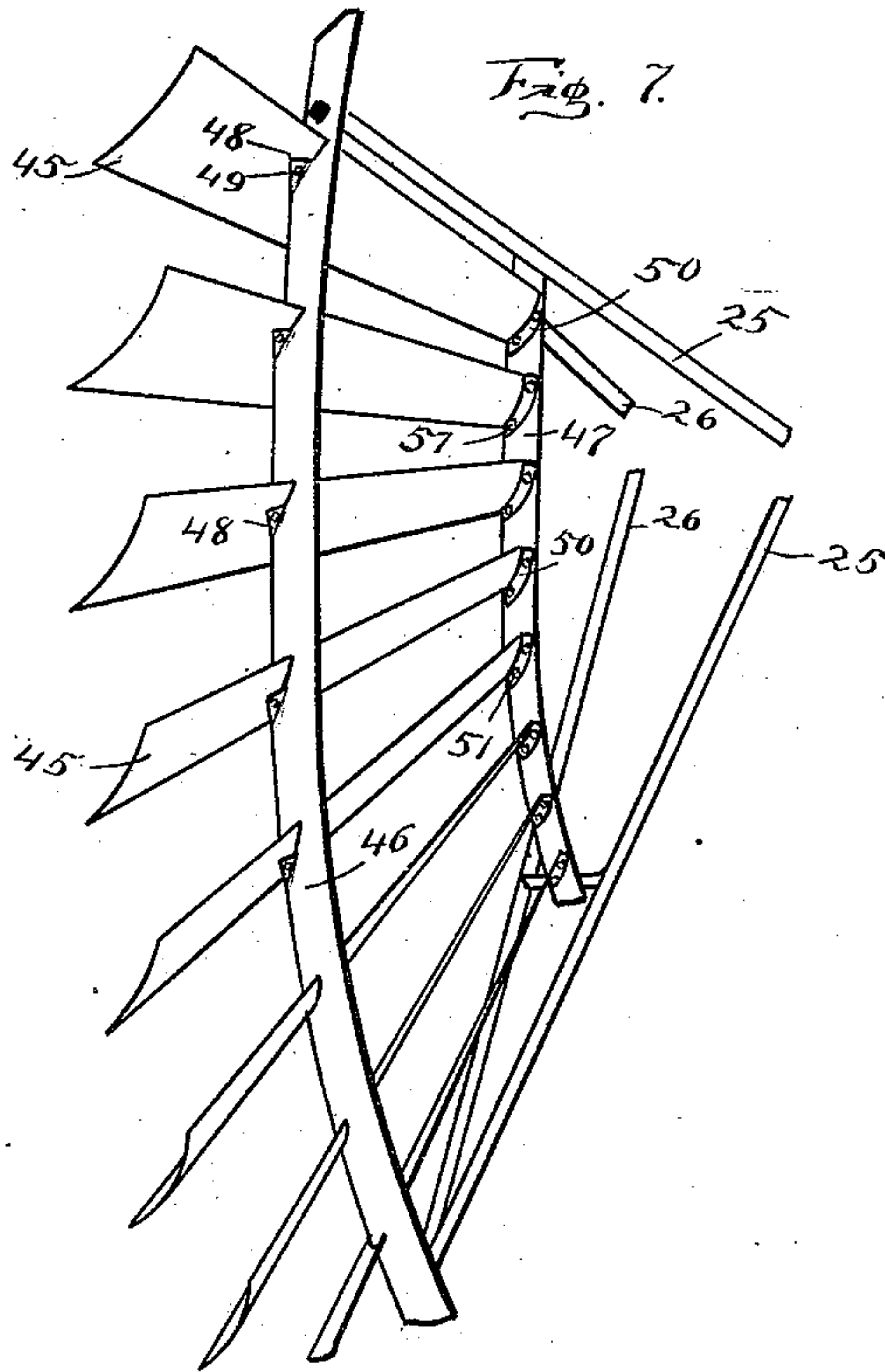
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# UNITED STATES PATENT OFFICE.

ELI J. SCHROCK, OF GOSHEN, INDIANA.

## WINDMILL.

SPECIFICATION forming part of Letters Patent No. 549,749, dated November 12, 1895.

Application filed April 12, 1895. Serial No. 545,465. (No model.)

*To all whom it may concern:*

Be it known that I, ELI J. SCHROCK, a citizen of the United States, residing at Goshen, in the county of Elkhart, in the State of Indiana, have invented certain new and useful Improvements in Windmills; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in windmills all parts of which are of metal.

The object of my invention is to provide a windmill embracing the following novel features: first, an improved wind-wheel having a longitudinally-slotted hub so constructed and arranged as to firmly grip the shaft when in position thereon and having an improved means for securing the wheel vanes or sails to the outer wheel-rim without the aid of additional parts; second, an improved spring-governor removably mounted on the tail-vane casting and provided with convenient means for regulating the tension and leverage thereof; third, an improved friction-brake adjustably mounted upon the main casting, having a guiding and holding block longitudinally adjustable upon the tail-vane casting. This object I attain by the mechanism illustrated in the accompanying drawings, in which similar figures of reference indicate corresponding parts throughout the several views.

Figure 1 is a side elevation of my improved windmill, partly in section, showing the construction of the wheel-hub and the manner of securing the same upon the shaft, and also showing the construction and arrangement of the spring-governor when in position for use. Fig. 2 is a detail of the slotted adjustable holding device for regulating the tension of the governor. Fig. 3 is a detail of the tail-vane buffer. Fig. 4 is a view of the reverse side from that seen in Fig. 1, showing the arrangement of the friction-brake and the holding-block which secures the brake-shoe in contact with the crank-wheel. Fig. 5 is a detail plan of the brake, partly in section, showing the manner of securing the same in position. Fig. 6 is a detail plan of the hold-

ing-block for the free end of the brake-lever. Fig. 7 is a detail of a portion of a wheel-rim, showing my improved means for securing the vanes or sails thereon. Fig. 8 is a detail of the curved slot in which the vanes are secured, showing the integral upright flange to which the said sails are riveted. Fig. 9 is a modified form of the said slot with a section of a sail in position therein and secured by means of a punch.

The tubular main casting 1, of any proper construction, preferably arranged as shown in Fig. 1, has an integral surmounted guide-casting for the upper end of the pump-rod, which is connected to wheel-shaft by means of a crank-wheel 18 and a pitman in a well-known manner, an integral oblique wind-wheel casting 2, in which the wind-wheel shaft 19 is rotatably mounted in the usual manner, and a pair of lateral lugs 5 and 6 for the support of the tail-vane casting 3.

My improved wind-wheel comprises a tubular metallic hub 20, of proper dimensions, adapted to be loosely mounted on the outer end of the wheel-shaft 19, of proper size and strength, and has proper integral spiders 23 and 24, of well-known form, upon the inner and outer ends thereof, respectively, and is provided with a pair of diametrically-opposite longitudinal slots 21, Fig. 1, which admit of readily and securely clamping the said hub with a firm grip to the said shaft by means of the threaded bolt 22, which passes diametrically through both the said shaft and hub and is then secured by a proper nut. By this construction the wheel can be readily detached upon the removal of the bolt 22 and the hub can be conveniently adjusted to firmly grip the shaft by tightening the said bolt. By providing my improved hub with the said diametrical slots the said holding-bolt 22 can be made to spring the sides of the hub into a positive gripping contact, thereby enabling the hub to hold rigidly to the supporting-shaft by a frictional contact, thereby equalizing the strain upon the hub and relieving the said bolt of all lateral strain, affording far greater security, less strain upon the wheel, and causing the wheel to be better balanced and supported when in operation. It is obvious that the said hub can be made in two



or more parts, but with less convenience, without departing from the spirit of my invention.

The radial wheel-braces 25 and 26 are secured at their inner ends to their respective spiders 23 and 24 in any proper manner, and they have their outer ends fixed in the outer wheel-rim 46, Fig. 7, which is provided upon its outer edge and at measured intervals with the concave slots 52, Fig. 8, which have at their outer ends and upon their convex sides an upturned triangular flange 48.

The metallic floats or sails 45, of proper dimensions, are laterally concavo-convex and are arranged in an oblique position, with their concave sides facing outwardly. The said floats are provided upon their inner ends with an integral upturned flange 50, which is rigidly secured to the inner rim 47 by proper rivets 51, Fig. 7. The said floats are further secured by being mounted at a proper distance from their free ends in the said slots 52 of the outer rim and are rigidly fixed therein by means of the rivets 49, which also pass through the flanges 48. The said floats or sails are thus rigidly and securely fixed in position in the outer rim without the aid of any additional parts.

Another and modified form of the said slot 52 is seen in Fig. 9, in which, instead of the upturned flange 48, the said slot is slightly enlarged at its inner end, and the inner edge of the float 45 is made to fill out the said enlarged end by means of a punch or in other proper manner, thereby securing the float against displacement, though I prefer the form shown in Fig. 8.

The swinging tail-vane casting 3, of the usual form, is pivotally mounted on the said lugs 5 and 6, substantially in line with the wind-wheelshaft. The lower hinge-lug of the tail-vane is provided upon its upper and lower faces with the integral conical lugs 15 and 16, adapted to fit and form a bearing in corresponding recesses in the adjacent faces of the rod 10 and the lug 6, while the upper hinge-lug is secured by the screw-threaded pin 13, having a proper washer 14, Fig. 1. The removable governor-rod 4 is vertically arranged upon the said conical lug 15, has its upper end recessed to receive the pointed lower end of the screw-threaded pin 13, and is thereby firmly secured in position.

The wire spring 11, of proper strength and formed of one piece, has a central rearwardly-extended loop by which it is connected to the tail-vane, and is provided with a pair of coils by which it is loosely mounted upon the said rod 4, Fig. 1. The free inwardly-extended ends of the said wire spring 11 bear against the main casting 1, Fig. 4, in all positions of adjustment of the tail-vane, and thereby secure the tension of the said coils under all conditions of service.

At a suitable point on the tail-vane casting

is rigidly fixed the oblique plate 17, having near its outer end a longitudinal slot indicated only by dotted lines in Fig. 2.

The plate 29 has at or near its inner end a longitudinal slot 31, registering with the said slot in the plate 17, and in which the holding-bolt 30 is adjustably mounted, thereby securing the said plates in any desired position of longitudinal adjustment. The said plate 29 has upon its outer end a hook 12, in which the rearwardly-extended loop of the wire spring 11 is removably secured.

At or near the lower edge of the tail-vane casting 3 is slidably mounted on the bolts 32 an adjustable buffer 8, having a pair of longitudinal slots 33, and a semicylindrical head 7, in the outer end of which is arranged a threaded screw 9, which strikes against the buffer-lug 28 on the said main casting. The said plate 8 and the said screw 9 are both longitudinally adjustable to limit the swing of the tail-vane under the tension of the said spring-governor. The wheel-casting 2 is provided with a lateral lug 54, adjacent the inner face of the crank-wheel, Fig. 5, having at its outer end the transverse slot 39, in which my improved brake is pivotally mounted. The brake-lever 35, preferably of spring metal, has upon its inner face and near its inner end a perforated lug 55, loosely secured in the said slot 39 by means of the pin or pivot 36. The said inner end of the lever 35 is also provided with a threaded adjusting-screw 37 to limit the outward movement of the said lever by coming in contact with the inner face of the said slot 39. The brake-shoe 34 is rigidly fixed on the inner face of the said lever 35 at a point directly adjacent to the perimeter of the crank-wheel 18 by means of a proper screw 40. The said shoe 34 has an inner concave face provided upon its outer edge with an upright flange to bear upon both the perimeter and the outer face of said crank-wheel to better lock the same.

The tail-vane casting 3 is provided with a flange 43, arranged in the same horizontal plane as that of the lever 35, and upon this flange is adjustably mounted the block 41, Figs. 4 and 6, having its base 44 longitudinally grooved to slide upon the flange 43 and provided with a longitudinal slot in which the securing-bolt is arranged. The said block 41 is provided upon the lower edge of its convex face with a lateral flange, the upper face of which forms a bearing for the free end of the brake-lever 35 and also serves to guide it into a proper engagement with the convex face of the said block 41 when the tail-vane is arranged in a position parallel with the wind-wheel, thereby securely holding the same in a position of rest by the engagement of the said shoe 34 with the said crank-wheel. It will be seen that the arrangement of the free end of the pivoted lever 35 with the block 41 will cause the said upright flange on the shoe



34 to impinge upon the adjacent face of the crank-wheel and thus aid in stopping and securing the same.

It is obvious that while I employ but two  
5 coils in the spring 11 a series of coils may be so employed without departing from the spirit of my invention.

Having thus described my invention and the manner of employing the same, what I desire to secure by Letters Patent is—  
10

1. In a wind wheel a removable metallic hub provided with diametrically opposite slots, as shown, and having a diametric adjusting bolt passing through both the hub and the rotat-  
15 able shaft, adapted to spring the opposite sides of the said hub into frictional contact with the said shaft, whereby the said bolt is relieved of lateral strain and the hub is rigidly secured in position by the said frictional  
20 contact, all substantially as described.

2. In a windmill a spring governor to hold the wind-wheel normally in the wind, consisting of a vertically disposed and removable rod 4 pivotally mounted in the tail-vane casting, as shown, a coil spring 11 having its coils  
25 arranged as shown, and loosely mounted on said rod, the free ends of said spring having a bearing against the main casting and the looped extended end thereof being provided  
30 with means for adjusting the tension of said spring, substantially as described.

3. A detachable governor for windmills adapted to normally keep the wind engine in

gear, comprising an upright rod 4 pivotally mounted on the conical lug 15 and loosely  
35 secured at its upper end by a removable pin, as shown, a spring having two or more coils loosely mounted upon said rod, and having its free ends loosely secured by the main casting, as shown, and provided with a rearwardly ex-  
40 tended loop having suitable means for adjusting the tension of said spring, substantially as described.

4. In a windmill a friction-brake to lock the wind wheel when out of the wind, comprising  
45 a brake-lever 35 of spring-metal pivotally mounted in a slotted lug as shown, on the main-casting, having a shoe 34 fixed thereon to engage the perimeter of the crank-wheel, and provided at its inner end with an adjust-  
50 ing screw 37 for the purpose described, and the flanged and slotted holding block 41 adjustably mounted upon the tail-vane casting and adapted to automatically press the said  
55 shoe into engagement with the said crank-wheel by engaging and securing the free end of the said brake-lever, all substantially as described.

Signed by me at Goshen, Elkhart county, State of Indiana, this 8th day of April, A. D. 60  
1895.

ELI J. SCHROCK.

Witnesses:

L. BURR WHIPPY,  
JOHN W. PARK.