

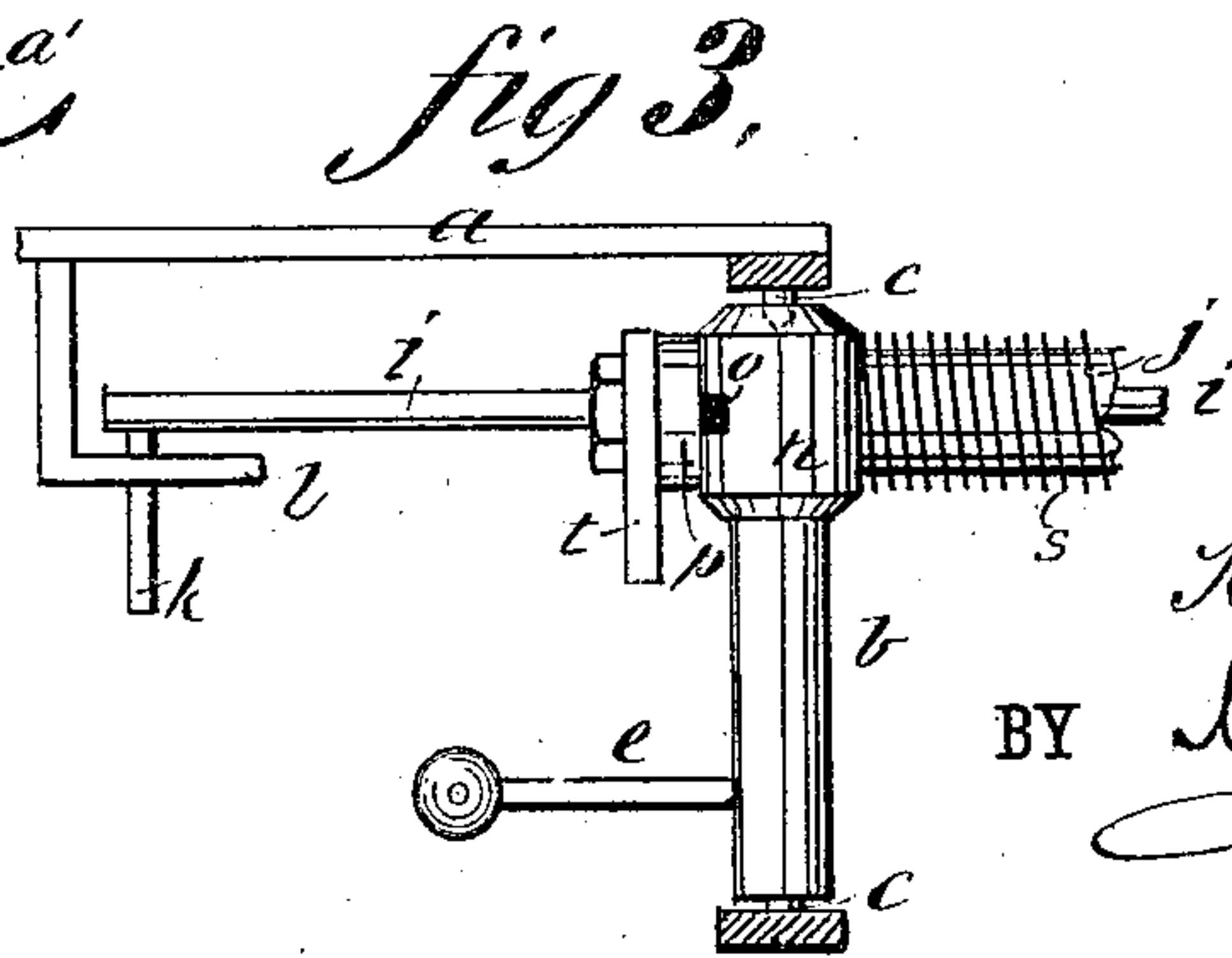
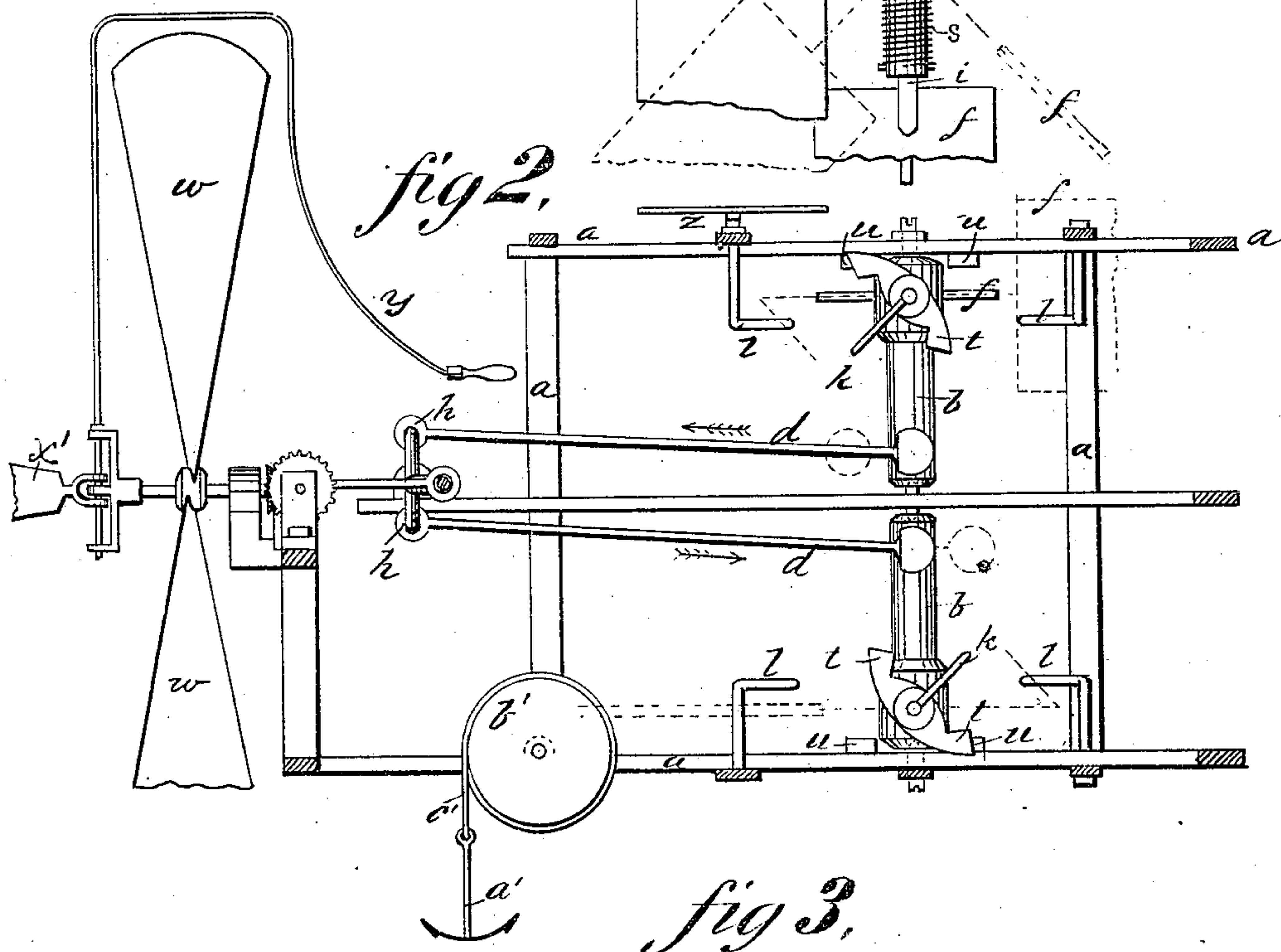
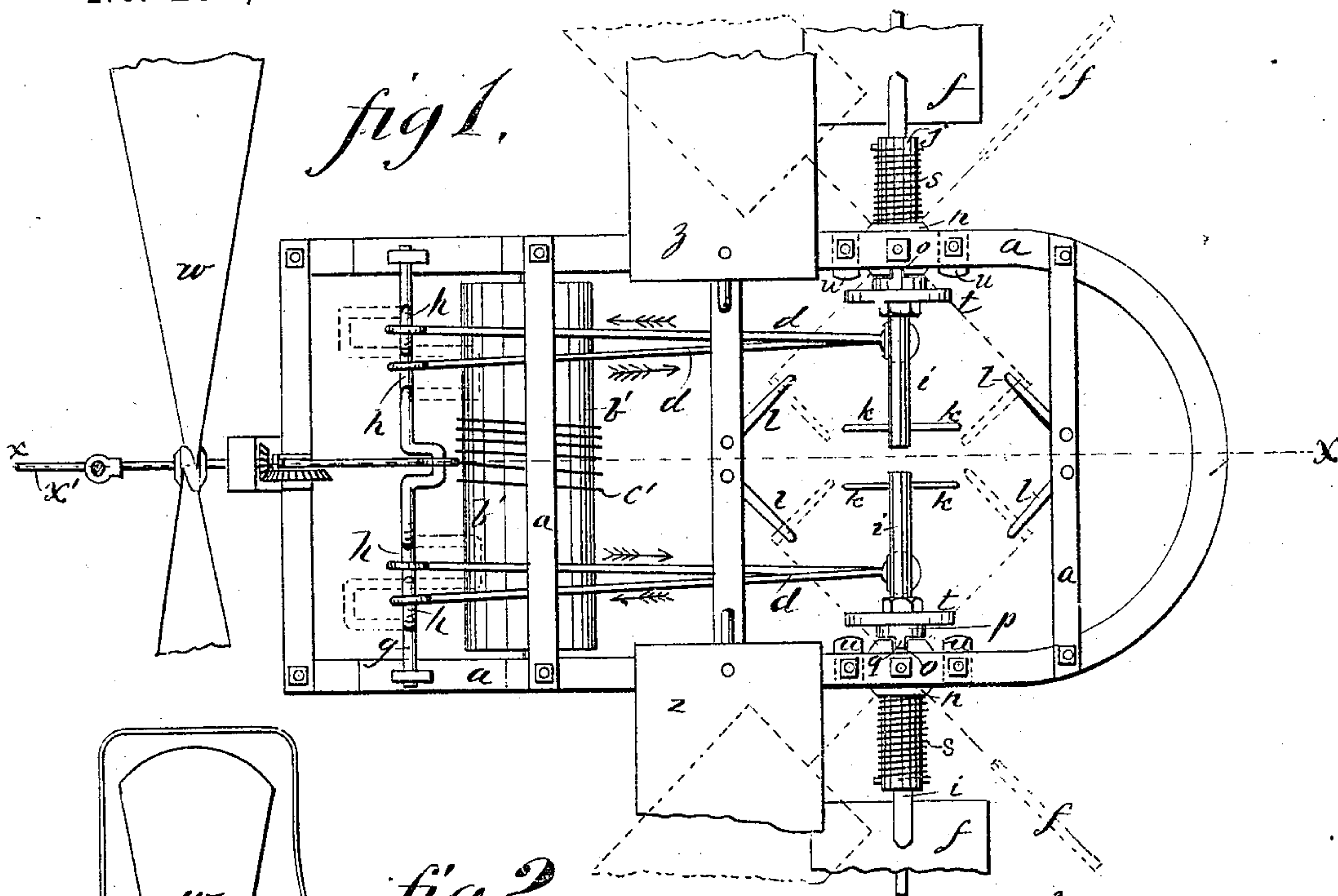
(No Model.)

2 Sheets—Sheet 1.

K. D. DAVIS.
BALLOON PROPELLER.

No. 291,990.

Patented Jan. 15, 1884.



WITNESSES:

Chas. C. Howell,
C. Sedgwick.

INVENTOR:

K. D. Davis

BY

Munn & Co

ATTORNEYS.

(No Model.)

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fig 4.

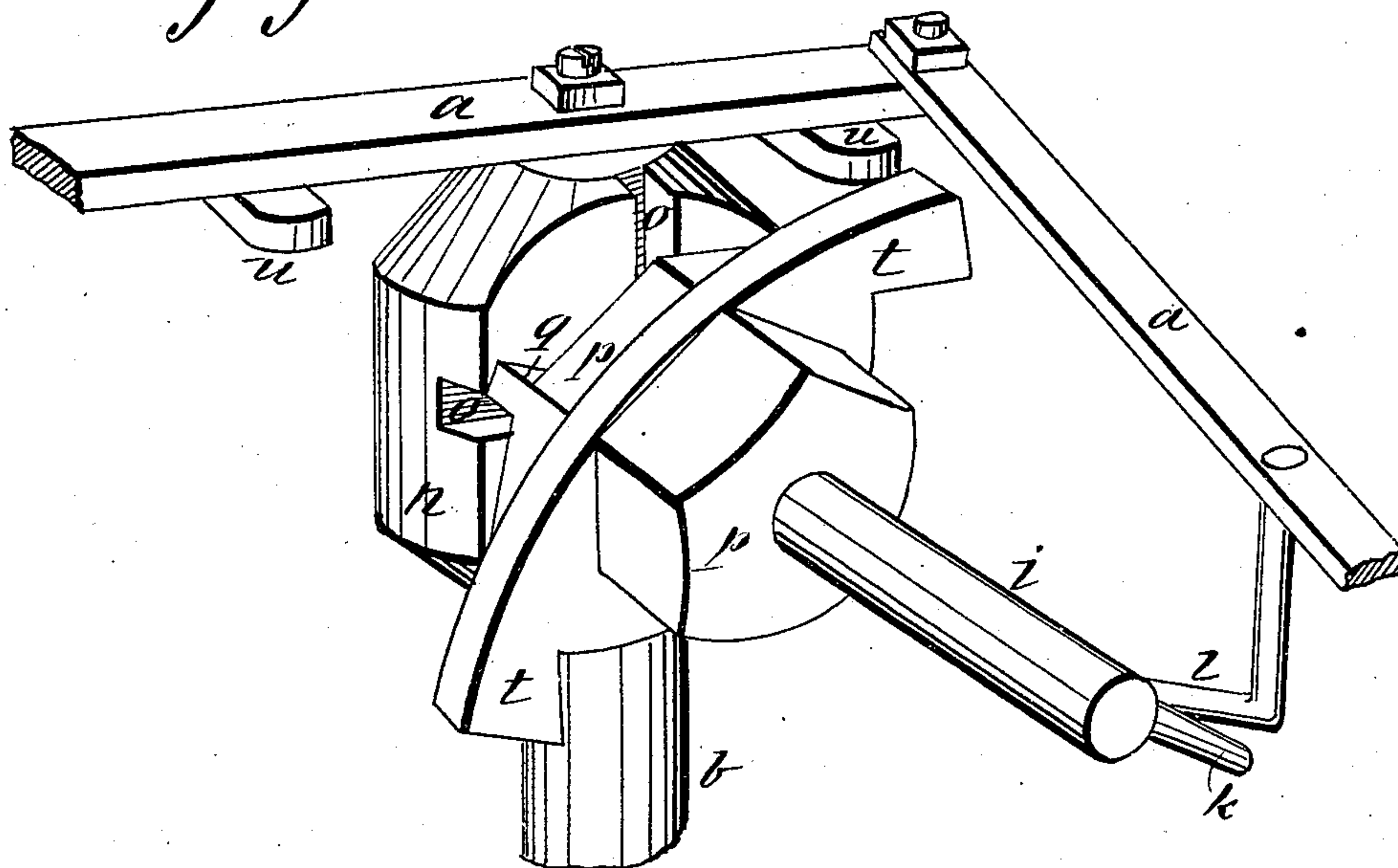
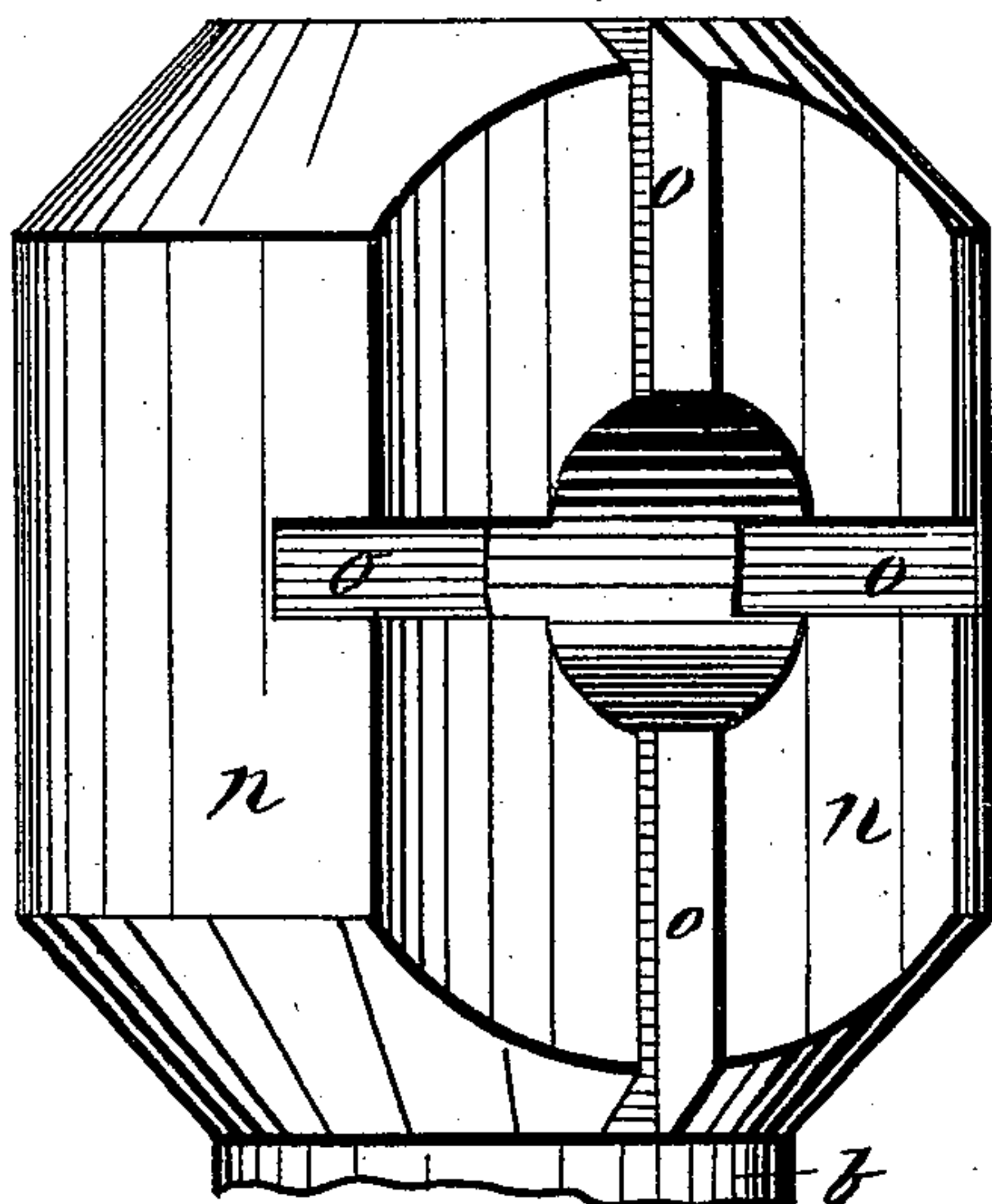


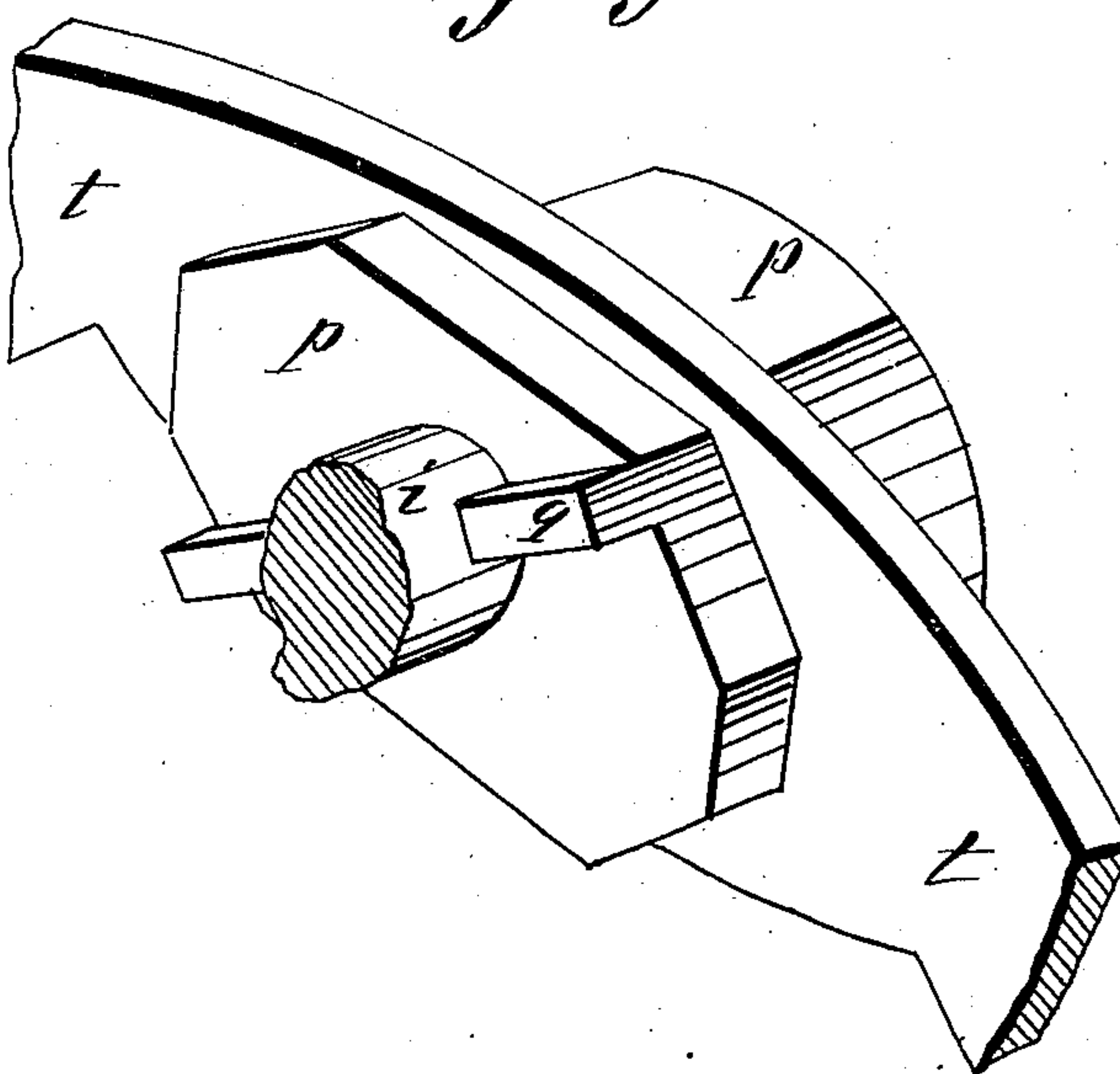
fig 5.



WITNESSES:

Chas. T. Howell,
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fig 6.



INVENTOR:

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UNITED STATES PATENT OFFICE.

KANSAS D. DAVIS, OF COLE CITY, GEORGIA.

BALLOON-PROPELLER.

SPECIFICATION forming part of Letters Patent No. 291,992, dated January 15, 1884.

Application filed January 5, 1883. (No model.)

To all whom it may concern:

Be it known that I, KANSAS D. DAVIS, of Cole City, in the county of Dade and State of Georgia, have invented a new and Improved Balloon-Propeller, of which the following is a full, clear, and exact description.

The object of the invention is to form, for gas-balloons or devices which depend upon a gas-field for their elevation, a propeller adapted to be attached to the car thereof or its frame in any suitable manner.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of my wing-motive apparatus for balloons. Fig. 2 is a sectional elevation of the said apparatus, taken on the line *x x* of Fig. 1. Fig. 3 is a detail inside elevation. Figs. 4, 5, and 6 are details of the reversing apparatus of the wings in perspective views.

In any suitable light and strong frame, *a*, of the requisite length, breadth, and height, I arrange, say, two vertical wing-posts, *b*, on opposite sides of the frame and in the same vertical axis—that is to say, one above another—pivoting said posts in suitable bearings, *c*, to enable them to be vibrated by power applied to them by connecting-rods *d* and arms *e*, to swing the wings *f* forward and backward for propelling the machine, said wings being mounted on said wing-posts for being so operated. The power may be applied to the connecting-rods *d* in any approved way—say by a double-crank shaft, *g*, having double and reversed cranks *h*, for working the wings of the respective sides of the machine reversely to each other—that is, for swinging one forward and the other backward at the same time; but while this contrivance is preferred, because it affords a simple means of connection for a greater number of wings by increasing the number of cranks, in case it is desired to increase the number of wings vertically by having more in each series, and in case of employing two or more series in a row along each side of the machine, the several series may all be connected to one crank-shaft. I do not limit myself to such contrivance, but will avail

myself of any of the known and approved methods. The wings *f* are mounted on the said wing-posts *b*, so as to project horizontally therefrom beyond the sides of the frame, for properly working in the air, by means of arms *i*, the arms being extended through the posts *b*, and the hollow sleeves *j* attached to them and projecting outwardly from the posts for the better support of the wing-arms. Inside of the post the arms *i* extend nearly to the center of the machine, and have a strong finger, *k*, projecting at right angles from them to turn the wings sidewise and edgewise to the wind, as required at the respective ends of their strokes, by contact with the projecting studs *l*, suitably located and projecting from the frame.

In order that the wings may be locked in their respective positions during their forward and backward strokes, the wing-posts have a hub, *n*, surrounding the bore, through which the wing-arms project inwardly, which has four radial grooves, *o*, corresponding with the two positions in which the wings are to set, and the wing-arms have a hub, *p*, which has two radial ribs, *q*, which are to be sprung into said notches by springs *s*, when the wings come to their respective positions; and to lift the said ribs out of the notches, for allowing the wings to turn, the said hubs *p* are provided with short arms *t*, which strike against the studs *u*, attached to and suitably located on the frame of the machine, just before the reversing-fingers *k* touch the studs *l* and cause the arms *i* to shift lengthwise enough to disconnect the ribs from the grooves. When the reverse movement begins, the ribs *q* drop into the grooves as soon as the arms *t* escape from the studs *u*, and hold the arms fast until the end of the movement of the arms in the other direction is reached, or nearly so, when said ribs are again disconnected and the arms are again reversed, and so on. Thus I may work the wings rapidly and with great power in manner required for having the greatest propelling effect with the least resistance on the back stroke. The wings thus contrived may be used alone or in connection with an auxiliary screw-propeller, *w*, that may be geared with the crank-shaft *g* or not, for the purpose of connecting with the driving-engine.

Behind the said screw-propeller a rudder, *x'*, will be located, for steering the machine, said rudder to be worked by a lever, *y*, or other approved means, and on the top of the frame 5 or on any suitable part of the machine two or more horizontal sailing-wings, *z*, will be applied for use in assisting the machine to ascend or descend by inclining them accordingly, as such wings are used in other machines, said 10 wings to be arranged to extend laterally from the machine, and to be provided with the requisite attachments for so operating them.

For arresting the flight of the machine, and to facilitate the lowering of it to the ground 15 when arrested, I propose to have the anchor *a'* employed to arrest it suspended from a drum, *b'*, by the cord *c'*, and will provide the said drum with a crank or other means, or connect it with the driving-power for turning it to 20 wind up the rope and pull the balloon, in which the motive power is used, down to the ground.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

25 1. In a balloon-propeller, the combination, with the frame, posts *b*, and wings *f*, of the arms *i*, extending through the posts, and provided with supporting-sleeves *j*, projecting outwardly from the posts, as shown and described.

30 2. In a balloon-propeller, the reversing-wings

f and sailing-wings *z*, combined with means for operating them, for the purpose specified.

3. The combination of the driving-shaft *g*, having the reverse-cranks *h* and connecting-rods *d*, with the two wings *f* and wing-posts *b*, 35 located on the respective sides of the machine, as described.

4. The wings *f*, arranged to turn in the wing-posts, by which they are vibrated, and having a turning-finger, *k*, in combination with the 40 reversing-studs *l*, substantially as described.

5. The wings *f*, arranged to turn in the wing-posts, by which they are vibrated, and provided with the locking-grooves *o*, ribs *q*, and springs *s*, substantially as described. 45

6. The combination of the unlocking-arms *t* and studs *u* with the wings *f*, arranged to turn in the posts by which they are vibrated, and having the locking-grooves *o*, ribs *q*, and 50 springs *s*, substantially as described.

7. The combination, in a balloon-motor, of the vibrating wings *f*, posts *b*, turning-fingers *k*, reversing studs *l*, locking-ribs *q*, and grooves *o*, and the unlocking-arms *t*, and studs *u*, substantially as described.

KANSAS D. DAVIS.

Witnesses:

I. R. FAISON,
G. C. REESE.