

(No Model.)

G. R. FERRARIO.  
AUTOMATIC FLIER.

No. 459,747.

Patented Sept. 22, 1891.

FIG. 1.

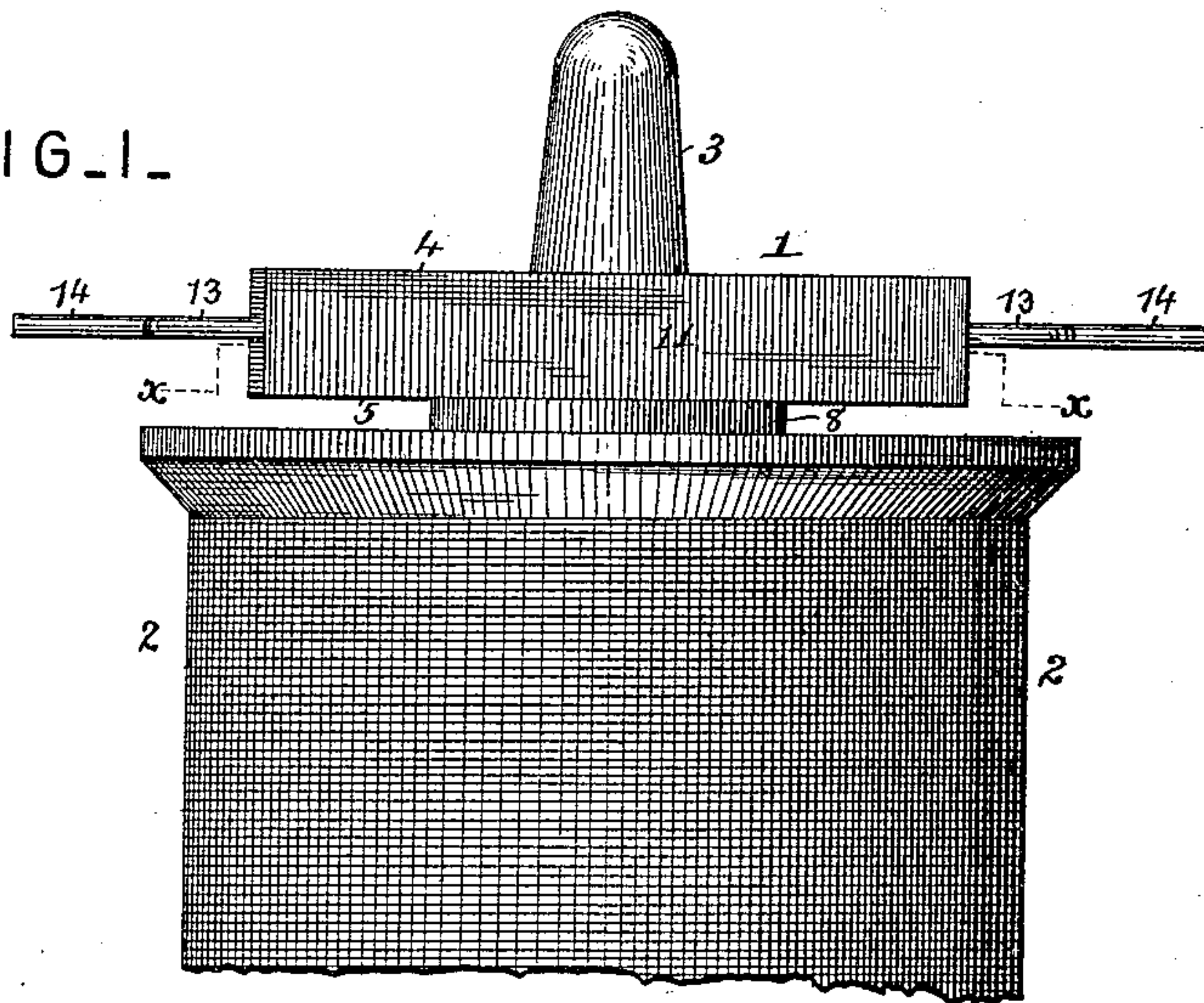


FIG. 2.

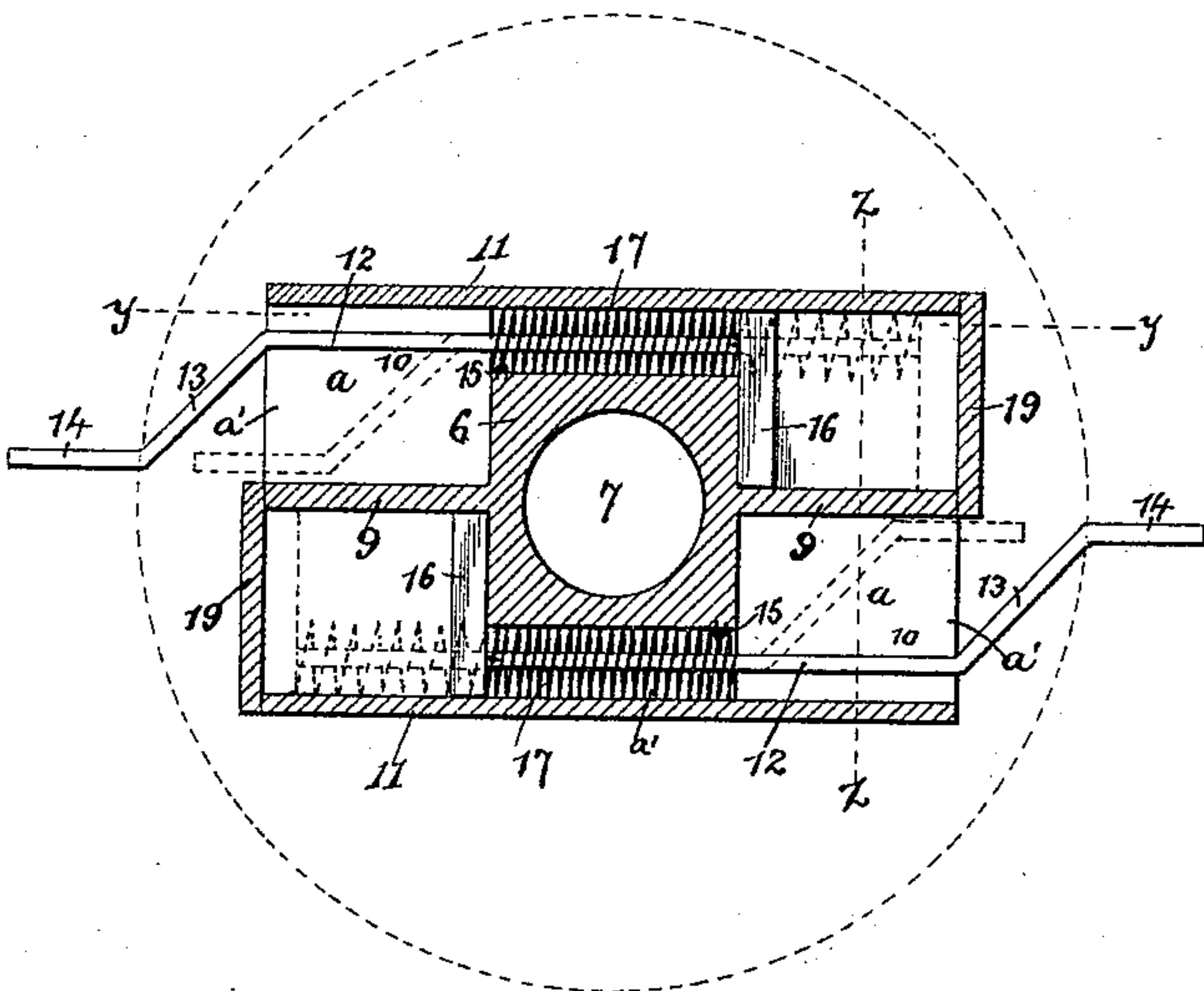


FIG. 4.

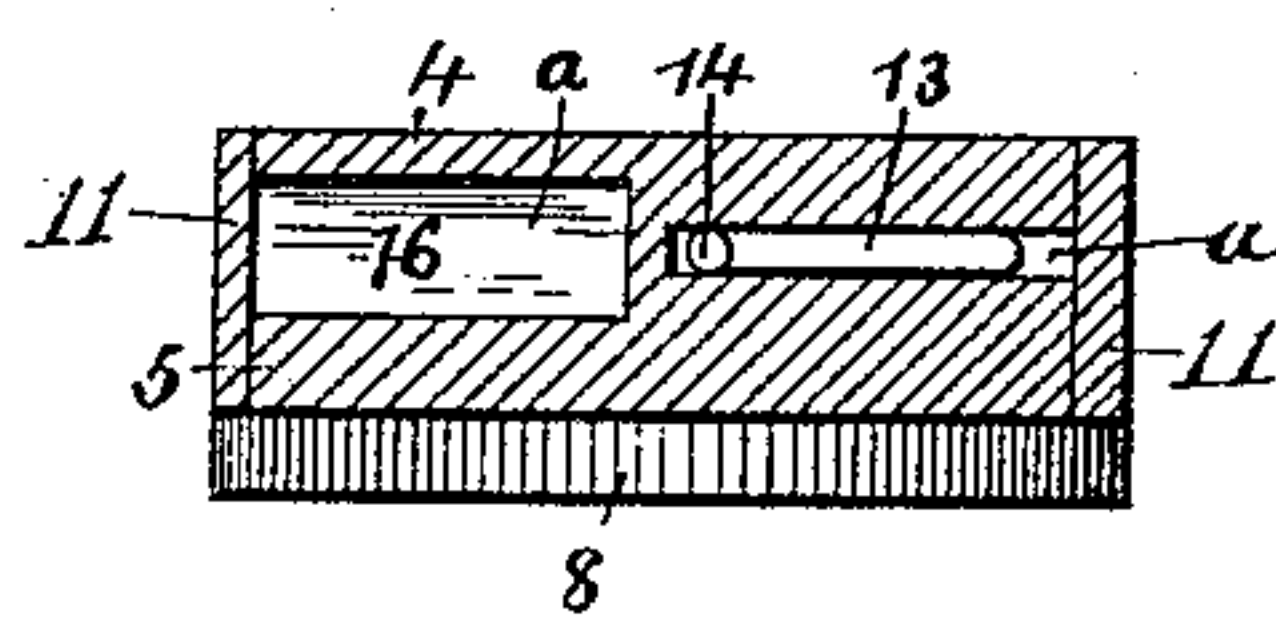
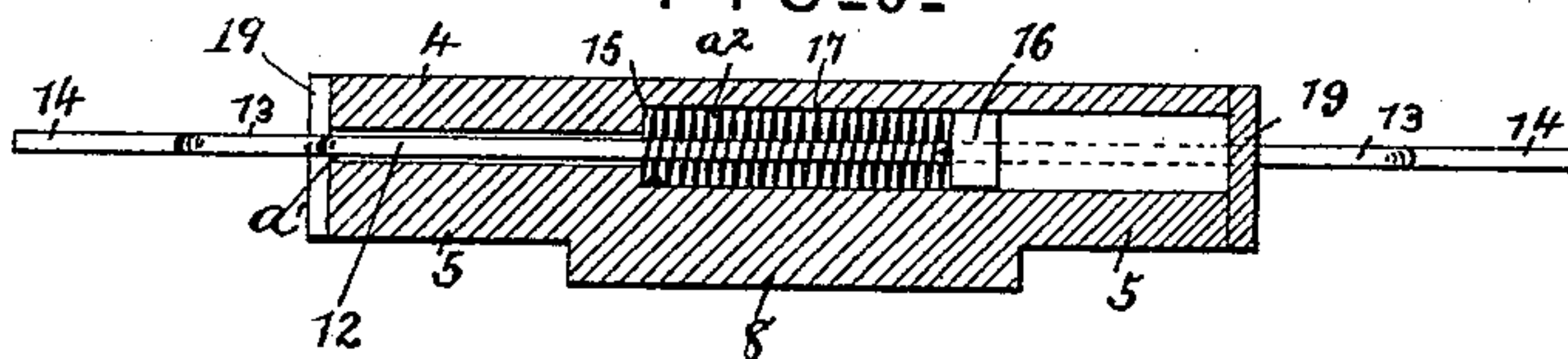


FIG. 3.



Witnesses

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# UNITED STATES PATENT OFFICE.

GIUSEPPE R. FERRARIO, OF ALTOONA, PENNSYLVANIA:

## AUTOMATIC FLIER.

SPECIFICATION forming part of Letters Patent No. 459,747, dated September 22, 1891.

Application filed December 24, 1890. Serial No. 375,724. (No model.)

*To all whom it may concern:*

Be it known that I, GIUSEPPE R. FERRARIO, a citizen of the United States, residing at Altoona, in the county of Blair and State of Pennsylvania, have invented a new and useful Automatic Flier, of which the following is a specification.

My invention relates to fliers for spinning-machines and is intended more especially for use upon machines which are run at a very high rate of speed. It has been customary when spinning fine threads at a high rate of speed to dispense with the use of a flier, as the lightest fliers in use have been found to frequently break the thread when a high rate of speed is attained. Although the operation of spinning may be perfectly performed without the use of the flier so long as the machine is kept running at a high and steady speed, the thread being spun and wound as rapidly as it can leave the bobbin, this manner of performing the operation is, however, attended with the disadvantage that when the speed of the machine becomes slower from any cause—as, for instance, when stopping—the thread runs from the bobbin faster than it is spun and wound, thus twisting into loops and forming kinks, which injure the quality of the finished thread.

The object of the present invention is to produce an automatic flier which will allow the thread to pass freely from the bobbin when the latter is turning at or above a predetermined rate of speed, but when the speed falls below the given rate the arms of the flier will come in contact with the thread and place sufficient tension thereon to prevent the formation of loops and kinks.

With this object in view, and such others as fairly fall within the scope of the invention, my invention consists of the mechanism illustrated in the accompanying drawings; the peculiar construction, combination, and arrangement of which will be hereinafter fully described, and the specific points of novelty particularly pointed out in the claims.

In the drawings, Figure 1 is a side elevation of my improved flier mounted upon the end of a bobbin of the ordinary construction. Fig. 2 is a horizontal sectional view on the line  $x x$  of Fig. 1, showing the circumference of the bobbin in dotted lines. Fig. 3 is a longitudinal sectional view taken on the line  $y$

$y$  of Fig. 2. Fig. 4 is a transverse sectional view taken on the line  $z z$  of Fig. 2.

Similar numerals of reference denote corresponding parts in the several views.

In Fig. 1 is shown my improved flier 1, mounted upon a bobbin 2, supported upon a spindle 3, the said bobbin and spindle being of the ordinary construction, and my improved flier fits loosely over the end of the spindle and rests upon the top of the bobbin in the usual well-known manner.

My invention consists of a rectangular body 1, composed of the upper and lower side pieces 4 5, connected together by the square central portion 6, having the perforation 7, through which passes the spindle 3. The lower side 5 may be somewhat thicker than the upper side 4 and may have a boss 8 round the perforation 7 to rest against the end of the bobbin 2.

Between the two sides 4 and 5 around the central portion 6 is left a space which is divided by a longitudinal partition 9 into two longitudinal spaces  $a a$ , in each of which is arranged one of the arms 10 10. The edges of the space between the two sides 4 5 are closed by the edge pieces 11 11. The arms 10 10 are of wire of a suitable size, and have straight portions 12 12, which are arranged within the spaces  $a a$  parallel with and near to the edge pieces 11 11. The outer ends of the said arms 10 10 are bent toward the longitudinal center of the body 1 at an angle of about forty-five degrees, as at 13 13, and finally bent again to bring their extremities 14 14 parallel with the longitudinal center of the body 1, the effect of which is to cause the extremities 14 14 to project beyond the circumference of the bobbin at diametrically-opposite points parallel with the diameter thereof, as shown in Fig. 2. The straight portions 12 12 of the arms 10 10 extend through the narrow parts  $a' a'$  of the spaces  $a a$  between the square central portion 6 and the edge pieces 11 11 to a point beyond the said square central portion and have secured to their inner ends rectangular weights 16 16. Coiled springs 17 17 are arranged upon the straight portion 12 of the arms 10 10 within the narrow spaces  $a' a'$ , one end of each of which springs is secured to the inner ends of the arms 10 10 adjacent to the weights 16 16, or, if found preferable, they may be attached to the



weights, as will be obvious. The opposite ends of the springs are attached to the sides of the square central portion 6 of the body 1 adjacent to the respective arms 10 10 at the corners 15 15 farther from the weights 16 16, as will be seen by reference to Fig. 2. The purpose of the springs 17 17 is to keep the extremities 14 14 of the arms 10 10 normally extended beyond the circumference of the bobbin 2, as shown in Fig. 2. The space *a* between the sides 4 and 5 is large enough to allow of the bent ends of the arms 10 10 being drawn within the said space to bring their extremities 14 14 within the circumference of the bobbin 1, as shown in dotted lines in Fig. 2, and is somewhat enlarged, as at *a*<sup>2</sup> in Fig. 3, to provide room for the springs 17 and the weights 16. The ends of the spaces *a a*, in which the weights are situated, are closed by end pieces 19 19.

In the manufacture of my improved flier the sides 4 5, the central portion 6, the longitudinal partition 9, and the end pieces 19 19 may be all formed integral, if found convenient to do so; but I do not wish to limit myself to the exact form or number of parts herein described, as my invention will be constructed in the manner which is found to be best in practice, and slight modifications in the form and number of parts may be made without departing from the spirit of my invention.

The operation of my invention is as follows: The flier 1 is placed upon the end of the spindle 3, upon which it fits loosely, with the boss 8 thereof resting upon the end of the bobbin 2, so as to be turned by friction therewith. When the spindle has attained a high rate of speed, the centrifugal force will cause the weights 16 16 to overcome the tension of the springs 17 17 and move toward the end pieces 19 19, thus drawing the arms 10 10 inwardly to bring their extremities 14 14 within the circumference of the bobbin 2, as shown in dotted lines in Fig. 2. When in this position, it will be understood that the thread will be free to pass from the bobbin without touching the arms 10 10. As long as the high rate of speed continues the arms 10 10 will remain within the body 1, and the thread can pass freely from the bobbin; but when the speed is reduced from any cause and falls below a predetermined rate the springs 17 17 will overcome the centrifugal force and force the arms outwardly, so that their ends 14 14 will project beyond the circumference of the bobbin and engage the thread, thereby preventing it from running too freely from the bobbin and forming loops and kinks. By varying the strength of the springs and the size of the weights the arms of the flier may be arranged to operate at any desired speed, as will be obvious.

In order to obtain the best results in the use of my invention it is better when stopping the machine to allow it to slow down for a few seconds before coming to a stop, as by

so doing the arms will be allowed more time to engage the thread than if the power was thrown off instantly.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A flier for spinning-machines, consisting of a body having recesses, the weighted arms arranged in said recesses, and means for projecting the said arms beyond the said body, substantially as described.

2. A flier for spinning-machines, consisting of a rectangular body having recesses, the weighted arms arranged in said recesses, and means for projecting the said arms beyond said body, the weights retracting them within the said body when the latter is rotated, substantially as described.

3. A flier for spinning-machines, consisting of a rectangular body having longitudinal recesses, the arms arranged in said recesses, and means for projecting the said arms beyond the said body, and weights for retracting them within the said body when the latter is rotated, substantially as described.

4. A flier for spinning-machines, consisting of a body having recesses, the arms arranged within recesses and having weights secured to their inner ends to retract said arms within said body when the flier is rotated rapidly, substantially as described.

5. A flier for spinning-machines, consisting of a body having recesses, the arms arranged within the recesses and having springs secured thereto to project said arms beyond the said body, substantially as described.

6. A flier for spinning-machines, consisting of a body having recesses, the arms arranged within the recesses and having weights to retract the arms within the said body when the flier is rotated rapidly, and springs to project the said arms beyond the said body, substantially as described.

7. A flier for spinning-machines, consisting of a body having recesses, the weighted arms arranged in said recesses, and means for projecting the said arms beyond the said body, in combination with a bobbin and spindle upon which the said body is free to turn, substantially as described, for the purpose set forth.

8. The combination, with a spindle carrying a bobbin, of a flier consisting of a body having recesses, the arms arranged within said recesses, means for projecting the said arms beyond and weights for retracting them within the body 1 when the latter is rotated rapidly, and a boss 8 upon the said body 1 to rest upon the end of the said bobbin, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

GIUSEPPE R. FERRARIO.

Witnesses:

ARNOLD EGOLF,  
JAMES O'TOOLE.