

L. T. HOUGHTON.  
SHEET METAL FLIER FRAME.

APPLICATION FILED MAR. 28, 1903. RENEWED SEPT. 28, 1911.

1,008,598.

Patented Nov. 14, 1911.

2 SHEETS—SHEET 1.

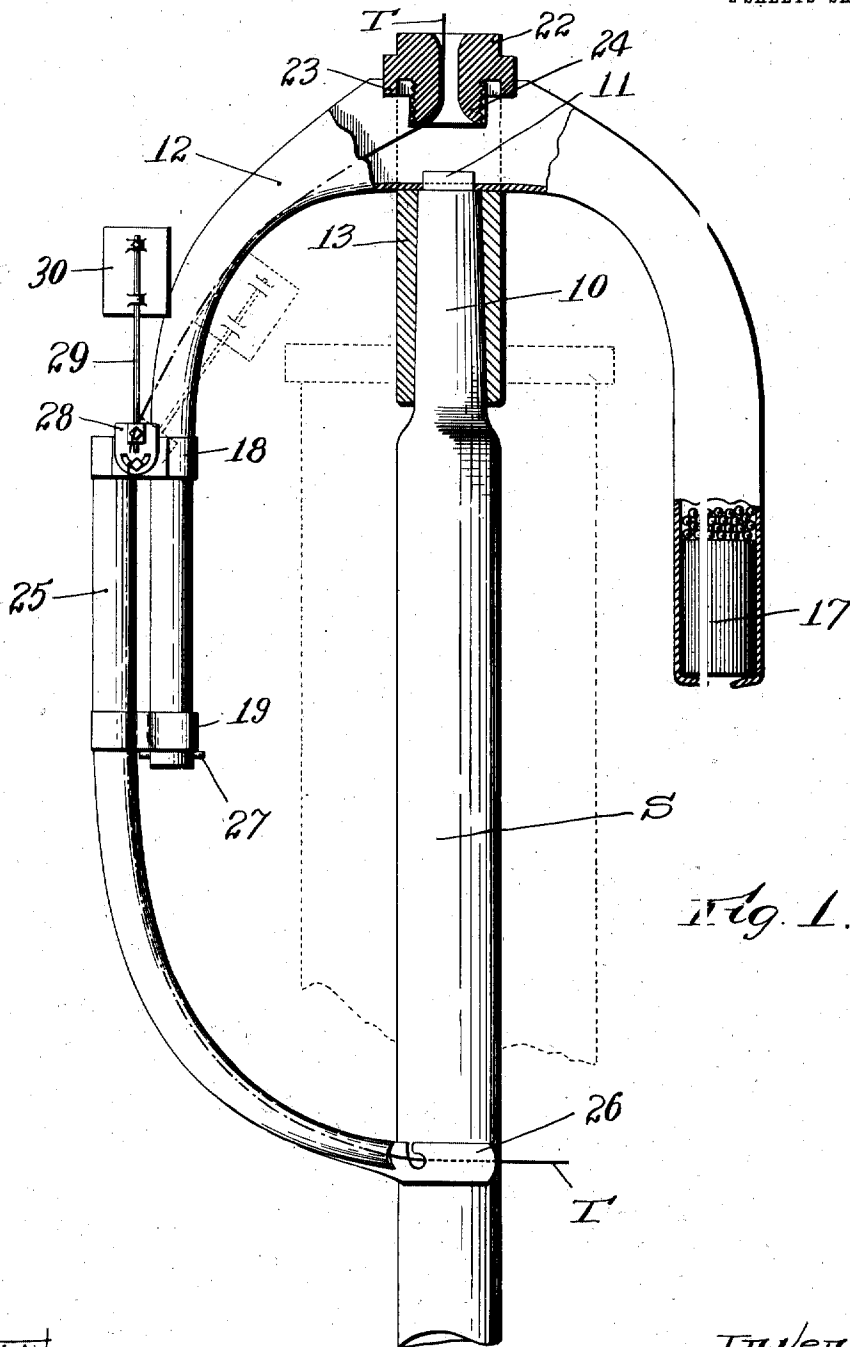


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 2.

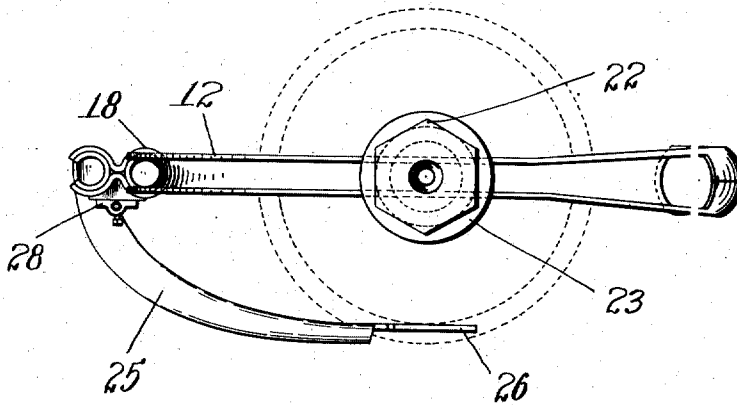


Fig. 4.

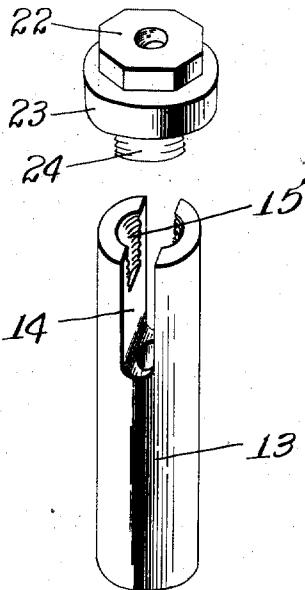


Fig. 6.

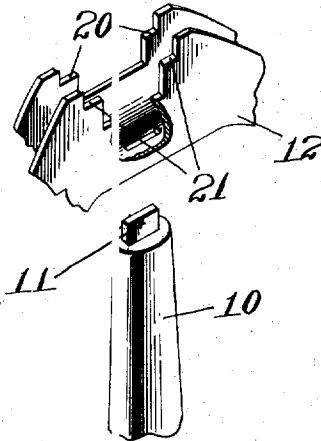


Fig. 3.



Fig. 7.

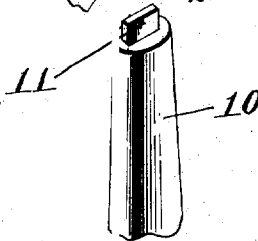


Fig. 5.

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# UNITED STATES PATENT OFFICE.

LEWIS T. HOUGHTON, OF WORCESTER, MASSACHUSETTS.

## SHEET-METAL FLIER-FRAME.

1,008,598.

Specification of Letters Patent.

Patented Nov. 14, 1911.

Application filed March 28, 1903, Serial No. 149,977. Renewed September 28, 1911. Serial No. 651,838.

*To all whom it may concern:*

Be it known that I, LEWIS T. HOUGHTON, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Sheet-Metal Flier-Frame, of which the following is a specification.

This invention relates to that class of fliers which are employed in roving-frames or for similar purposes.

The especial objects of this invention are to provide a strong, simple and efficient flier frame which may be stamped out of sheet metals; to provide improved means for counterbalancing the frame to insure the even running thereof; to provide a strong, simple and efficient joint for connecting the flier frame to its center piece; and to provide means for adjustably controlling the tension of the presser-foot.

Reference is to be had to the accompanying drawings which show one form in which this invention can be embodied, and in which—

Figure 1 is a side view partially in section of a spindle having a flier-frame constructed according to this invention applied thereto. Fig. 2 is a plan view of the same. Fig. 3 is a perspective view showing the clamps which journal the tube of the presser-foot upon one arm of the flier-frame. Fig. 4 is a perspective view of the top nut of a flier-frame. Fig. 5 is a perspective view of the center piece or bushing thereof. Fig. 6 is a fragmentary perspective view of a portion of the sheet metal body, and Fig. 7 is a perspective view of the end of the spindle.

The flier frames which have heretofore been employed for making roving or for similar purposes have formerly been forged into shape by hand. That is to say, the usual practice in constructing a flier-frame has heretofore called for skilled hand labor to forge the thread receiving tubular arms of the flier-frames, while in order to secure the perfect balance of such frames it has heretofore been customary to grind the opposite sides of said frames so that a perfect balancing of the frames can only be secured after repeated tests.

One especial object of the present invention is to provide a flier-frame having a body portion which may be worked into shape from a sheet metal blank by means of dies and tools which will dispense with hand labor.

To counterbalance a flier-frame constructed according to this invention one or more counterbalancing weights are employed which are located inside of one of the tubular legs of the frame. Combined with the body portion of each flier-frame is a center piece or bushing, the center piece and body portion being connected by a special joint which will reinforce and strengthen the body portion and hold the parts rigidly together. A presser-foot is carried by a tube also preferably stamped from sheet metal, and the operation of the presser-foot may be controlled by a special regulating attachment.

Referring to the accompanying drawings for a detail description of a flier frame constructed according to this invention, as shown in Fig. 1, S designates a spindle loosely mounted on which, as indicated by dotted lines, is a large receiving spool. At its upper end, the spindle S is provided with a tapered section 10 for engaging the central bushing of the flier-frame, and with a key or top projection 11 for locking the flier-frame to the spindle.

A flier-frame constructed according to this invention comprises a tubular center-piece or bushing 13, and a body portion 12. The center-piece or bushing 13, as shown in Fig. 5, is provided with a transverse slot 14, and is counterbored and threaded as at 15. The body portion 12 of a flier-frame constructed according to this invention is formed from a sheet metal blank which is shaped to form two tubular or partially tubular arms having a U-shaped cross section which are thereafter bent or curved to the form shown. The larger or counterbalancing arm may be crimped or partially closed at its lower end to hold a counterbalancing weight 17 in place, and in practice, the counterbalance 17 is usually slightly under weight, the full counterbalancing effect desired being obtained by dropping in small loose pieces, such for example, as shot, or similar fragments of metal.

As shown most clearly in Fig. 6, the body portion 12 of the flier-frame is cut out or milled transversely to form two sets of bearing ledges 20 and 21. In fastening a sheet metal body portion 12 to a center piece or bushing 13, the body portion is set down into the slot 14, and the parts are secured together by a top nut comprising a hexagonal top section 22, an overhanging section 23 which is preferably counterbored as

shown in Fig. 1, and a threaded section 24. When the top nut is screwed down in place, as illustrated in Fig. 1, the lower end of the nut engages the bearing shoulders 21, while the overhanging section 23 of the nut engages the shoulders 20.

In practice the top nuts are screwed down into place under considerable pressure, and the overhanging sections 23 are counterbored to insure bearings at the outside diameters of the nuts to secure the greatest leverage. Journaled on the other leg of the sheet metal tubular frame 12 by means of clamps 18 and 19, is a partially closed presser-foot tube 25. The clamps 18 and 19 may be secured on to the presser-foot tube by fastening pieces or screws, as shown in Fig. 3, and the parts may be held up by a bottom-pin 27 as shown in Fig. 1.

In the use of a flier-frame as thus constructed the thread T passes down through the top nut along the tubular arm of the sheet metal frame 12, down through the presser-foot tube 25, and through the eye of a presser-foot 26. The weight of the presser foot 26 and that part of its support which is inside the axis on which the presser-foot support swings or turns is less than the weight of that portion of the tube 25 on the other side of the axis, so that when the flier frame is revolving at high speed, centrifugal force will tend to carry the presser-foot into engagement with the roving or yarn being wound on the spool this being the ordinary practice in the use of flier-frames of this class. One objection to relying on centrifugal force alone to operate the presser-foot is due to the fact that the action of the presser-foot would vary according to the speed at which the device is to be operated. This invention overcomes this defect by providing a regulating attachment which can be set to different positions to vary the action of the presser-foot as desired. To accomplish this purpose, a small piece 28 is pivoted on the upper clamp 18 so that it may be swung or turned to different positions in which it may be fastened by small screws as shown. Extending up from the piece 28 is an arm 29 carrying a small wind-shield or blade 30.

When the wind-blade 30 is in the position illustrated by full lines, the air pressure acting thereon will increase the pressure of the presser-foot upon the spool, but by turning the wind-blade 30 to the position indicated by dotted lines, or so that the same is extended over to the other side of the flier-frame arm, the wind pressure will tend to move the presser-foot away from the spool. By this regulating device centrifugal action may be more or less opposed or assisted as required to produce the desired presser-foot action according to the speed at which the device is to be operated.

I am aware that numerous changes may be made in my flier-frame without departing from the scope of my invention as expressed in the claims. I do not wish, therefore, to be limited to the particular constructions I have herein shown and described but

What I do claim and desire to secure by Letters Patent of the United States is:—

1. As an article of manufacture, a flier frame comprising a body portion having an arm of substantially U-shaped cross-section, an arm constituting a counterbalance therefor, and a top nut held in position by the body portion and spaced from the lower side of the top of the U-shaped arm and having a perforation for receiving the thread.

2. As an article of manufacture, a flier frame comprising a body portion having an arm of substantially U-shaped cross section, an arm constituting a counterbalance, said body portion having shoulders between said arms, and a top nut held in place by said shoulders and spaced from the bottom of said body portion, and having a perforation for receiving the thread, whereby the thread may pass directly down through the top nut and along said U-shaped arm.

3. As an article of manufacture, a flier frame comprising a body portion having two arms extending in opposite directions, one constituting a counter-balance and the other having a passage therealong for the thread, said body portion having shoulders between said arms, and a top nut held in place by said shoulders and spaced from the body portion and having means for receiving and guiding the thread so that it may pass directly down through the top nut and along the arm having the passage.

4. As an article of manufacture, a flier frame comprising a body portion having two arms extending in opposite directions, one comprising a counterbalance and the other having a passage therealong for the thread, and a top nut held in position above the bottom of the bow part of said body portion, and having a perforation through which the thread is adapted to pass, said counterbalancing arm being tubular in form, and being closed at the end, a weight supported at the closed end of said tubular arm, and loose pieces above said weight for adjusting the same.

5. As an article of manufacture, a flier-frame comprising a sheet metal body portion formed of a blank bent to form a channel or U-shaped center part, with partly closed legs extending therefrom, and a center piece or bushing having a slot at its upper end for receiving the sheet metal body portion.

6. As an article of manufacture, a flier-frame comprising a sheet metal body portion having its central part U-shaped in cross section with curved partly closed tubu-

lar legs extending down therefrom, a center piece or bushing having a transverse slot in which the sheet metal body is fitted, and a top nut having an extension threaded into the bushing for clamping said parts together.

7. As an article of manufacture, a flier-frame comprising a sheet metal body portion having its central part U-shaped in cross section, with curved partially closed tubular arms extending down therefrom, a center piece or bushing having a slot at its upper end for receiving the sheet metal body portion, and a top nut having an extension threaded into the bushing, an overhanging bearing section, and a hexagonal section at its upper end, the bearing section and end of the top nut engaging shoulders milled out of the sheet metal body portion to clamp the parts together.

8. In a construction of the class described, the combination of a flier-frame, a presser-

foot having pivotal connection therewith, a wind-blade, and means for fastening the wind-blade in different positions to vary the action of the presser-foot. 25

9. In a construction of the class described, the combination of a flier-frame, a presser-foot having pivotal connection with one of the arms thereof, a wind-blade, and means for fastening the wind-blade in different adjusted positions, whereby the same may be set either outside or inside the pivot of the presser-foot to increase or diminish the pressing action of said presser-foot, substantially as described. 30 35

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

LEWIS T. HOUGHTON.

Witnesses:

LOUIS W. SOUTHGATE,  
PHILIP W. SOUTHGATE

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."