2 Sheets--Sheet 1.

A. LIGIBEL.

Casting Umbrella Tips, &c.

No. 166,282. Patented Aug. 3, 1875.

Fig. 1.

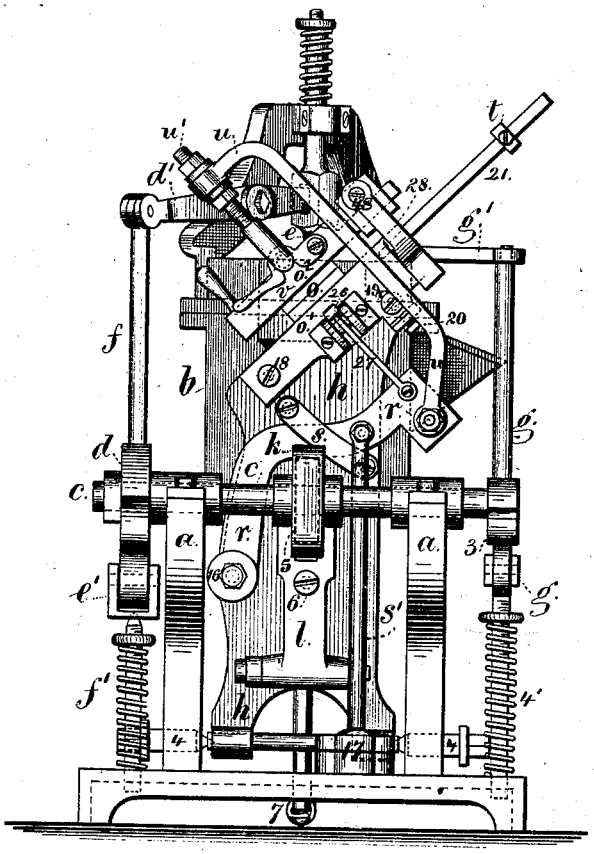
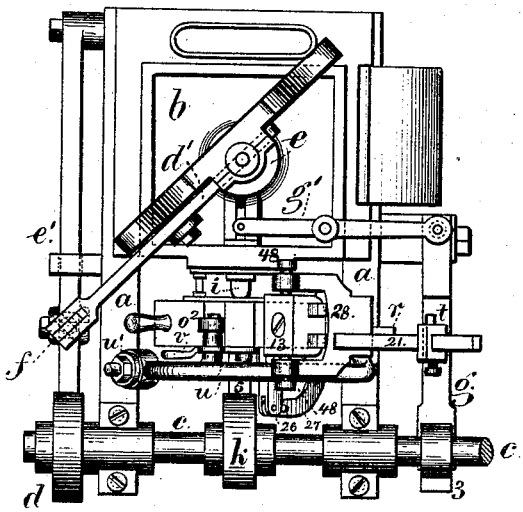


Fig. 2.



Witnesses
Chas. H. Smith
Harold Sewell

Inventor
Adolphus Ligibel
per Lemuel W. Serrell
Attiy.

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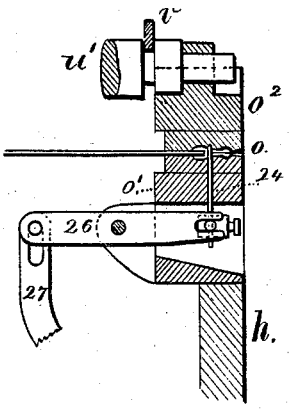
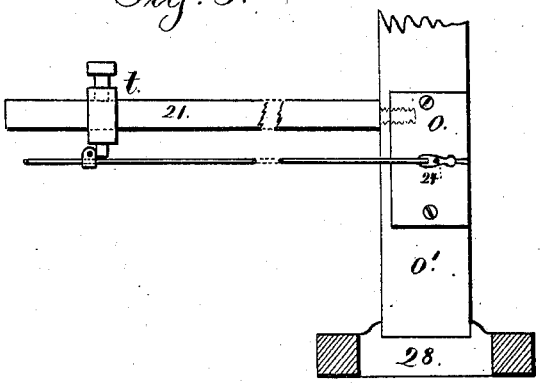


Fig. 4.

Fig. 3.



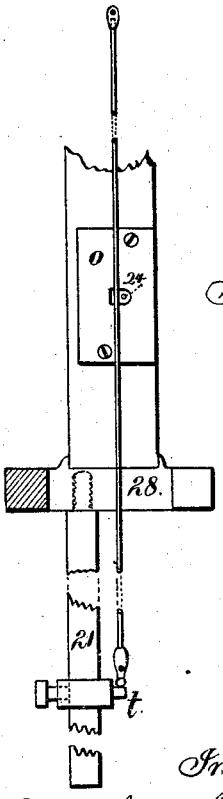


Fig. 5.

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UNITED STATES PATENT OFFICE.

ADOLPHUS LIGIBEL, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO WINTER & BALL, OF SAME PLACE.

IMPROVEMENT IN CASTING UMBRELLA-TIPS, &c.

Specification forming part of Letters Patent No. **166,282**, dated August 3, 1875; application filed April 19, 1875.

To all whom it may concern:

Be it known that I, ADOLPHUS LIGIBEL, of Jersey City, in the county of Hudson and State of New Jersey, have invented an Improvement in Casting Umbrella Tips, Heads, and Laps, of which the following is a specification:

Efforts have been made to cast the laps or connecting pieces upon the ribs of umbrellas; but they have not been successful, in consequence of the inaccuracy of workmanship.

In the manufacture of umbrella-frames it is necessary that the distance between the hole at the end for the crown-wire and the lap or joint for the stretcher be exactly the same in each rib, and that the holes be parallel with each other, otherwise the ribs will not lie close to and parallel with the stick or handle.

My machine is made for the purpose of rapidly casting the tips, heads, and laps upon umbrella-ribs, and at the same time insuring great accuracy in the manufacture.

I make use of a machine somewhat like a type-casting machine, and combine therewith a compound jaw or mold, of an internal shape corresponding with the external shape of the tip, head, or lap, and a movable mandrel, forming a core for the hole that is made in the lap, head, or tip, when cast.

I also employ a gage to determine the position of the lap, tip, and head in relation to each other.

In the drawing, Figure 1 is a front elevation of the machine. Fig. 2 is a plan. Fig. 3 is a plan view of the lower die, showing a rib in place for having a tip cast thereon; and Fig. 4 is a cross-section of the dies as closed, with the parts in place for casting the tip. Fig. 5 is a plan view of the lower die, with a rib in place for having a lap cast thereon.

The frame *a* carries the bath *b* of type or similar metal, that is to be kept in a melted state by gas-burners or otherwise; and *c* is the actuating-shaft, that is provided with the cam *d*, acting upon the lever *d'* to operate the pump *e* through the agency of the lever *e'*, link *f*, and spring *f'*, in a manner corresponding generally to that in a type-casting machine; and a bent lever, *g*, cam 3, spring 4', lever *g'*, and sliding pointed valve working within the nipple *i* serve to close the orifice of said nipple when the molds are drawn away. The mold-frame *h* is mounted upon center-screws 4 4, and is pressed back by the cam *k* on *c* acting against the roller 5 within the adjustable arm *l* upon *h*, that is provided with the set-screw 6, so that the frame *h* may be positioned to press the molds back properly against the nipple when the cam *k* has given the frame its extreme back movement. The spring 7 serves to move the frame toward the cam *k*. The two-part molds *o* are connected to the frame *h*. One is in the adjustable block o^1, that is hinged at 18, and positioned by the screw 20, and clamped by the screws 19. The other half of the mold *o* is fastened to the swinging head o^2, that is connected by the forked joint 48 to the block o^1, and positioned by the end of such head o^2 passing through the joint-block 28, and being clamped therein, when in place, by the screw 13. Upon the mold-frame *h* is a bent lever, *r*, pivoted at 16, and swinging behind the guide-bar *s* by the action of the link *s'*, that is attached at the lower end 17, at a distance from the pivots 4 of the frame *h*, and at the upper end to the said lever *r*, so that, as the mold-frame is swung back toward the nipple *i* upon the bath *b*, the bent lever *r* will be pulled down at its moving end, and, by the link *u*, will close the mold. This link is provided with the adjusting rod and nuts *w'*, the horizontal end of which rod passes into a hole in the head o^2, and is retained by the notched lever *v*.

This construction allows the link to be disconnected from the head, so that that can be swung back to open the mold for cleaning or otherwise.

The molds themselves are made of the shape required for the tip at one end, and the head of the other, or for the lap in the middle of the rib. (These forms are represented in the detached views.)

It is preferable to cast the middle lap or joint-piece first, and in that case the straight steel wire is passed in between the molds *o* and the end stops against the adjustable gage *t* upon the arm 21, the faces of the molds containing half-round grooves to receive such steel rib, and the mold being shaped as shown to form the lap; but it is preferable, both on

account of expense and to insure accuracy, to cast the lap with the joint-hole in it, and for this purpose a pin, 24, is inserted up through the lower die, and the end passes into a hole in the upper die, so that the metal will be cast around that pin. (See Fig. 4.) This pin has to be withdrawn from the lap or tip, and for this purpose the lever 26 is employed, and the link 27 to the lever *r*, so that the pin is projected up through the mold as the mold closes and moves toward the teat on the bath of melted metal; and after the tip, head, or lap has been cast by the jet of melted metal forced into the mold by the pump, and the mold is being drawn back and opened, the pin is drawn down out of the hole in the cast lap or tip.

In casting the tip and head, the steel rib is inserted into the mold in the direction shown in Figs. 3 and 4, and the lap rests upon the adjustable gage *t*, so that its exact position is determined in relation to the tip that is cast upon the end of the rib.

The arm 21, upon which the adjustable gage *t* is supported, may be removed from the position shown in Figs. 1, 2, and 5 to that shown in Fig. 3; or a second arm may be provided.

I claim as my invention—

1. The two-part mold *o*, connected respectively to the swinging mold-frame *h* and swinging head o^2, in combination with such frame *h*, swinging head o^2, bent lever *r*, and link *u*, for opening and closing the mold, substantially as specified.

2. In combination with the two-part mold *o*, the pin 24, lever 26, link 27, lever *r*, and link *s'*, as and for the purposes set forth.

3. The combination, with the molds *o* and casting mechanism, of the adjustable gage *t* and arm 21, for positioning and holding the rib, as set forth.

Signed by me this 14th day of April, A. D. 1875.

ADOLPHUS LIGIBEL.

Witnesses:

THOS. W. BALL,

JOSEPH WARREN.