

(No Model.)

F. BOMMARIUS.

APPARATUS FOR WINDING FLEXIBLE LIGHTING MATCHES.

No. 407,716.

Patented July 23, 1889.

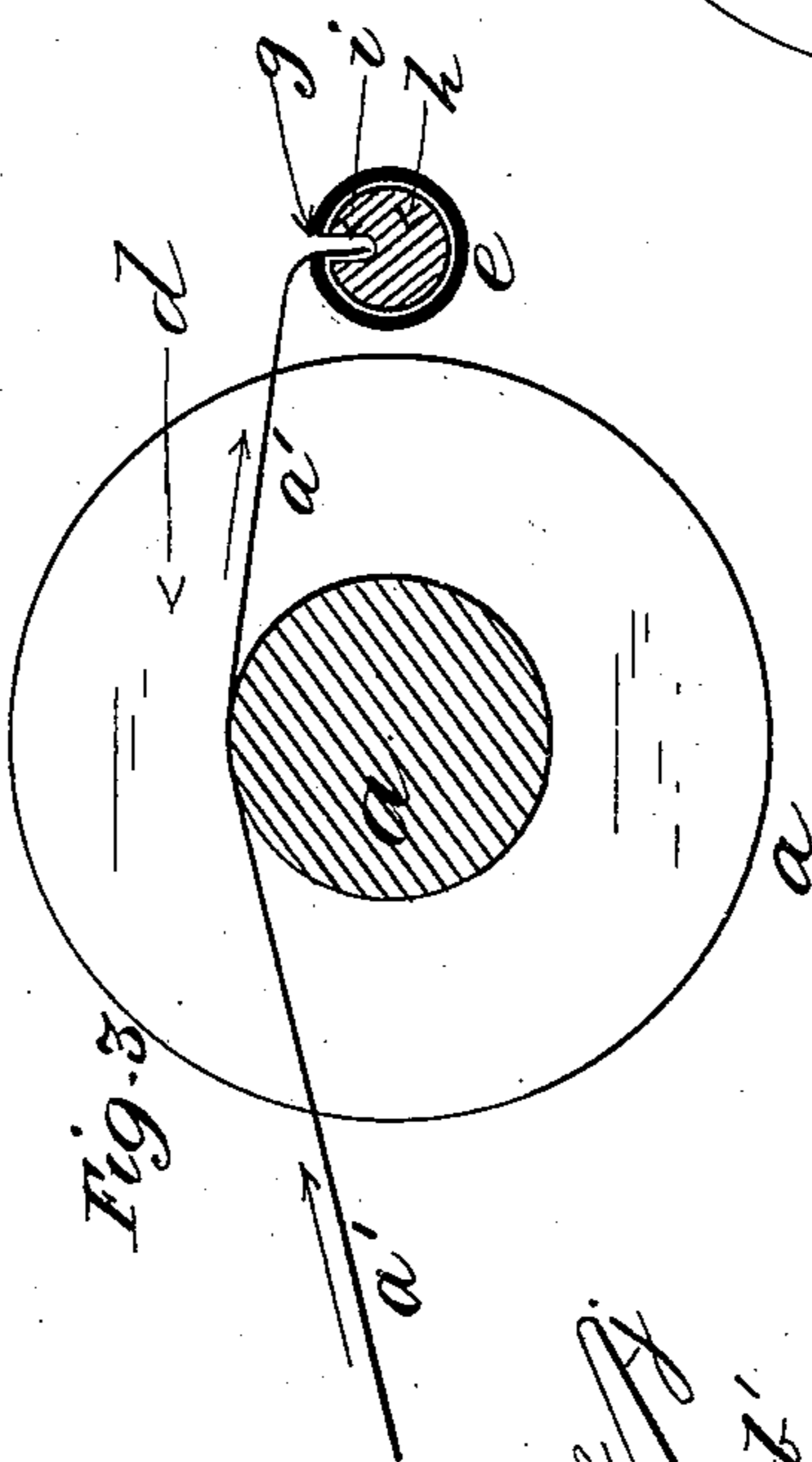
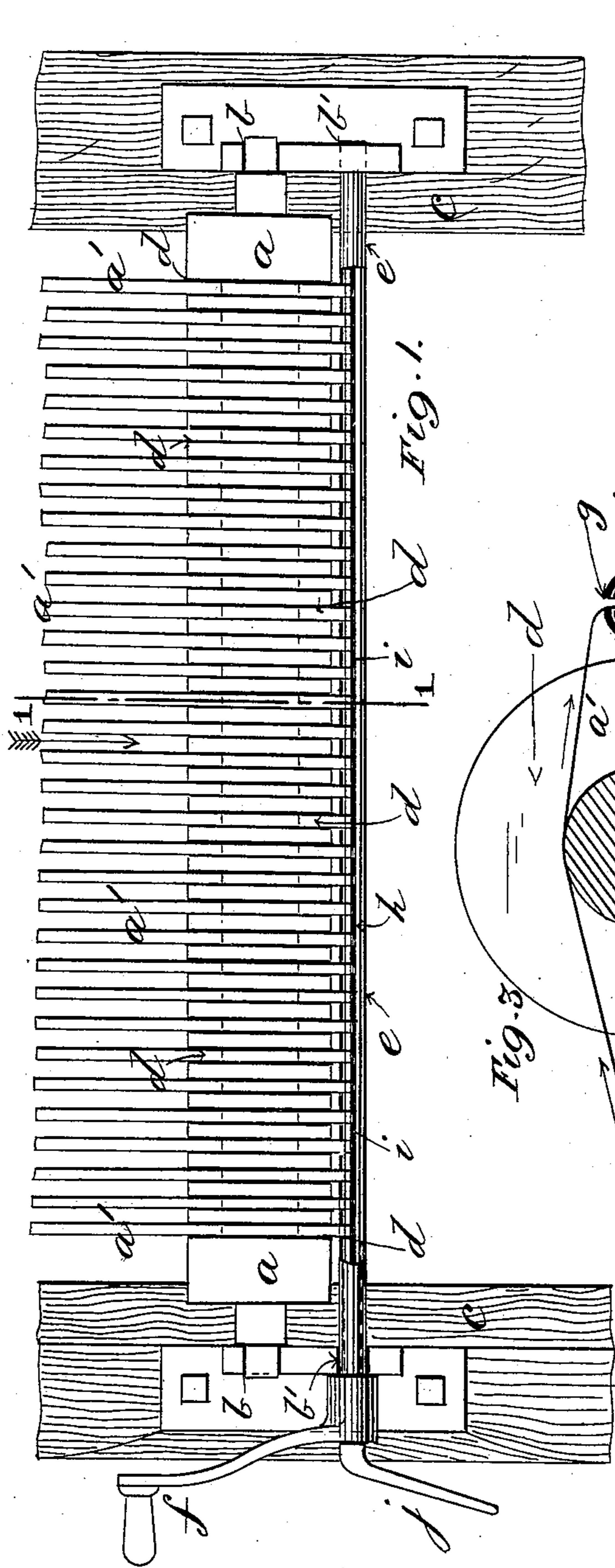


Fig. 4.

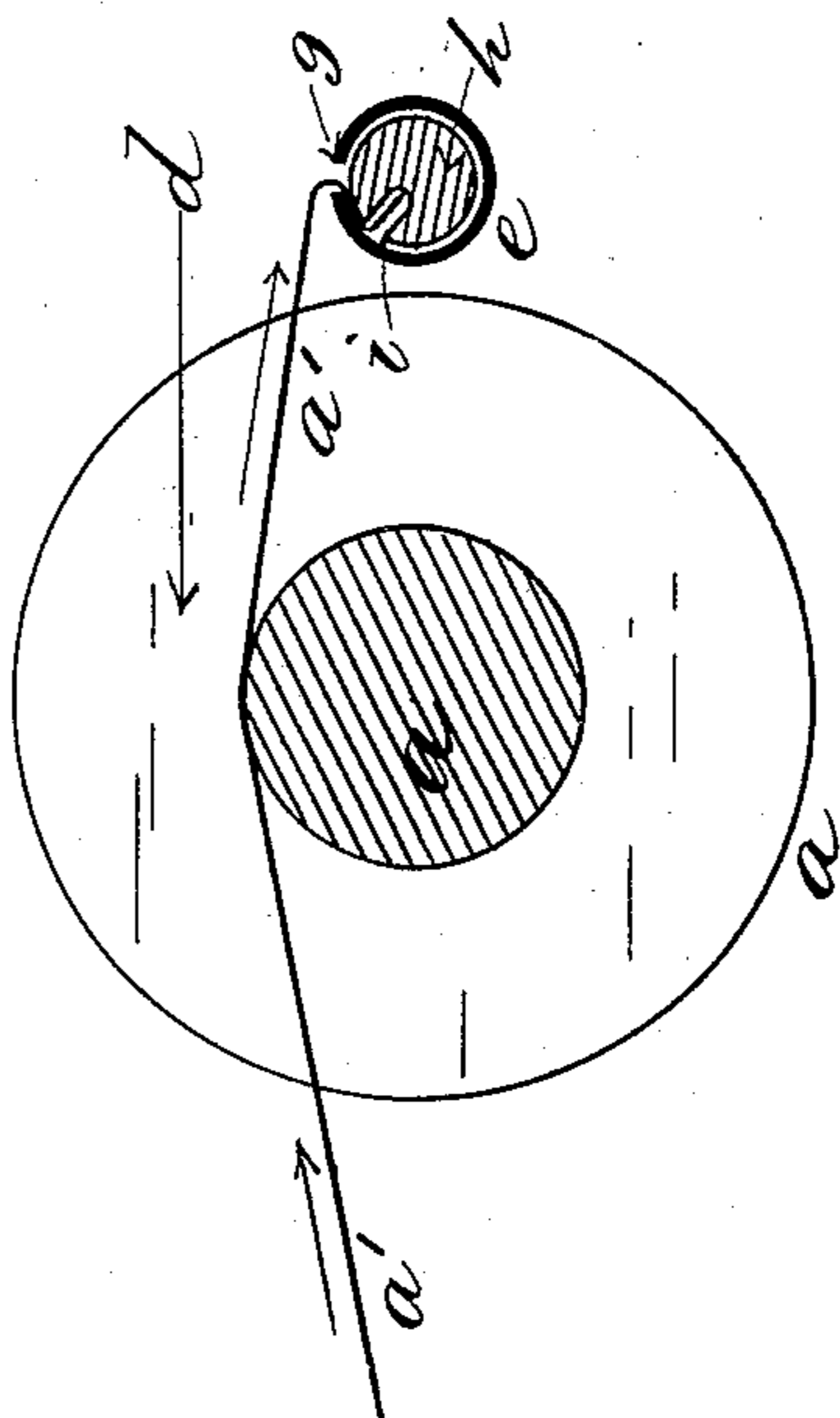
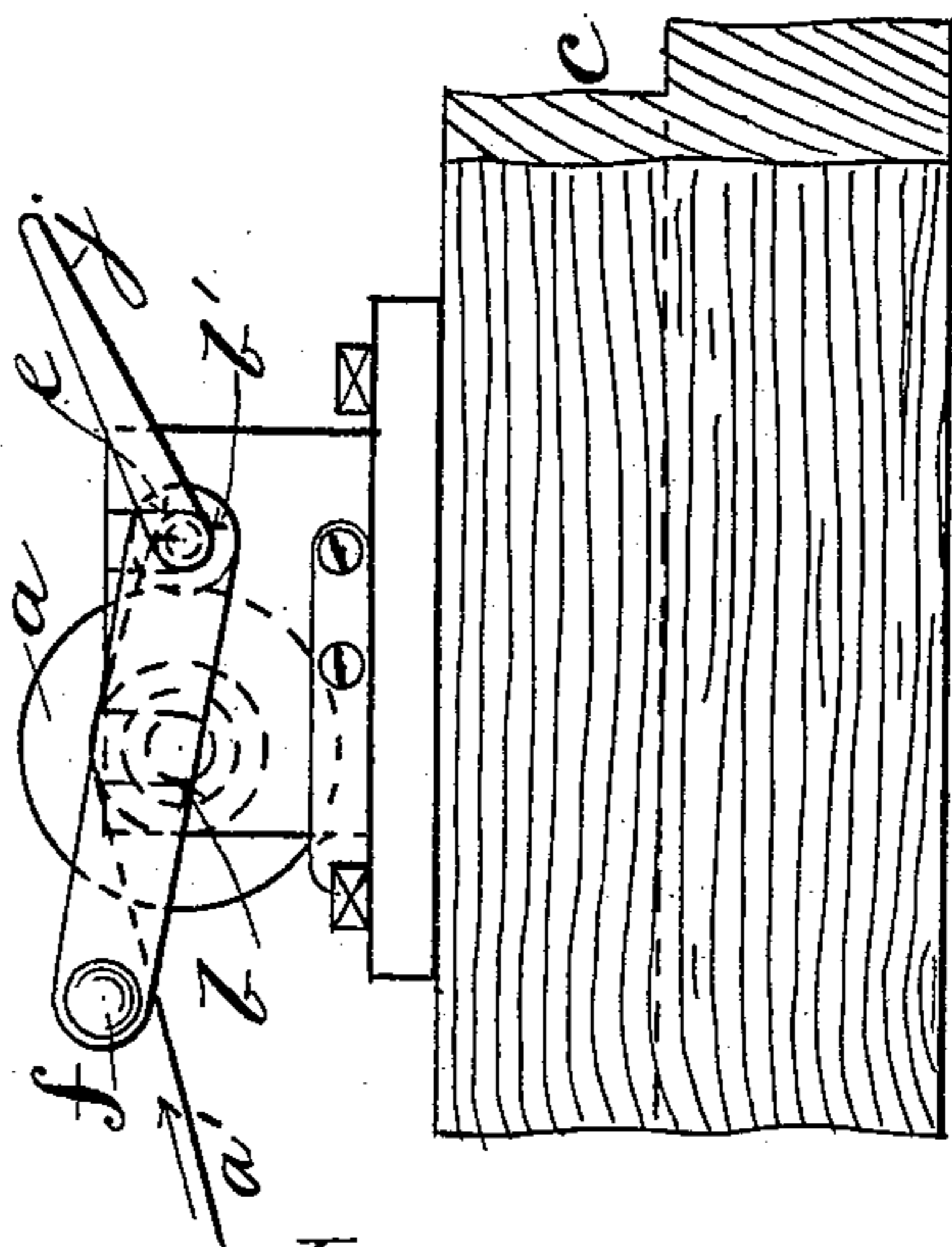


Fig. 2.



WITNESSES  
S. L. Schrader.  
W. M. Byrne.

INVENTOR  
Frederick Bommarius  
Paul Bakerell,  
his attorney.

# UNITED STATES PATENT OFFICE.

FREDERICK BOMMARIUS, OF NEW ORLEANS, LOUISIANA, ASSIGNOR TO THE  
CARROLL FLEXIBLE MATCH COMPANY, OF MISSOURI.

## APPARATUS FOR WINDING FLEXIBLE LIGHTING-MATCHES.

SPECIFICATION forming part of Letters Patent No. 407,716, dated July 23, 1889.

Application filed November 12, 1888. Serial No. 290,616. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK BOMMARIUS, a citizen of the United States, residing at the city of New Orleans, State of Louisiana, have  
5 invented a certain new and useful Improvement in Apparatus for Winding Flexible Lighting-Matches, of which the following is a full, clear, and exact description.

My invention relates to a novel device for  
10 winding the flexible paper matches manufactured by my improved machine for which application for a patent has been made of even date herewith, Serial No. 290,617, filed November 12, 1888, and has for its object to simultaneously and rapidly wind a series of flexible  
15 match-strips delivered from the said machine into coils of matches ready for package and use.

It consists in the combination of a roller  
20 having circumferential grooves or channels by which an entire series of flexible match-strips is guided and directed to a double winding-spindle, one spindle within the other, which on being respectively rotated first seize  
25 the ends of the strips and then wind them into coils ready for use.

On the accompanying drawings, Figure 1 represents a plan of my improved winding device, partly broken away; Fig. 2, an end  
30 view thereof; Fig. 3, a transverse section on line 1 1 in Fig. 1 to an enlarged scale, and Fig. 4 a similar view showing an altered position of its parts.

Like letters of reference denote like parts  
35 in all the figures.

*a* represents a roller mounted horizontally between open-slotted bearings *b*, fixed on the sides of a table, having longitudinal guides *c*, in which the rectangular frame (not shown)  
40 carrying a series of flexible match-strips, as shown and described in my said accompanying application for a patent, is placed.

The roller *a* is formed on its circumference with circular grooves or channels *d*, parallel  
45 to each other and corresponding in number and distance apart with the flexible match-strips *a'*, coming from the said frame, as indicated by the arrows.

Immediately behind and parallel with the

roller *a* is mounted horizontally between the  
5c side bearings *b'* and removably therein a tubular spindle *e*, having at one end outside the bearing *b'* a handle *f*. Through the wall of the tubular spindle *e* is a longitudinal slot *g*,  
Figs. 3 and 4, of a length somewhat exceeding  
55 that between the outermost grooves *d* on the roller *a*.

Within the tubular spindle *e* is inserted from its open end, where the handle *f* is located, a  
rod or spindle *h*, along which is formed a  
60 groove or channel *i*, corresponding with the slot *g* of the tubular spindle *e*. On the end of the rod *h*, beyond the handle *f*, is fixed a handle *j*.

The flexible paper match-strips *a'*, delivered  
65 from the rectangular frame of the machine, as before named, are directed through the upper portions of the grooves *d* in the roller *a*, and the forward ends of the strips *a'* inserted through the slot *g* of the tubular spindle *e*  
70 into the groove or channel *i* of the inner rod or spindle *h*, as seen in Fig. 3. The rod or spindle *h* is then partially rotated by its handle *j* in either direction, (the tubular spindle *e* meanwhile remaining stationary,) so as to  
75 cause the ends of the strips *a'* to be caught and jammed between the rod *h* and the inner surface of the tubular spindle *e*, as shown in Fig. 4. The tubular spindle *e* is then rotated by its handle *f*, and, carrying with it the rod  
80 *h*, winds the strips *a'* simultaneously around the outside of the tubular spindle *e* as a core, and so on upon themselves into a series of coils similar to a watch-spring.

I claim—

85 The combination of a tubular spindle *e*, mounted removably in bearings and having slot *g* and handle *f*, with rod or spindle *h*, having groove or channel *i* and handle *j*, substantially as shown, and for the purpose described.  
90

In testimony whereof I affix my signature, in presence of two witnesses, this 2d day of November, 1888.

FREDERICK BOMMARIUS.

Witnesses:

JOHN MALLEN,  
H. L. LOOMIS, Jr.