

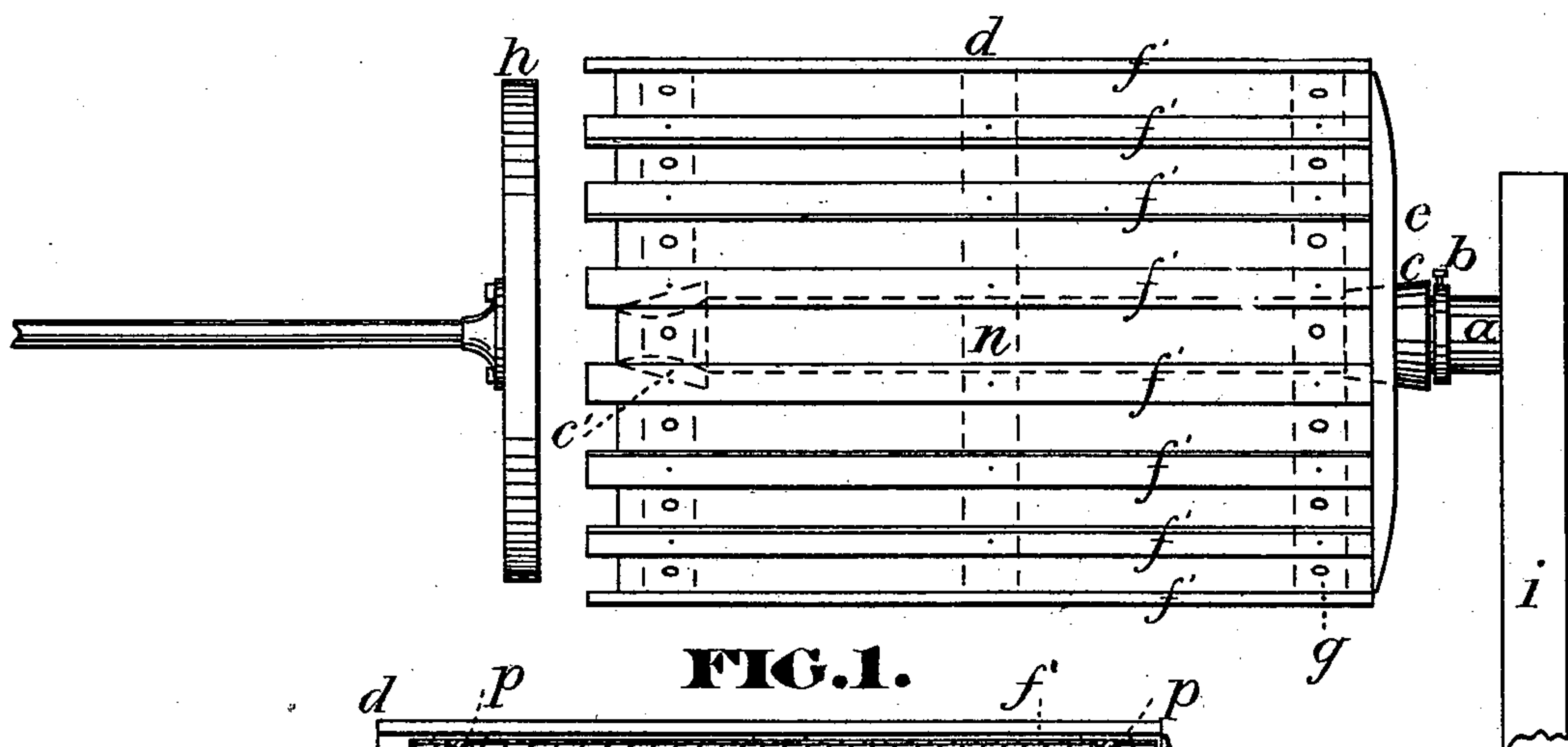
(No Model.)

L. S. BILLINGS.

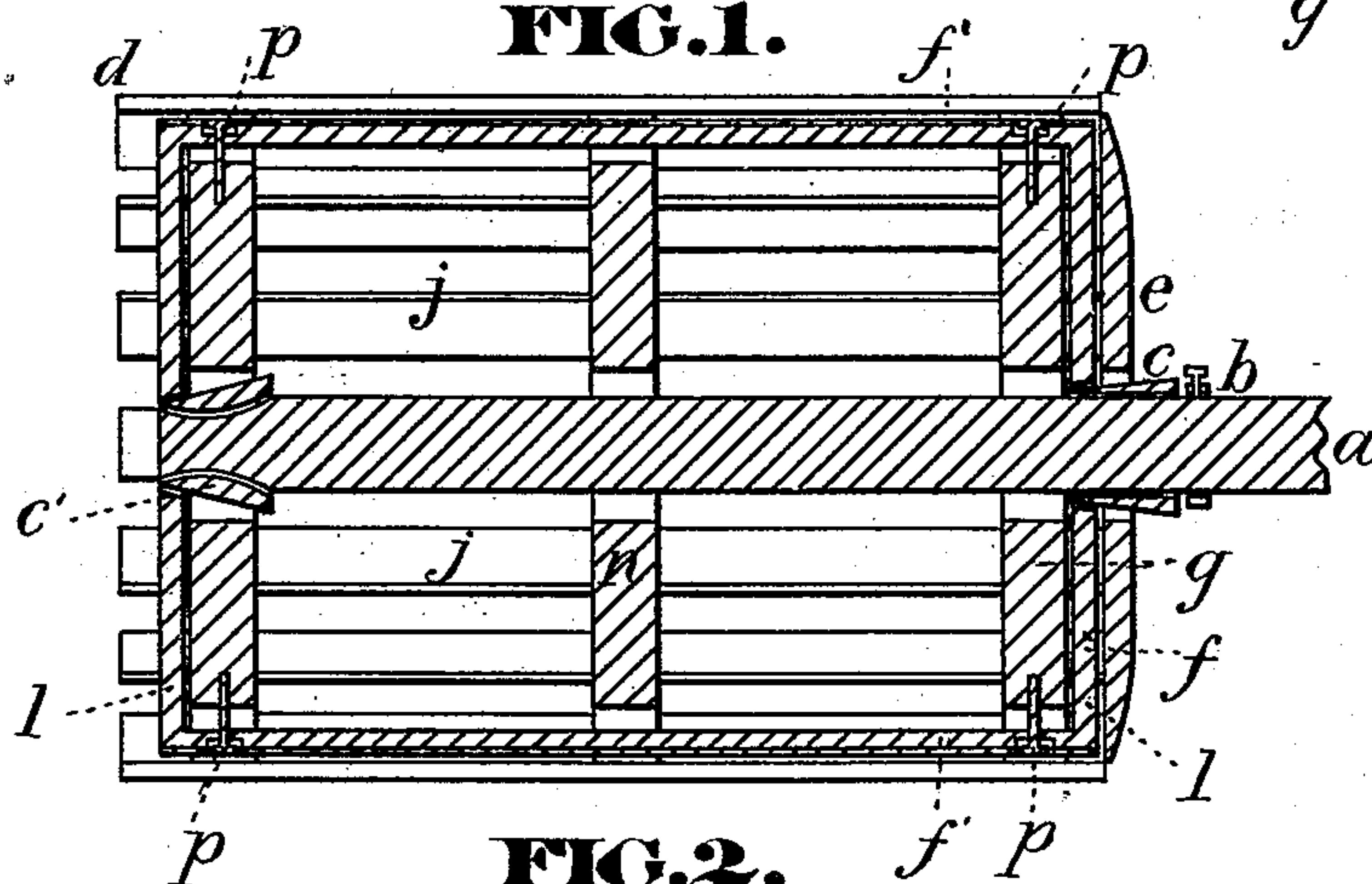
FORMER.

No. 275,349.

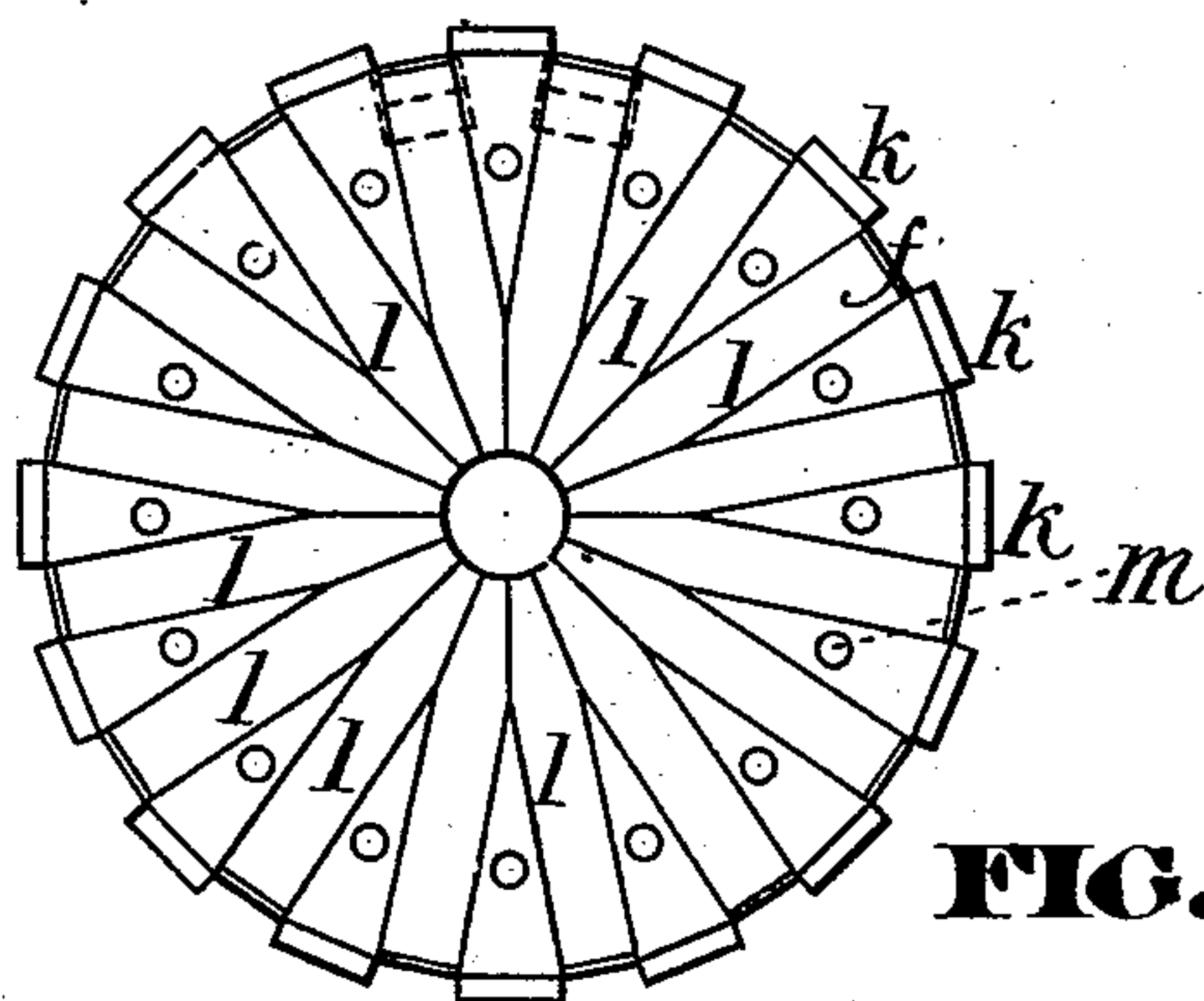
Patented Apr. 10, 1883.



**FIG.1.**



**FIG. 2.**



**FIG. 3.**

## WITNESSES.

Chas. H. Kimball.  
John P. Kenigau.

**INVENTOR.**

Leander S. Billings -  
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William Henry Clifford



# UNITED STATES PATENT OFFICE.

LEANDER S. BILLINGS, OF SOUTH PARIS, MAINE.

FORMER.

SPECIFICATION forming part of Letters Patent No. 275,349, dated April 10, 1883.

Application filed December 16, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, LEANDER S. BILLINGS, of South Paris, in the county of Oxford and State of Maine, have invented certain new and useful Improvements in Formers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 is a side view. Fig. 2 is a sectional elevation. Fig. 3 is an end view of the expanding-disk.

Same letters show like parts.

My invention relates to formers for the manufacture of wooden crates. It has for its object to provide a former that can be expanded and contracted, so as to hold the crate while being formed and admit of its being easily removed when completed.

My invention consists of the combination of a shaft, *a*, having ring *b* and expanders *c c'*, with the former *d*, having the end *e*, expanding-disk *f*, and expanding-bars *f'*, inner head, *g*, central disk, *n*, and removable head *h*, and bolts *p*, hereinafter set forth.

*i* is the support of the shaft *a*. This shaft carries the expanders *c c'*, so made as to form a wedge, if cut in a vertical section. The expander *c* encompasses the shaft *a*.

*b* is a ring to hold the expander *c* in place and prevent its slipping back on the shaft. It is provided with a thumb-screw for tightening. The expander *c'* will rotate on the shaft, but will not slide along the same.

*e* is an end supported by the shaft *a*. *g* is an inner head. Both of these parts have holes into which the shaft *a*, with its expander *c*, enters. A space is left between the end *e* and the inner head, *g*. Into this is placed the expanding-disk *f*. It is composed of the fixed pieces *k* and the radially-moving pieces *l*. The fixed pieces are bolted to the inner head, *g*, by the bolts *m*. The radially-moving pieces *l* are connected with the expanding-bars *f'*, so that as they (the radially-moving pieces *l*) are pushed out they will carry out with them the expanding-bars *f'*, and thus expand the former.

*n* is a centrally-located disk to keep the former stiff.

*h* is a head to keep its end of the former expanded when the shaft *a* has been pushed into

the hole *o*. On this device I propose to make crates such as are used to surround and protect tin cans, oil-cans, and such other articles liable to bruising, &c., in use and in transportation. The protecting-crate is composed of slats extending its length, with spaces between them.

The method of use is as follows: When the former is in a condition not expanded the slats of the crate are placed on the longitudinal parts *j*. They are then at first held by a string around the center of the former outside of said slats. The shaft *a* is then pushed into the hole *o*, the expander *c* driving out the expanding-bars *f'* and holding the slats of the crate to be made at a desired size. Hoops having been formed, are then placed around the slats and are nailed thereto. The crate and former are revolved on the shaft *a* as the workman progresses in the nailing. Before nailing the hoops, it should be remarked, the removable head *h* is pushed in at its end of the former. This head is made of the same diameter as the former is when expanded. Then the nailing is done.

*p* are bolts entering the inner head, *g*. They are not driven in to the full length of their shanks, but project some distance from the head *g*, so as to allow the expanding-bars *f'* to move on them and still be held in place.

When the crate is finished, so far as the nailing of the hoops is concerned, then the shaft *a* is drawn back, the expanding-bars *f'* drop inwardly, and the crate is easily removed from the former. This former can be made of any shape desired, either curved or rectangular in a whole or half circle. The former can be solid, if desired.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

In a crate-former, the combination of the shaft *a*, having the ring *b* and expanders *c c'*, with the former *d*, having the end *e*, expanding-disk *f*, the expanding-bars *f'*, inner head, *g*, central disk, *n*, removable head *h*, and bolts *p*, as herein set forth.

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

LEANDER S. BILLINGS.

Witnesses:

V. A. GREENLEAF,

W. O. FROTHINGHAM.