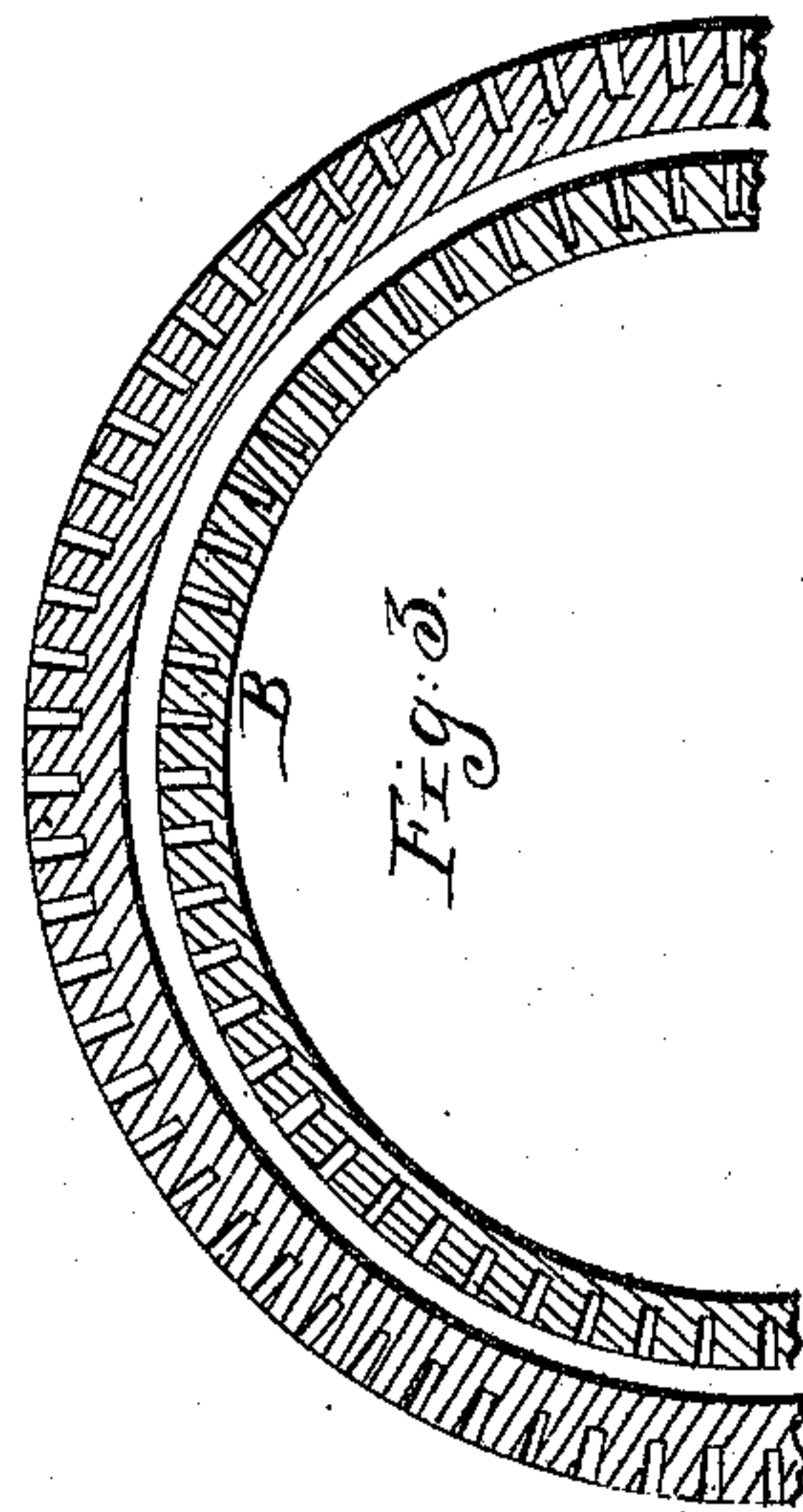
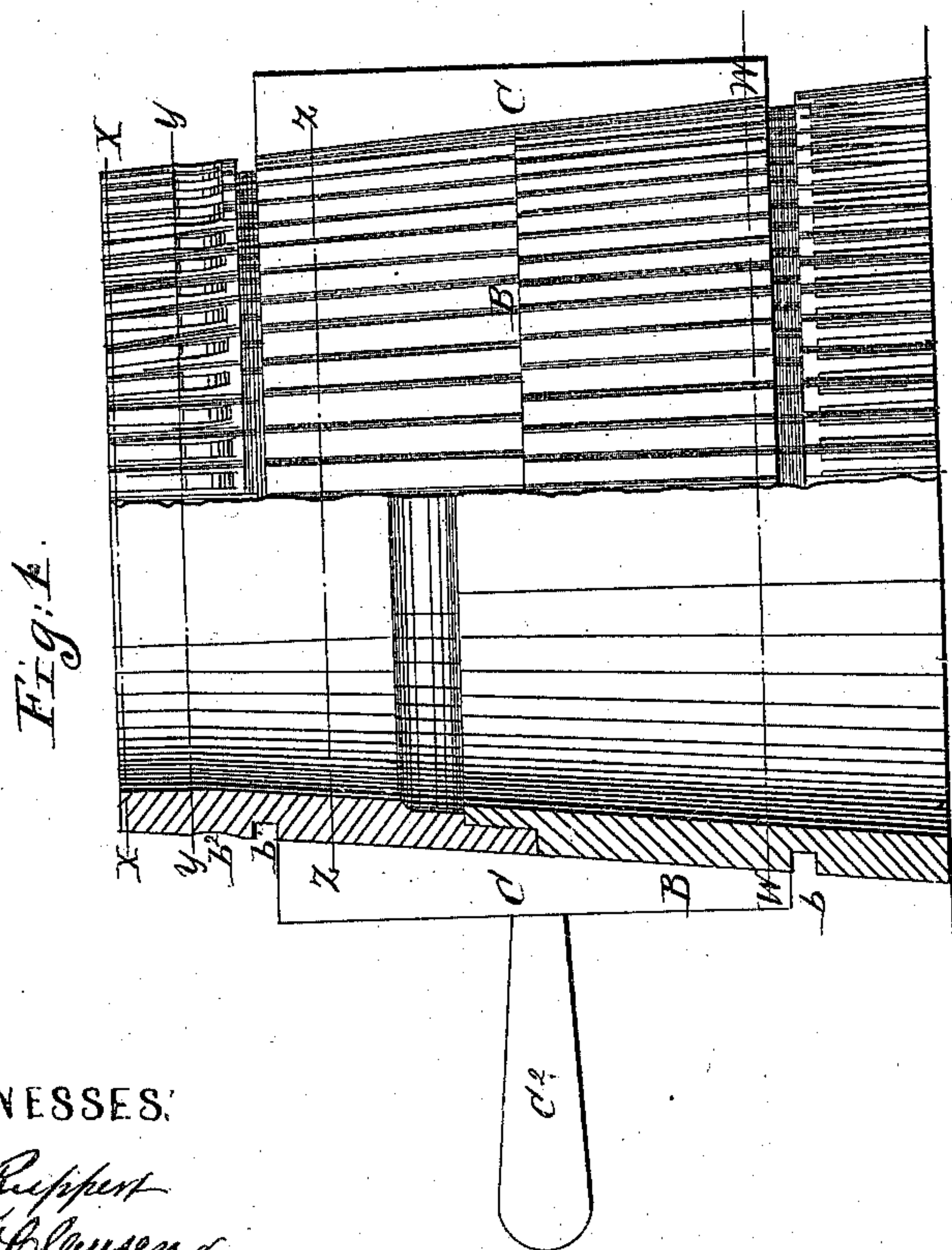
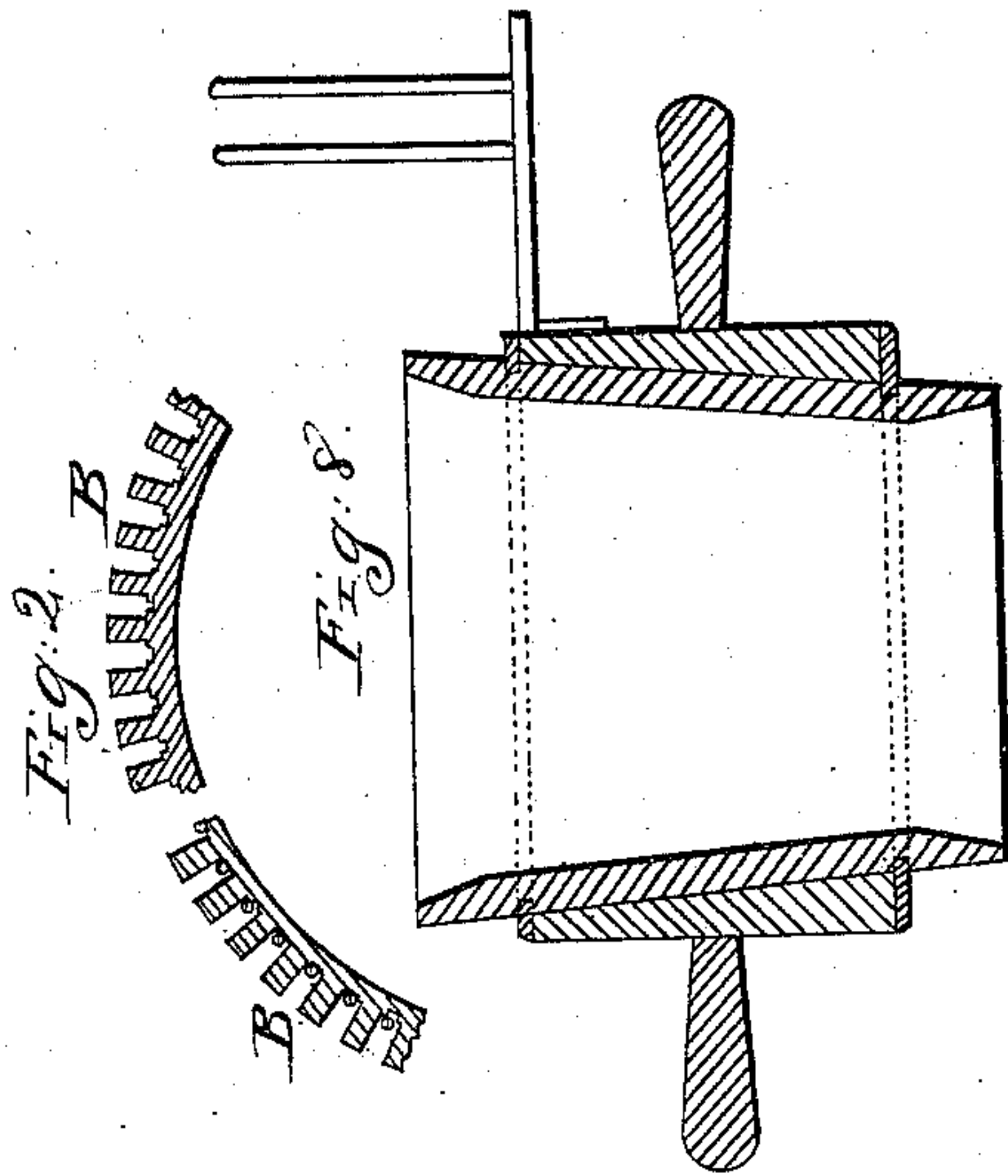


J. McCune.

## Circular Knitting.

*N<sup>o</sup> 94,904*

*Patented Sept. 14, 1869.*



WITNESSES:

A. Ruppert  
C. F. Clausen

INVENTOR:

J. McBine  
D. T. Holloway & Co  
Atty

J. M<sup>c</sup>Clune.  
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Fig. 50

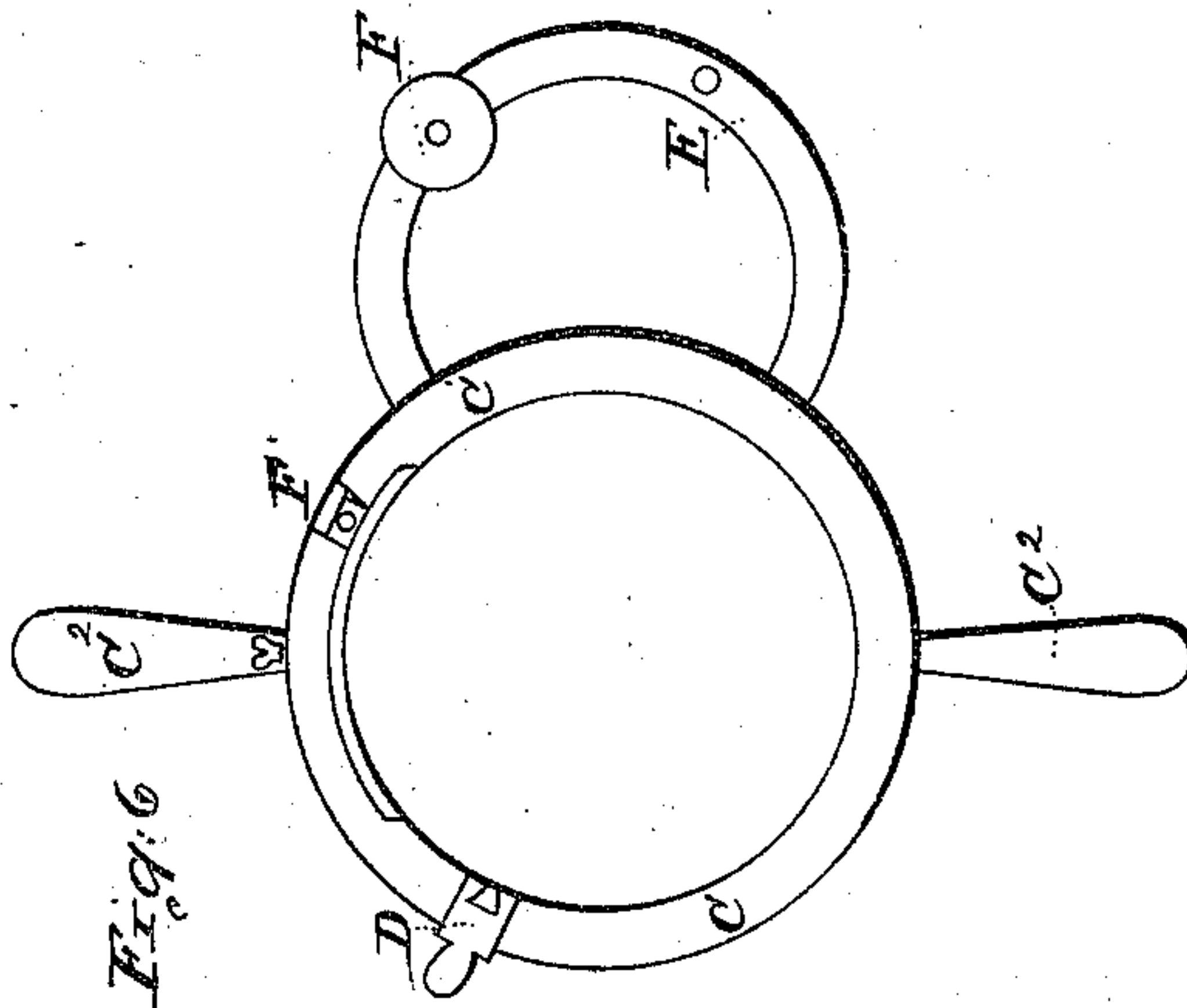
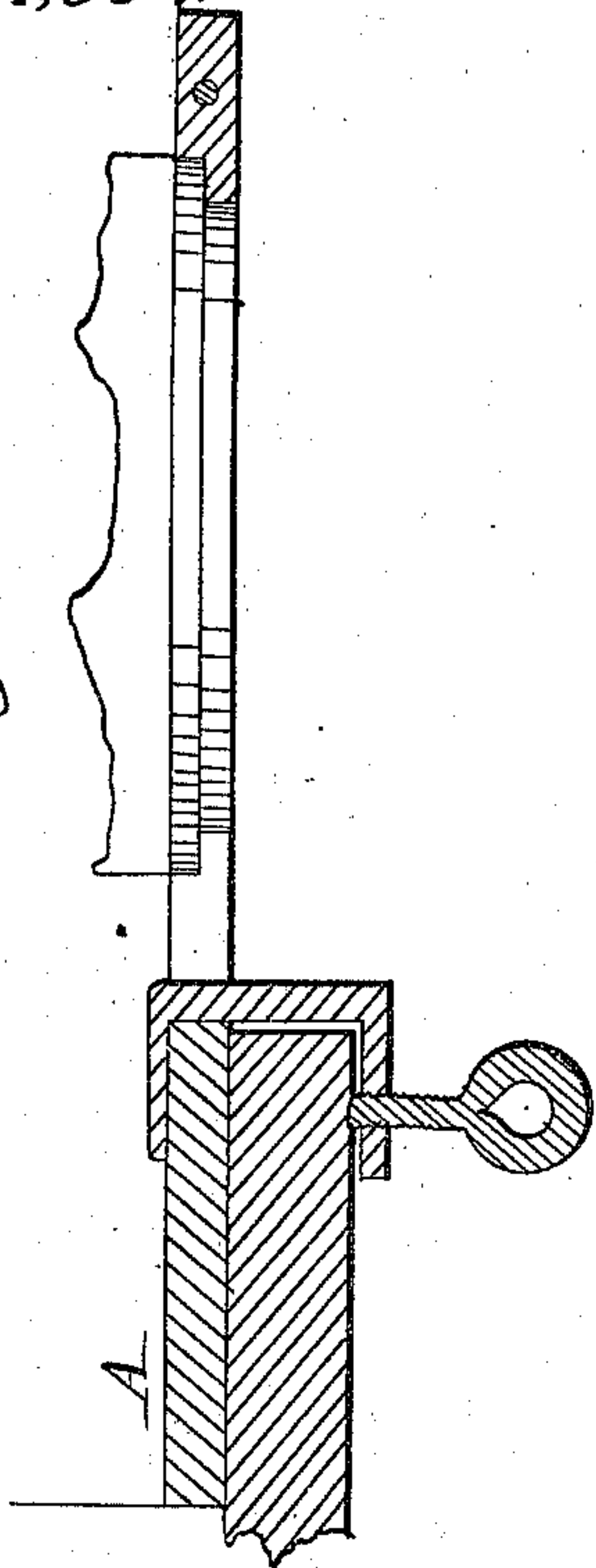
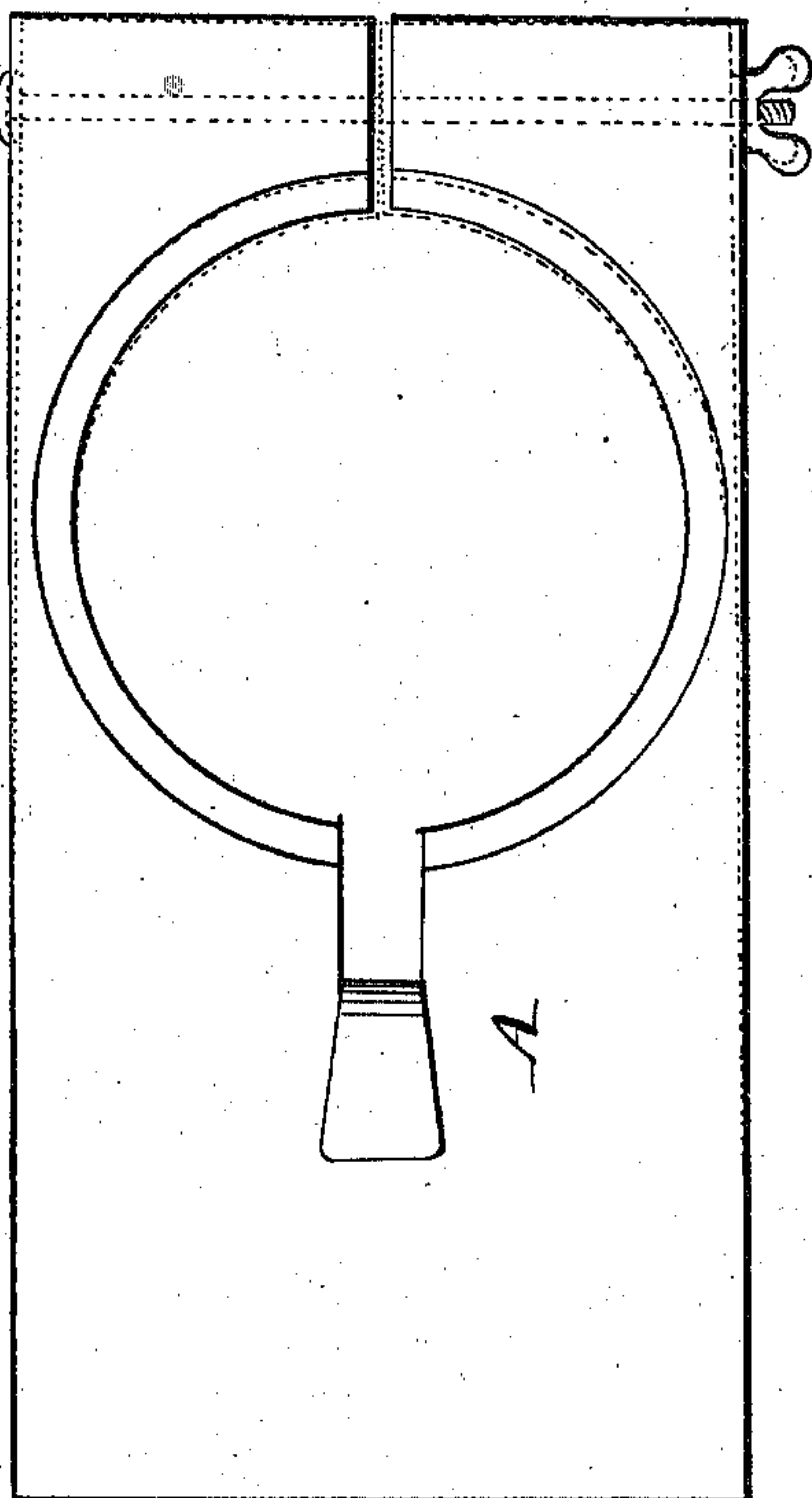


Fig. 6

Fig. 9



WITNESSES:

Ch. Ruppert  
C. F. Glussen

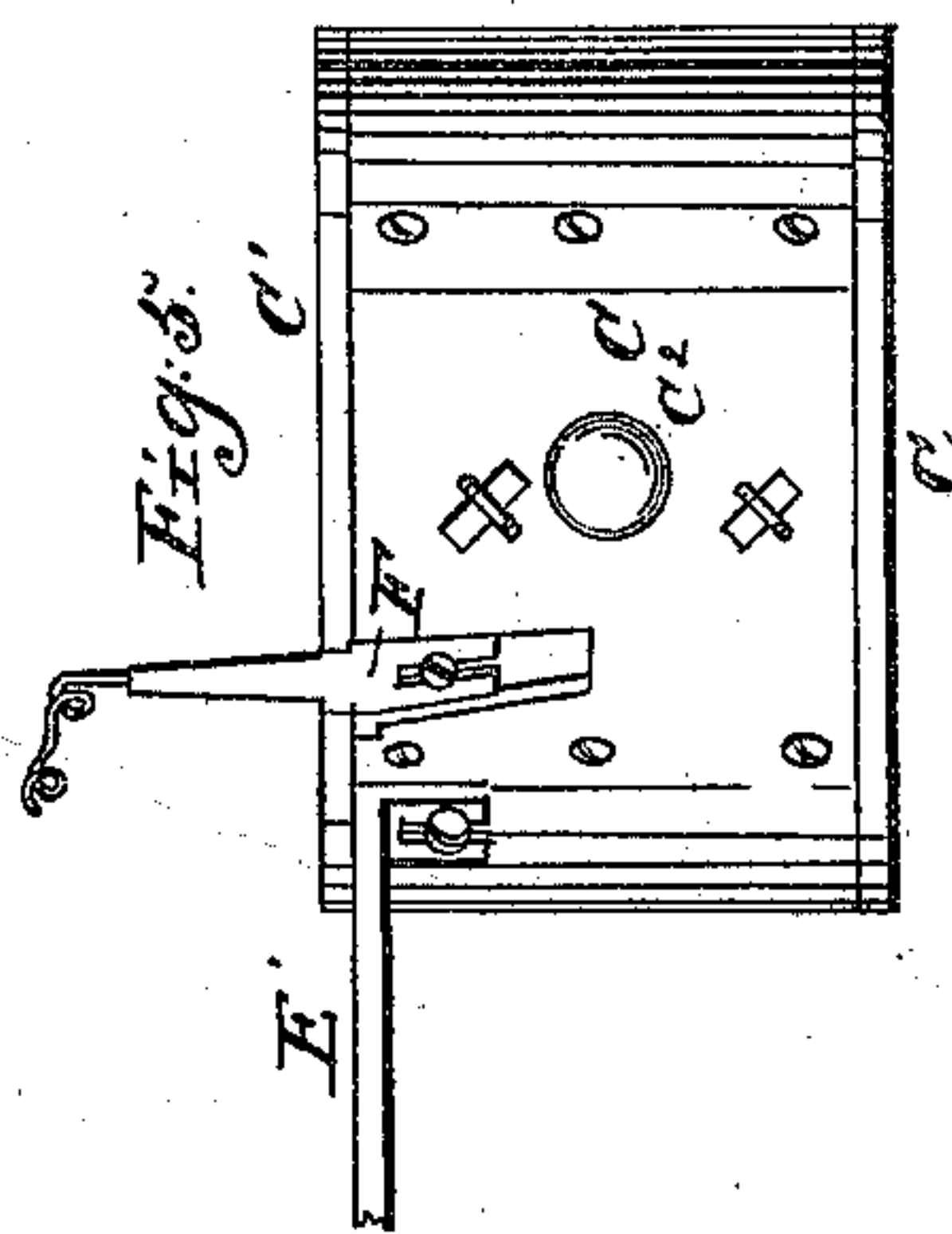


Fig. 5

Fig. 7

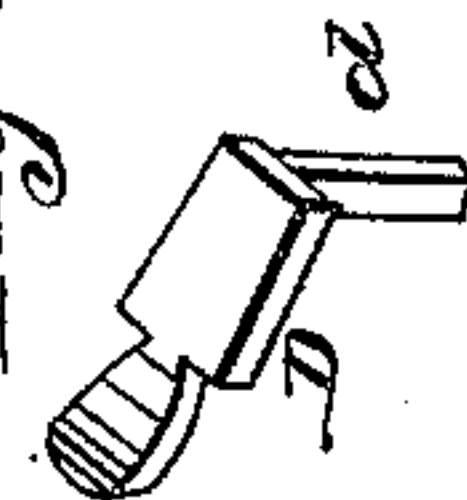
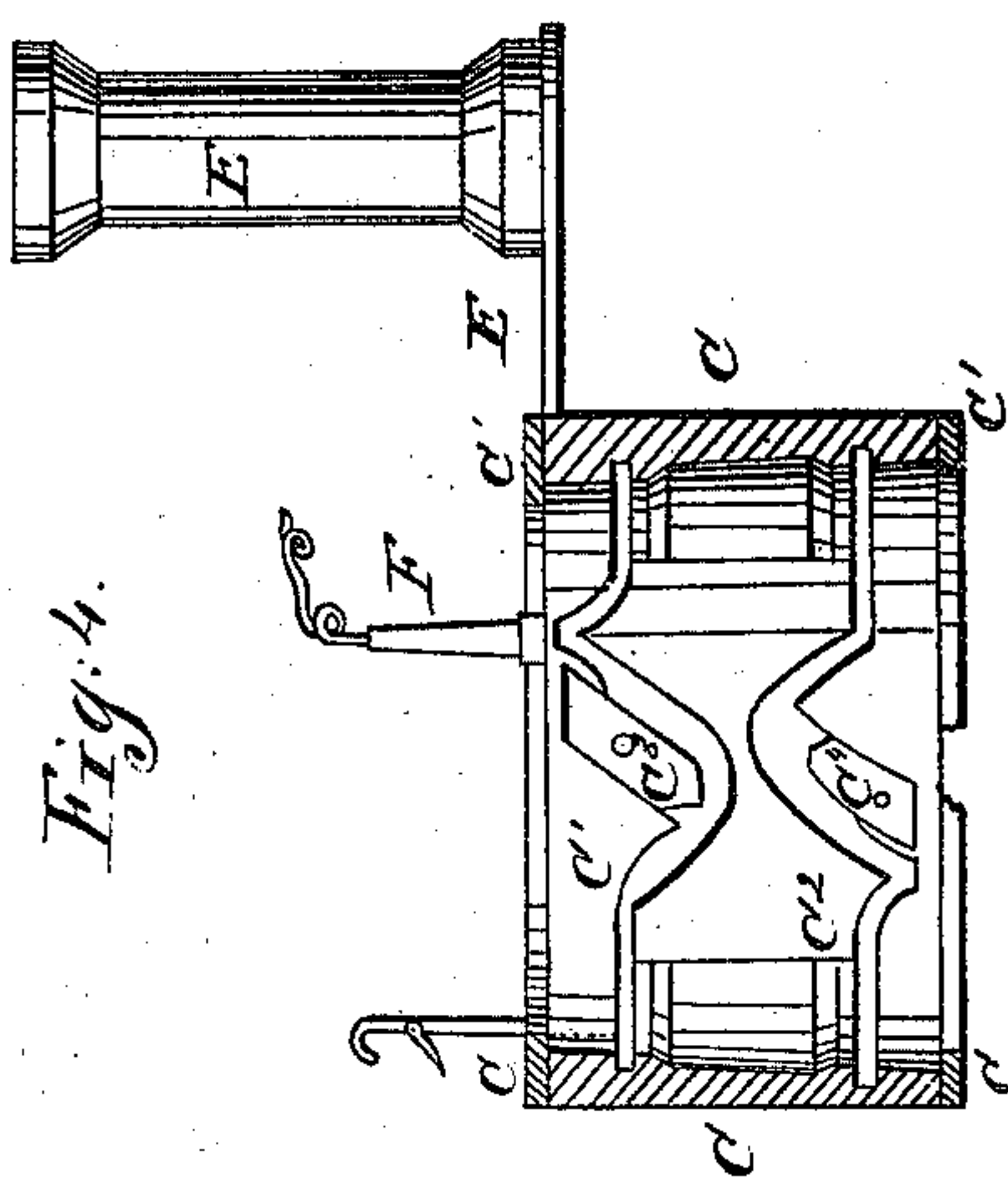


Fig. 4



INVENTOR:

J. M<sup>c</sup>Clune  
D. P. Holloway & Co  
Atty



# United States Patent Office.

J. McCUNE, OF AUBURN, INDIANA.

Letters Patent No. 94,904, dated September 14, 1869.

## IMPROVEMENT IN KNITTING-MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

### To all whom it may concern :

Be it known that I, J. McCUNE, of Auburn, in the county of De Kalb, and State of Indiana, have invented an Improved Knitting-Machine; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a view, partly in section and partly in elevation, of the tapering needle-cylinder, showing the cam-cylinder in red outlines.

Figure 2 represents partial horizontal sections in lines *x x* and *y y* of fig. 1.

Figure 3 represents similar sections on lines *z z* and *w w* of fig. 1.

Figure 4 is a sectional elevation of the cam-cylinder, showing the arrangement of the grooves in its interior surface.

Figure 5 is a side elevation thereof.

Figure 6 is a plan or top view of the same.

Figure 7 is a perspective view of the removable slide.

Figure 8 is a sectional elevation of the machine, showing its arrangement when doing large work.

Figure 9 is a plan or top view of the bed or frame in which the needle-cylinder is to be held.

Figure 10 is a longitudinal section thereof.

Corresponding letters refer to corresponding parts in the several figures.

My invention relates to that class of rotary knitting-machines, in which a circular series of latched needles, placed in vertical grooves on the outer surface of a stationary needle-cylinder, with butts projecting into grooves formed in the inner surface of the cam-cylinder, is made to form the stitches, by alternately elevating and depressing the needles as the cam-cylinder is revolved; and my improvements consist in providing a tapering needle-cylinder and cam-cylinder, so constructed and combined that the needles may be used at either end, and thus larger or smaller work be made on the same machine.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A, in the drawings, represents the frame or bed, so constructed that either end of the needle-cylinder may be firmly held therein. It is to be clamped to the ledge of a table or stand by means of a clamping-device, as shown in fig. 10.

B represents a tapering hollow cylinder, which may be made in two sections, to be firmly joined together in any approved manner, for the purpose of facilitating the formation of the vertical grooves on its exterior surface, in which the needles reciprocate, said grooves on one end not being in line with all in the other.

These grooves are to be equal distances apart at either end of the cylinder, and their number is determined by its circumferences and the character of the work to be performed by the machine.

Formed in the exterior surface are the horizontal grooves *b* and *b'*, for the reception of the guide-pieces holding the cam-cylinder in position, as also a depression, *b''*, where it is to be firmly held by the frame when the large end of the cylinder is to be used.

C represents the cam-cylinder or shell, which is fitted neatly on the needle-cylinder, between the grooves *b* and *b'*, so that each end of the latter projects the proper distance therefrom. It is held in position by the guide-pieces *c* and *c'*, which are semi-annular rings screwed to each end of the shell, after the same has been placed over the needle-cylinder, and projecting into the grooves *b* and *b'* thereof. Its interior arrangement differs from that now in common use in rotary knitting-machines of this description only in this respect, namely, that its interior surface is tapering to fit over the tapering needle-cylinder, and provided with two cam-grooves, *C*<sup>1</sup> and *C*<sup>2</sup>, for giving motion to the needles, the former being used when operating with the smaller end of the cylinder, and the latter when larger work is to be made at the other end.

Sliding cams *C*<sup>3</sup> and *C*<sup>4</sup> may be made to increase or lessen the sweep of the needles, and thus looser or tighter stitches be made, in the ordinary manner.

The cam-cylinder is revolved by means of its handles *c*<sup>2</sup>, secured to it in any convenient manner.

D represents the removable slide, which is to be placed in a space between the semiannular rings at either end of the shell, its guide *d* sliding in a dovetailed groove in the interior surface thereof, said groove extending from the top of the cam-cylinder at each end down to each of the cam-grooves, and being of the same depth therewith. By removing this slide and bringing the groove successively opposite all the needle-grooves, passages are opened, through which the needles may be inserted in, or withdrawn from the machine, affording a convenient means of changing the needles from one end of the needle-cylinder to the other.

E represents the yarn-carrier, which revolves on a spindle secured to the support F. This support is a bent piece of iron, the ends of which are bent so as to form flanges. It can be attached at either end of the shell by means of set-screws passing through slots in its flanges and screwed into the shell.

F represents the yarn-guide, which is also made detachable, and can be mounted on either end of the shell, as circumstances may require.

This machine is more particularly designed to make stockings, but a variety of other articles, such as un-



der-shirts, children's jackets, shawls, &c., may be made on it, by making a flat web with selvage, as in making the heel or toe of stockings, with nearly all the needles, and then uniting the pieces by hand. Its peculiar advantages for making stockings are, that the large end or calf may be made on the large end of the machine, and the work can then be transferred to the small end to complete it, thus obviating, to a great extent, the objectionable necessity of knitting looser and tighter at different stages of the operation. Large stockings may be made on the large end, and small ones at the small end of the machine, by employing all the needles, and other sizes by removing every fourth, fifth, sixth, &c., needle, narrowing being effected by lifting loops off some of the needles and putting them on those next by, and removing the empty needle.

Widening and narrowing may also be effected, to some extent, by changing the sweep of the needles by means of the sliding cams.

Having thus described my invention,

What I claim, and desire to secure by Letters Patent, is—

1. A rotary knitting-machine, having a tapering needle-cylinder grooved at both ends, so that the needles can be used at either end for the purpose of knitting different sizes of fabrics on the same machine, the parts being constructed and arranged substantially as and for the purpose set forth.

2. The combination of the tapering and reversible needle-cylinder B, with the tapering and reversible shell C, having the cam-grooves C<sup>1</sup> and C<sup>2</sup>, all constructed and operating as described, so that a fabric may be knit at both ends of the needle-cylinder, substantially as and for the purpose set forth.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

J. McCUNE.

Witnesses:

W. W. GRISWOLD,

H. E. ALTENBURG.