(No Model.) 2 Sheets—Sheet 1.

# J. E. BROADBENT.

## MACHINERY OR APPARATUS FOR WINDING YARN.

No. 512,860. Patented Jan. 16, 1894.

*FIG: 1.*

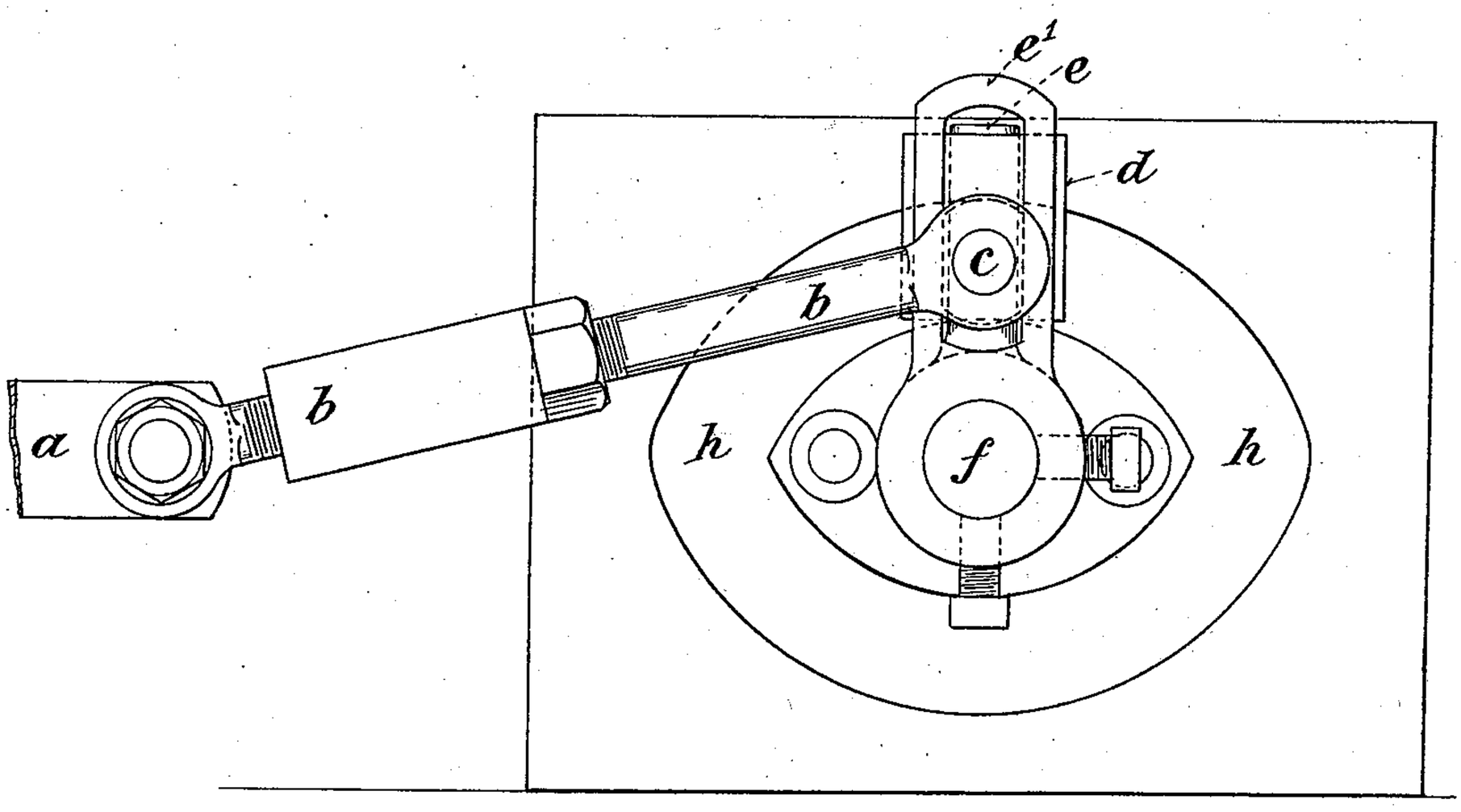



*FIG: 2.*

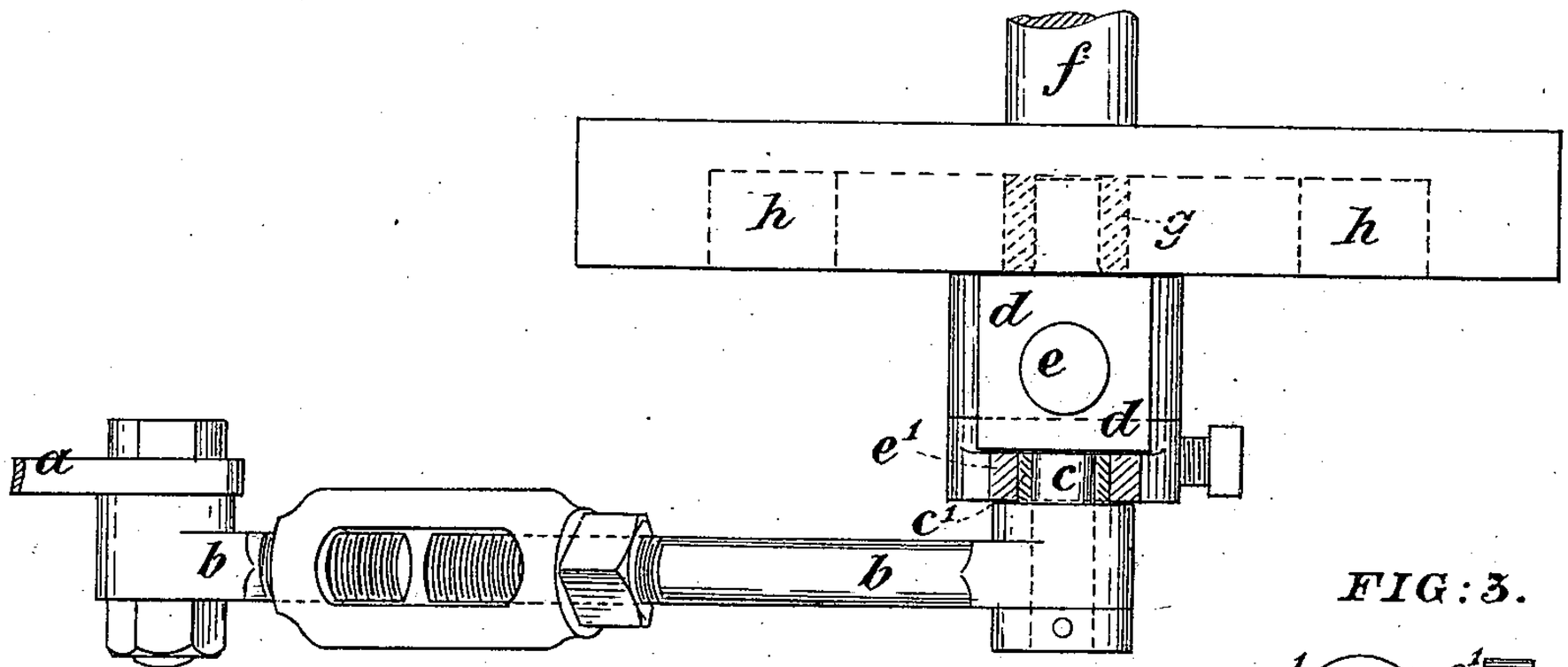



*FIG: 3.*


Witnesses.

Richard F. Laffin

James U. Codman Jr.

Inventor.

James Edward Broadbent,

per Edw. Dunmer,

atty.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.)

2 Sheets—Sheet 2.

# J. E. BROADBENT.

## MACHINERY OR APPARATUS FOR WINDING YARN.

No. 512,860. Patented Jan. 16, 1894.

*FIG: 4.*

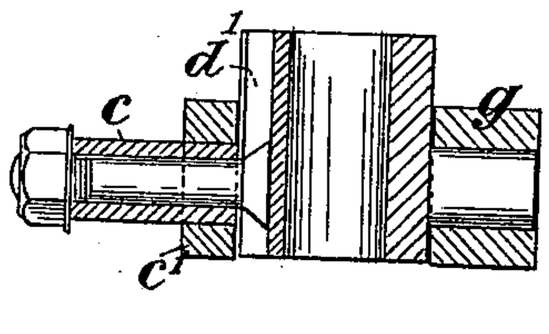



*FIG: 5.*

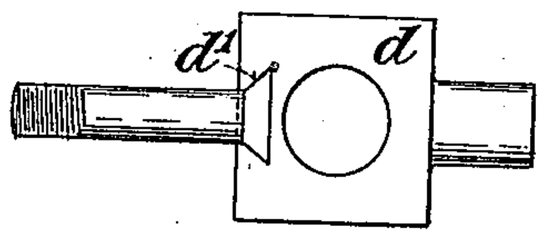



*FIG: 6.*

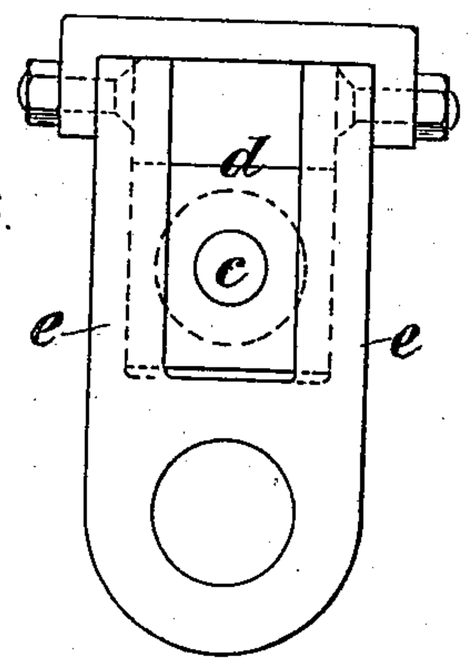



*FIG: 7.*

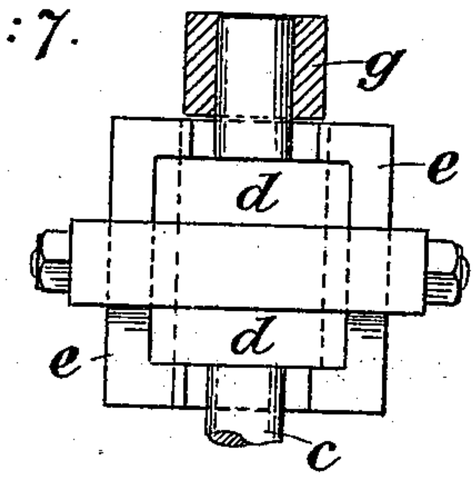
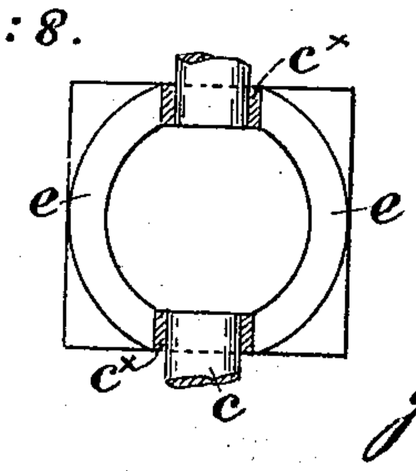



*FIG: 8.*




Witnesses.

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# UNITED STATES PATENT OFFICE.

JAMES EDWARD BROADBENT, OF STALYBRIDGE, ENGLAND, ASSIGNOR TO ROBERT BROADBENT & SON, OF SAME PLACE.

## MACHINERY OR APPARATUS FOR WINDING YARN.

SPECIFICATION forming part of Letters Patent No. 512,860, dated January 16, 1894.

Application filed April 13, 1893. Serial No. 470,238. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES EDWARD BROADBENT, a subject of the Queen of Great Britain and Ireland, residing at Stalybridge, in the county of Chester, England, have invented Improvements in Machinery or Apparatus for Winding Yarn or Thread, of which the following is a specification.

This invention relates principally to machines for winding yarn on bobbins or tubes usually called quick-traverse winding frames, and the object of the invention is to simplify the motion for actuating the traverse or slide bar and at the same time render it capable of being driven at a very high speed, and also capable of adjustment to vary the length of the traverse.

In order that this invention may be clearly understood I have annexed hereto two sheets of drawings illustrative thereof and have marked the same with letters of reference corresponding with those in the following description.

Figure 1 is a face view and Fig. 2 a plan of my improved traverse motion. Figs. 3, 4, 5, 6, 7 and 8 show detached parts and modifications hereinafter more particularly referred to.

The invention consists in connecting the traverse or slide bar *a* by a link *b* (preferably adjustable as to its length as shown on the drawings) to a crank pin *c* carried by a sliding block *d* to which motion is given by the following means. The block *d* is mounted so as to be capable of sliding in or upon a crank-arm *e* or its equivalent, fixed upon a cross shaft *f* at one end of the frame, and on a level with the said traverse or slide bar *a*. The block *d* is also provided with a bowl *g* running in a grooved cam or plate *h* fixed to the frame and parallel with the orbit or plane of rotation of the said block *d*. The groove of this cam *h* is so curved around the center of the shaft *f* above named that it regulates the speed of the throw or traverse of the slide bar *a* so as to compensate for the slow motion of the crank pin in passing the horizontal centers and make a sharp return at either end of the traverse thus effecting by a simple modification of the crank motion what is usually done by a lever and a heart or circular cam or other more complicated device.

The crank pin *c* by which the link *b* is connected to the block *d* is or may be adjustable in a groove *d'* in the latter as shown detached at Figs. 4 and 5 or otherwise so that although the traverse of the bowl *g* in its groove is constant that of the crank pin *c* may be increased or decreased according to the length of bobbin required. In some cases the block *d* slides upon its crank-arm *e* which is in the form of a rod see Figs. 1, 2, 4 and 5 and it is prevented from turning thereon by passing the crank pin *c* through a small block *c'* shown detached at Fig. 3 sliding in a radial groove in a second crank-arm *e'* fixed on the aforesaid shaft *f* and coinciding with the direction of the first lever *e*. Or the crank-arm *e* may be made in the form of a slotted or grooved box either square (as shown on Figs. 6 and 7) or cylindrical (as shown at Fig. 8). In these cases the second crank-arm *e'* is dispensed with and in the latter case the blocks $c^{\times}$ are employed in the slots to keep the block *d* from turning in its crank-arm *e*.

I claim as my invention—

1. The combination with a traverse or slide-bar and a crank-arm, of a block movable on said arm, a crank-pin adjustable on said block, a link connecting said pin with said bar, and a stationary oblong cam curved around the center of the crank and engaging with said block, substantially as set forth.

2. The combination with a traverse or slide-bar and a crank-arm, of a block movable on said arm, a crank-pin adjustable on said block, a link adjustable as to its length and connecting said pin with said bar, and a stationary oblong cam curved around the center of the crank and engaging with said block, substantially as set forth.

3. The combination of a traverse or slide-bar, a crank-arm, a block movable on said arm, a crank-pin adjustable on said block, a cam formed by a groove in a stationary plate, a bowl secured to said block and adapted to run in said groove, said cam being curved around the center of the crank, substantially as specified.

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

JAMES EDWARD BROADBENT.

Witnesses:

J. E. HUGHES,

JNO. HUGHES.