

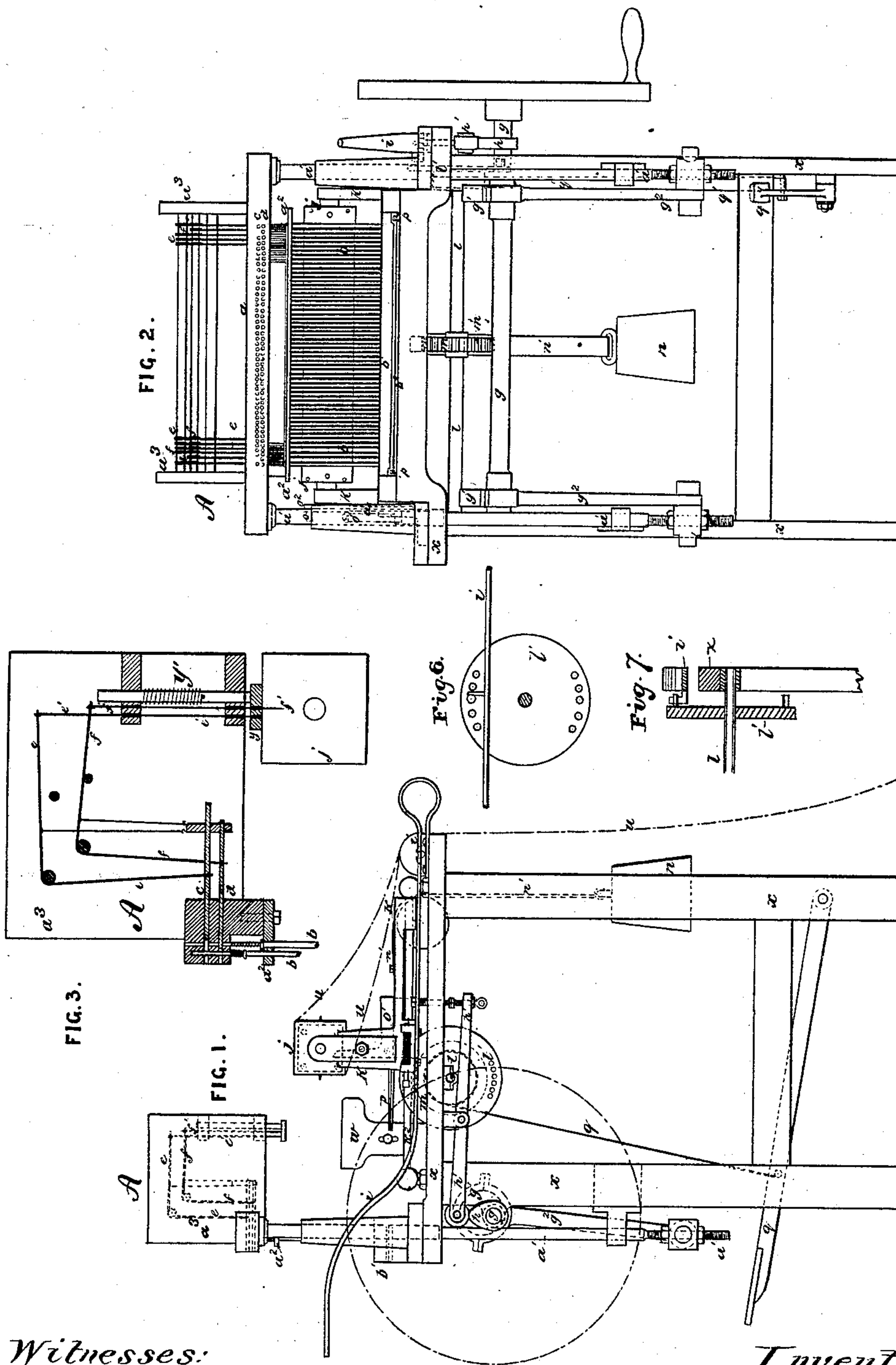
(No Model.)

2 Sheets—Sheet 1.

J. NUTTALL.  
MACHINERY FOR CUTTING CARDS.

No. 245,859.

Patented Aug. 16, 1881.



Witnesses:  
Donn S. Twitchell.  
C. Sedgwick

Inventor  
J. Nuttall  
By Munn & Co.  
Attorneys

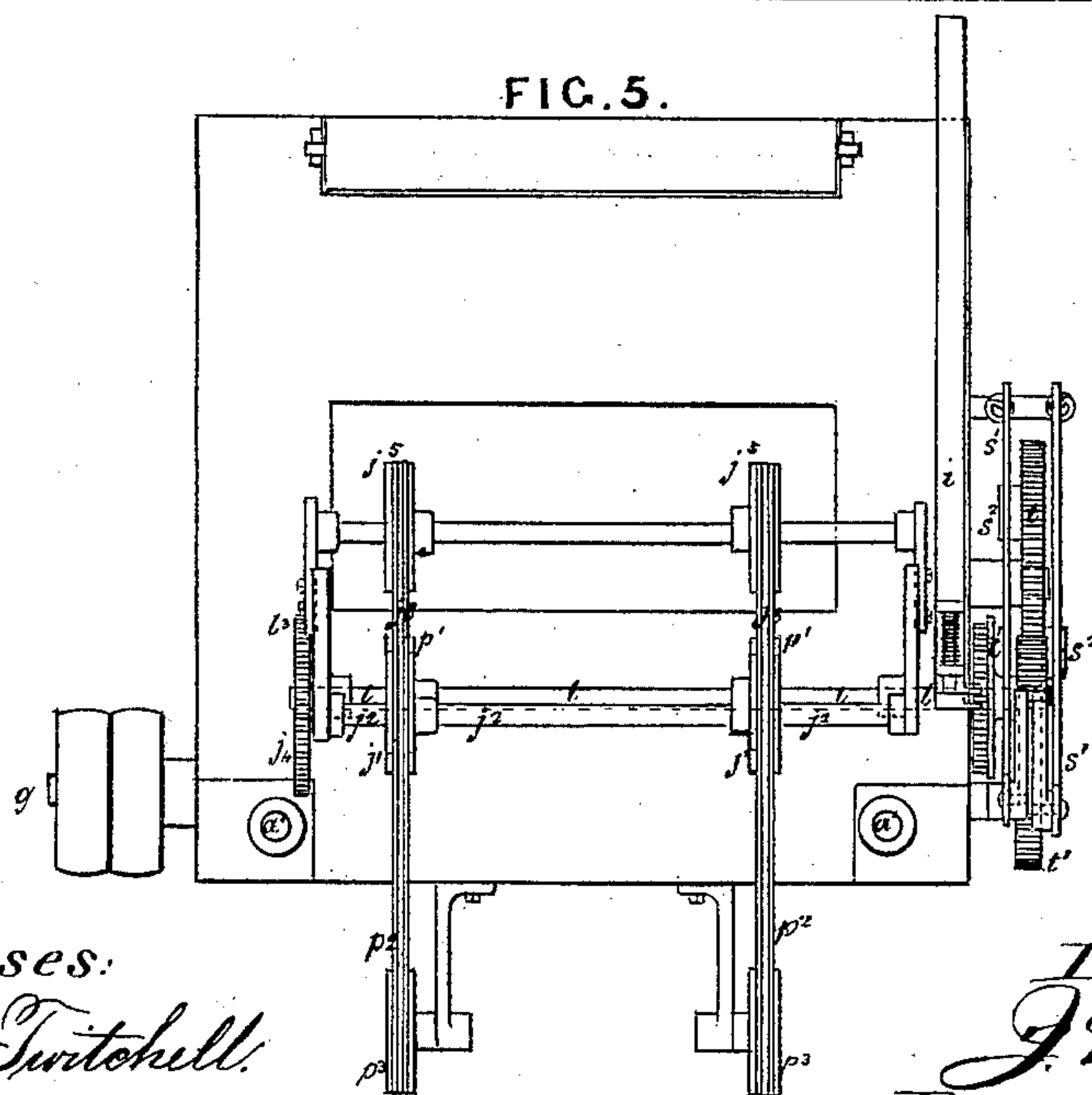
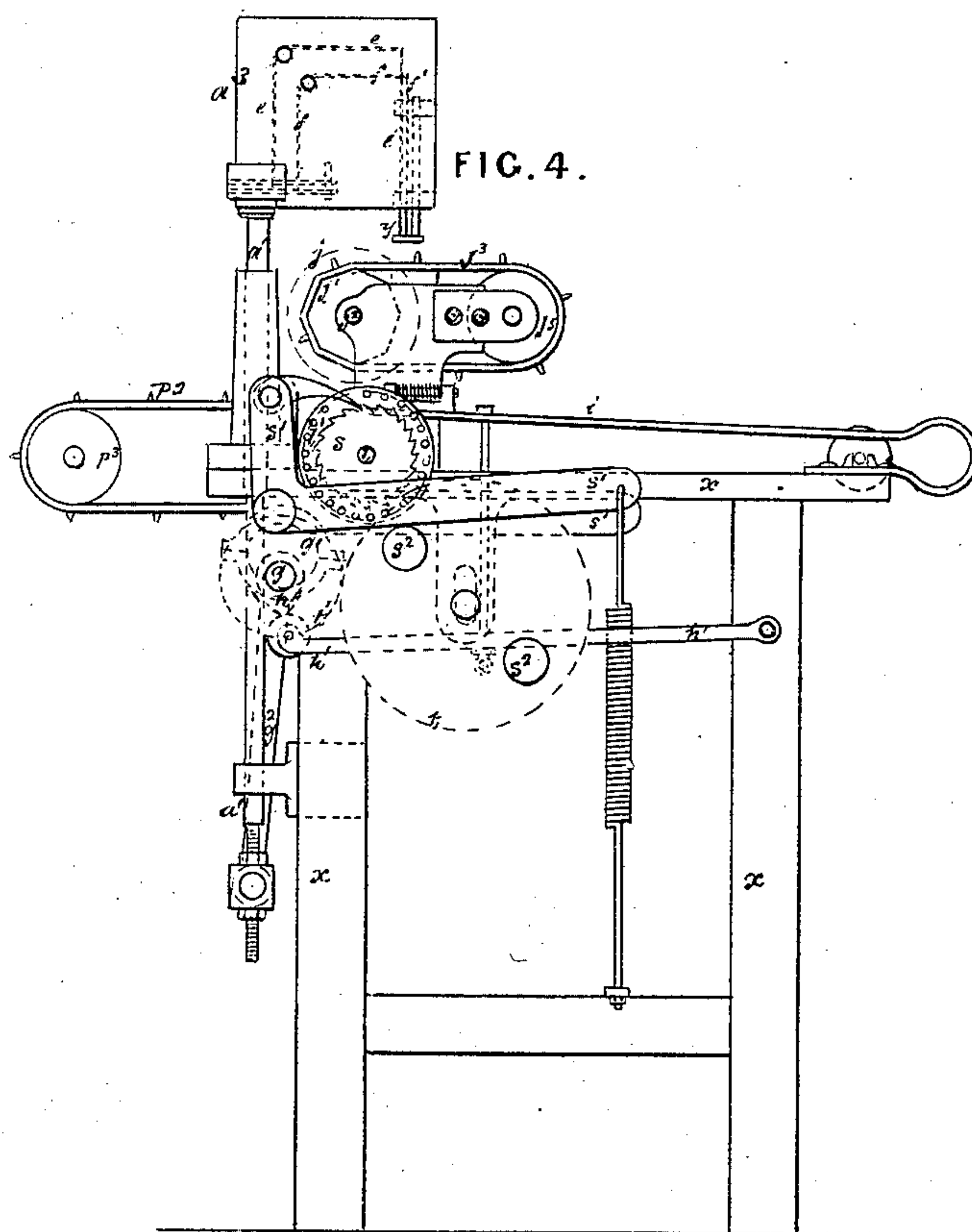
(No Model.)

2 Sheets—Sheet 2.

J. NUTTALL.  
MACHINERY FOR CUTTING CARDS.

No. 245,859.

Patented Aug. 16, 1881.



Witnesses:  
Dann S. Twitchell.  
C. Sedgwick

Inventor:  
J. Nuttall  
By Munn & Co  
Attorneys



# UNITED STATES PATENT OFFICE.

JAMES NUTTALL, OF HEAP BRIDGE, NEAR BURY, COUNTY OF LANCASTER,  
ENGLAND.

## MACHINERY FOR CUTTING CARDS.

SPECIFICATION forming part of Letters Patent No. 245,859, dated August 16, 1881.

Application filed March 19, 1881. (No model.) Patented in England May 4, 1880.

*To all whom it may concern:*

Be it known that I, JAMES NUTTALL, of Heap Bridge, near Bury, in the county of Lancaster, England, have invented certain new and useful Improvements in the Method of and Machinery for Cutting Cards, (for which I have obtained a patent in Great Britain, No. 1,882, bearing date May 4, 1880;) and I hereby declare the following to be a description thereof, reference being had to the annexed two sheets of drawings, forming part of this specification.

My improvements relate to the cutting of pattern-cards for looms; and the invention consists in the machine for effecting the same as described and claimed hereinafter with reference to the accompanying drawings.

In the drawings, Figure 1 is a side elevation of the improved card-cutting machine. Fig. 2 is a front elevation of the same. Fig. 3 is a vertical longitudinal section of the selecting-head. Fig. 4 is a side view, and Fig. 5 a plan view, of the machine as fitted for operation by power. Figs. 6 and 7 are detail views.

Similar letters of reference indicate corresponding parts.

The portions marked *x* are the main frame of the machine, carrying the operative mechanism.

*A* is the selecting-head, sustained above the frame by slide-rods *a'*, that are fitted to move in suitable guides. The slide-rods *a'* are fitted at their lower ends with adjustable gibs, to which are connected the rods *g<sup>2</sup>* of eccentrics *g'*, which are upon a cross-shaft, *g*, that carries a crank-handle for its operation, whereby the head *A* is reciprocated.

The parts of head *A* are as follows:

*a* is a cross-bar connected to slide-rods *a'*, formed with two rows of horizontal apertures, that receive keys *c d*, and two rows of vertical apertures, that receive punches *b*.

*a<sup>3</sup> a<sup>3</sup>* are end plates, sustained on bar *a* and carrying cross-bars, on which are hung crank-levers *e f*, that connect respectively with the upper and lower keys, *c d*, there being a lever, *e* or *f*, for each key.

*e' f'* are selecting-needles, suspended from the levers *e f* and working through suitable guides at the back of head *A*. These needles

correspond in number with the levers *e f*, keys *c d*, and punches *b*.

*y* is a presser-plate carried by a rod, *y'*, on which is a spiral spring for steadying the pattern-card when the selecting-head descends, which plate is perforated for the needles *e' f'* to pass through.

There are spiral springs above collars on punches *b*, tending to press them downward, and the downward motion is limited by the collars bearing on a plate, *a<sup>2</sup>*, attached to the under side of bar *a*.

The chain of cards used as patterns in cutting fresh cards is carried by a four-sided head or block, *j*, which is hung on pivots in end plates of sliding frame *k*, that is sustained on rods *k<sup>2</sup>*, fixed on the frame *x*. A strap, *n'*, connected to the frame *k*, sustains a weight, *n*, which tends to draw the frame back from the head *A*.

To the front of frame *k* are attached nippers *p p* for receiving the card to be cut.

A shaft, *l*, is sustained on the main frame of the machine and carries a pinion, *m*, that engages with a rack attached to the under side of frame *k*, and there is also fixed on shaft *l* a wheel or disk, *l'*, and a pulley, from which a strap, *q'*, passes to a treadle, *q*, so that by pressure on the treadle the shaft is turned. A lever, *h'*, is hung at the side of wheel *l'*, and bears by one end on a cam, *h*, fixed on the operating-shaft, *g*, while its other end is connected with a spring-arm or hand-lever, *i*, placed above frame *x*, and also at the side of wheel *l'*, which is provided with a series of pins projecting from one of its sides. The lever *i* is provided with a lug, which engages with the pins on the disk *l'* to prevent the shaft *l* from turning, and thereby holding the frame *k*, carrying the pattern-head *j*, from being moved forward or drawn back by the weight *n*, except when the lug on the lever *i* is disengaged from the pins on the disk by being depressed by the operator or drawn down by the cam *h* through the medium of the lever *h'*.

On one pivot of the head *j* is fixed a plate, *o<sup>2</sup>*, from which four pins, *o*, project, and on the main frame is hung a weighted arm or tumbler, projecting in the path of the lower pins,



o, so that as the head *j* moves back it is given a quarter-revolution by the contact with the tumbler, while at the forward movement the tumbler is pressed down without effect.

5 At *u* is shown the chain of pattern-cards passing around head *j*.

On the front of frame *k* are nippers *p* for receiving the card to be cut.

10 *w* is an adjustable steady-plate, over which the plate *o*<sup>2</sup> passes at its forward movement, so that the head *j* is prevented from turning during the cutting operation.

15 *b*<sup>2</sup> is a plate on which the cards rest while being cut, formed with holes for the punches to enter, and *b'* is a plate also perforated for the punches and placed above the plate *b*<sup>2</sup>, so that the cards may pass beneath.

The operation is as follows: The operator presses down arm or lever *i* with his hand, and 20 depresses the treadle *q*, thus drawing forward the frame *k* with the pattern-cards; the nippers open, and a blank card is placed between them. The treadle is then released, and the weight draws the frame *k*, with the pattern-card, beneath the needles *e f*, and blank card 25 beneath punches *b*, as required to cut the first two rows of holes; when the lever *i* is released, and the lug engaging with the pins on the disk *l* holds the said frame stationary. The 30 main shaft is then operated, and the eccentrics bring down the selecting-head. In descending, each needle that strikes a blank space of the pattern-card raises the end of its lever *e* or *f*, and the other end of the lever is 35 moved to draw back the key *c* or *d*, so that the corresponding punch *b* is pressed upward in the aperture of bar *a*, instead of cutting the blank card, while each selecting-needle that 40 passes through a hole in the pattern-card does not move the lever to which it is connected, and the key to which the lever connects remains across the aperture in which the corresponding punch is fitted, so that the punch is forced through the card to be cut. These po- 45 sitions are shown in Fig. 3. The head *A* then rises, and the cam *h*, acting by lever *h'*, draws down arm *i*, which allows one peg of wheel *l'* to pass, and the weight *n*, acting through the rack and pinion, moves frame *k* back a dis- 50 tance sufficient for the cutting of the second two rows of holes at the next descent of the head. Two rows of holes are thus cut at each revolution of the shaft.

The pattern-cards being in chain, the lacing 55 and peg holes are filled, and consequently corresponding holes would not be cut in the blank cards if provision were not made for that purpose. I form holes in the head *j*, near its ends, corresponding with the lacing and peg holes, 60 for the selecting-needles to enter and bend or crank the corresponding levers *e* or *f*, so that their upper ends are above the ends of the head, instead of the pattern-cards, and the levers that correspond with the middle lace-hole 65 are connected by cross-wires with the levers

that correspond with the end holes, so that they will work together.

In the power-machine shown in Figs. 4 and 5 the peg-wheel *l'* has pegs in number one for each two rows of holes in the card, and at in- 70 tervals the pegs are placed at a greater distance apart to allow for the joining of the cards.

75 *s* is a ratchet-wheel fixed on shaft *l*, and having the same number of teeth as there are pegs.

*s'* is a lever carrying a pawl that engages the ratchet-wheel.

80 *t* is a spur-wheel having studs *s*<sup>2</sup> for moving lever *s'*, and driven by a pinion, *t'*, on shaft *q*.

*l*<sup>3</sup> is a spur-wheel on shaft *l*.

85 *p'* are chain-pulleys on the same shaft, carrying chains *p*<sup>2</sup>, which pass also over the chain-pulleys *p*<sup>3</sup> and carry the cards to be cut, which will be laced together.

90 *j' j'* are chain-pulleys keyed on a shaft, *j*<sup>2</sup>, driven by spur-wheels *l*<sup>3</sup> and *j*<sup>4</sup> from shaft *l*. The chain-pulleys *j'* drive chains *j*<sup>3</sup>, passing over chain-pulleys *j*<sup>5</sup>, which chains carry the pattern-cards.

The lever *i*, actuated by cam *h*, is fitted to stop the shaft *l* and the chains while the cards are being cut.

95 At the ends of the presser-plate *y*, I make holes to fit pegs on the chains *j*<sup>3</sup>, to secure the chains while the selecting-needles act on the pattern-cards. I use, also, a similar presser-plate to hold the chains *p*<sup>2</sup> while the cards are being cut.

100 Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In machines for cutting cards, the combination of a reciprocating head carrying the punches and selecting-needles, a traversing 105 head carrying the pattern-cards and blanks, and mechanism, substantially as described, for giving an intermittent movement to the traversing head, substantially as shown and described. 110

2. The sliding punches *b*, keys *c d*, levers *e f*, and selecting-needles *e' f'*, in combination with the reciprocating head *A* and pattern block or cylinder *j*, substantially as shown and described, whereby the punches and selecting- 115 needles are operated by one motion of the head, as specified.

3. The cam *h*, lever *h'*, arm or lever *i*, wheel *l*, provided with pegs, pinion *m*, frame *k*, provided with a rack engaging the pinion, weight 120 *n* and strap, and the pattern-head *j*, substantially as shown and described, combined for operation as specified, whereby the traversing frame is moved back at every revolution of the operating-shaft, as specified.

JAMES NUTTALL.

Witnesses:

CHARLES ALFRED BARLOW,  
Patent Agent, Manchester.  
WILLIAM ALFRED JAMESON.