

No. 824,380.

F. PITTARD.

PATENTED JUNE 26, 1906.

READER OR MACHINE FOR PERFORATING PAPER TO BE USED WITH
THE JACQUARDS IN AUTOMATIC EMBROIDERY MACHINES.

APPLICATION FILED FEB. 21, 1905.

3 SHEETS—SHEET 1.

FIG. 2

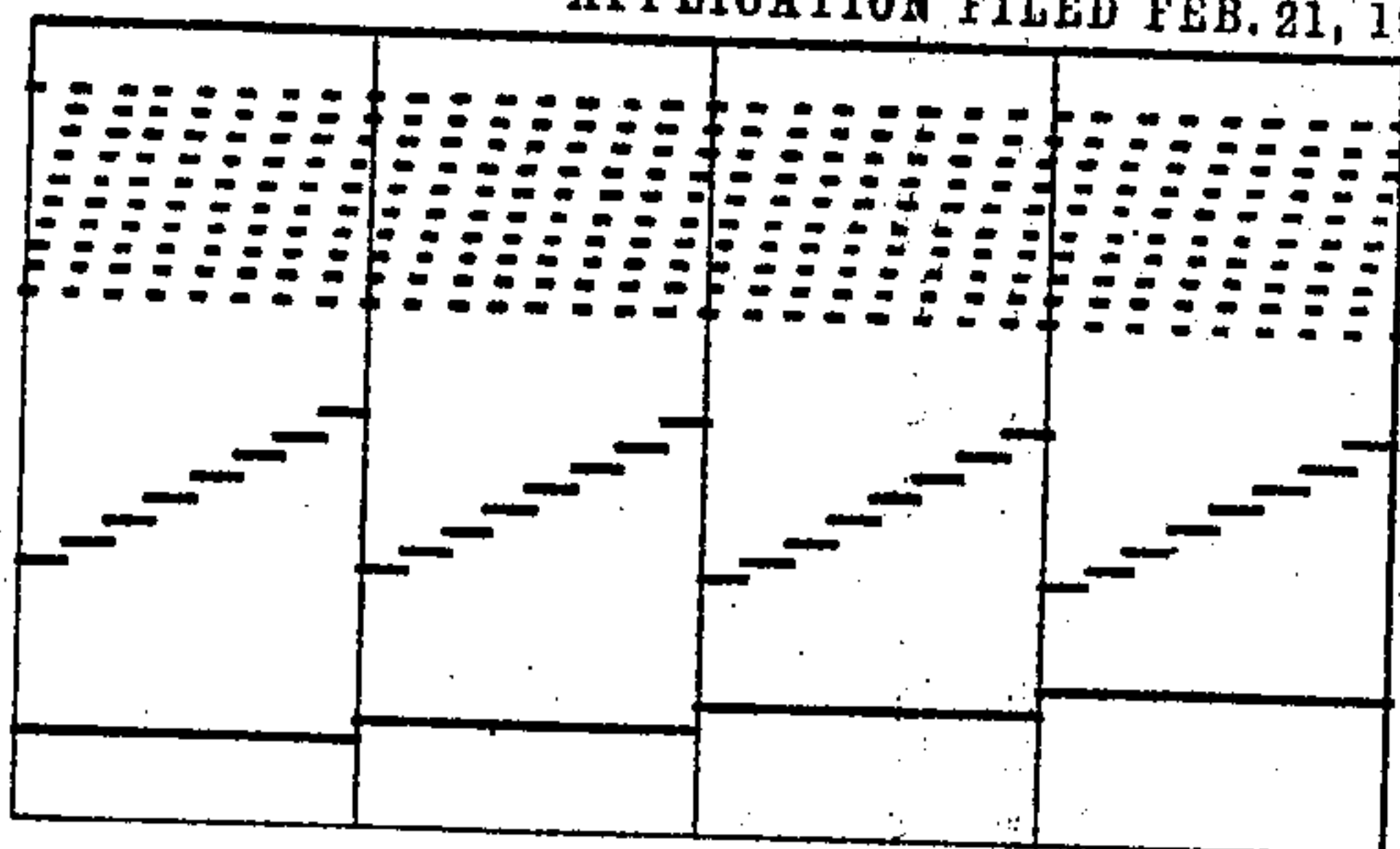
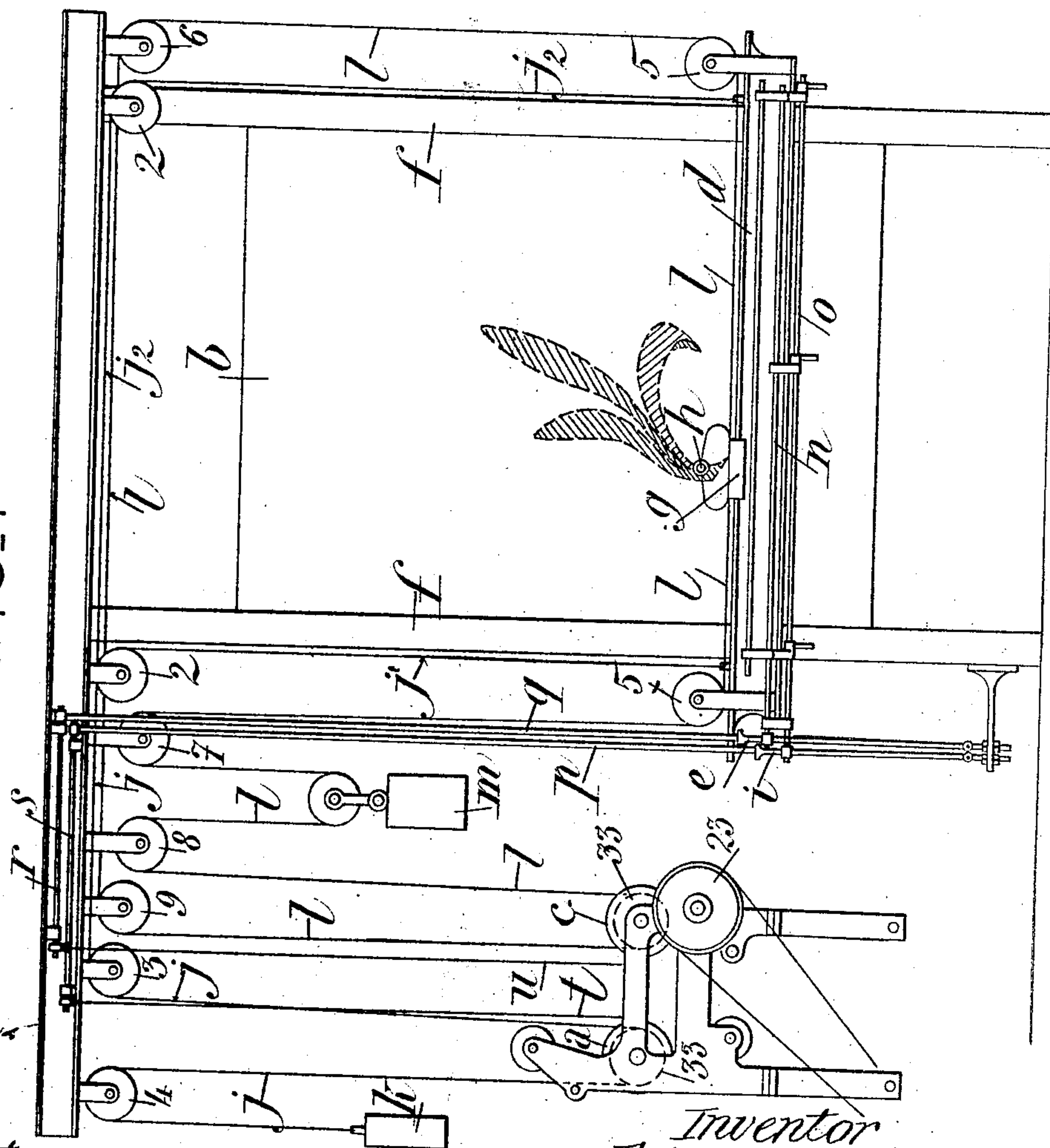


FIG. 1



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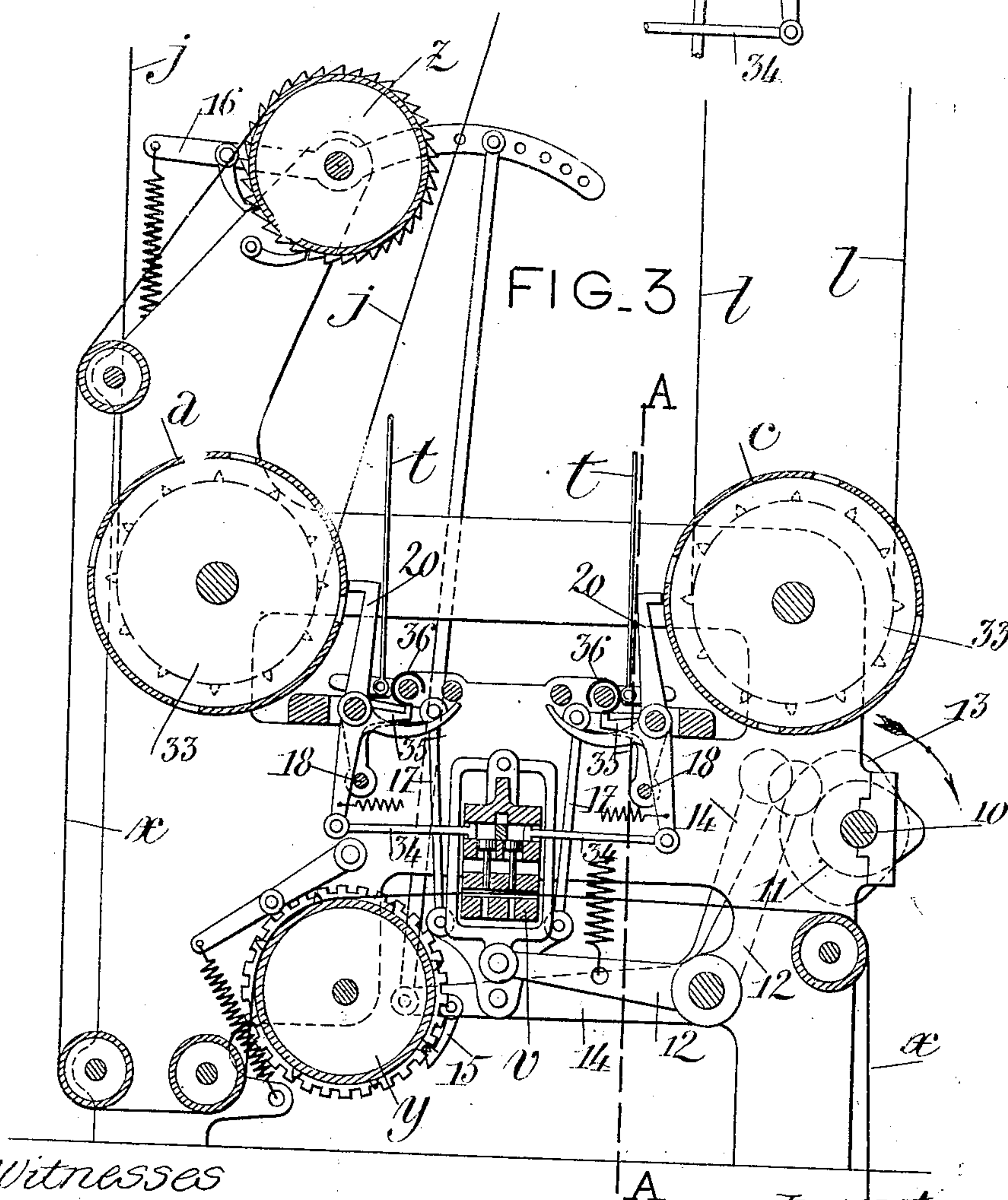
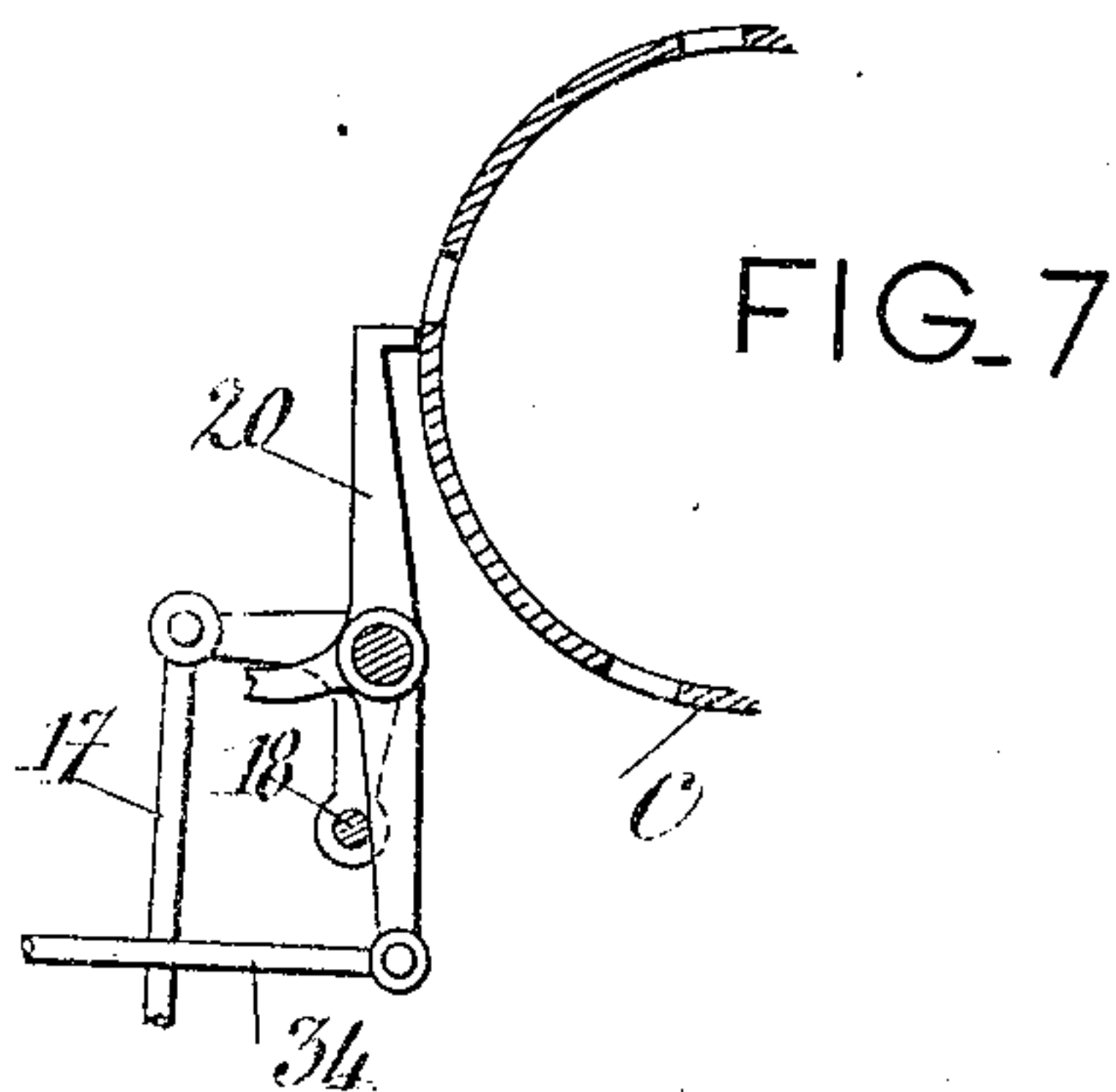
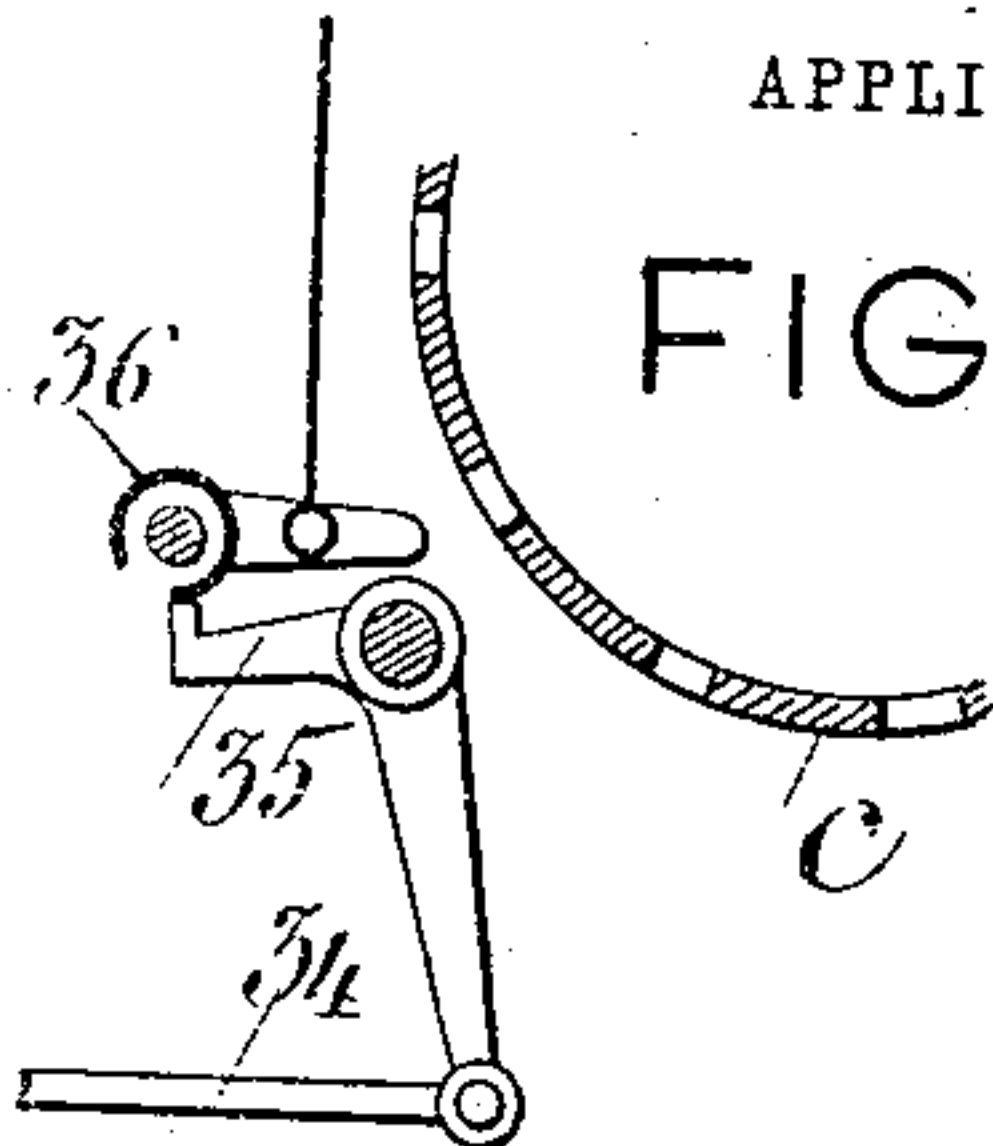
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3 SHEETS—S. ET 2.



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UNITED STATES PATENT OFFICE.

FRÉDÉRIC PITTARD, OF LYON, FRANCE, ASSIGNOR TO SOCIÉTÉ ANONYME DE BRODERIE AUTOMATIQUE, OF LYON, FRANCE.

READER OR MACHINE FOR PERFORATING PAPER TO BE USED WITH THE JACQUARDS IN AUTOMATIC EMBROIDERY-MACHINES.

No. 824,380.

Specification of Letters Patent.

Patented June 26, 1906.

Application filed February 21, 1905. Serial No. 246,774.

To all whom it may concern:

Be it known that I, FRÉDÉRIC PITTARD, a citizen of Switzerland, residing at 90 Boulevard du Nord, Lyon, France, have invented

5 new and useful Improvements in Readers or Machines for Perforating Paper to be Used with the Jacquards in Automatic Embroidery-Machines, of which the following is a specification.

10 The invention consists of a machine for perforating the paper used in the working of the jacquard in the automatic embroidery-machine forming the subject of United States Patent No. 714,129, dated November

15 25, 1902. In this machine the fabric is stretched on a vertical frame, which is moved in front of the needles. These movements are obtained simultaneously in the vertical and the horizontal direction by series of pawls

20 acting on racks or ratchets arranged in steps. The jacquard chooses from each series the pawl suitable for the motion to be given, this choice being determined by the holes perforated in the paper passing through the jac-

25 quard. The automatic reading has for its object to perforate these holes in the paper according to the indications given by the design to be reproduced, these indications being first transmitted to cylinders, which are

30 perforated according to a similar arrangement to that of the racks or ratchets in steps employed in the embroidery-machine, and these cylinders then transmit them to the perforator. The accompanying drawings

35 illustrate the arrangements employed for this purpose.

Figure 1 is a general view of the apparatus. Fig. 2 is a development of the perforated cylinders. Fig. 3 is a transverse section of the

40 perforator. Fig. 4 is a longitudinal section of the same drawn on the line A A of Fig. 3. Fig. 5 is a front view of the same, showing the driving mechanism. Figs. 6 and 7 are details of Fig. 3.

45 The apparatus shown in Fig. 1 consists of two parts—the reading apparatus, which follows the contours of the design drawn on a very large scale on the vertical board *b*, and the “perforator,” properly so called.

50 In front of the board *b* moves vertically a horizontal rod *d*, guided by the uprights *f*, and on the rod *d* moves horizontally a carriage *g*, carrying a pointed finger *h*, which

can thus be caused to follow all the contour of the design drawn on the board *b*. The rod *d* is supported by two metallic ribbons *j'* *j''*, passing over pulleys 2 2 and uniting into a single ribbon *j*, which descends from the pulley 3 to operate the cylinder *a* of the perforator, rises over the pulley 4, and is terminated by a counterweight *k*, balancing the weight of the rod *d*, which can thus be moved without much effort. To the carriage *g* are attached the two ends of a metallic ribbon *l*, which passes round the pulleys 5 5, mounted at the ends of the rod *d*, rises and passes over the pulleys 6 7, is stretched by a counterweight *m* between the pulleys 7 and 8, descends from the latter to drive the cylinder *c* of the perforator, and returns over the pulley 9 to the pulley 6. The counterweight *m* enables the ribbon *l* to remain always stretched notwithstanding the vertical motion of the rod *d*. It results from these arrangements that the vertical ascending or descending movements of the carriage *g* are transmitted to the cylinder *a* in extent and direction that its horizontal movements to right or left are transmitted in the same manner to the cylinder *c* and that it is only necessary to bring the finger *h* to any point of the board *b* to bring by that means the cylinders *a* and *c* to a determined position corresponding entirely to this point. In order to insure this agreement, the pulleys 3 3, Figs. 1, 3, and 4, round which pass the ribbons *j* and *l*, are furnished with teeth which gear with perforations of the ribbons.

Independently of the operation of the cylinders *a* and *c*, which serves to read the design, the reading apparatus also comprises the operation of various parts serving for putting the perforator in operation and to the piercing of holes which, in the embroidery-machine, act to determine accessory functions, such as the stoppage of the machine, the tension of the threads, &c. This operation is effected by hand at the moment convenient to the reading and by means of rods, such as *n o*, of variable number, extending the entire length of the rod *d* and capable of being operated at the same time as the carriage *g*. These rods *n o* carry at one of their ends fingers *e i*, which bear upon vertically-stretched metallic ribbons *p q*. These ribbons *p q* thus shortened by the pressure of the

fingers *e i* transmit their movement by mechanical connections *r s* to other ribbons *t u*, connected to the mechanism of the perforator.

5 The perforator, Figs. 3, 4, and 5, consists, first, of two cylinders *a* and *c*, the surface of which is perforated, as indicated by the development, Fig. 2, and upon which bear series of fingers 20, the ends of which being
10 bent in the form of nibs can enter the perforations; second, of mechanism for drawing paper forward; and, third, of the perforating mechanism. The paper *x*, supplied from an exterior roller, passes through the perforator
15 *v*, then over the drawing-roller *y*, and is wound on the receiving-roller *z*. The movements are given to the apparatus by the shaft 10, which drives the perforator by means of the cam 11 and levers 12. Another
20 cam 13 drives by the levers 14 the pawls 15 and 16, which effect the periodic winding of the paper. The same levers also act by means of the connecting-rods 17 upon raising-levers 18, which remove at the required
25 time the fingers 20 from the perforated cylinders.

The driving-pulley 21, Fig. 4, receives a continuous motion from any suitable motor. It is mounted loosely on the shaft 10 and
30 drives the latter only during the duration of one revolution at the moment when the reading operative, having brought the cylinders into the required position, operates the ribbon *u*, Figs. 1 and 5. For this purpose
35 the pulley 21 is fixed to a notched wheel 23, with which a pin 24 can engage, such pin being carried by an elbow-lever 25, articulated to the end of an arm 26, keyed on the shaft 10. Ordinarily the pin 24 is disengaged
40 from the notched wheel and engaged in a fixed notch carried by the arm 27. It is maintained in this position by a pawl 22, connected to the ribbon *u*. The wheel 23 then turns without driving anything. When the
45 reading operative by means of the rod *n*, Fig. 1, acts upon the ribbon *u*, the latter raises the pawl 22 and liberates the lever 25, which by the action of a spring 37 causes the pin 24 to engage in one of the notches of the wheel
50 23. This latter then causes the lever 26 and shaft 10 to move with it; but before the completion of a revolution, the operative having let go the band *u*, ratchet 22 is made to return to its position by its own weight, while lever
55 25, which continues to turn with arm 26, meets ratchet 22 after the shaft has made one revolution, causing thus stud 24 to be disengaged from the notched wheel 23 and to be engaged in the fixed notch of lever 27. The
60 notched wheel continues therefore to turn without taking along stud 24, and the latter being fixed by lever 27 all the parts with which it is connected will remain at rest until band *u* is again actuated. When the reading
65 operative has brought the finger *k*, Fig. 1, to

a point of the design where the needle should pass through the fabric, it may happen that this point does not exactly correspond with one of the small divisions which have
70 served to trace the perforations of the cylinders. The position of the latter is rectified by a cam 19, Figs. 4 and 5, which from the commencement of the movement acts by the lever 28, connecting-rods 29, and balance-levers 30 upon the pawls 31, which latter act
75 upon ratchet-wheels 32, fixed to the cylinders. These are then fixed to their exact position when the fingers 20, Figs. 3 and 4, liberated from the raising-levers 18, come to bear upon their surface. Cam 19 is secured on
80 shaft 10, which makes but one revolution during each operation. Said cam is concentric on the greater part of its circumference and operates the ratchets 31 only during a very
85 short moment at the beginning of the movement when the cylinders *a* and *c* are nearly brought into their position. Ratchets 31 bring then the cylinders into their exact position and keep them there during that time
90 required for engaging the fingers 20 in suitable perforations. When the revolution of shaft 10 is nearly completed, lever 28 falls into the recess of cam 19, and the ratchets 31
95 redescend, however, at this moment. Shaft 10 and cam 19, secured to the latter, are rendered immovable, and ratchets 31 recommence their function only when band *u* is again actuated.

The perforations of the cylinders *a* and *c*, of which Fig. 2 shows the development, are
100 divided into several series corresponding to the series of pawls of the jacquard and arranged in similar manner, so that in any given position of the cylinder a single finger
105 of each series can enter the perforations. These fingers then push back in the perforating apparatus *v* the rods 34, the heads of which become placed above corresponding punches, so that when the perforating apparatus is operated by the levers 12 these
110 punches alone pass through the paper. Other punches operated at each stroke perforate on the edges the holes, serving to draw the paper forward either by the roller *y* or by the jacquard. Lastly, other fingers 35 (shown in
115 detail at Fig. 6) can at the will of the reader operate special punches of variable number. (These fingers, raised like the others by the raising-levers 18, are placed in action by the
120 ribbons *t t*, which operate the cylinders 36, furnished with a groove which comes in front of the nib of the finger when the reader operates the corresponding ribbon *t*. The holes
125 perforated by these punches serve to determine accessory functions of the embroidery-machine and may be varied in number and position, according to the nature of the embroidery to be executed. Each point of the
130 design is thus figured on the paper by two rows of holes, one of which corresponds to

the vertical position of the point and the other to its horizontal position. These two rows of holes transported into the jacquard and placed in relation with two series of
 5 pawls of a similar arrangement to that of the fingers of the perforator will place in operative position certain of these pawls, which acting the ones on the horizontal motion, the
 10 others on the vertical motion, of the fabric will bring before the embroidery-needle the point corresponding with the point figured on the design.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an apparatus for automatically perforating paper used in the working of a jacquard employed in automatic embroidery-machines, a reader composed of a finger capable of receiving simultaneously a vertical motion and a horizontal motion so as to follow the contour of the design, two perforated cylinders, connections for transmitting the horizontal movement of the finger to one cylinder
 25 and the vertical movement to the other cylinder, fingers adapted to enter the perforations in the cylinders, one finger at a time in a cylinder, punches, and means operated by the finger which enters the perforation to
 30 cause the corresponding punch to act.

2. In an apparatus for automatically perforating paper used in the working of a jacquard employed in automatic embroidery-machines, a reader composed of a finger capable of receiving simultaneously a vertical motion and a horizontal motion so as to follow the contour of the design, two perforated cylinders, connections for transmitting the horizontal movement of the finger to one cylinder

der and the vertical movement to the other cylinder, fingers adapted to enter the perforations in the cylinders, one finger at a time in a cylinder, punches, and means operated by the finger which enters the perforation to cause the corresponding punch to act and
 45 means for operating some of the punches by hand-controlled means from the reader.

3. In an apparatus for automatically perforating paper used in the working of a jacquard employed in automatic embroidery-machines, a reader composed of a finger capable of receiving simultaneously a vertical and a horizontal movement, two perforated cylinders, connections for transmitting to one cylinder the vertical movement of the finger
 55 and the horizontal movement to the other cylinder, fingers adapted to enter the perforations in the cylinders, one finger at a time in a cylinder, punches, means for feeding the paper past said punches, means for operating
 60 the punches means operated by the finger which enters the perforation in the cylinder to cause the corresponding punch to act on the paper, means for causing the fingers to leave the perforations, means for rectifying
 65 the position of the cylinders, a shaft and cams thereon for operating the paper-feeding means, the punch-operating means, the finger-removing means and the rectifying means.

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

FRÉDÉRIC PITTARD.

Witnesses:

GASTON JEAUNIAUX,
 MARIN VACHOU.