

E. HUEBLER.
 APPARATUS FOR THE PRODUCTION OF FRINGES.
 APPLICATION FILED JUNE 30, 1908.

970,055.

Patented Sept. 13, 1910.

3 SHEETS—SHEET 1.

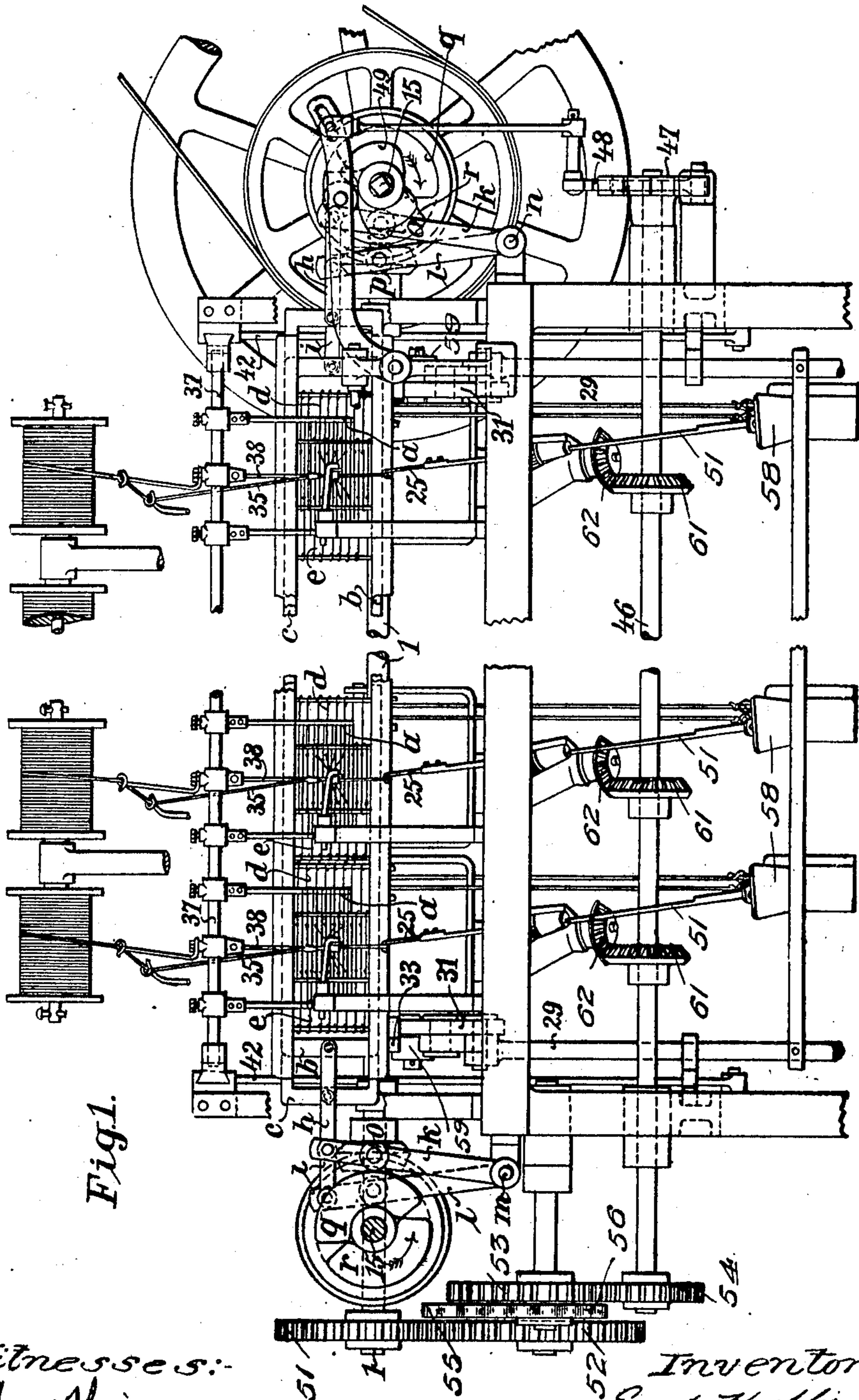


Fig. 1.

Witnesses:
 Henry Thies
 J. George Barry

Inventor:
 Ernst Huebler
 by attorney
 Thomsen & Co.

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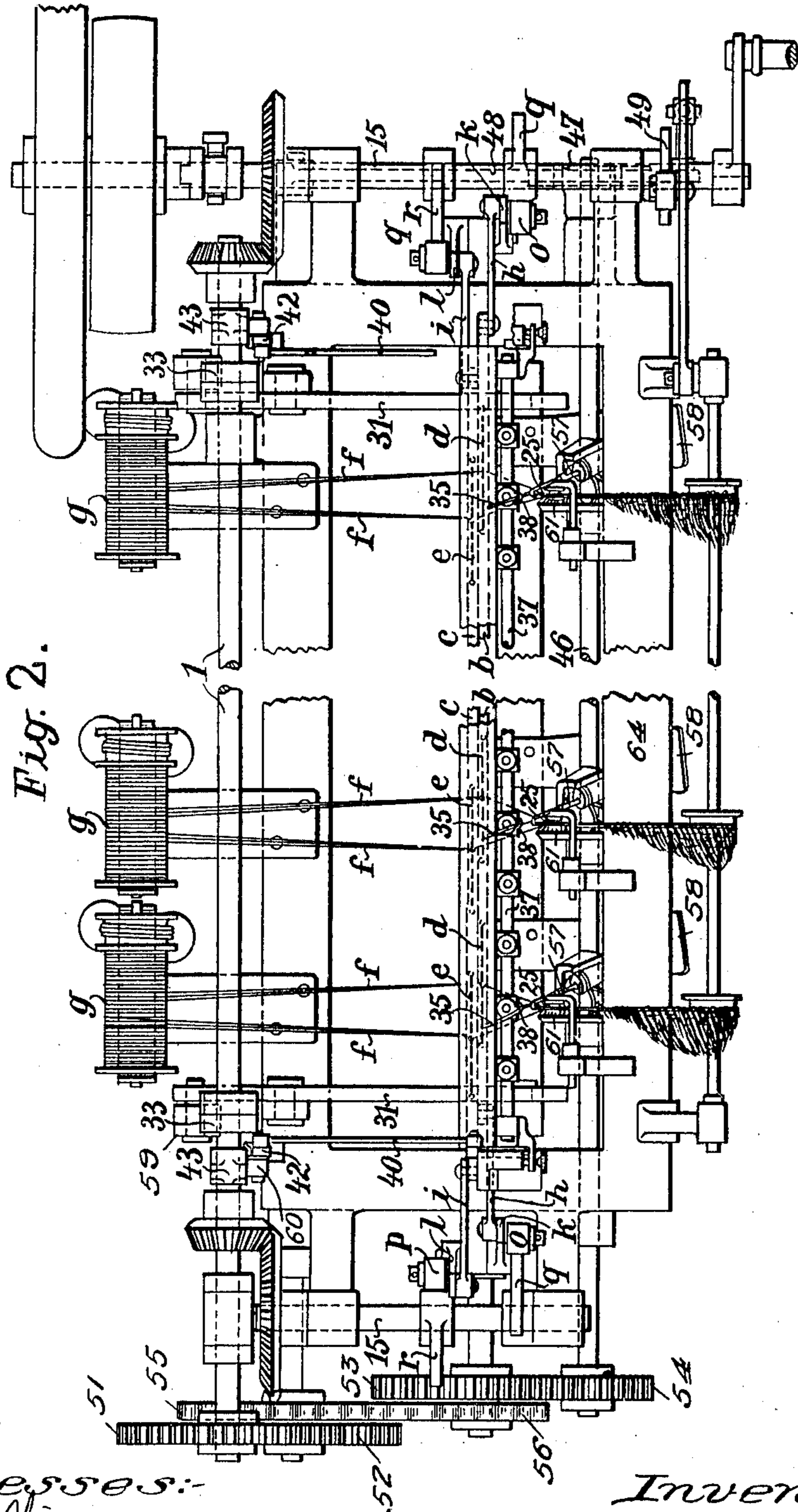


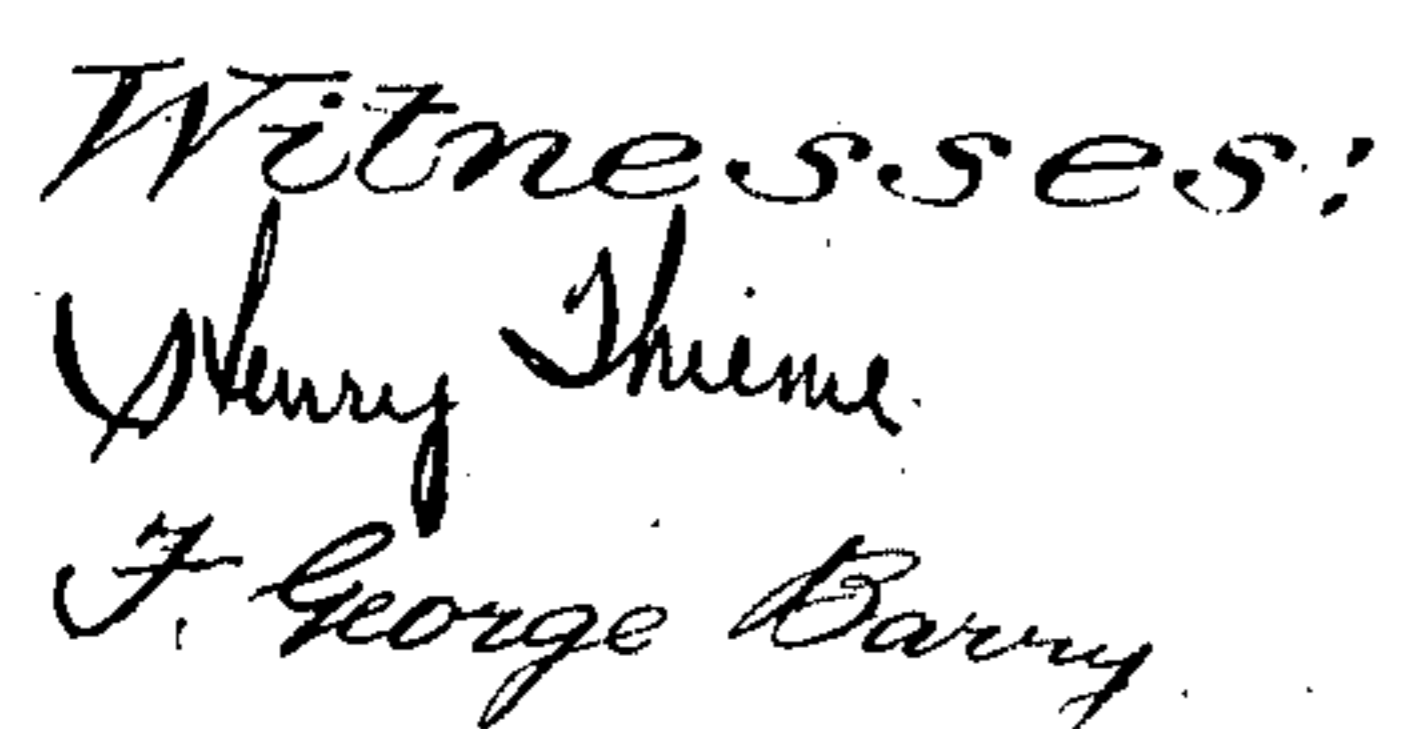
Fig. 2.

Witnesses:
 Henry Thime
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Inventor:
 Ernst Huebler
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3 SHEETS—SHEET 3.



Inventor:-
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UNITED STATES PATENT OFFICE.

ERNST HUEBLER, OF DRESDEN, GERMANY.

APPARATUS FOR THE PRODUCTION OF FRINGES.

970,055.

Specification of Letters Patent. Patented Sept. 13, 1910.

Application filed June 30, 1908. Serial No. 441,259.

To all whom it may concern:

Be it known that I, ERNST HUEBLER, a subject of the King of Saxony, and resident of Louisenstrasse 10, at Dresden, Kingdom of Saxony, German Empire, have invented new and useful Improvements in Apparatuses for the Production of Fringes, of which the following is a specification.

The present invention has for its object improvements in apparatus for the production of fringes.

In a known apparatus for the manufacture of fringes a fringe-thread fastened at one end to a tension or selvage thread is drawn off from a bobbin into the shape of a loop of required length by a hooked needle moved up and down and rotated around its central longitudinal axis. The loop formed is twisted into the shape of a fringe-stem to be fastened to the tension-thread by means of two winding-threads running in opposite directions one to another. However the fringes produced by the process mentioned above are provided with a selvage so narrow that they are unfit for sewing; therefore, these fringes can be used for special purposes only.

Now the object of this present invention is to arrange the apparatus for the production of fringes described above in such a manner that all kinds of fringes, for instance curtain-, gold-, silver-fringes and the like of any suitable width and provided with a fabric-like sewing-selvage of any width can be produced.

I am well aware that apparatus are known in which fringes provided with a woven sewing-selvage of any suitable width can be produced. In such known apparatus however the warp-threads binding the fringe-thread in the manner of a fabric or web and the fringe-thread itself are raised and lowered by heddles to be moved up and down. The pressing of the fringe-threads against the fabric produced is obtained by a reed arranged in a lathe and the necessary stretching and twisting of the fringe stems taking place in a direction at a right angle to the warp-threads is effected in a horizontal direction. In consequence of this fact and in using several apparatus arranged side by side for the production of fringes of a width up to 10 inches the entire apparatus must be of extraordinary large dimensions in width so that such apparatus to be mounted necessitates a very large area. Besides this, the

construction of an apparatus of necessary dimensions in width necessitates a larger quantity of material and the arrangement of heddles moved up and down by treadles and weights and rotating hooks moved to and fro is objectionable.

With a view to overcoming the above named objections, my present invention is characterized by the following coacting parts, to wit: an automatic weaving device, a rotary hooked needle and a thread laying guide. The weaving device is composed of a reed and heddles and the rotary hooked needle may be moved axially, and the thread laying guide can be moved forward and backward. The heddles situated in rear of the thread guide mentioned allow the passage of the binding-threads to be drawn off from a bobbin for the fringe-stems to be formed. Such heddles are positively moved horizontally to and fro in such a manner that by the coöperation of such parts together with the rotary hooked needle moved in an upward and downward direction, fringes provided with woven sewing-selvages are produced.

By the axially movable and rotating hooked needle together with the weaving-device moved to and fro in a horizontal plane fringes of a width of two to ten inches can be produced in a most expeditious, economical and efficient manner.

Figure 1 shows a longitudinal elevation and Fig. 2 a plan of several mechanisms forming together the apparatus according to the present invention. Fig. 3 shows a vertical section of Fig. 1 and Fig. 4 shows on a larger scale some fringes produced together with the parts necessary to bind in.

All fringe producing mechanisms of the apparatus are actuated by hand or power from a shaft 15, the rotary movement of which is transmitted by bevel-wheels to the shaft 1 and from it to a second shaft arranged in the left hand part of the apparatus. The ratio of the diameters of the bevel wheels is such that the shaft 1 is twice rotated during one revolution of the shaft 15.

The numeral 25 indicates the hooked needles which are intermittently rotated by a corresponding rotary movement of the shaft 46 from the shaft 1 by means of pinions 51, 52, 53 and 54 and the wheel-segments 55 and 56 shown in Figs. 1 and 3. The segment 55 forms part of or is secured to the pinion 52 and, during its permanent

rotary movement, engages intermittently the segment wheel 56 fastened to the shaft of the pinion 53. These wheels are so arranged that the teeth of one or more of them may be changed in a well known manner so that the revolutions of the hooked needles necessary for fringes of a width of from two to ten inches can be varied in number within a very short time by correspondingly inserting or removing teeth.

The hooked needles 25 are fixed to spindles 57 the lower ends of which rest on supports 58 held by the two rods 29 arranged in lateral bearings. Each of such rods is connected to one of the ends of an oscillating double-armed lever 31 the other end of which is provided with a roller 59 and actuated by a cam 33 arranged on the shaft 1 in such a manner that the rods 29 and thereby the supports 58 with the hooked needles 25 are raised and lowered correspondingly for the purpose of engaging and drawing downward the fringe-thread 35. A rod 37 carrying the fringe-thread guides or carriers 38 is arranged above the hooked needles 25 and connected at both ends by connecting-rods 40 to one armed oscillating levers 42 provided with rollers 60. The rollers 60 of the oscillating levers 42 are actuated by cams 43 secured to the shaft 1 in such a manner that the rod 37 carrying the thread-guides 38 is positively moved in a forward and backward direction at the right moment.

For the rotary movement of the spindles 57 of the hooked needles 25 a series of bevel-wheels 61 the number of which corresponds to the number of such hooked needles is fastened to the shaft 46 intermittently rotated as described above. Each of the bevel-wheels 61 engages a bevel-wheel 62 arranged on the lower end of a spindle 63. All such spindles are supported within a casing 64, connected or fastened at its ends to the rods 29 in a convenient manner. On the upper part of the spindles 63 the pinions 65 are provided with engaging pinions 66 on the spindles 57 of the hooked needles 25. On rotating the shaft 46 these hooked needles are intermittently rotated by the bevel wheels 62 and pinions 65 and 66, as clearly seen in Fig. 3.

A reed *a* provided for each fringe producing mechanism is adjustably secured to the rod 37 carrying the fringe thread guides 38 and is moved forward and backward by the to and fro movement of these thread guides. Two frames *b* and *c* arranged in rear of the reeds *a* are guided in a suitable manner and positively and horizontally moved to and fro in the following manner: Both ends of each of the frames *b* and *c* are connected by rods *h* and *i* to the levers *k* and *l*. The levers *k*, *l* of the lefthand side of the machine are pivoted at *m* in bearings

so as to be oscillated and the levers *k*, *l* of the righthand side of the machine are pivoted at *n*, Fig. 1, in bearings, so as to be oscillated likewise. The levers *k*, *l* are provided with lateral rollers *o*, *p* actuated by the cams *q*, *r* fixed to the shafts 15 in such a manner that by one rotation of the latter the frames *b* and *c* are twice and positively moved one against another. Each frame *b* and *c* carries for each fringe producing device the same number of heddles *d* and *e* horizontally fastened on vertical rods.

The binding threads *f* for the formation of the sewing selvage necessary for the fringes are passed through the heddles *d*, *e* and the reeds *a* and drawn off the bobbins *g* suitably arranged in bearings. During each to and fro movement of the frames *b* and *c* the heddles *d*, *e* cause the binding or intersecting of one fringe-stem by the threads *f* as shown in Fig. 4 whereby fringes provided with a woven sewing selvage of larger or smaller width can be produced.

In case it is intended to produce a sewing selvage of extraordinary density or width it is necessary only to pass a group of two or more threads *f* separately guided through the heddles through the space situated between each two splits of the reed.

In the arrangement shown in Fig. 4 the threads *f* separately passing through the heddles *d* and *e* are separately guided through a space situated between each two splits of the reed and the hooked needle 25 has just drawn the fringe thread 35 in the shape of a loop of necessary length through the lease of shed formed by the threads *f* opened by the heddles *d*, *e*. In the next moment, the thread guide 38 advances together with the reed for the purpose of beating the fringe-thread drawn downward to the finished fabric. Afterward the loop is bound or intersected into the threads *f* by the next alternate movement of the frames *b* and *c* and twisted into the shape of a fringe-stem by the rotary movement of the hooked needle subsequently taking place. By adjusting the stroke of the hooked needle fringe-stems of any length can be produced at the same time, such lengths depending upon the adjustment of such stroke.

For securing the right position of the hook of each hooked needle, when at rest, necessary for removing such hook from the finished fringe stem, a ratchet wheel 47 secured to the shaft 46 is engaged by a pawl 48 to be disengaged by a cam 49. This pawl 48 must be raised and lowered again twice during one revolution of the shafts for the reason that the production and binding or intersection of the two fringe-stems must be effected during such one revolution. For this purpose the cam 49 is formed in the shape of two wings as clearly seen in Fig. 1,

so that the pawl 48 can engage the ratchet-wheel 47 after each formation of the fringe-stem, to secure the right position of the hooked needle necessary for removing it
5 from the fringe-stem by the picker 50.

What I claim is:

10 In an apparatus for the production of fringes provided with a woven sewing sel-
vage, a hooked needle, means for rotating
the needle and simultaneously moving the
same axially for drawing out and twisting a
predetermined amount of thread, and a
thread guide capable of a horizontal re-
ciprocating movement, in combination with

an automatic weaving device comprising a 15
reed, means for horizontally reciprocating
the reed, heddles situated in rear of the reed
and means for positively and horizontally
reciprocating the heddles in a direction
transverse to the movement of the reed. 20

In testimony, that I claim the foregoing
as my invention, I have signed my name in
presence of two witnesses, this seventeenth
day of June, 1908.

ERNST HUEBLER.

Witnesses:

PAUL ARRAS,
CLÄRE SIMON.