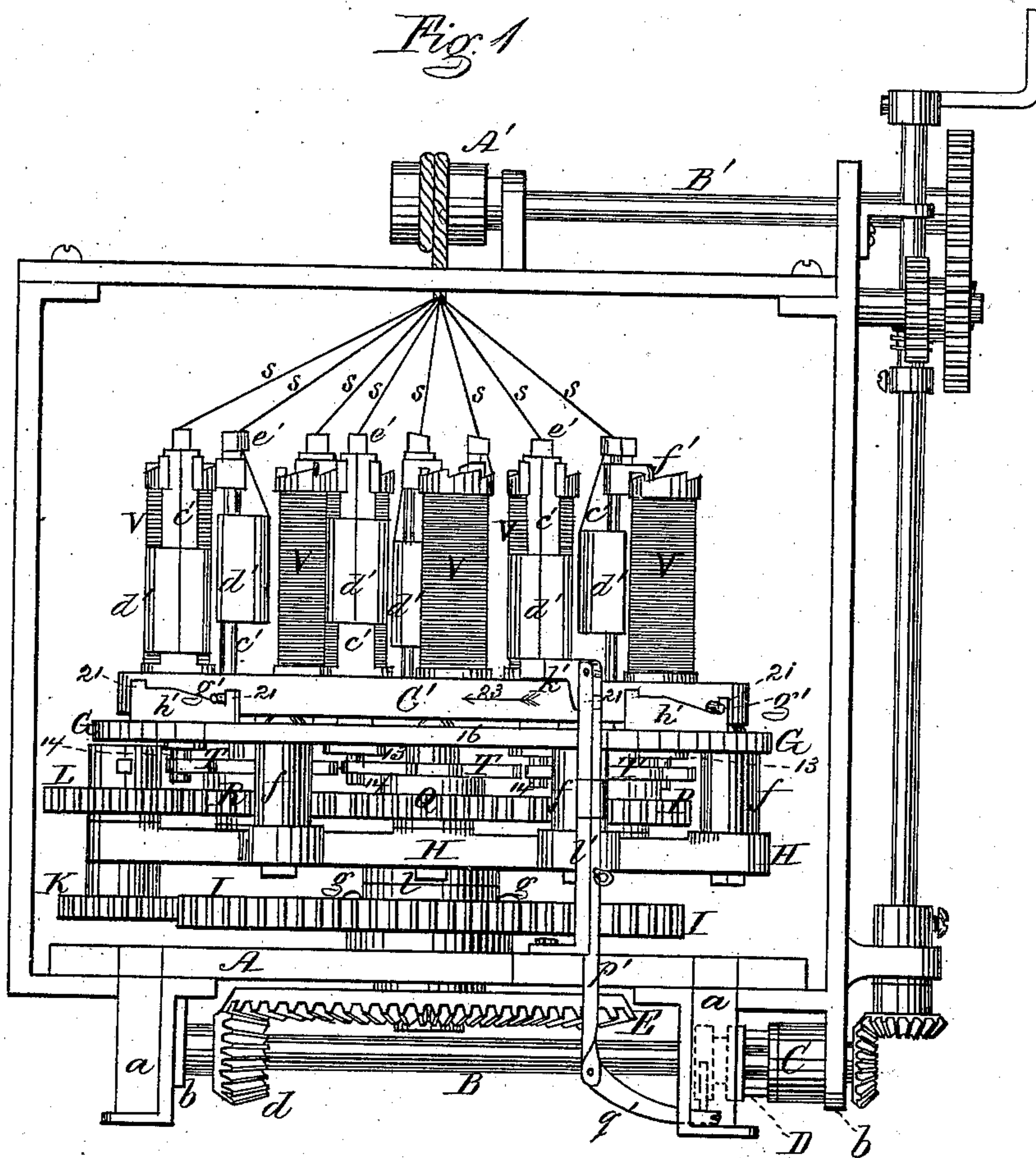


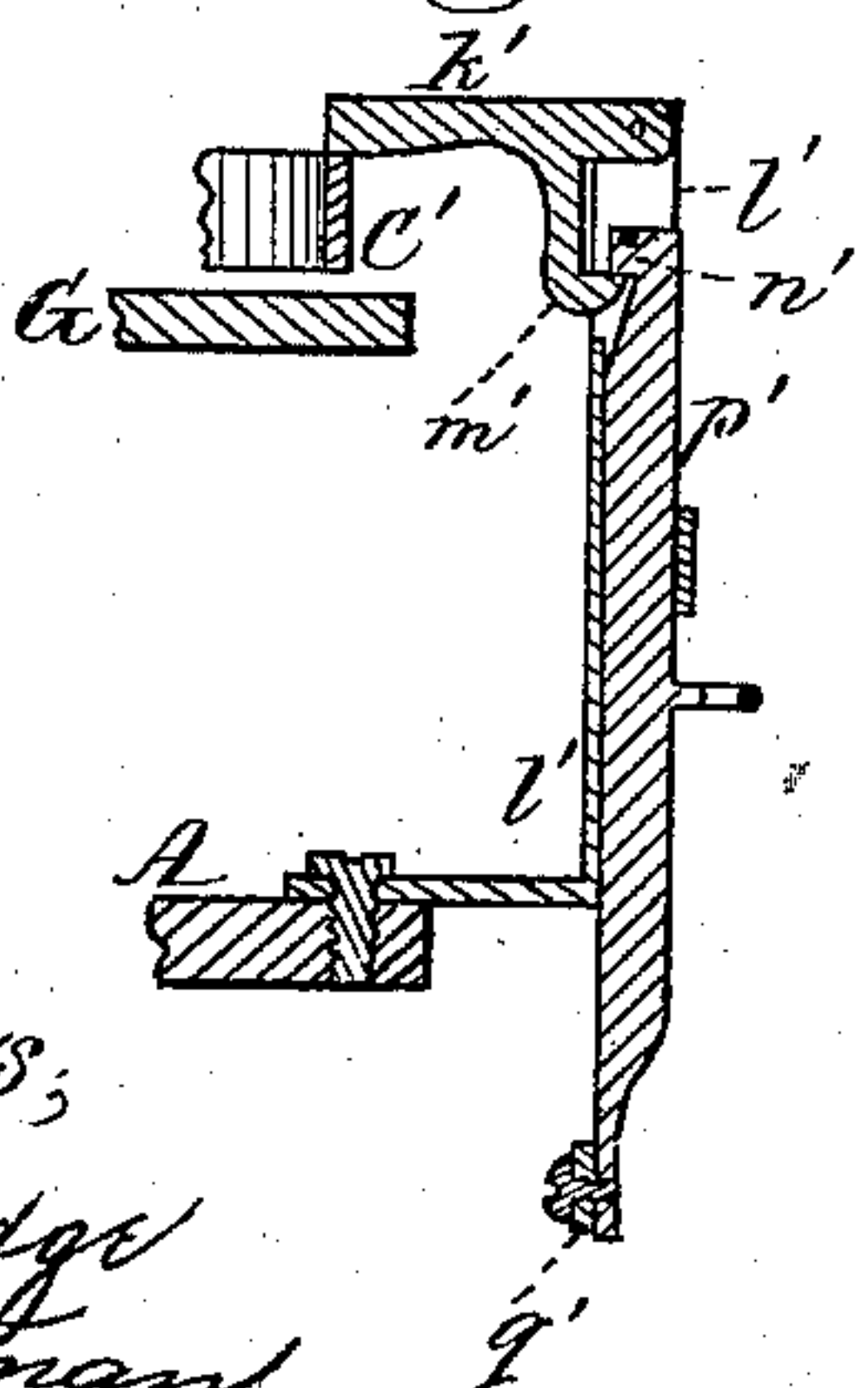
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No. 227,940.      Patented May 25, 1880.

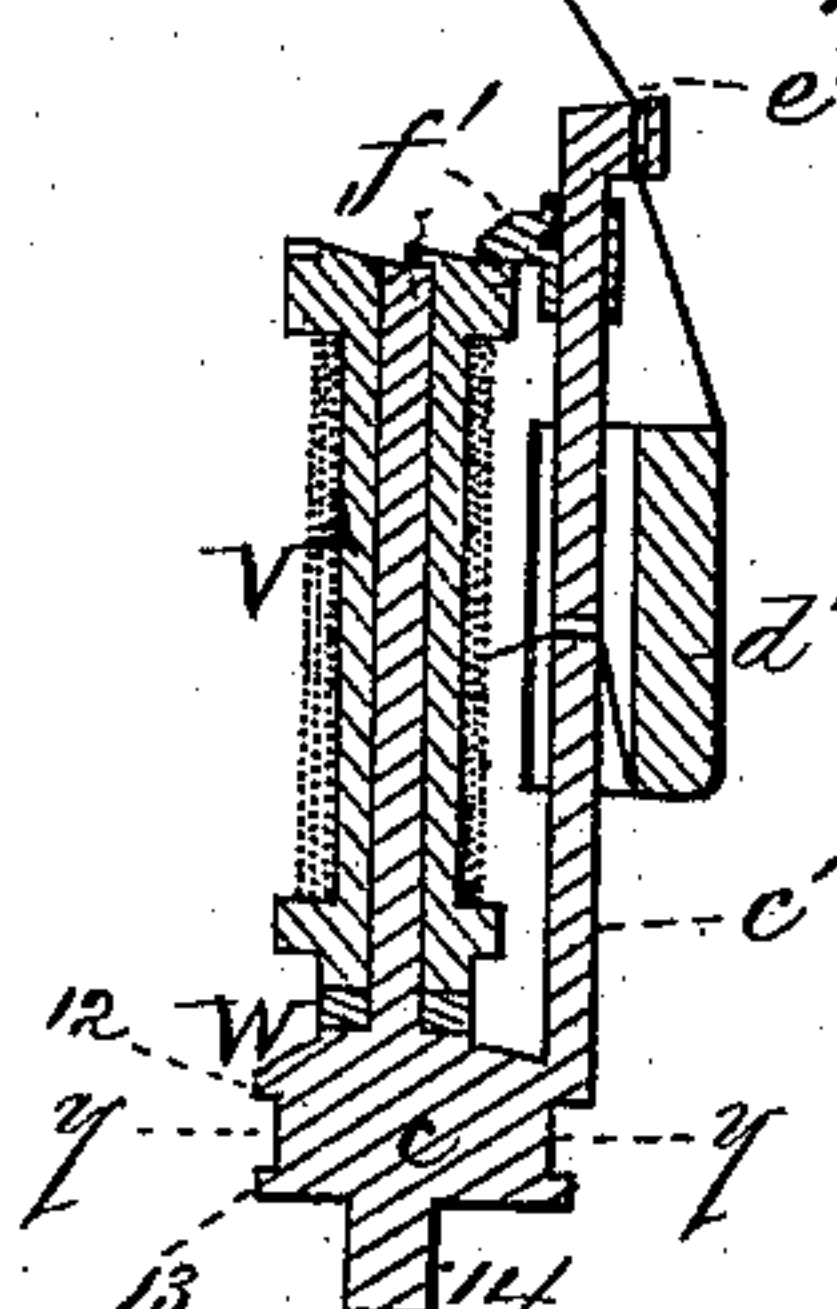
*Fig. 1*



*Fig. 6*



*Fig. 7*



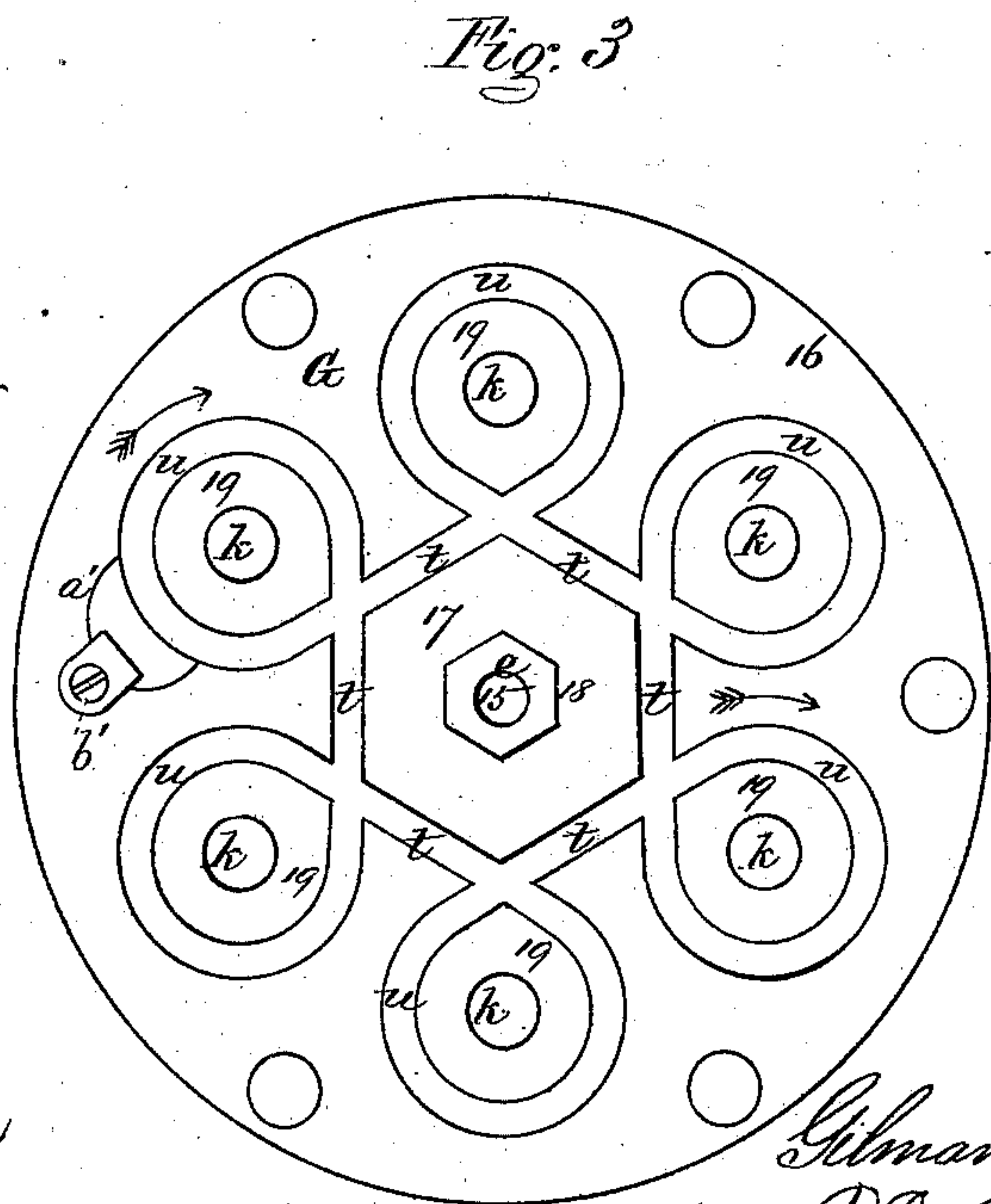
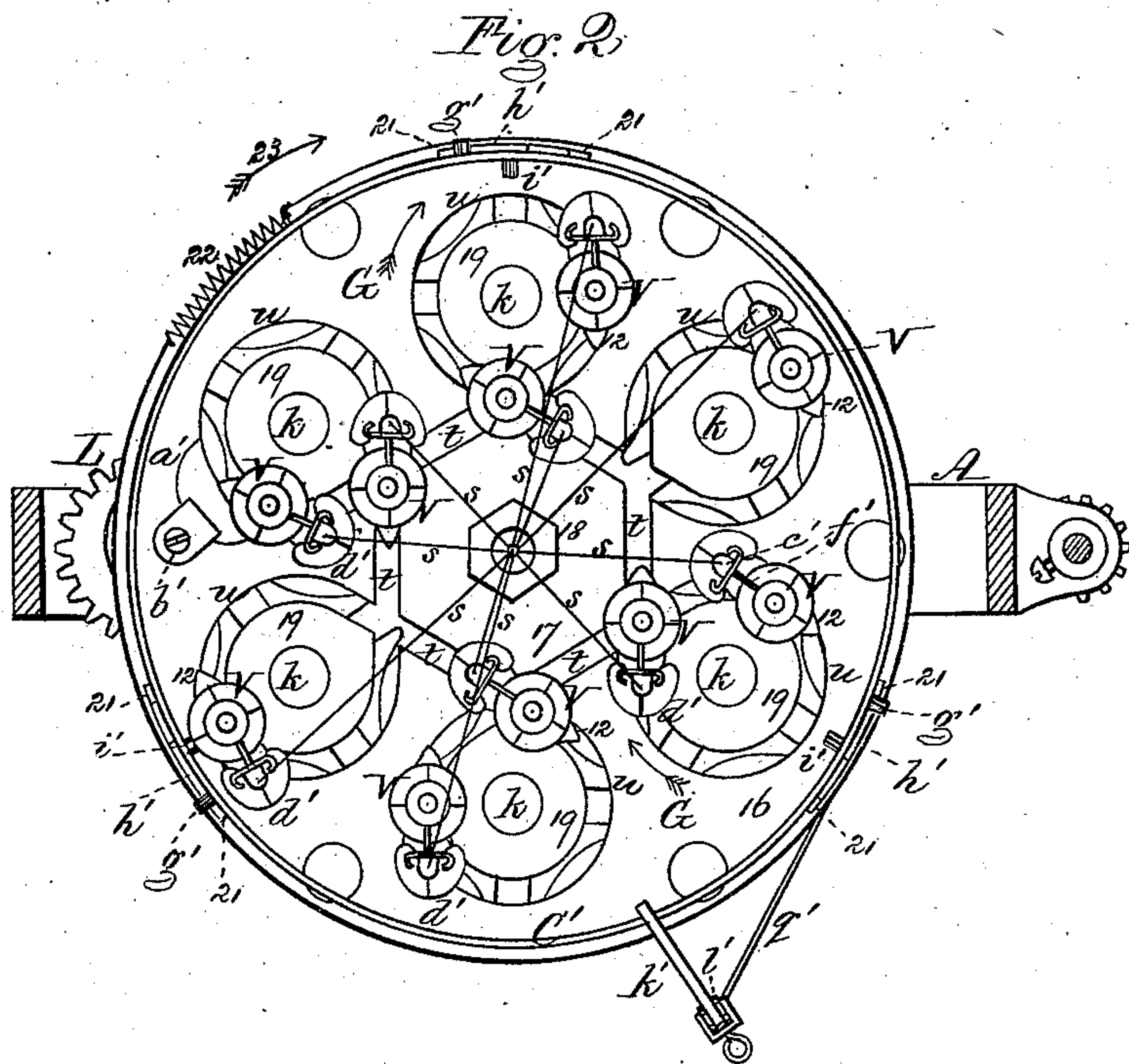
*Fig. 8*



Witnesses;  
W. J. Cambridge  
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Gilman K. Winchester  
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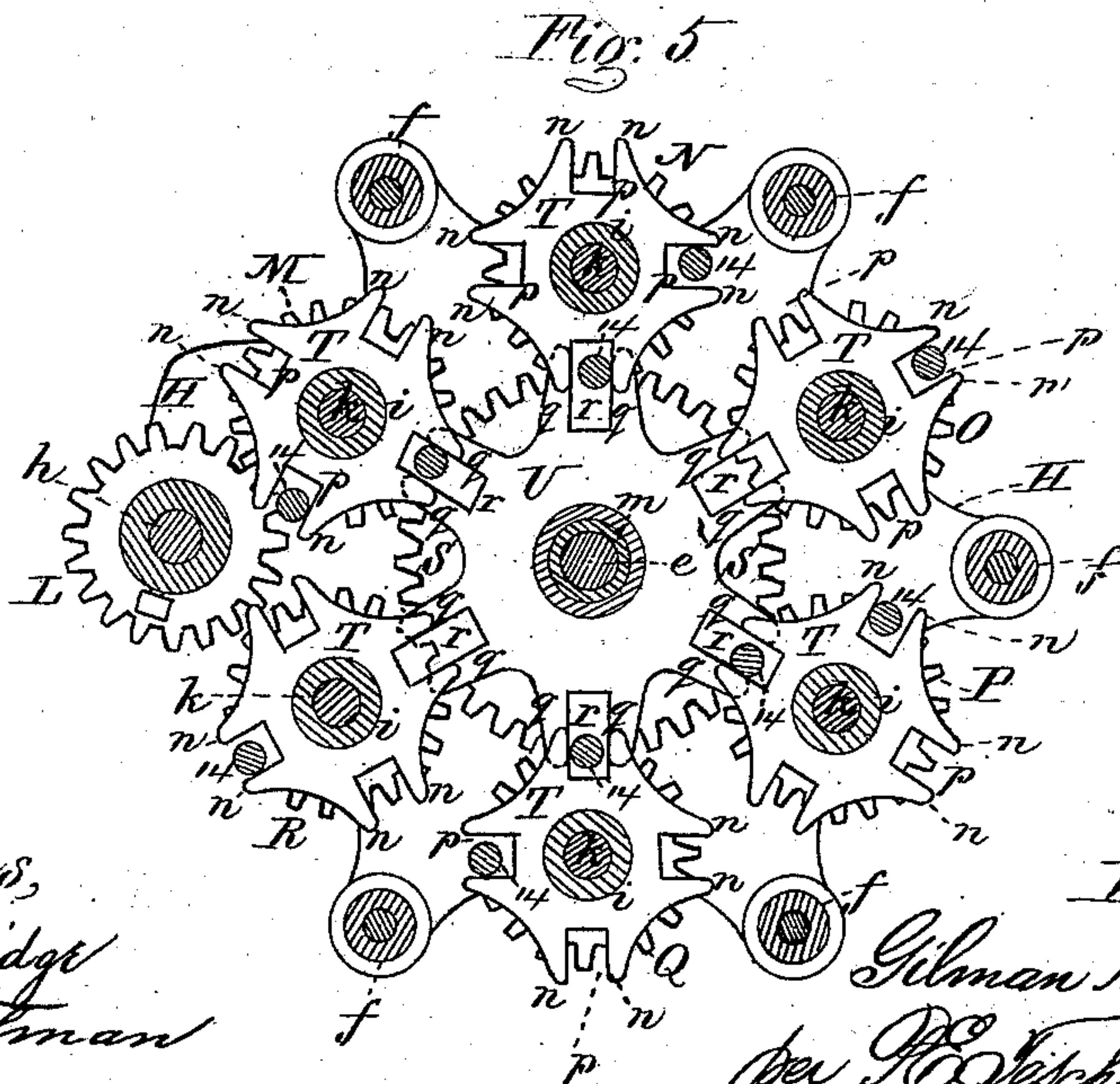
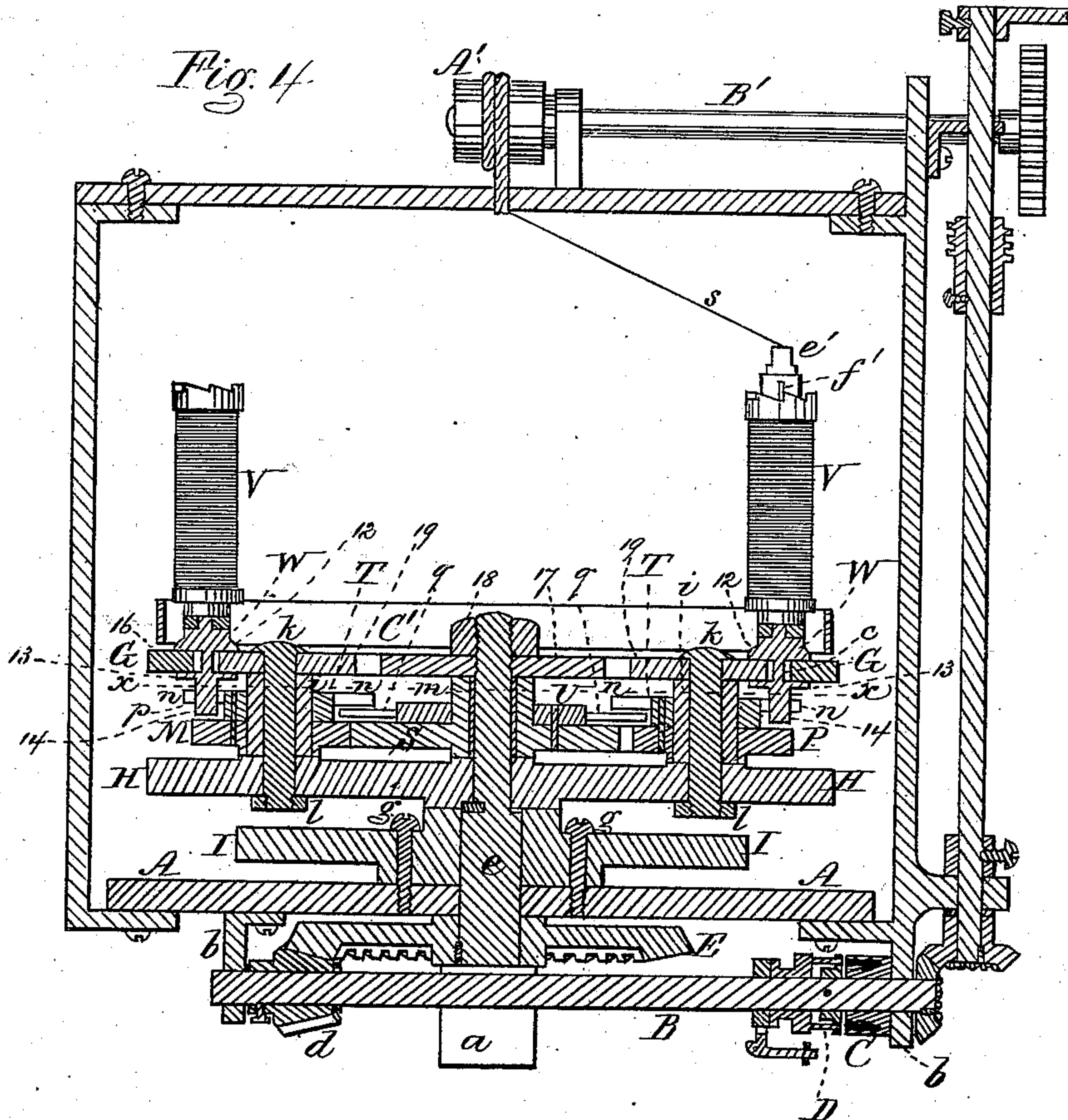


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# UNITED STATES PATENT OFFICE.

GILMAN K. WINCHESTER, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO  
THE SILVER LAKE COMPANY, OF NEWTON, MASSACHUSETTS.

## MACHINE FOR MAKING CORDAGE.

SPECIFICATION forming part of Letters Patent No. 227,940, dated May 25, 1880.

Application filed June 18, 1879.

*To all whom it may concern:*

Be it known that I, GILMAN K. WINCHESTER, of Providence, in the county of Providence and State of Rhode Island, have invented certain Improvements in Machines for Making Cordage, in which the strands are combined by an interlocking twist, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an elevation of one side of my improved machine. Fig. 2 is a plan of the same, the take-off roll, with its connecting mechanism and supporting-bar, being removed. Fig. 3 is a plan of the table or top of the machine, the spools and their carriers being removed. Fig. 4 is a vertical section through the center of the machine. Fig. 5 is a horizontal section on the line *xx* of Fig. 4. Fig. 6 is a sectional detail. Fig. 7 is a central vertical section through one of the spools and its carrier. Fig. 8 is a horizontal section on the line *yy* of Fig. 7.

My invention relates to that class of machines for making cordage in which the strands are combined by an interlocking twist, and has for its object to simplify the construction of these machines, so as to render them more durable and less expensive to build and keep in repair, and also to enable them to be run with greater speed than heretofore, thus increasing the production of the cordage made thereby.

To this end my invention consists in sundry details of construction, as hereinafter fully described and claimed.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A represents the bed of the machine, which is supported on legs *a*, and is provided on its under side with lugs *b*, in which are formed bearings for the horizontal driving-shaft B, at one end of which is the driving-pulley C and a clutch mechanism, D, and at the opposite end a bevel-pinion, *d*, which engages with and drives a large horizontal bevel-gear, E, to which is keyed a ver-

tical shaft, *e*, which passes up through the center of the machine, and has securely fixed to it a plate or platform, H, from which rise posts or studs *f*, to the upper ends of which is secured a circular table or disk, G, which is thus caused to revolve with the platform H when the latter is turned by the shaft *e*.

Between the bed A and platform H is placed a large stationary gear-wheel, I, which is held immovably in place by means of screw-bolts *g*, and with this wheel I engages a small gear, K, secured to the lower end of a short vertical shaft, *h*, having its bearing in the platform H, this shaft *h* having also secured to it, between the table G and the platform H, another small gear, L, which engages with a gear, M, of a series of six gears, M N O P Q R, which revolve around sleeves *i* on vertical bolts *k*, arranged at equal distances apart around the periphery of the platform H, to which they are secured by nuts *l*.

The gear M, which is driven by the gear L, engages with and rotates a central gear, S, which revolves on a sleeve, *m*, surrounding the vertical shaft *e*, and this gear S engages with and drives in the same direction all the rest of the series of gears, each of the gears M N O P Q R being provided with a forked plate, T, of the form seen in Fig. 5, each plate having four pairs of prongs or horns, *n*, projecting from it, forming four notches or bifurcations, *p*, which are arranged at equal distances apart.

The central gear, S, is also provided with a forked plate, U, of similar form to those T, but having six pairs of prongs or horns, *q*, forming six notches or bifurcations, *r*, these horns *q* being located in a horizontal plane just below that of the horns *n*, which overlap the horns *q*.

V are the spools or bobbins (ten in number) upon which the threads or strands *s* are wound, these spools revolving upon vertical spindles rising from their carriers W, each of which consists of an upper plate or portion, 12, and a lower plate, 13, fitting the former upon the upper surface and the latter against the under surface of the table G, these two plates 12 13 being connected by an elongated elliptical web or portion, *c*, pointed at both extremities, (see Fig. 8,) which fits within the grooves or



raceways of the table G, pins or projections 14 on the under side of the bottom plates, 13, of the carriers W extending down between the horns of the plates T U, by which the carriers  
 5 W, with their spools, are actuated and caused to travel through the raceways. These raceways consist of a series of straight slots, *t*, arranged around the center 15, forming a hexagonal track, and a series of circular slots, *u*, forming  
 10 circular tracks, which are connected with or intersect the hexagonal track, each of the straight slots *t* being tangent to the two circular slots *u* adjacent thereto, as seen in Fig. 3, the table G consisting of the main portion 16,  
 15 a hexagonal portion, 17, secured on the top of the sleeve *m* by a nut, 18, and a series of nearly circular portions, 19, secured on the tops of the sleeves *i* by means of the bolts *k*.

As the table G is rotated the spool-carriers  
 20 W, with their spools, are each caused to travel, without interruption of motion, first around one of the circular slots *u* in the direction of the arrow until it arrives at the intersection of the contiguous straight slot *t* therewith, when its pin  
 25 14 enters one of the bifurcations *r* of the plate U, which is at that time in the proper position to receive it. The carrier W is now moved by the plate U through the straight slot *t* to the next circular slot *u*, when the pin 14 enters one  
 30 of the bifurcations *p* of the next plate, T, by which it is carried around the next circular slot *u* to the next straight slot *t*, and so on entirely around the table G, each spool passing over precisely the same track as its predecessors—viz., around a common center in the  
 35 raceways *t*, and successively around the circular raceways *u*, by which movements of the spools each strand is caused to pass around two other strands, thus forming a cord with  
 40 an interlocking twist, the rotation of the table increasing the twist, while the interlocking of the strands is accomplished by the peculiar movements of the spools in the tracks above described.

45 The transfer of the spool-carriers from the circular to the straight slots and again to the circular slots is effected by the peculiar form of the portions *c* of these carriers, which are elongated and pointed, one of these points pro-  
 50 jecting into a straight slot before the carrier leaves a circular slot, and into the next circu-

lar slot before the carrier leaves the straight slot, by which means the change in the direction of motion is effected as desired.

The numbers of the teeth of the gears of the  
 plates T U are so proportioned with respect to  
 each other that the forks or bifurcations *p r*  
 will be brought into their proper relative po-  
 sitions at the desired times.

A small portion, *a'*, of the table G is made  
 60 removable to allow of the insertion and removal of the spool-carriers W, this portion *a'* being held in place by a screw, *b'*.

A' is the take-off roll, which is rotated at the desired speed by a horizontal shaft, B',  
 65 connected with the driving-shaft by suitable mechanism, which forms no part of my present invention, and will not, therefore, be particularly described.

By thus giving the spools a continuous mo-  
 70 tion without any interruption whatever the operation of making the cord is greatly accelerated and the production of the machine increased, while the mechanism is also simplified and rendered much more durable and less  
 75 liable to get out of repair.

The central shaft, *e*, may, if desired, be made hollow, to allow of the passage through it of a piece of wire, cord, or other suitable material to form a core around which the strands may  
 80 be entwined.

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

1. The spool-carrier plate G, provided with a series of circular raceways, *u*, arranged around  
 85 a common center and connected by a series of straight short raceways, *t*, tangential to the circular raceways *u*, substantially as described.

2. The table G, having the raceways *t u* and platform H connected thereto, in combination with spool-carriers W, forked plates T and U, constructed as described, and the gears  
 90 M N O P Q R S, for actuating the carriers W and causing them to travel in the raceways *t u*, substantially in the manner and for the purpose set forth.

Witness my hand this 2d day of June, A. D. 1879.

GILMAN K. WINCHESTER.

In presence of—

ARNOLD S. HOOD,  
 BENJ. B. EDMANDS.