

# Kennedy & Plummer Twisting Head.

N<sup>o</sup> 21,538.

Patented Sep. 14, 1858.

Fig. 1.

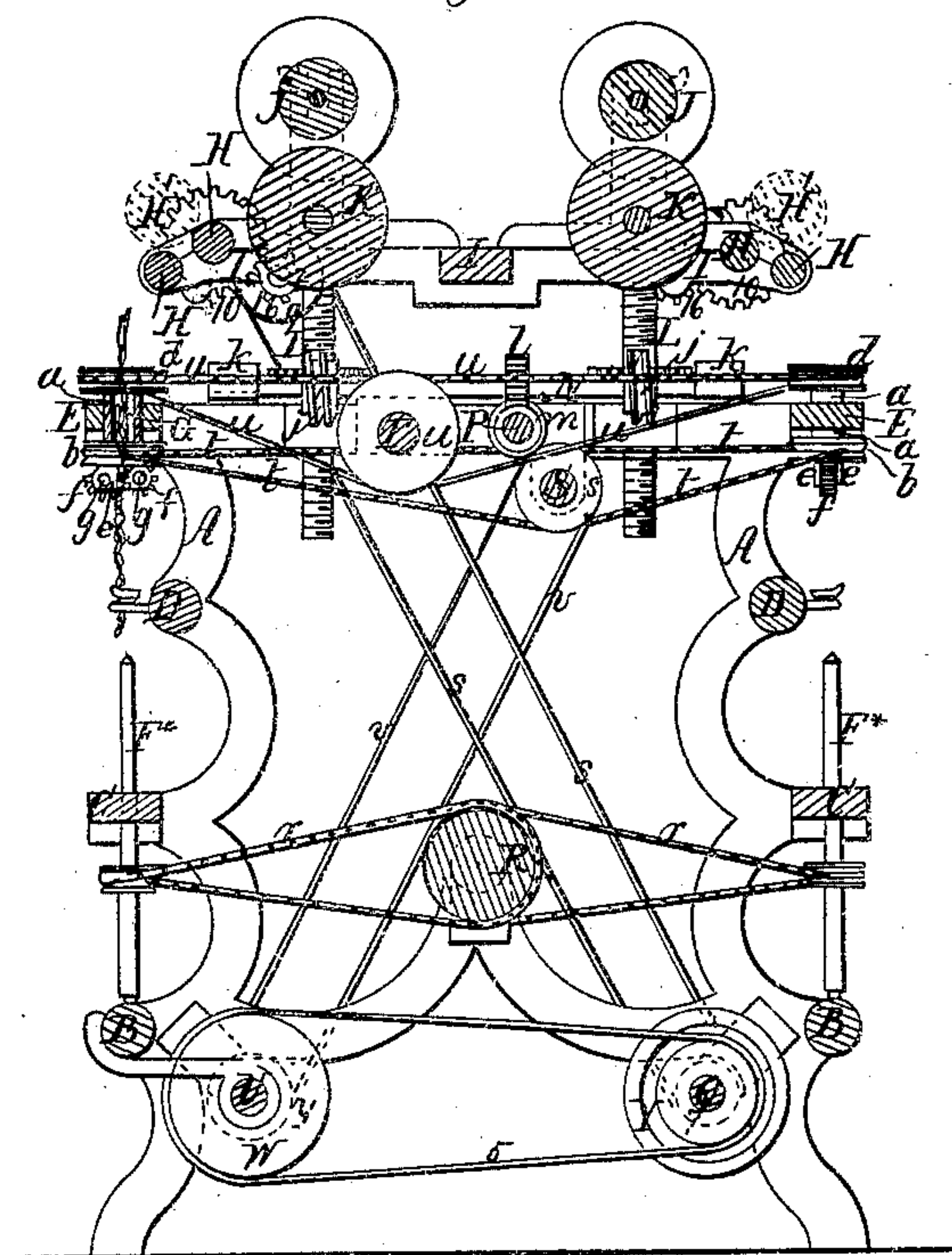


Fig. 2.

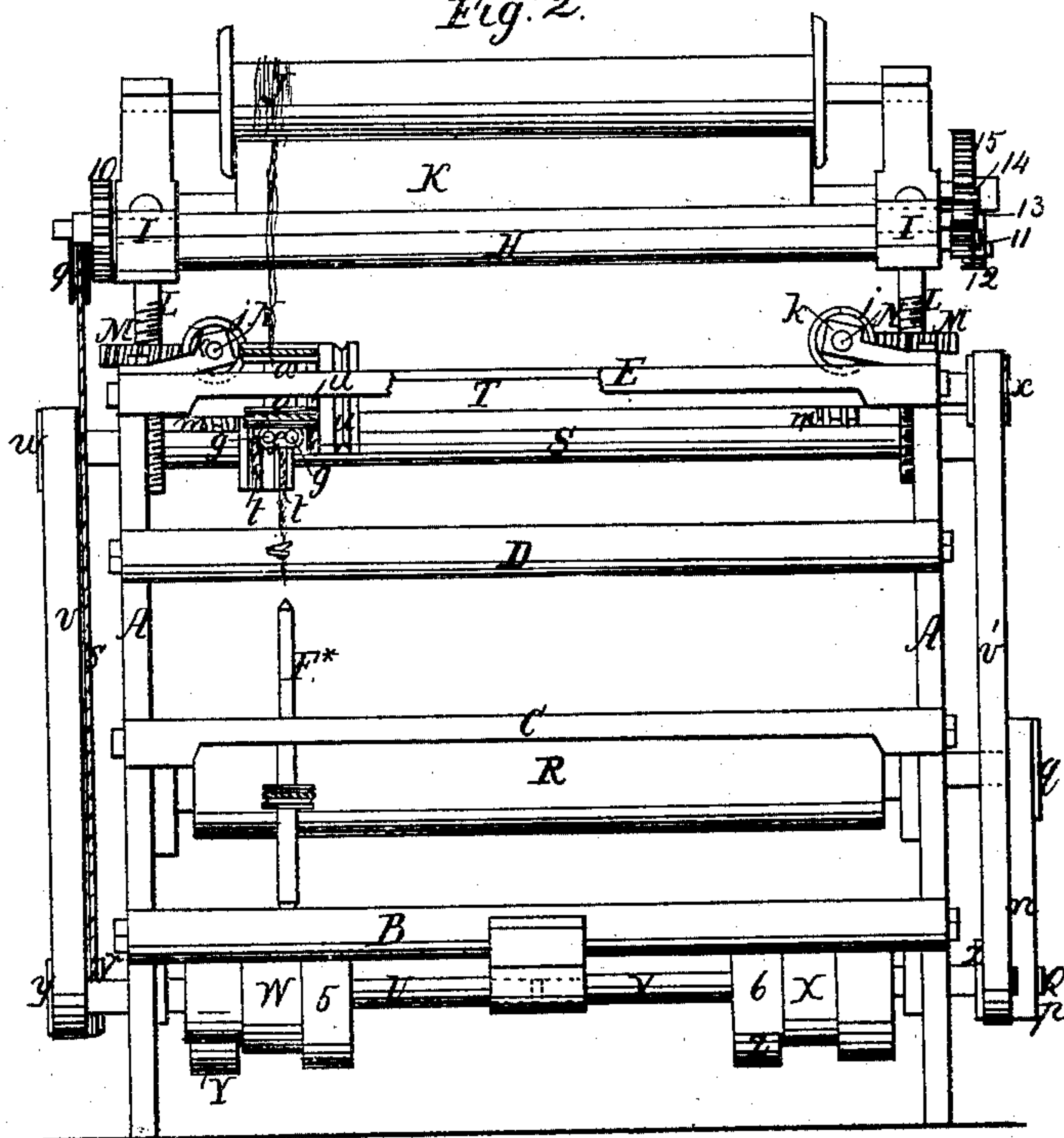


Fig. 3.

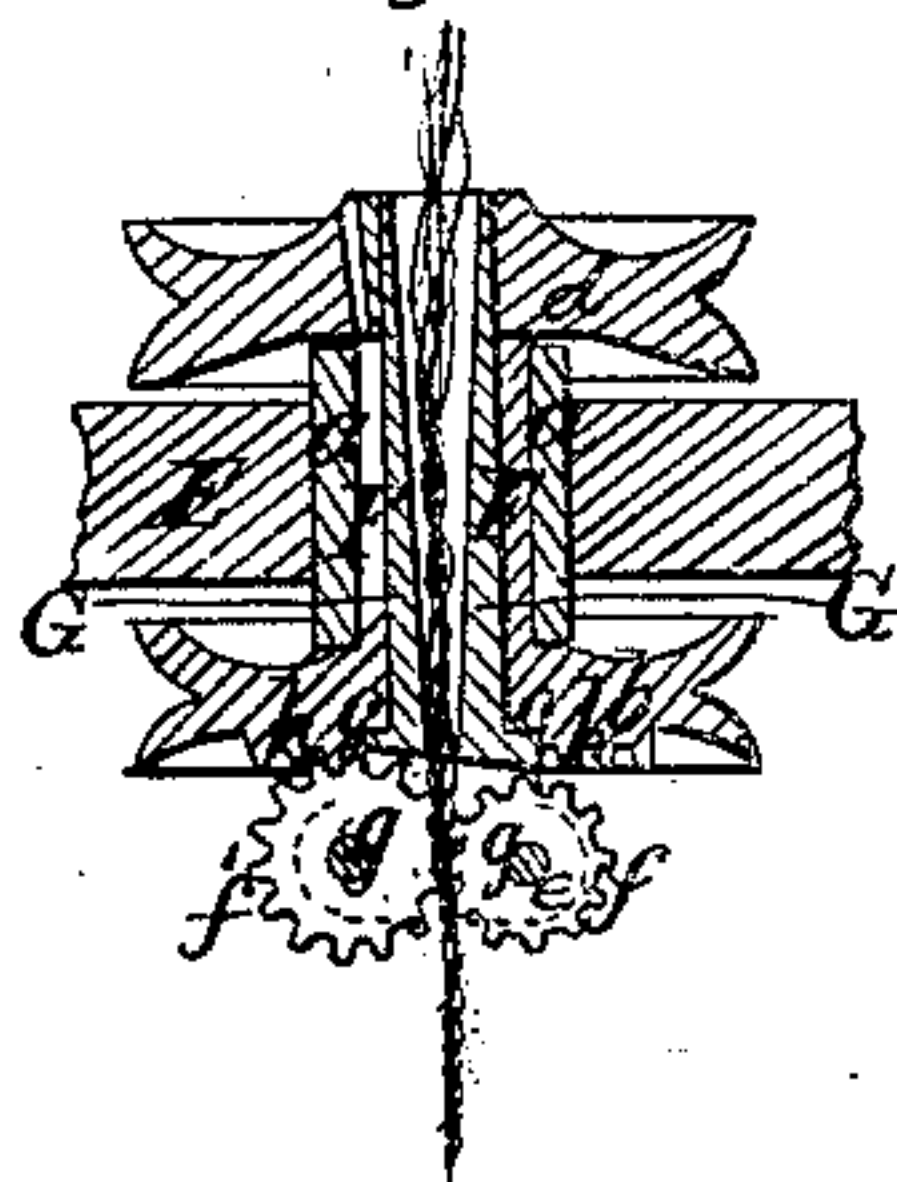
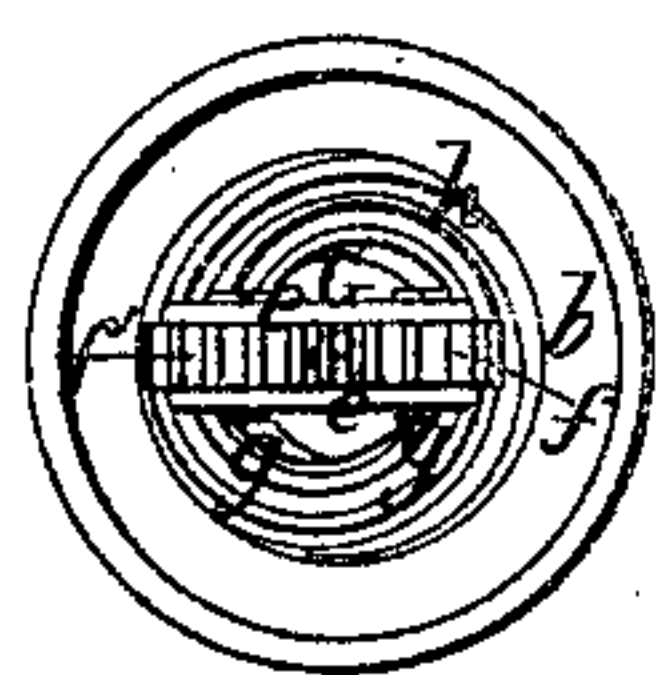


Fig. 4.





# UNITED STATES PATENT OFFICE.

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TO THEMSELVES, AND JOHN BACHELDER, OF LISBON, CONNECTICUT.

## MACHINERY FOR DRAWING AND TWISTING WOOL.

Specification of Letters Patent No. 21,538, dated September 14, 1858.

*To all whom it may concern:*

Be it known that we, JOHN W. KENNEDY and JOHN T. PLUMMER, of Plainfield, in the county of Windham and State of Connecticut, have invented certain new and useful Improvements in Machinery for Drawing and Twisting Wool or other Fibrous Materials; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, is a transverse vertical section of a spinning frame with our invention applied. Fig. 2 is a front elevation of the same. Fig. 3 is a vertical central section, on a larger scale than Figs. 1 and 2, of the combination of tubes and drawing rollers which constitutes an important feature of our invention. Fig. 4, is an inverted plan corresponding with Fig. 3.

Similar letters of reference indicate corresponding parts in all the figures.

The nature of this invention consists, firstly, in a certain novel combination of tubes and drawing rollers and means of operating the said rollers, by which the processes of drawing and twisting can be performed simultaneously or either of the said processes separately, and by which, when the two processes are combined, great convenience is afforded for varying the relative degrees of draft and twist to suit various lengths and qualities of fiber.

It also consists in making the whole of that part of a drawing and twisting or spinning frame, which carries the back drawing rollers and the rollers or their equivalents on which the roving to be drawn and twisted or spun is contained, adjustable vertically, to enable the distance between the back and front drawing rollers on both sides of a double frame to be regulated according to the length of staple, and yet preserve the proper relation between the back drawing rollers and the roller or its equivalent which contains the roving.

To enable others to make and use our invention, we will proceed to describe its construction and operation.

A, A, Figs. 1 and 2, are the end standards of the frame, united and stayed by the rails B, B, C, C, D, D, and E, E.

F\*, F\*, are the spindles, which may be either of the "ring" or "flier" kind, sup-

ported on the step rails B, B, and working in guide rails C, C.

H, H, H, are the back drawing rollers, extending the whole length of the frame to hold the rovings while they are drawn by the greater velocity of the rollers hereinafter described. Above each spindle its respective rail E, contains a bush or bearing *a*, to receive a tube F (see Figs. 1 and 3) which is provided at its lower end with a grooved pulley *b*; the length of said tube above said pulley being just sufficient for its lower end to be flush with or a trifle above the top of the bearing *a*, when the pulley is close to its bottom. The tube F is bored truly to receive a tube G, which fits to turn freely within it. This tube G is made with a shoulder *c*, around the lower part of its exterior, and its length above the said shoulder is sufficient to enable it to protrude far enough through the tube F, when inserted from the bottom thereof, to receive a grooved pulley *d*, which is put on after its insertion, and which, when keyed or otherwise tightly secured to the tube G, confines both tubes in the rail E, but leaves them free to rotate independently of each other in either direction. The interior of the tube G, is made conical and largest at its upper end; but below its mouth or lower end, the said tube has formed upon or secured to it two plates *e*, *e*, between which are received a pair of drawing rollers *f*, *f'*, which are fitted to rotate freely on two axles *g*, *g*, inserted through the said plates, said axles being at right angles to the axis of the tube G and so arranged that the rollers *f*, *f'*, will draw a roving through the tube, G. The rollers *f*, *f'*, are toothed across their faces so as to engage with each other like cog wheels and that one may derive rotary motion from the other; but the teeth are rounded and do not engage with each other so deeply as to cut or injure the roving. The object of making the rollers with teeth is that they may derive the rotary motion on their axes necessary to effect the drawing of the roving by one of them *f'*, gearing into a groove *h*, *h*, of convolute form (shown in Figs. 3 and 4) on the lower side of the pulley *b*, or on a plate attached to said pulley when the tube F rotates independently of and at a different velocity to G; and in order that only one of said rollers may gear into said groove, *f'*, is made larger in diameter than *f*. Only



one spindle and its corresponding set of tubes F, G, and drawing rollers  $f$ ,  $f'$ , are shown on each side of the frame, as that is sufficient to explain our invention.

5 I, is the adjustable portion of the frame, which carries the two sets of back drawing rollers H, H, H', and the rollers J, J, and K, K, the former of which carry the roving to be drawn and twisted, and rest upon the  
10 latter, from which they derive motion by friction. This frame is supported by four upright screws L, L, L, L, of the same pitch which work through a corresponding number of nuts M, M, M, M, which rest on the  
15 end standards A, A. The parts of the screws L, L, below the nuts pass freely through holes in the standards. By turning the nuts M, M, in one direction, the screws L, L, are caused to rise, and by turning them  
20 in the opposite direction, the said screws are permitted to descend. In order that the screws may all be turned the same distance and the adjustable portion I, of the frame raised and lowered at all parts alike, the  
25 nuts M, M, have worm wheels secured to them or formed upon them, and the two at each end of the frame are geared with short endless screws  $j$ ,  $j$ , on one of two shafts N, N, working in bearings  $k$ ,  $k$ , secured to the standards A, A, and the said shafts are  
30 furnished each with a worm wheel  $l$ , to gear with one of two endless screws  $m$ ,  $m$ , on a shaft P, which works in bearings in the standards A, A. By turning this shaft P,  
35 all the screws are worked at once and the adjustable portion I, of the framing, with the rollers H, H, H', J, J, and K, K, are raised and lowered and the distance between the back-drawing rollers H, H, H', and  
40 front drawing rollers  $f$ ,  $f'$ , adjusted to suit the length of staple.

Q, is the main shaft of the machine, from which motion is communicated to the several working parts.

45 R, is the drum for driving the spindles, receiving motion from Q, through a belt  $n$ , and pulleys  $p$ , and  $q$ , and giving motion to the spindles in the usual manner by belts  $r$ ,  $r$ .

50 S, is the shaft for driving the tubes F, F, carrying pulleys  $s$ ,  $s$ , from which belts  $t$ ,  $t$ , run to the pulleys  $b$ ,  $b$ , on said tubes.

T, is the shaft for driving the tubes G, G, carrying pulleys  $u$ ,  $u$ , from which belts run  
55 to the pulleys  $d$ ,  $d$ , on the said tubes. The two shafts S, T, are driven by belts  $v$ ,  $v'$ , running to their pulleys  $w$ , and  $x$ , from pulleys  $y$ , and  $z$ , on two short shafts U, and V, which are driven by belts 5, and 6, run-  
60 ning around their cone pulleys W, and X, from cone pulleys Y, and Z, on the main shaft Q. The cone pulleys permit of the relative speed of the tubes F, and G, being varied to vary the relative degrees of twist  
65 and draft. 8, is a band running from a

pulley 7, on the main shaft to a pulley  $g$ , on the adjustable portion I, of the frame, and driving the latter pulley, which carries a spur gear 16, which, by a suitable train of spur gearing 10, 11, 12, 13, 14, 15, drives  
70 the back drawing rollers H, H, H', and feed roller K.

The adjustable portion I, of the frame having been adjusted by turning the shaft P, in the manner hereinbefore explained,  
75 and the belts 5 and 6 adjusted to give the proper velocity of revolution to the tubes F, G, relatively to each other and to the rollers H, H, H', to produce the requisite relative degrees of draft and twist, the ends  
80 of the rovings are brought from the roller K, between the rollers H, H, and H', through the tube G, and between the rollers  $f$ ,  $f'$ , and thence to the spindles F\*, F\*, and all is ready for operation. Rotary motion  
85 then being imparted to the main shaft Q, the movements of the several parts of the machine in the manner already described commences, and the operations of drawing  
90 and twisting are produced simultaneously; the twist being produced between the back and front drawing rollers—where the draft is produced—by the rotary motion of the tube G, which carries the front drawing  
95 rollers  $f$ ,  $f'$ ; and the draft being produced by the velocity of the rollers  $f$ ,  $f'$ , being greater than that of the rollers H, H, H'; the velocity of said rollers  $f$ ,  $f'$ , depending upon the difference in velocity between the  
100 tubes F, and G, which causes the teeth of the roller  $s$ , to work in the convolute groove  $h$ . The draft and twist thus produced in this machine prepares the rovings for the operation of the spindles F\*, F\*; but the same combination of tubes F, G, toothed  
105 rollers  $f$ ,  $f'$ , and convolute groove  $h$ , may be used in combination with the back rollers H, H, H', or their equivalents in a machine without spindles, for drawing and  
110 twisting fibrous materials or for either drawing or twisting alone. When drawing alone is required, the tube G will be kept stationary, and the rollers  $f$ ,  $f'$ , caused to rotate on their axles  $g$ ,  $g$ , at a velocity to  
115 produce the requisite draft, by the revolution of the tube F, and consequent action of the convolute groove  $h$ , on the roller  $f$ . When twisting alone is required, both tubes F, G, are set in motion, but the relative  
120 velocity must be such as to produce a motion of the rollers  $f$ ,  $f'$ , on their axes just fast enough to take up the roving as fast as it is supplied.

We do not claim the attachment of the front drawing rollers in a rotating tube  
125 through which the roving passes, so as to give the twist between the back and front drawing rollers, as we are aware that such application of the rollers has been made  
130 with a different and less simple contrivance



than we have employed to produce the rotary motion of the so-attached rollers. But

What we claim as our invention, and desire to secure by Letters Patent, is:—

5 1. The combination of the tubes F and G, the toothed drawing rollers, and the convolute groove *h*; the whole applied and operating substantially as described to effect the draft and twist simultaneously or either  
10 alone.

2. Making the upper part of the frame

which carries the back drawing rollers and the rollers or their equivalents which carry the roving to be drawn and twisted, adjustable vertically substantially as and for the 15 purpose specified.

JOHN W. KENNEDY.  
JOHN T. PLUMMER.

Witnesses:

WILLIAM DYER,  
ELIJAH Y. SMITH.