

C. Feickert Cordage Mach.

Nº 19,554.

Patented Mar. 9, 1858.

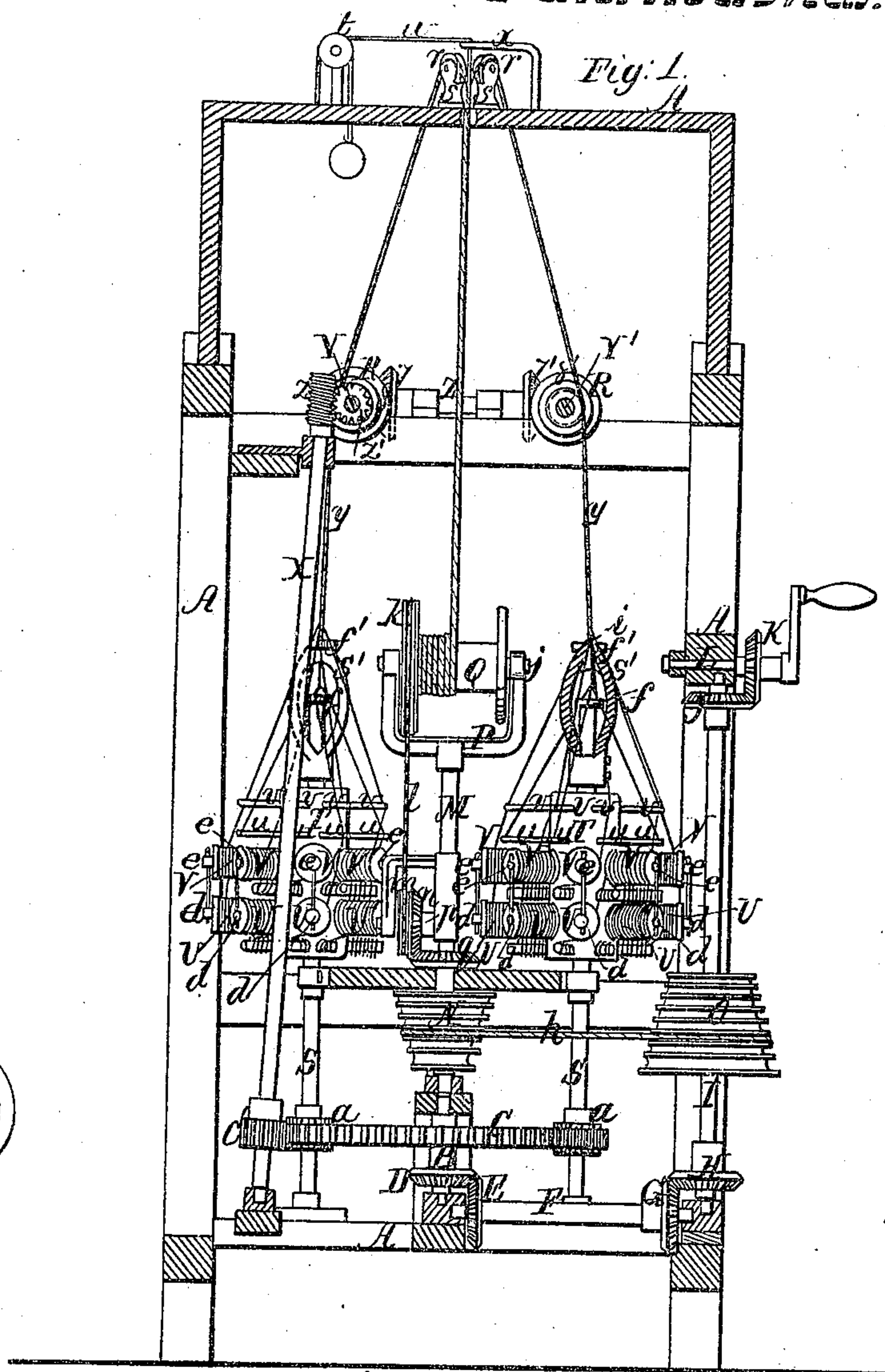


Fig. 4.

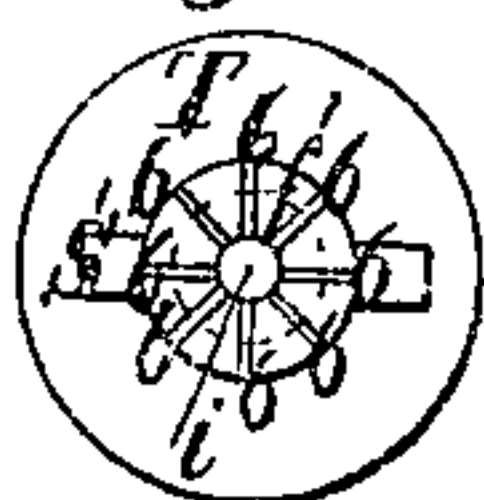


Fig. 3.

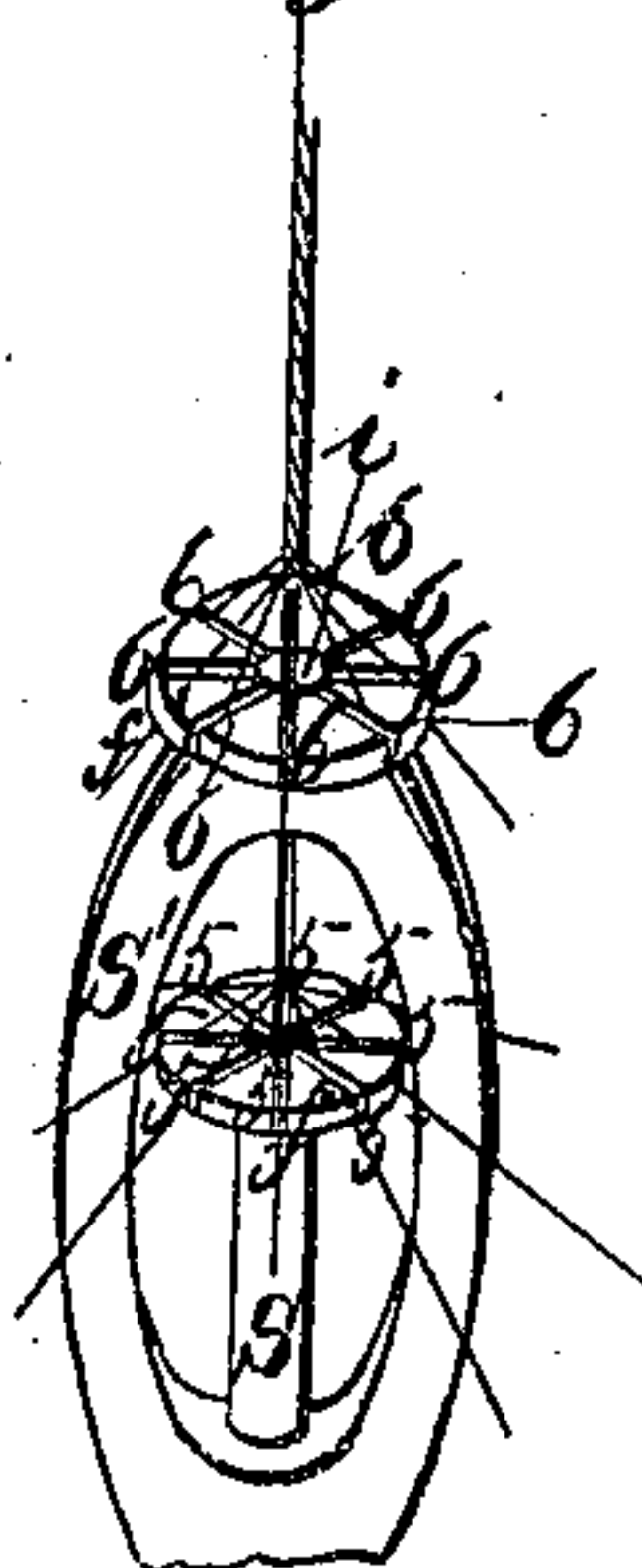
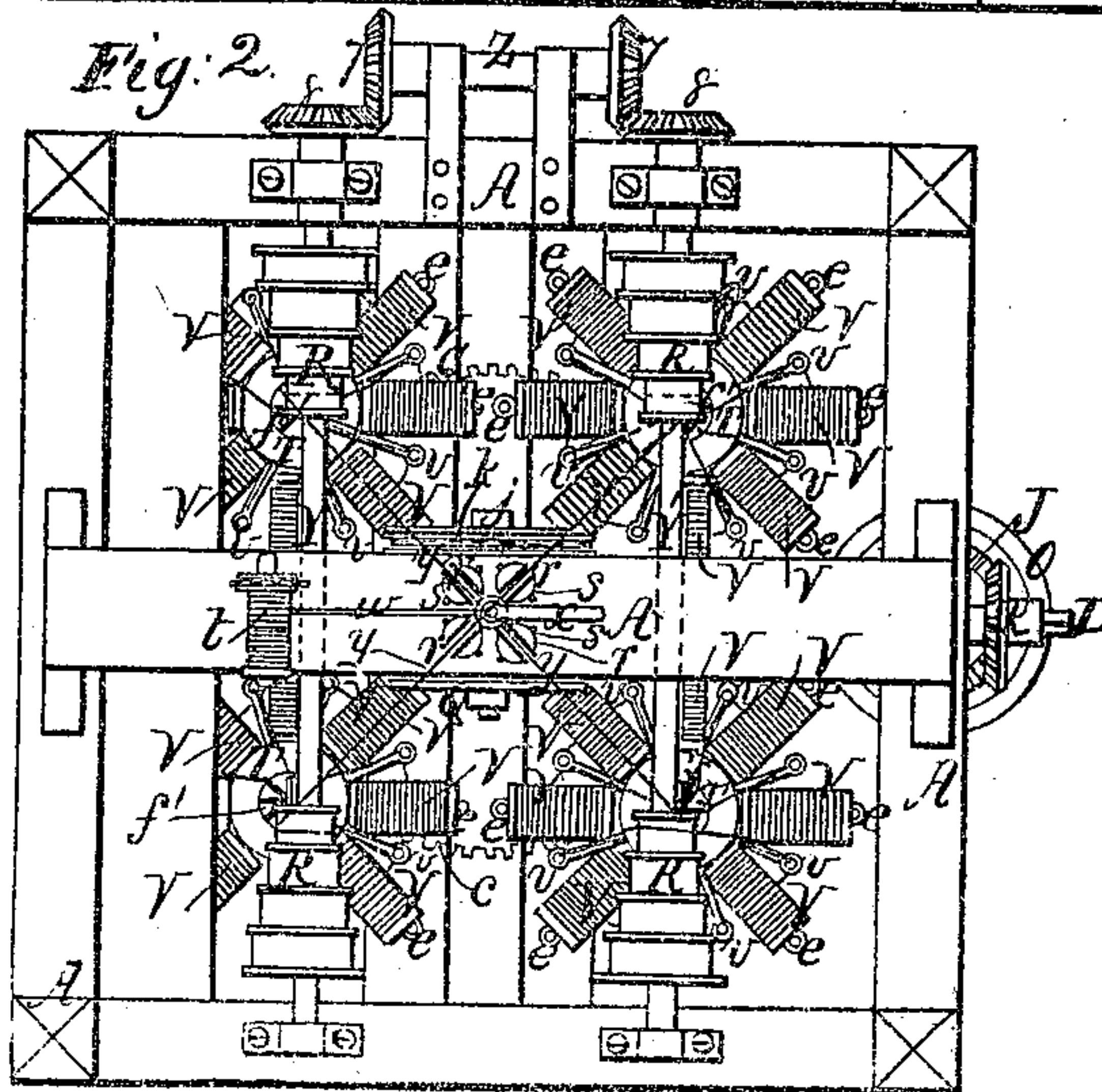


Fig. 2.



UNITED STATES PATENT OFFICE,

CHARLES FEICKERT, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINERY FOR MANUFACTURING PLAITED CORD.

Specification forming part of Letters Patent No. **19,554**, dated March 9, 1858.

To all whom it may concern:

Be it known that I, CHARLES FEICKERT, of the city, county, and State of New York, have invented a new and useful Improvement in Machinery for Manufacturing what is Known as "Plaited Cord;" and I 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 central vertical section of a machine with my improvement. Fig. 2 is a plan of the same. Figs. 3 and 4 are detail views of portions of the machine.

Similar letters of reference denote like parts in all the figures.

The cord known as "plaited cord," which is manufactured by this machine, is composed of strands of cotton which have first a separate covering of silk or worsted wound upon each and are afterward laid together in the same way as the strands of ordinary rope. The process of covering the strands with silk or worsted is termed "plaiting" them.

My invention consists in the employment of certain means of producing the strands and covering them with silk or worsted at the same operation and by the same motion, whereby the threads constituting the body of each strand and the threads of silk or worsted covering the same are caused to have the same twist, and consequently the covering is not likely to become loose upon the body of the strands. It consists, also, in the employment of what are hereinafter termed "regulators," for the purpose of preventing too great a strain upon the twisted and plaited strands before they are laid together to produce the cord, and thereby insuring the required softness of the cord.

It further consists in a certain arrangement of the strand twisting and plaiting contrivances and the laying mechanism by which the whole are combined, so as to form a machine of compact and convenient form in which the strand twisting and plaiting and the laying operations are effected simultaneously in a very perfect manner.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is the framing of the machine, in the center of the lower part of which there is a short

upright shaft B, (see Fig. 1,) carrying a large spur-gear C and a small bevel-gear D. The latter gear engages with a bevel-gear E on a horizontal shaft F near the bottom of the machine, and the latter shaft carries a second bevel-gear G, which engages with a bevel-gear H on an upright shaft I at one side of the machine, and this shaft I carries another bevel-gear J, which gears with a bevel-gear K on a short horizontal shaft L, which constitutes the driving-shaft of the machine. The upright shaft B and its spur-gear C derive motion from the driving-shaft through the train of shafting and bevel-gearing above described, and the large spur-gear C gears with and drives a number of small spur-gears *a a*, which are fast on the strand-spindles S S.

The strand-spindles, of which there may be any desirable number, are arranged vertically in stationary bearings *b b* and *c c* at equal distances apart around the spur-gear C, so that the only motion they receive is a rotary one, each on its own axis. Each of these spindles is furnished with a deep hub T, in which are secured two sets of arms *d d* and *e e*, which are arranged radially in two planes perpendicular to the axis of the spindle, and which constitute the axles for two sets of spools U U and V V. There is an equal number of these arms and spools in each set, and those of each set are arranged at equal distances apart. The lower sets of spools U U carry the cotton threads which are to be twisted or laid together to form the bodies of the strands, and the upper sets V V the fine silk or woolen threads which are to form the covering or plaiting for the strands. The tops of the strand-spindles are each furnished with a flange *f*, in which there is a series of notches 5 5, (see Fig. 2,) corresponding in number with the spools U U in one set, and to the upper part of each of said spindles there is fitted a head-piece S', (shown in Fig. 2, which represents one of said head-pieces and the top of its spindle in perspective, and in Fig. 4, which is a plan view of the head-piece,) the top of which head-piece is furnished with a flange *f'*, in which there is a series of notches 6 6 6, corresponding in number with the spools V V in one set. The head-pieces S' S' have open sides, but are closed at the top, with the exception of a central opening *i* in each. The notches 5 5 in the

flanges *ff* receive and serve as guides to the cotton threads from the spools *U U*, and the notches *6 6* in the flanges *ff* receive and serve as guides to the silk or worsted threads from the spools *V V*. The threads from the spools *U U* before passing into the notches *5 5* pass through guides *u u* in the form of cams attached to the hubs *TT* of the strand-spindles, and those from the spools *V V* pass through guides *v v* of similar form before passing into the notches *6 6*. The heads *S' S'* have openings in their sides to allow the threads from the spools *U U* to pass into the notches *5 5* in the flange *f*, as shown in Figs. 1 and 3. In the latter figure the cotton threads from spools *U U* are shown in blue color and the silk or woolen threads from the spools *V V* in red color for the sake of distinction. A friction-spring *g* is applied to every spool *U* and *V* to act as a drag to prevent the cotton or silk being unwound therefrom too easily. Instead of two sets of spools *U V*, three or more sets may be used, arranged one set above another in the same manner as represented.

M is the laying-spindle, arranged in an upright position centrally between the strand-spindles, and consequently in line with the shaft *B*, but independent thereof. This spindle carries a pulley *N*, which receives a belt *h* from a pulley *O* on the shaft *I*, and this belt transmits to it from the said shaft *I* the rotary motion necessary to lay or twist the strands together to produce the cord. The laying-spindle carries at its upper end a frame *P*, which supports the shaft *j* of a large spool *Q*, on which the finished cord is to be taken up. The shaft *j* is perpendicular to the laying-spindle. The spool *Q* has attached to it a pulley *k*, round which runs a band *l* from a pulley *m*, which is secured to a bevel-gear *n*, which turns on a horizontal axle *p*, which is attached to the laying-spindle and stands radial thereto. The bevel-gear *n* gears with a stationary bevel-gear *q*, which is secured to the framing in a position concentric to the laying-spindle, and as the said bevel-gear *n* revolves with the laying-spindle it derives from the stationary gear *q* a rotary motion on its own axis, and by that means gives to the pulley *m* attached to it a similar motion, and from that pulley a rotary motion on their axes is given to the pulley *k* and spool *Q* by the band *l*.

On the top of the framing of the machine, and at equal distances from, but as close as practicable to, the vertical center thereof, a number of guide-pulleys *r r*, corresponding with the number of strand-spindles, are placed in fixed bearings *s s*, the arrangement of the said pulleys being such that the twisted and covered strands *y y* from the strand-spindles passing up to and over them and afterward descending on the nearest sides thereof will be conducted nearly close together, and on being attached to the spool *Q* of the laying-spindle will by the rotary motion of the said spindle be laid together and

twisted together, and by the rotary motion of the spool *Q* on its axis be taken up as fast as laid and twisted. At a short distance from the guide-pulleys *r r* a spool *t* is arranged in fixed bearings on the top of the machine to supply a filling-thread *w* to make a core to the cord for the purpose of making it of the largest possible size with the smallest possible quantity of silk or wool, and over the guide-pulleys *r r* there is a fixed guide *x* to conduct the core *w* between the strands *y y*.

Y Y' are horizontal shafts fitted to bearings arranged on the framing of the machine about midway between the tops of the strand-spindles and the guide-pulleys *r r*. These shafts carry pulleys *R R R R*, which I term "regulators," corresponding in number with the strand-spindles, (viz., four, two on each shaft,) and arranged so as to stand almost directly over the strand-spindles, and said shafts derive a positive rotary motion from the spur-gear *C* through the agency of an upright or slightly-inclined shaft *X*, which is geared with the spur-gear *C* by a small gear *C'* and with the shaft *Y* by an endless screw *z* and worm-wheel *z'*, the shaft *Y'* being geared with *Y* by a shaft *Z* and two pairs of bevel-gears *7 8* and *7' 8'*. The strands are conducted one or more times around their respective regulators *R R'* on their way to the rollers *r r*, and as these regulators have a positive and unvarying motion the strands are taken up by them at a uniform velocity relatively to the velocity of the revolution of the strand-spindles before being laid and twisted together to form the cord. The velocity of the band *l*, which drives the spool *Q*, should be rather greater, or at any rate not less, than sufficient to take up the cord as fast as it is twisted; but the friction of the band *l* is intended to be only sufficient to drive the spool when there is a very moderate degree of tension on the cord, and so that when a certain degree is exceeded the said band will slip on the pulley *k* and cause its operation to be retarded or temporarily arrested. Thus it will be seen that by the use of the regulators interposed between the strand-spindles and the laying-spindle the tension on the strands during the twisting and covering or plaiting operation and the tension on the cord during the laying and twisting of the strands together may be properly regulated relatively to each other to give the cord the requisite degree of softness. The regulators are made with their peripheries in steps, as shown in Fig. 2, to admit of the strands being taken around larger or smaller portions of them to take them up faster or slower.

Having described the operations of the parts of the machine individually, I will now proceed to describe briefly the combined operations of forming and covering or plaiting the strands and of laying and twisting them together to form the plaited cord. The cotton threads from the spools *U U*, after passing through the guides *u u* and notches *5 5* in the

flanges *f f*, which operate, like the laying-blocks of rope-machines, to lay the threads together, are by the rotary motion of the strand-spindles twisted together to form the strands, which, after passing through the central holes *i i* in the head-pieces *S'S'* of the spindles, are by the same rotary motion which twists them together covered with the threads of silk or wool from the spools *V V*, which latter threads, after passing through guides *v v*, are laid evenly by passing through the notches *6 6* in the flanges *f' f'* and wound around the strands, the flanges *f' f'*, like *f f*, operating like the laying-blocks of rope-machines. This method of forming and covering the strands, it is obvious, gives the same twist to the threads forming the body and to those forming the covering. The strands thus twisted and covered are taken up by the regulators *R R* and conveyed to the pulleys *r r*, which are combined to operate, like the laying-block of a rope-machine, to lay the strands together, and after passing between the said pulleys the strands are twisted together by the rotary motion of the laying-spindle, and as fast as

they are laid and twisted together into a cord the cord is taken up by the spool *Q*.

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

1. The construction of the strand-spindles, substantially as herein described, whereby the operations of twisting together the threads to form the strands and the covering or plaiting of the strands are performed simultaneously and by the same rotary motion and a uniform twist thus given to the threads of the body and of the plaiting or covering.

2. The regulators *R R*, applied, substantially as described, between the strand-spindles and the laying-spindle, for the purposes herein set forth.

3. The arrangement of the strand-spindles, the laying-spindle, and the rollers *r r* or other equivalent for laying the strands, substantially as described, for the purpose set forth.

CHAS. FEICKERT.

Witnesses:

W. TUSCH,
W. HAUFF.