Sheet 1 - 6 Sheets.

W. C. Hibbard.

Spinning Mach.

No. 6,388. Patented Apr. 24, 1849.

Fig. 1.

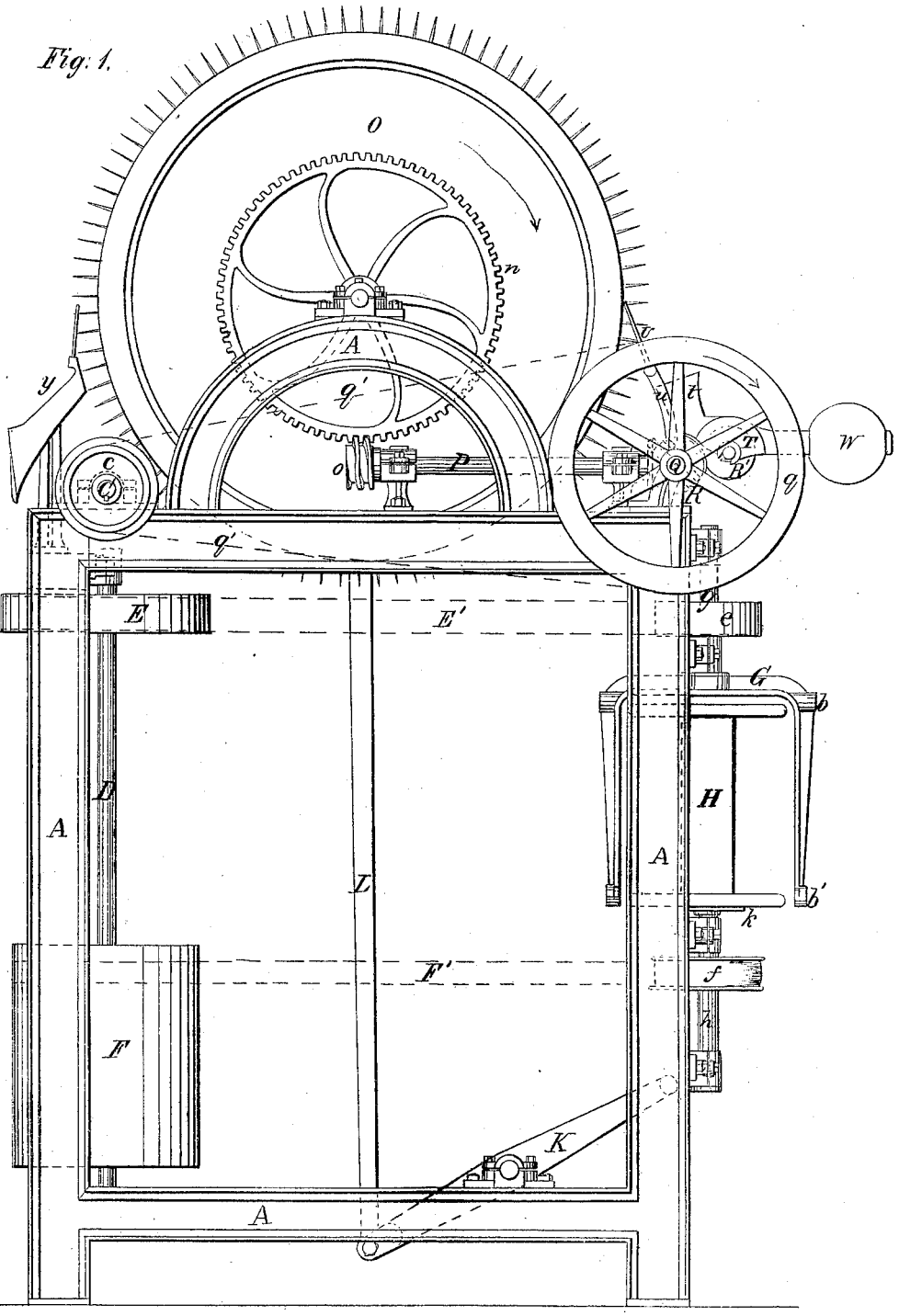

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Fig: 2.

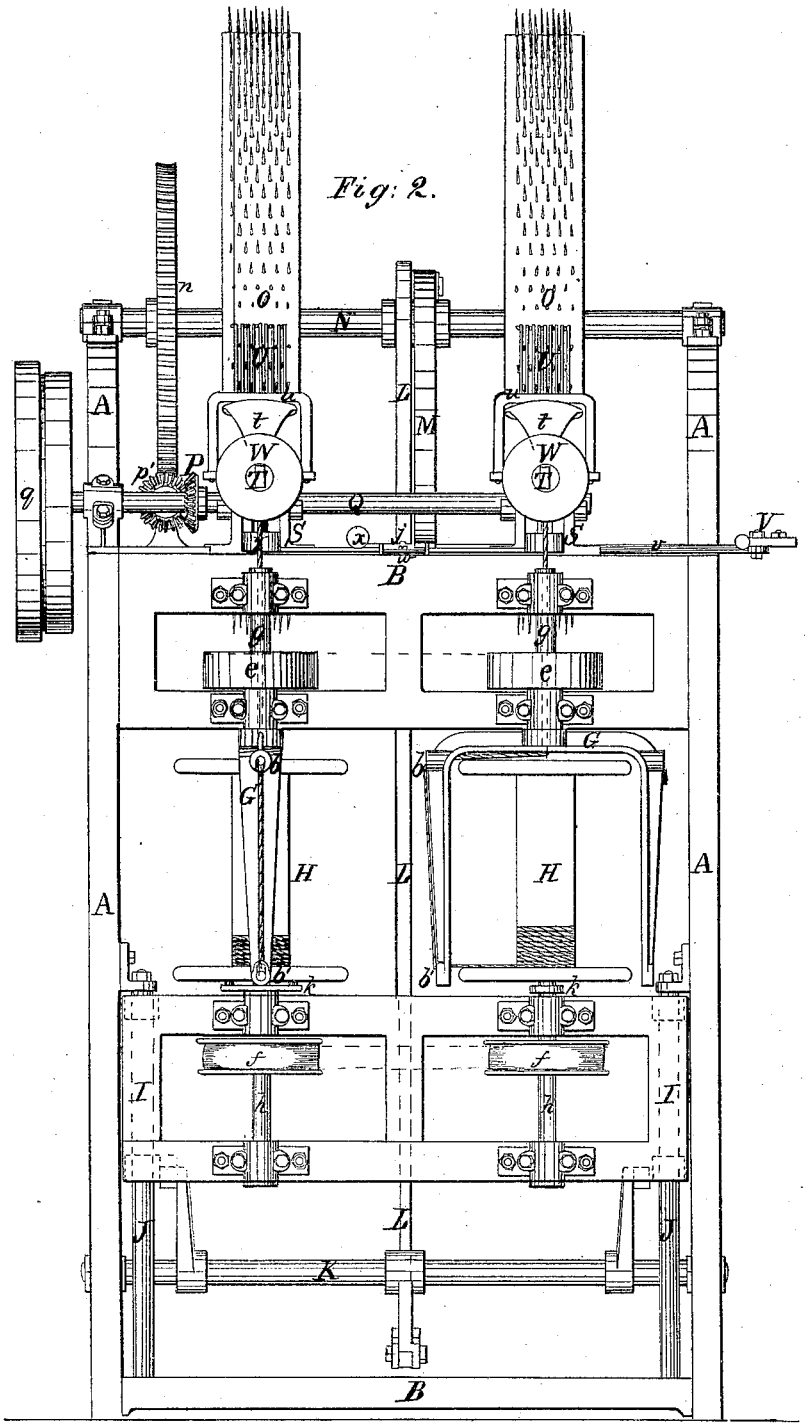

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Fig: 3. Teeth omitted.

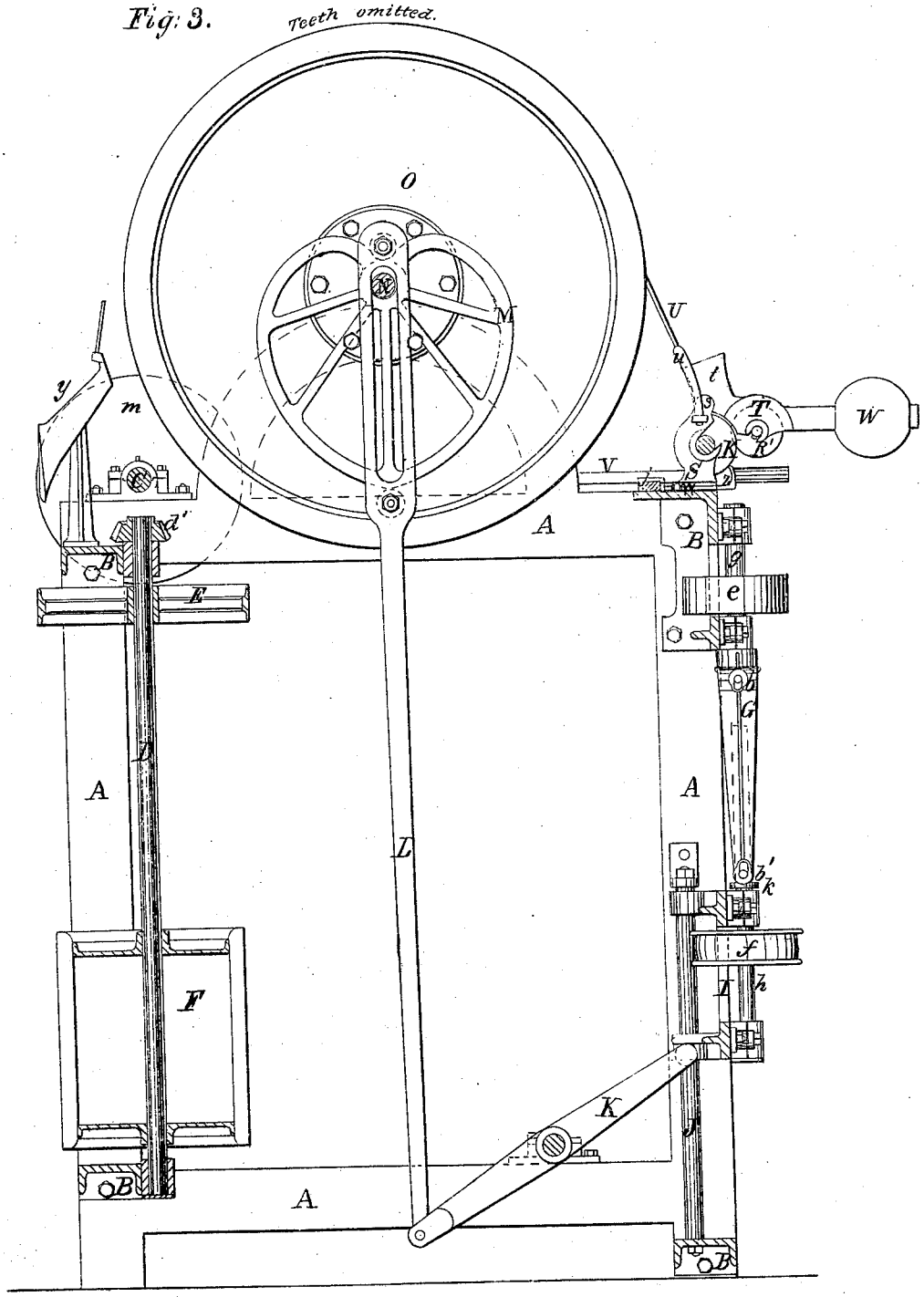

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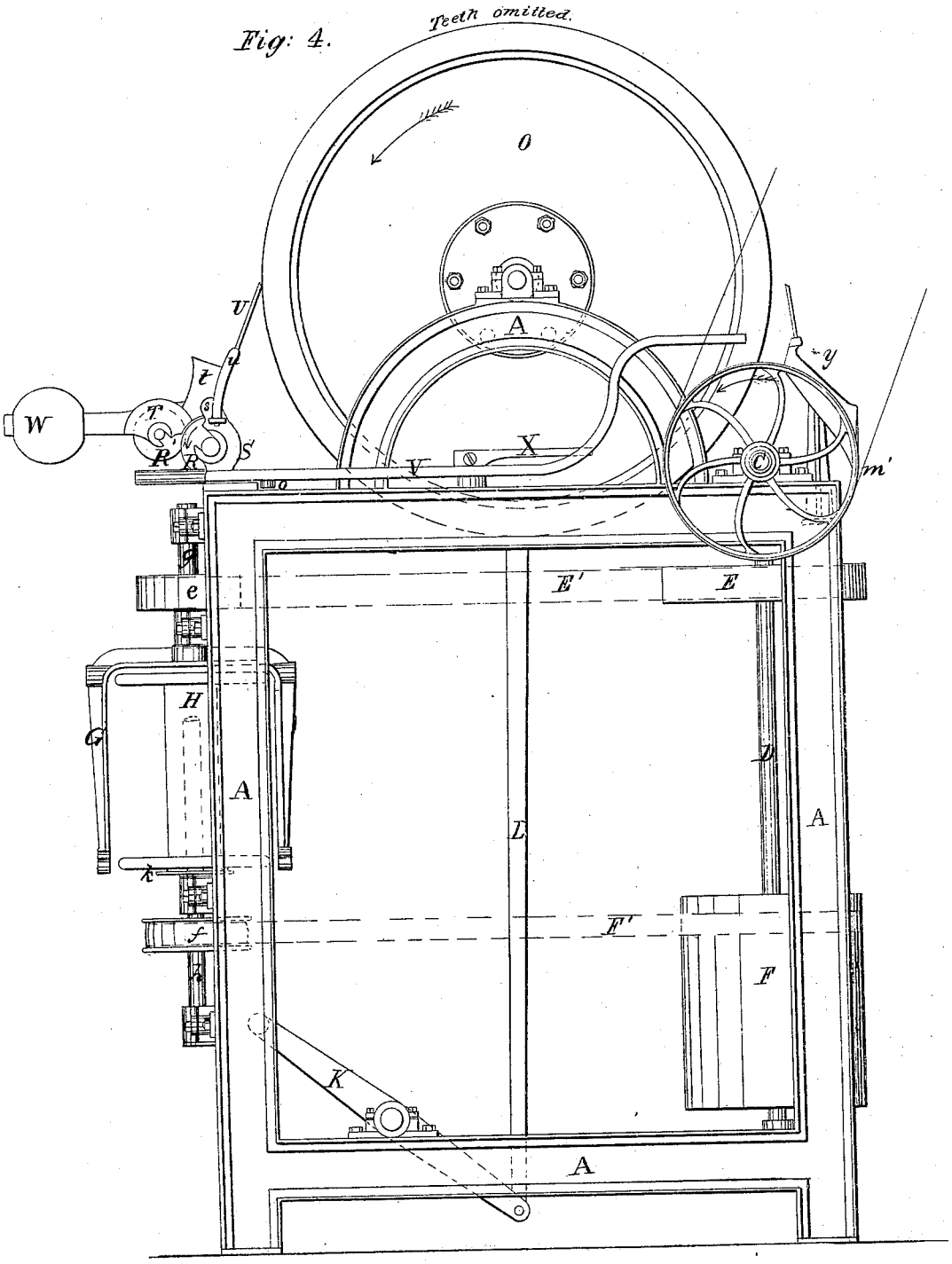
Fig: 4.



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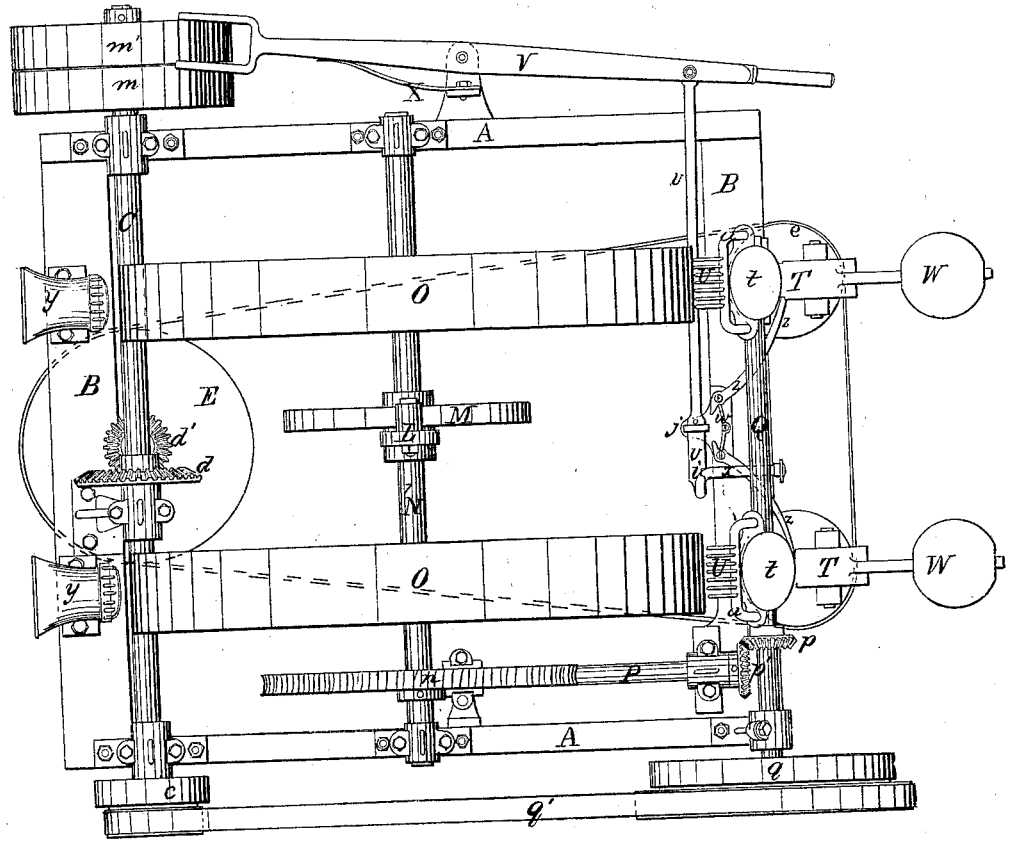
W. C. Hibbard.

Spinning Mach.

Patented Apr. 24, 1849.

No. 6,388.

Fig: 5.



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Spinning Mach.

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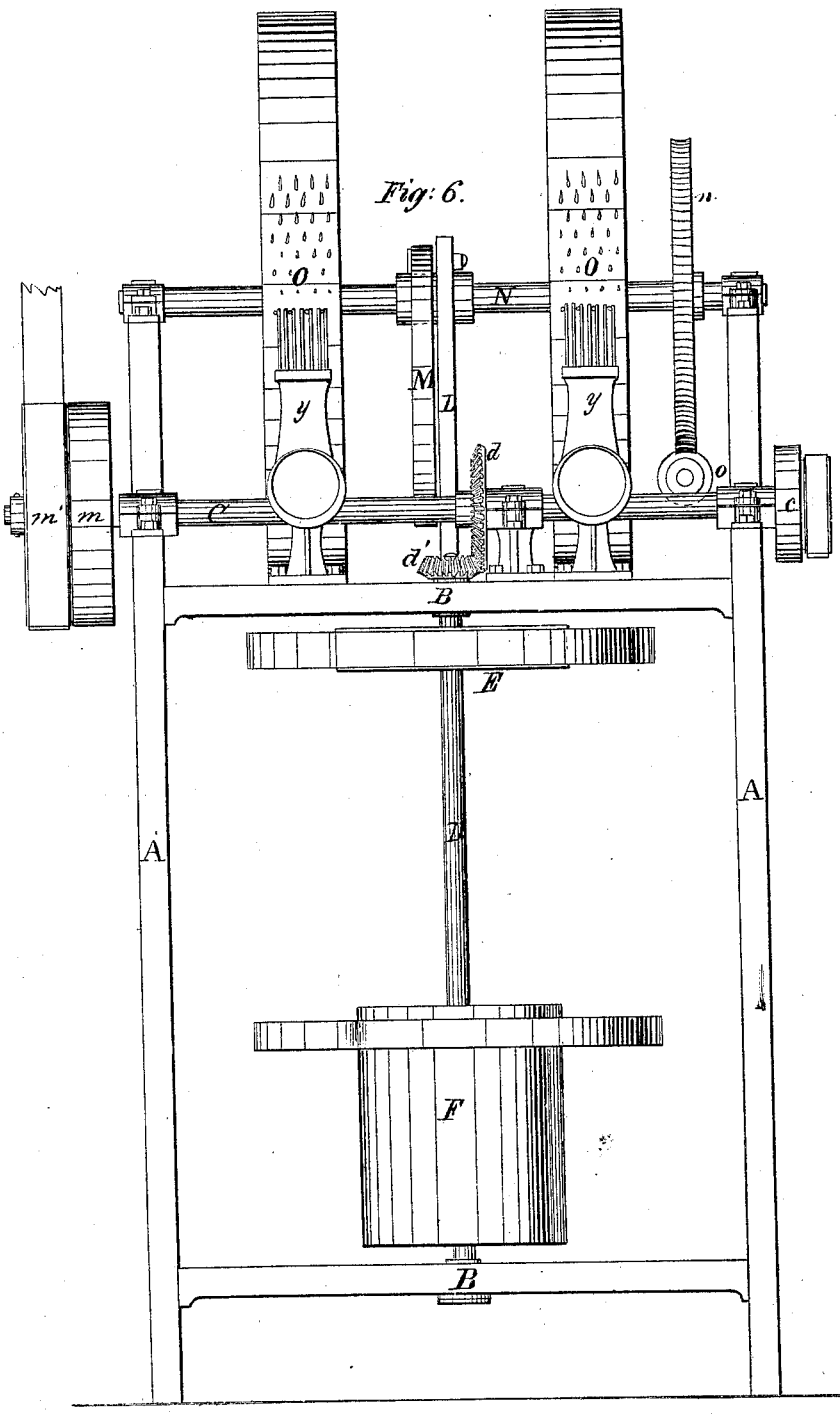
Fig: 6.



UNITED STATES PATENT OFFICE.

WM. C. HIBBARD, OF BOSTON, MASSACHUSETTS.

MACHINERY FOR SPINNING HEMP, &c.

Specification of Letters Patent No. 6,388, dated April 24, 1849.

To all whom it may concern:

Be it known that I, WILLIAM C. HIBBARD, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful improvements in machinery for spinning, drawing, slubbing, and roving hemp, flax, or other long fibrous substances; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1, is a side elevation. Fig. 2, a front end elevation. Fig. 3, a longitudinal vertical section. Fig. 4, a side elevation (other side). Fig. 5, a plan, and Fig. 6, a back end elevation of the machine for spinning hemp and flax into yarn for cordage. The letters refer to the same parts in each figure.

A, A, &c., are the side pieces of the frame and B, B, &c., the several girts or cross bars which unite the same, and with them form the frame upon which the several parts of the machine are arranged.

C, is the main driving shaft to which the motive power is applied to operate the machine, by means of a belt acting upon the fast and loose pulleys m, m', in the usual manner. It carries near its center the bevel gear d, which meshes into the bevel pinion d', on the vertical shaft D; and at its opposite end the pulley c, which drives the drawing roller shaft Q, as will be hereafter described. The vertical shaft D, is provided near its upper end with a pulley E, which by the belt E′ drives the fliers G; and at its lower end with a drum F, which by the belt F′, drives the spindles h, upon which the bobbins H, are fixed. The pulleys e, on the flier shafts g; and the pulleys f, on the spindles h, are of the same diameter; but the drum F, is smaller than the pulley E, which imparts a slower motion to the bobbin than to the flier, for a purpose to be hereinafter described. The fliers G, are each formed of a single piece of metal, of the form shown or any other analogous shape, and fitted upon the lower end of the hollow shafts g, which run in boxes attached to the front upper girt B (as is clearly shown in the drawings), and are driven by the pulleys e, upon the same, by the belt E′, as already described. In the center of the flier shaft g, and extending through its whole length, is a hole or bore as is shown by the red lines in Fig. 2, through which the yarn passes as it spins from the drawing rollers R, R′. There are also holes through the bosses b, b' of the fliers through which the yarn passes and is guided upon the bobbin H, as is shown by the red line Fig. 2.

The bobbins H, H, are attached to the spindles h, h, by the buttons k, k, and made to revolve with them. The spindles h, h, run in boxes attached to the bobbin frame I, and are arranged so that the line of their axis shall be perfectly concentric with the flier shafts g, g. Thus it will be seen that the bobbin H, is embraced by the flier G, without being in any way connected with it except by the yarn. The bobbin frame I, is made to rise and fall for the purpose of properly distributing the yarn upon the bobbins, and is guided in its vertical motion by the guide rods J, J, which are firmly attached to the frame. It receives its reciprocating motion through the medium of the rocker shaft K and roll L, from the heart M, upon the gill shaft N, in a perfectly obvious manner. O, O, are two cylinders called gills, the circumferences of which are armed with teeth set in rows both circumferentially and transversely, which receive and retain the material to be spun, prepared in the form of a ribband or sliver; and from which the material is drawn to be formed into yarn. They are mounted upon the shaft N, and are made to slowly revolve by means of the gear n, upon the same, which meshes into and receives its motion from the worm o, upon the worm shaft P.

Q is the drawing roller shaft upon which the drawing rollers R, R, are fixed, by which the material is drawn from the gills O, O, to form the yarn. It receives its motion by means of its pulley q, and belt q', from the pulley c, upon the main shaft first mentioned. It rests at each drawing roller R, R, in the stand S, S, to which are also attached the top levers T, T, by a joint at s, which carry the top rollers R′, R′. There is also attached to the top lever T′ a bosh or trumpet t, by which the fibers of the material are gathered to form the yarn as they leave the gill and are guided between the drawing rollers.

W, W, are weights upon the top levers which serve to press the top rollers upon the drawing rollers to prevent the material from slipping between them.

p, is a small bevel gear upon the shaft Q, which meshing into a similar gear *p'* upon the worm shaft P, imparts motion to the worm *o*, and in consequence to the gill shaft N, as already described.

U is a comb or rake, the teeth of which are inclined against the circumference of the gill O, and lie between the circumferential rows of the teeth of the same. It is made with as many teeth as there are spaces between the rows of the gill; which are set in the bent bar *u*, which is attached to the stand S, already described. It is called for distinction the clearer. Its office is to remove the fibers of the material spinning from among the teeth of the gill, which would otherwise remain in them; and unite them with those which are forming the yarn.

Y is a bosh or trumpet called for distinction the back trumpet, through which the ribband or sliver passes on to the gill O. It is also provided with a comb similar to the clearer, which serves to press the ribband or sliver in among the teeth of the gill and is therefore called the presser. The construction and application of both the clearer and presser will be sufficiently obvious from an inspection of the drawings without further description.

V is the shipper. It is pressed outward by the spring X, so that when at liberty it throws the driving belt on to the loose pulley *m'*, and stops the machine.

v is a rod which is attached to the shipper at one end, and at the other passes through the clasp *j* upon the front upper cross bar B, Fig. 5. It is provided with a notch *i* which hooks on to the clasp *j* when the shipper is in a position to throw the driving belt on to the fast pulley *m*.

x is a handle and knob by which the rod *v* may be worked by hand.

z z are two bent levers of the form shown in the drawing and are each attached by a screw, which serves for a fulcrum, to the top of the girt B offset. They are pressed forward by the spring *w* and when the machine is in operation, are held in the position shown in the drawing, by the yarn which passes down in front of them on its way from the drawing rollers to the fliers. The outer ends of these are made broad so as not to injure the yarn as it passes them. But if from any cause either of them are permitted to swing forward, the short arm of the lever acts upon the rod *v* and pushes the notch *i* from the clasp *j* when the shipper being at liberty, throws the belt upon the loose pulley *m'* and stops the machine.

The manner of attaching the several parts to the frame of the machine is believed to be sufficiently obvious from an examination of the drawings without any more particular description.

The operation of the machine is as follows: The material to be spun being properly prepared in the form of a ribband or sliver of the proper size, is drawn through the back trumpet and pressed in upon the teeth of the gill as it revolves, by the presser. From the opposite side of the gill it is drawn through the trumpet *t* by the drawing rollers R, R'; the relative velocity of whose circumferences when compared with the gill is such as to reduce the ribband or sliver to the proper size to form yarn. Any fibers that might remain among the teeth are removed by the clearer and drawn into the trumpet *t* with the rest. After leaving the drawing rollers, the yard passes down by the lever *z*, and through the bore of the flier shaft *g*, by which it receives a proper twist, and through the holes *b*, *b'* of the flier, and is wound upon the bobbin. The bobbin revolves as much slower than the flier, as is necessary to take up the yarn as fast as spun when the bobbin is empty, and any variation of velocity due to the variable diameter of the bobbin while filling is provided for by the slipping of the belt F' upon the flanged pulleys *f*, *f*, which belt is made narrower than the belt E', which drives the fliers, for that purpose. The bobbins rise and fall by means of the heart M, and machinery already described and distribute the yarn properly upon their surfaces. The operation is continued till the bobbins are filled; and when the bobbin frame I is at its lowest point, the machine is stopped, the yarn scoured, and the filled bobbins are lifted off from the spindle without any obstruction whatever. But should the yarn break or anything occur by which it ceases to be continuous, the lever *z* being no longer held by it will be thrown forward by the spring *w* and detach the shipper and stop the machine, as has been already described.

The machine here described is adapted to the spinning of rope yarns and spins two yarns. But the system of machinery by which one yarn is spun may be used singly or multiplied to any required extent in the same machine, and the motions and proportions of the same modified according to the nature and quality of the material to be manufactured.

In order to set forth more clearly the improvements which I claim to have made I will more particularly notice those parts to which said improvements are applied. The first peculiarity of my machine relates to the construction of the gill and its appendages, which is distinguished from other gills of various descriptions now in use (whether of the cylindrical, endless-screw, or endless-belt construction); by the absence of falling bars, clearing bars, revolving bars or other similar contrivance for removing the fibers from among the teeth of the gill; with the cams or other contrivances for

operating the same; and of the pressure rollers, endless presser belts, or lanterns, for pressing the ribband or sliver in upon the teeth; with some of which contrivances all gills heretofore in use, (so far as my knowledge extends) have been constructed. Instead of this complication of parts, which in practice has been found to be highly objectionable, I use only a cylindrical gill of the simplest construction with the teeth set permanently into it, and without any movable appendage to it whatever; which I am enabled to use by combining the same with the permanent clearer and permanent presser already described, which perform all the functions of the complicated machinery of the gills just mentioned, and are very much cheaper of construction and less liable to derangement. And by dispensing with the numerous cross bars with which gills are usually constructed, I am enabled to make the surface over which the material is drawn, perfectly smooth so as not to entangle the fibers of the ribband or sliver in the act of drawing.

The permanent clearer and permanent presser may also be applied to the endless chain gill (when its peculiar construction will admit of it) in a perfectly obvious manner. The improved cylindrical gill with the permanent clearer and presser is equally applicable to drawing, slubbing, and roving machines, and other preparatory machines for preparing long fibrous substances for spinning; or to any other purpose for which a gill is required.

The second peculiarity is in the construction of the flier, which is made to revolve perfectly independent of the spindle or bobbin. By which means (having only to carry the yarn) it can be made very simple and light and capable of revolving at a high velocity. It has all the advantages of the short fliers of various descriptions now in use in economy of construction and space occupied; and all the advantages of the long fliers in convenience in doffing the bobbin, &c., and without any of the disadvantages of either. It is also applicable to spinning, roving and twisting of every description of fibrous substances.

Having thus set forth my improvements, I shall claim as my invention;

The permanent clearer and presser in combination with the gill operating substantially in the manner herein described.

In witness whereof I have hereto affixed my signature.

WM. C. HIBBARD.

Witnesses:

LUCIENE GALE,

S. W. ROBINSON.