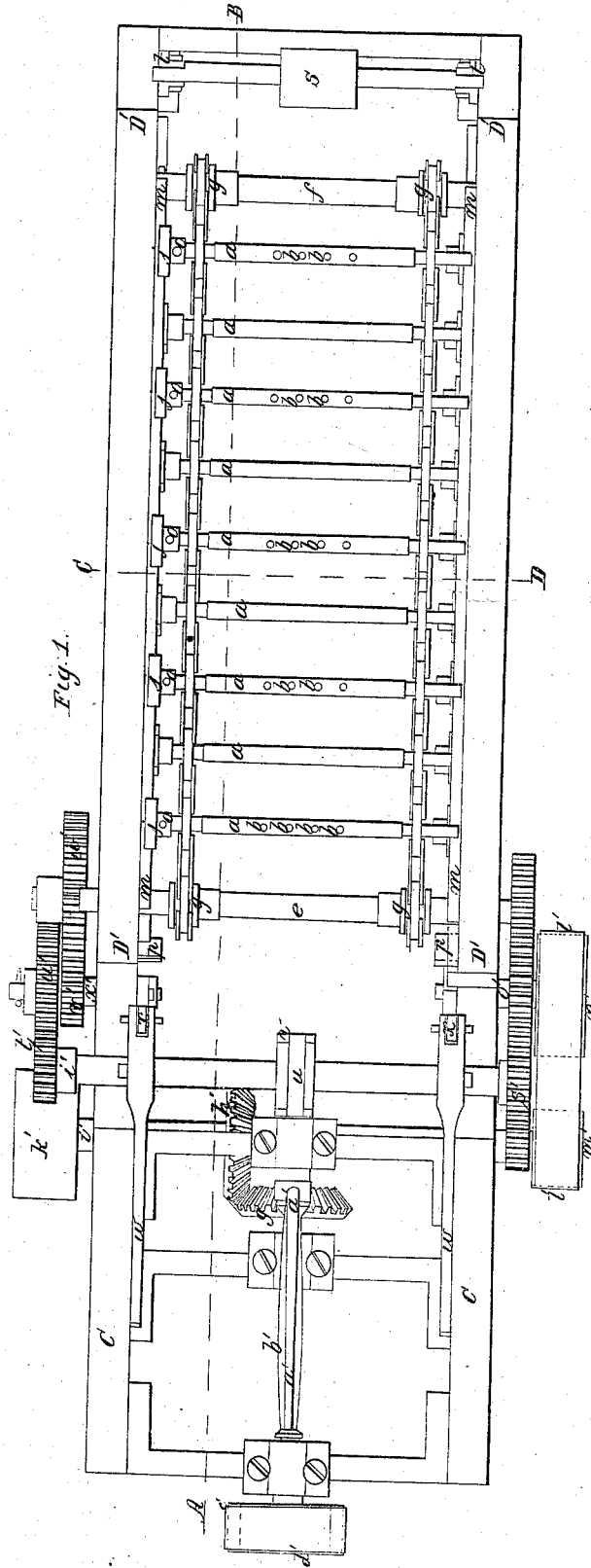


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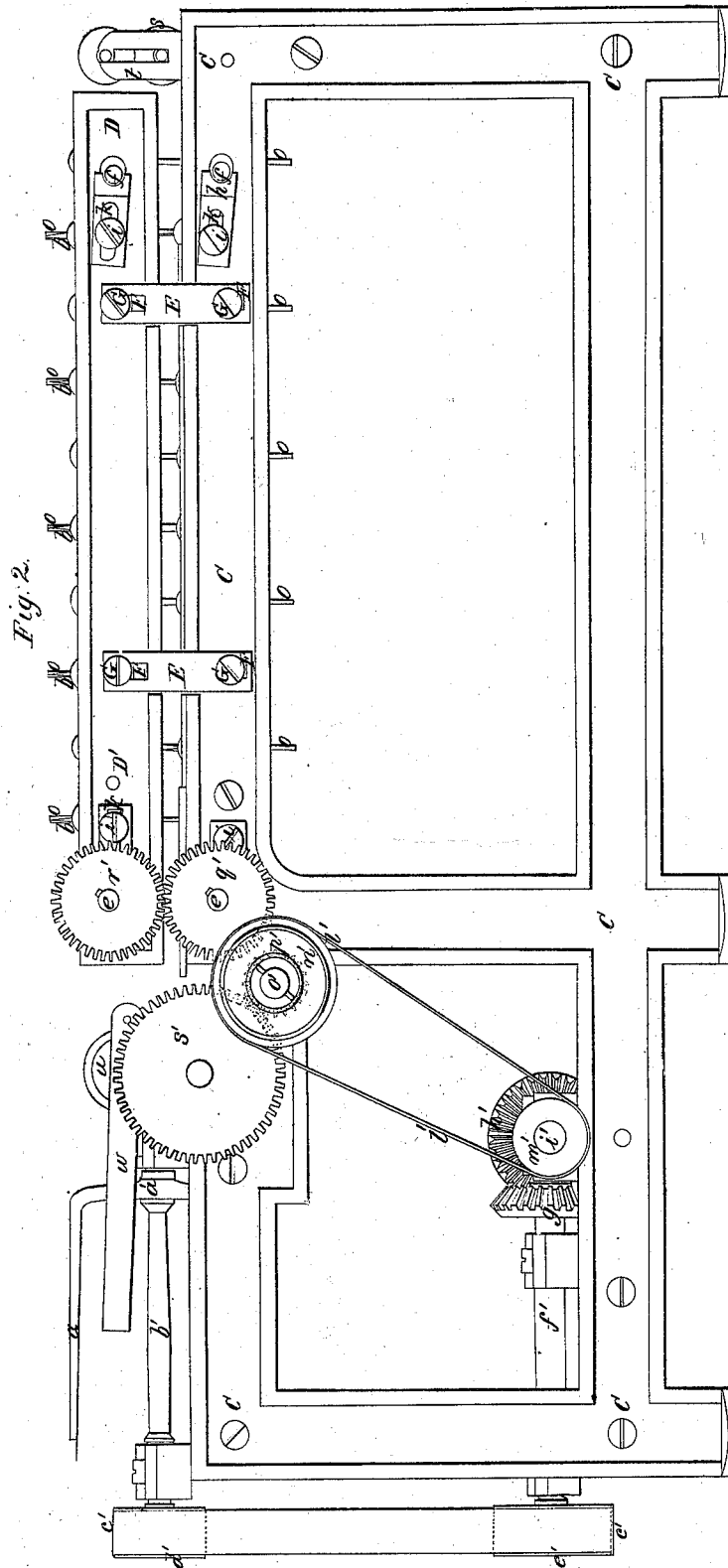
Patented Feb. 28, 1844.



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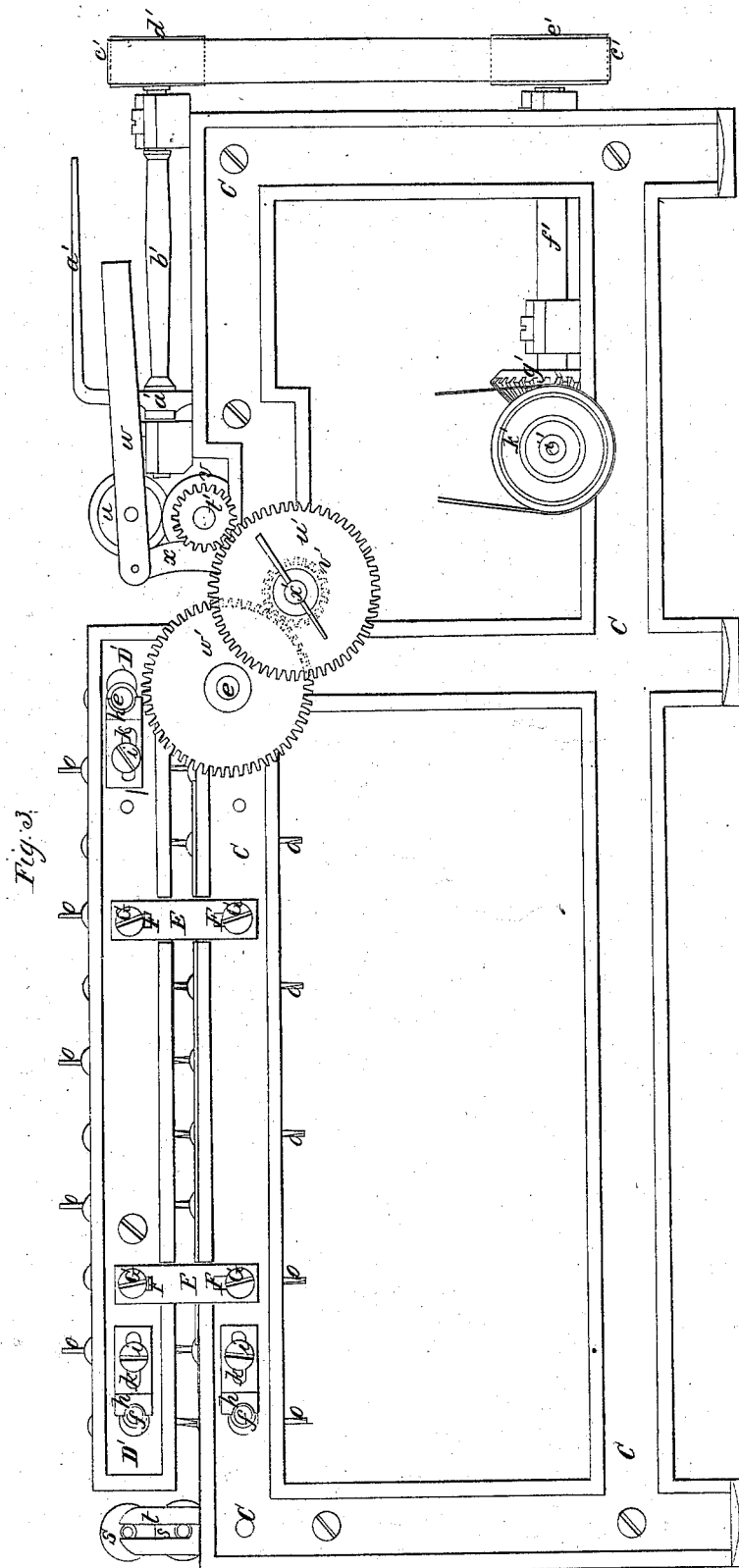
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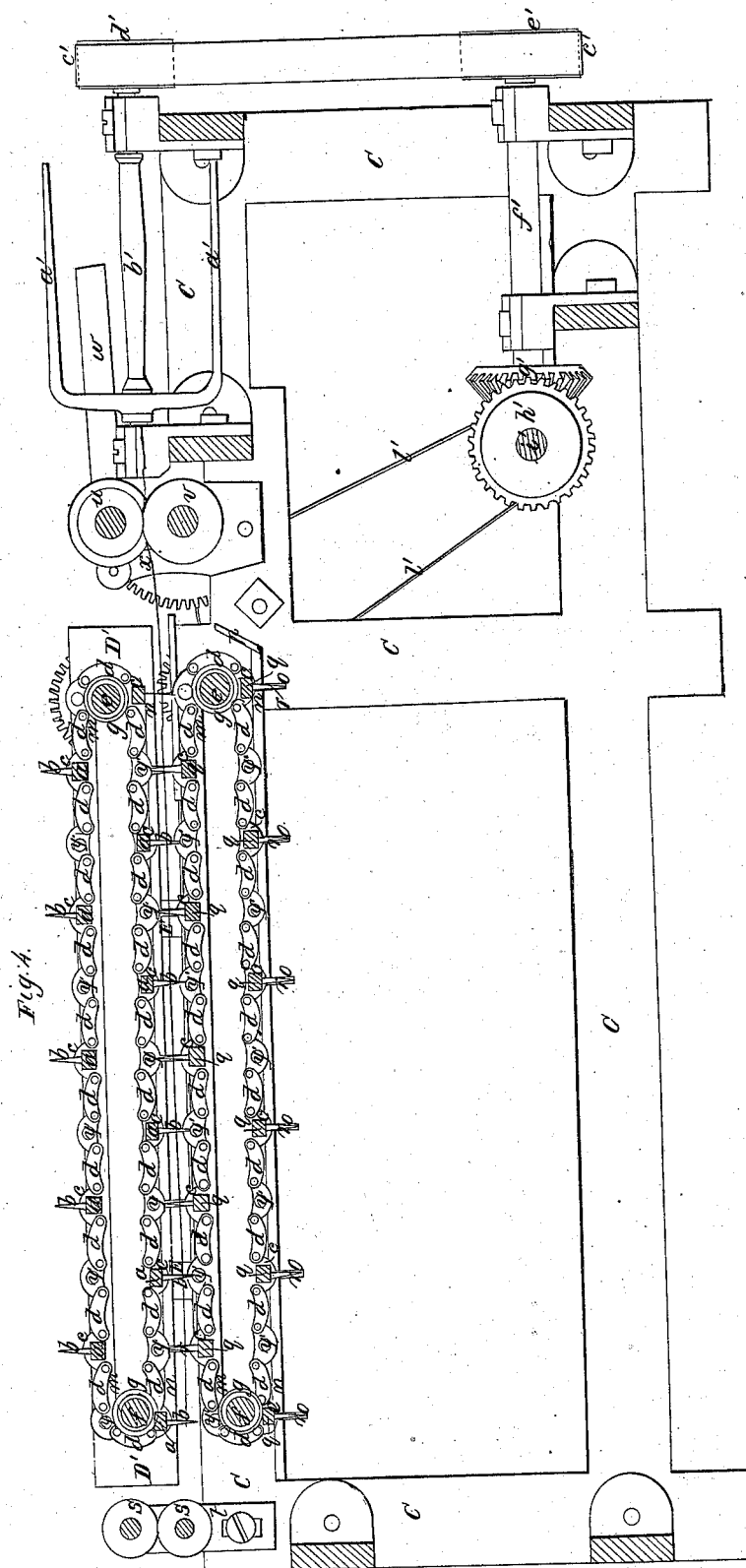
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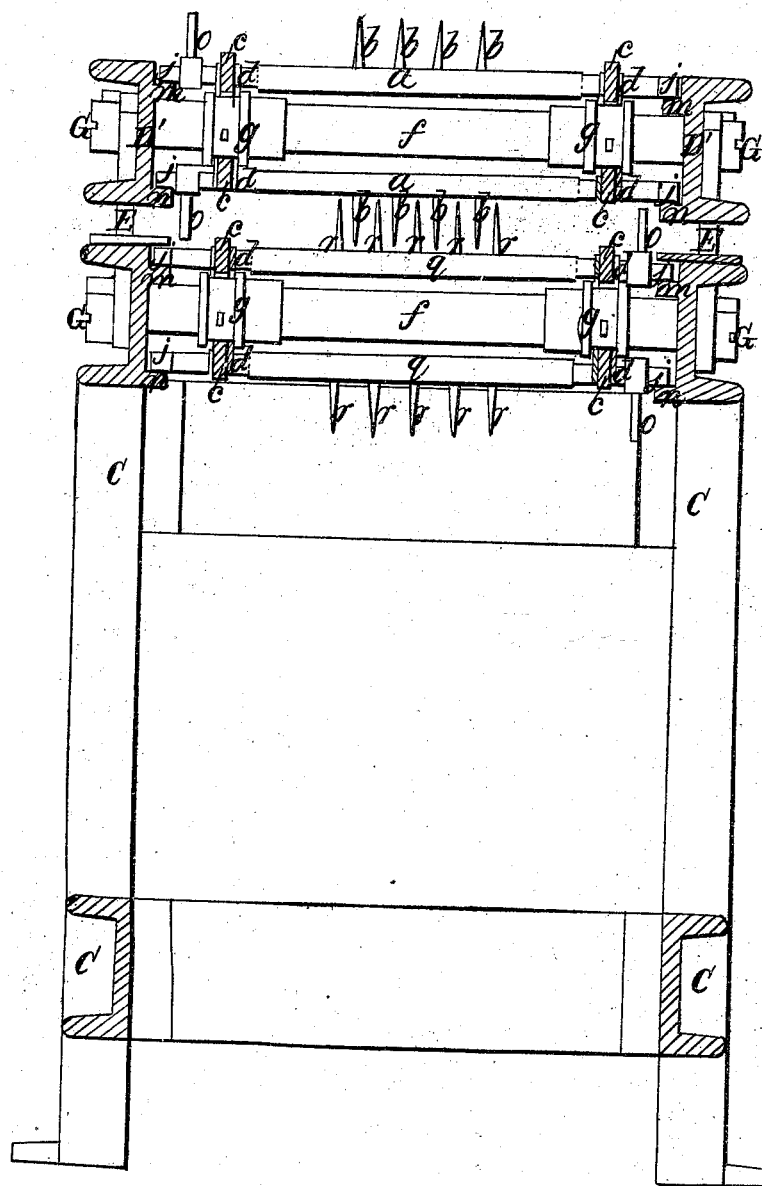
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W. Montgomery. Throstle.

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Patented Feb. 28, 1844.

Fig. 5.



UNITED STATES PATENT OFFICE.

WM. MONTGOMERY, OF BOSTON, MASSACHUSETTS.

MACHINERY FOR HECKLING OR PREPARING AND SPINNING HEMP AND OTHER MATERIALS.

Specification of Letters Patent No. 3,452, dated February 28, 1844.

To all whom it may concern:

Be it known that I, WILLIAM MONTGOMERY, of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Machinery for Preparing and Spinning Hemp and other Fibrous Materials, and that the following description, taken in connection with the accompanying drawings, hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements, by which my invention may be distinguished from others for a similar purpose, together with such parts or combinations as I claim and desire to have secured to me by Letters Patent.

The figures of the accompanying plates of drawings represent my improvements.

Figure 1, is a plan of my machine. Fig. 2, is an elevation of one side. Fig. 3, is an elevation of the opposite side. Fig. 4, is a longitudinal vertical section taken in the plane of the line A B, Fig. 1, and Fig. 5 is a transverse vertical section taken in the plane of the line C D Fig. 1.

My improved machinery belongs to that class of inventions for spinning hemp, &c., which form or twist the strand directly from the wide "sliver" and supersede some considerable portion of the usual preparative process or preliminary heckling which has commonly been necessary. Machines of the above class, which have heretofore been devised have been arranged with a series of "heckling drums," or with an endless leather belt having suitable heckling pins, and proper weights above or upon the hemp, to keep it on, or in connection with the pins. Such contrivances it will be seen operate in such a way as to strain and frequently break the fiber of the hemp, and the power required for working or driving such machinery is frequently very great.

My improved apparatus effectually heckles the hemp or separates and straightens the fibers without breaking them, while the manner of holding the sliver effects a great saving of power over the machines above mentioned.

C C C C C, &c., in the several figures represent the main framework on which the several moving parts are supported or have their bearings.

D' D', D' D', are two supporting bars, or

supplementary portions of the framework, which are connected to the main framework C C C C, &c., on each side so as to be capable of a vertical adjustment or movement up and down, by the connecting bars E, E, E E, which have suitable slots F, F, F, F, and confining screws G, G, G, G, working in the same in the usual way as shown in Figs. 2, 3.

The main novel feature of my improvements consists in having both above and below the sliver of hemp a series of traversing "gill bars" (so-called), having any number of heckling pins fixed in them, to that by drawing the sliver through the teeth of such bars so arranged with a more rapid motion than that with which the said bars and pins move, the fibers are effectually separated and straightened. The upper set of "gill bars" are represented at *a, a, a, a, a, &c.*, and are shaped as seen in Figs. 1, 4, 5, the heckling pins *b, b, b, b*, being properly fixed in each of them, and projecting from them in a direction perpendicular to one of the faces of the same as shown in Figs. 4 and 5. The journals of the "gill bars" rest and turn (when requisite but with considerable friction), in proper bearings or holes in the connecting bars *c, c, c, c, c, &c.*, which connect the links *d, d, d, d, &c.*, of the two endless chain belts *c d c d c d, &c., c d c d, &c.* These chain belts are stretched around the shafts *e, f*, arranged at any proper distance apart as shown in Figs. 1, and 4, and the wheels *g, g, g, g* on the said shafts have suitable teeth, which engage with the spaces in the links *d d, &c.*, of the chain belts in the ordinary way to insure the proper movement of the said belts and parts connected to the same. The journals of the shafts *e, f* have proper bearings in the adjustable blocks or boxes *h, h, h, h*, Figs. 2, 3, which are screwed to the supporting bars D' D' D' D' before mentioned by screws *i i i i* which work in the slots *k k k k*; the tightening or proper stretching of the chain belts it will be seen may be easily effected by this mechanical arrangement. On one end of each of the gill bars *a, a, a, &c.*, there is a guiding button *j, j, j* which slides along on the upper surfaces of the ledges *m m n n* formed on the inside of the supporting bars D D, D D, as shown in Figs. 1, 4, 5, which ledges may be formed into grooves if requisite for the more perfect guiding of the gill-bars. The motions of the shafts *e f*, and chain belts

c, d, c, &c. c, d, c, &c., carry the "gill bars" along mostly in a rectilinear direction (as will readily be understood), excepting where they turn around the said shafts, and the pins of the "gill bars" when they are traversing on the upper side of, or above the shafts *e f* project upward, while those moving beneath or on the underside of said shafts project downward as shown in Figs. 4 and 5, so that they may engage with the fibers of the hemp as the sliver is drawn through them as hereinbefore suggested. The "gill-bars" move along with the chain belts without turning in their bearings in the connecting bars *c, c, c*, excepting at the points or places where the teeth of the same are to leave the sliver of hemp, where instead of turning around with the chain belts they are caused to turn sufficiently in their bearings to retain or keep the heckling pins *b, b, &c.* in a vertical position, so that they may leave the sliver easily, and not break the fibers of the same which would be done if they did not turn as specified. To effect this turning a projecting stud *o, o*, is formed on one journal of each of the "gill bars," on the exterior of the chain belt as shown in Figs. 1, 2, 3, 4, 5. These studs when the teeth or pins of any "gill-bar" are about leaving the hemp come in contact with or bear against an inclined plane *p*, or other suitable stop arranged on the inside of the framework as shown in Figs. 1, and 4, which arrangement causes the journals of the "gill bars" to turn sufficiently to keep the pins vertical when they leave the sliver as herein above suggested. The lower set of "gill bars," before mentioned are arranged substantially in a similar manner to those hereinabove described, the pins which project upward engaging with or passing through the bottom of the sliver, in the same way as the pins of the upper set of gill-bars, which project downward pass through the top of the said sliver. The lower "gill bars" are designated by the letters *q, q, q, q*, and the heckling pins of the same by the letters *r, r, r, r*, to distinguish them from the similar parts in the other set. The other parts of the mechanical arrangement of the lower set of gill bars, &c., are designated by the same letters as those by which the similar parts of the upper set are denoted. The adjustable blocks or boxes for the lower shafts *e f* are connected to the main framework *C, C, C*, and the ledges or grooves *m m, n n* are formed on the inside of the same in the same manner as the similar parts of the upper set are connected to the supporting bars *D' D', D' D'*. The teeth of the two sets of "gill-bars" are arranged, so that those of one set shall pass through the spaces between those of the other, and the points of one set come near to the larger ends of the other, or to the

faces of the gill bars, in which they are placed.

The feed rollers *s, s*, are arranged at the rear of the machine in the usual way in slots in the upright standards *t, t*, Figs. 1, 2, 3, 4. The sliver of hemp to be twisted into a strand, is passed between the rollers and between the upper and lower sets of "gill-bars" as shown by the blue line in Fig. 4. being drawn through the teeth of the same, at a rate about ten times as fast as the said pins move by which means the fibers become properly separated and straightened before passing to the compressing or pinch rollers *u, v*, of the spinning apparatus which form the sliver into a roving.

The spinning machinery represented in the drawings is of the most ordinary kind, it being shown only to explain the application of my improvements to the same, and it will be evident that any of the most approved kinds of spinning apparatus may be used with the heckling machinery herein above described.

The journals of the roller *u* rest and turn in proper bearings in the levers *w w*, which may be weighted in the usual way, and which have their fulcrum in the upright standards *x, x*, as shown in Figs. 1, 2, 3, 4. The journals of the lower roller *v* have proper bearings in the frame *C C C*. The flier *a' a'* and spindle *b'* are arranged as seen in Figs. 1, 2, 3, 4, and need not be particularly described as they embrace no novelties. They are driven by a band *c' c'* which passes from a pulley *d'* on one end of the spindle to a pulley *e'* on the longitudinal shaft *f'* Figs. 1, 2, 3, 4. This shaft is driven by a beveled gear wheel *g* on one end of it the teeth of which engage with those of a beveled gear wheel *h'* on the driving shaft *i'* which driving shaft has a pulley or drum *k'* to which the power may be applied.

The chain belts *c d c, &c.*,—*c d c &c.*, and *e*, with the "gill bars" *a a, q q*, and *c*, are driven or moved by the following arrangement of pulleys cogged wheels &c. A band *l' l'* passes from the pulley *m'* (Figs. 1, and 2) on the driving shaft *i'* to a pulley *n'* on the short shaft *o'* which shaft has proper bearings in the framework *C C*. A cogged pinion *p'* shown by dotted lines in Fig. 2, on the shaft *o'* engages with a geared wheel *s'* on one end or journal *O* of the shaft of the lower pinch roller *v* of the spinning apparatus as shown in Fig. 2. A pinion *t'* on the other end of said shaft turns a cogged wheel *u'* on a short shaft *x'* Fig. 3, and another cogged pinion *v'* (shown by dotted lines in Fig. 3) on the same shaft *x'* engages with a cogged wheel *w'* on one end of the lower shaft *e*, and turns said shaft and the chain belts working with or on the same. A cogged wheel *q'* on the lower shaft *e*, but on the end opposite to that on which the wheel

w' is situated, engages with a wheel *w'* on the upper shaft *e* and turns the same and moves thereby the upper set of chain belts.

My machinery is peculiarly adapted to spin hemp having short fibers, as the heckling pins may be brought almost in direct contact with the compressing or roving rollers of the spinning apparatus, which cannot be done where heckling drums are used or where "lifters" (so called) are required to disengage the hemp from pins inserted in an endless leather belt. In spinning short fibers more heckling pins are necessary, and arrangements are made for this purpose as will be perceived by inspection of Fig. 4, the extra holes in the chain belts represented at *y y y*, &c., being for the insertion or accommodation of more "gill bars", having pins as usual. In this case also the upper and lower sets of gill-bars, heckling pins &c. must be brought nearer together which is accomplished by lowering the adjustable supporting bars *D' D' D'*, to which the upper set is connected, as hereinbefore described. The power required for driving my machinery, above described, is so small, that two or more fliers may be combined with the heckling machinery, by merely making the latter wide enough to heckle two or more slivers of hemp. The

friction or wear of the fibers by the heckling pins, as the sliver passes through them, will be less by my plan than by any of the others, above mentioned as heretofore described.

Having thus described my improvements I shall now proceed to specify such parts and combinations as I consider or believe to be new and claim as my invention.

I claim—

The combination of a projecting stud on one end of each of the "gill-bars" with a stationary inclined plane or other suitable bearing stop, attached to the inside of the framework, which combination causes the "gill bars" to turn so much in their bearings in the chain belts, as to make the heckling pins leave the sliver vertically, and without breaking the fibers of the hemp, the whole being as hereinabove set forth.

In testimony that the foregoing is a true description of my said invention and improvements I have hereto set my signature this seventeenth day of October in the year eighteen hundred and forty three.

WILLIAM MONTGOMERY.

Witnesses:

CHARLES F. SMITH,
EZRA LINCOLN, Jr.