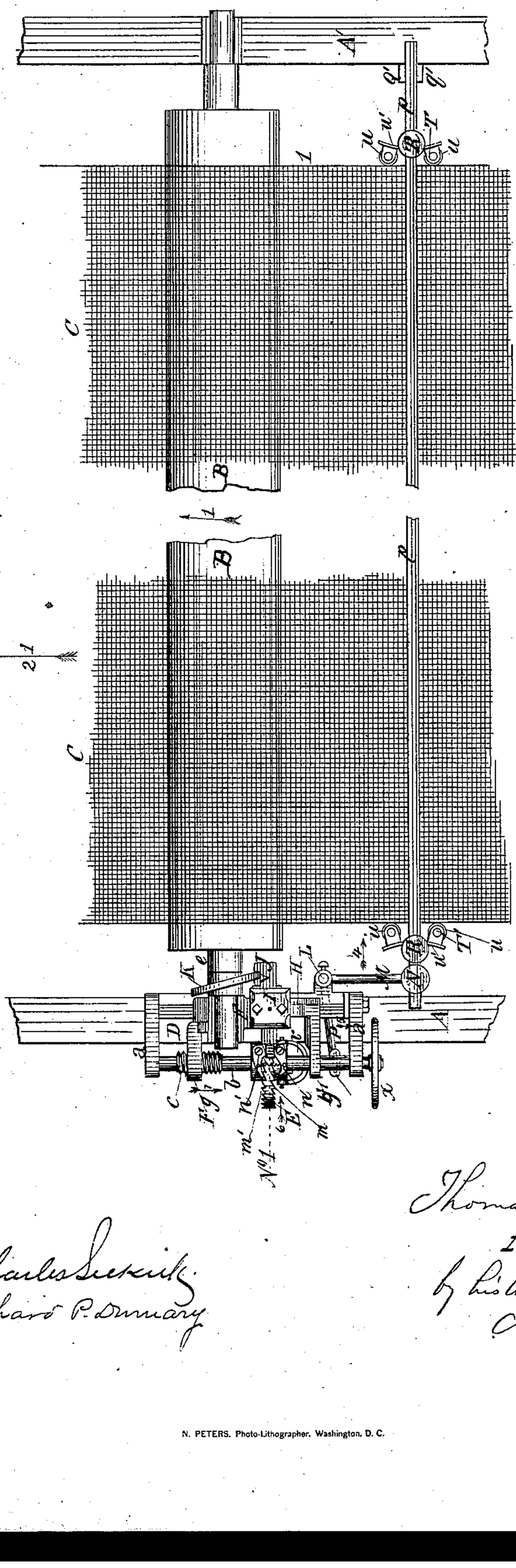
(No Model.) 3 Sheets—Sheet 1.

T. P. BARRY.

AUTOMATIC WIRE GUIDE FOR PAPER MACHINES.

No. 260,356. Patented July 4, 1882.



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(No Model.) 3 Sheets—Sheet 2.

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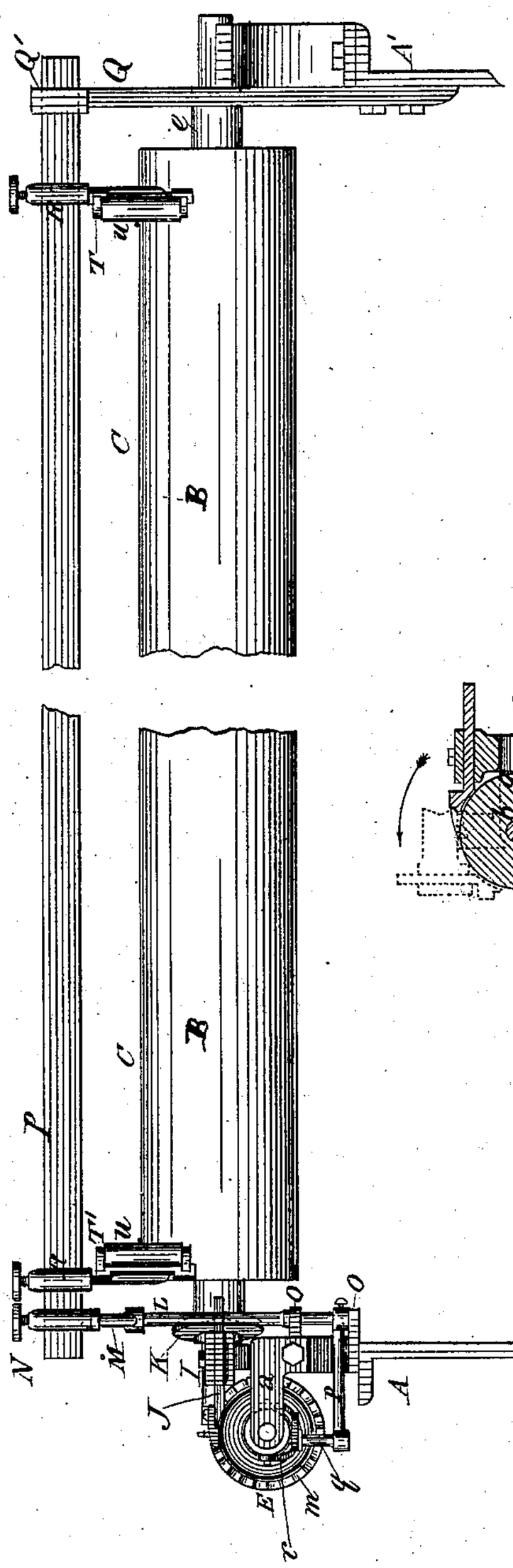

Fig. 2.

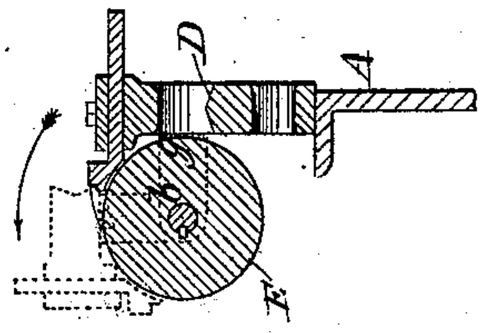

Fig. 5.

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(No Model.) 3 Sheets—Sheet 3.

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Fig. 3.

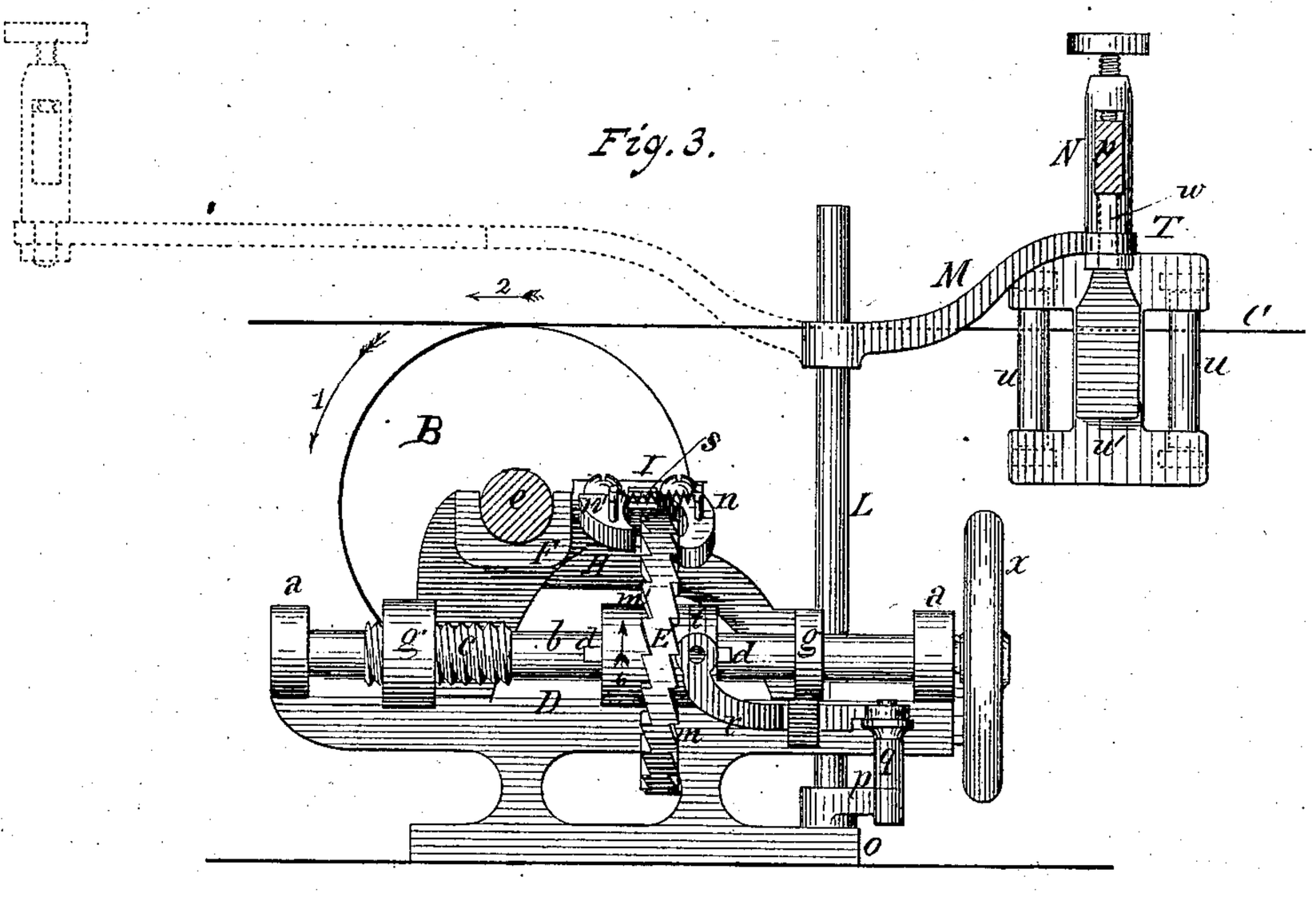
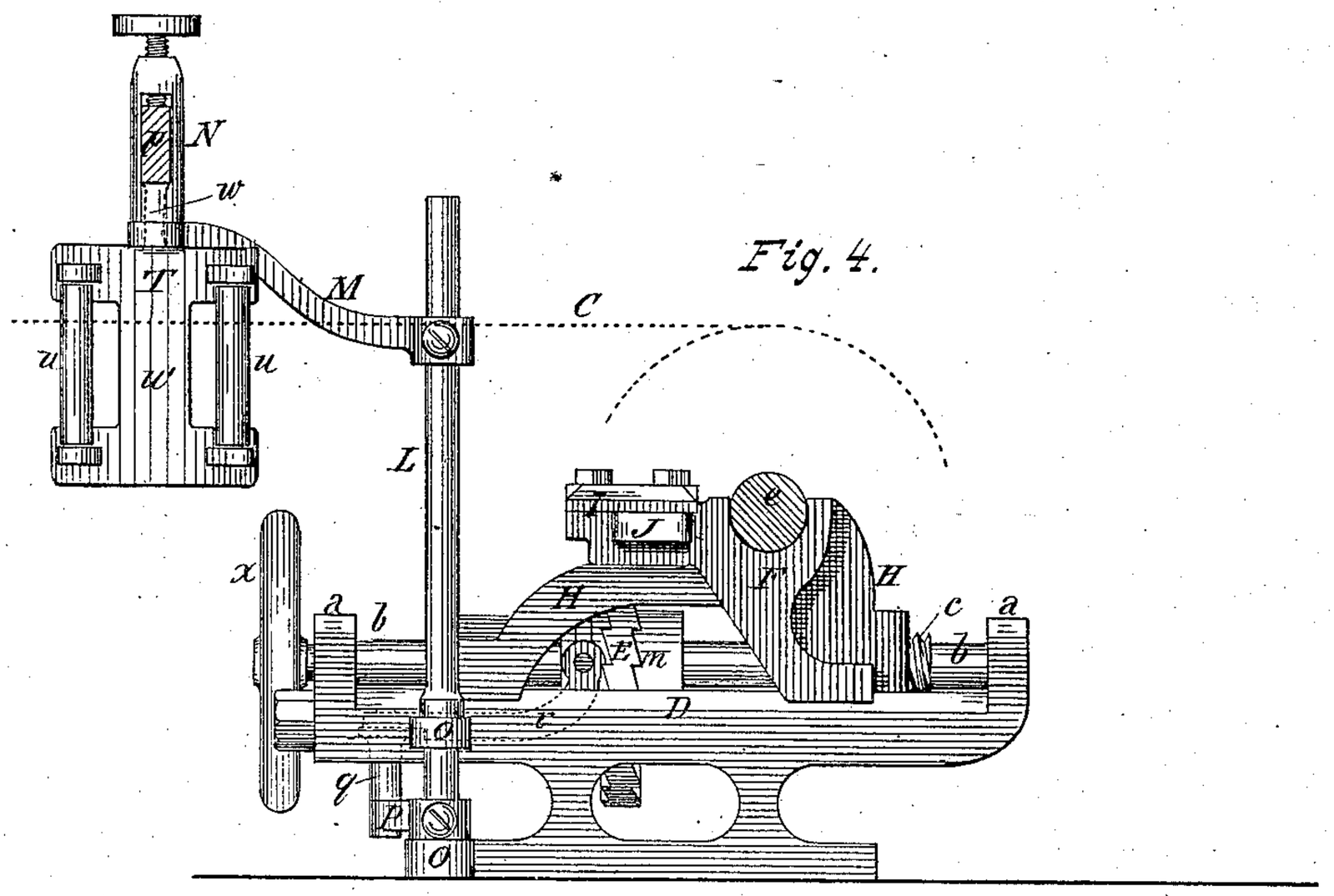


Fig. 4.



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UNITED STATES PATENT OFFICE.

THOMAS P. BARRY, OF STILLWATER, NEW YORK.

AUTOMATIC WIRE-GUIDE FOR PAPER-MACHINES.

SPECIFICATION forming part of Letters Patent No. 260,356, dated July 4, 1882.

Application filed October 26, 1881. (No model.)

To all whom it may concern:

Be it known that I, THOMAS P. BARRY, a citizen of the United States, and a resident of the town of Stillwater, in the county of Saratoga and State of New York, have invented certain new and useful Improvements in Automatic Wire-Guides for Paper-Machines, of which the following is a specification.

My invention relates to certain improvements in wire-guiding devices whereby wire aprons of the machine are guided as they are carried forward.

It consists of the combination of devices hereinafter described and specifically set forth.

The objects of my invention are to provide means by which the guide-roll cylinder which supports the wire apron is made to operate mechanism intermediate between the said guide-roll cylinder and guides at the side edges of the wire apron, so that said guides will be automatically operated to truly and properly guide the said wire apron in its forward movement, and also to provide means by which an attendant will be enabled to cause the said wire apron to be guided in its forward movement should certain parts of the automatic mechanism become disarranged or out of order. I attain these objects by means of the mechanism illustrated in the accompanying drawings, in which similar letters of reference indicate like parts.

Figure 1 represents a plan view of a section of a paper-making machine and my improved wire-guiding device attached. Fig. 2 is a side elevation of the guide-roll cylinder carrying the wire to be guided and an end view of my improved device. Fig. 3 is a front side elevation of the device. Fig. 4 is a rear side elevation of the same; and Fig. 5 is a cross-sectional view of the same, taken at line No. 1 in Fig. 1.

In the drawings, A A represent the frame of a paper-making machine, and B is a guide-roller supporting the wire web or apron C, which my improved device is intended to guide as it moves forward.

Secured to one of the side portions, A, of the frame of the machine is the bed or way D, made preferably with a V-shaped form, as shown in Fig. 5. Made with the said way, and extending outward and in a lateral direction from the same, are brackets *a a*, which brackets support shaft *b*, which is free to revolve in bearings made in the rear ends of said brackets. The said shaft is held from being moved longitudinally by the shoulders of the journals of the said shaft bearing against the sides of the bearings they work in.

Made with shaft *b* is a screw-thread section, *c*. Mounted on said shaft is a duplex ratchet-wheel, E, which is secured from turning on said shaft by a feather or spline, *d*, fixed in said shaft and working in a seat made in the hub of said ratchet-wheel.

F is a bearing of shaft *e* of guide-roll cylinder or roller B, which bearing is made solid with or attached to bracket H, which bracket is pivoted to shaft *b* by arms *g g'*, and is supported by way or bed D, on which the lower foot ends of said bracket rests, as shown in Figs. 1, 3, 4, and 5. Being thus pivoted to shaft *b* and supported by way or bed D, the said bracket H is adapted to be turned up from a horizontal position, as shown in the several figures, to the position shown by dotted lines in Fig. 5.

The pivoting eye or bearing in arm *g* of bracket H is provided with a screw-thread, which corresponds with the screw-thread of section *c* of shaft *b*, and said screw-threaded section works in said screw-threaded eye of arm *g'*, as shown in Figs. 1 and 3.

Mounted on the upper side of bracket H, and against or adjacent to bearing F of guide-roll cylinder B, is housing I, in which freely works bar J, which bar is adapted to be moved in either direction transversely to the direction of shaft *b*. A notch, *v*, Fig. 1, is made in the end of said reciprocating bar J next to the end of guide-roll cylinder B and in its side facing. Secured to the shaft of said guide-roll cylinder, so as to revolve with the same, is cam-wheel K, formed by an annular flange arranged in one direction slightly oblique to the axis of guide-roll cylinder B, as shown in Fig. 2. The said cam-wheel works in notch *v* of bar J and moves the said bar alternately in opposite directions as guide-roll cylinder B is revolved.

Pivoted to the end of reciprocating bar J, opposite to its notched end, are dogs *n n'*, Figs. 1 and 3, which dogs are held and drawn toward each other by spring *s*, Fig. 3, and engage respectively with the teeth *m m'* of wheel E, as shown in Figs. 1 and 3, accordingly as said

wheel E is in situation for engagement with said dogs, as will be hereinafter described.

Supported in arms *o o*, projecting from the way or bed D, is a vertical shaft, L. To the lower end of said shaft is secured crank *p*, provided with vertical arms *q*, Figs. 2, 3, and 4. Pivoted to the upper end of said vertical arm *q* is a forked pitman, *r*, which pitman is yoked to a loose collar or sleeve, *t*, on the hub of wheel E.

Secured to the vertical shaft L at its upper end is arm M, carrying a clamping device, consisting of upright stud N, provided with an oblong slot and set-screw. (Shown in Figs. 3 and 4.) Secured in said clamping device at one of its ends is the shifting-bar P, the opposite end of which works freely in sleeve Q, supported by standard Q′, attached to the frame of the machine, as shown in Figs. 1 and 2.

Secured to the shifting-bar P by clamping devices R R′ are guides T T′, which guides are each composed of two rollers, *u u*, Figs. 1, 2, 3, and 4, arranged and connected with plate *w′* by being pivoted to ears made with said plate, as shown in Fig. 4. The said guides thus composed are each pivoted to their respective clamping devices R R′, as indicated by dotted lines *w* in Fig. 4, and are each capable of a swiveling movement.

Secured to one end of shaft *b* is a hand-wheel, X, which may be operated in either direction for shifting the bearings of guide-roll by hand when circumstances require, as will be hereinafter described.

The manner in which the several parts of my improved device operates is as follows: The guides T T′ are set near to the side edges of the wire apron C, with their rollers *u u* at a distance from the same as the machine-tender may select. The guide-roll cylinder B revolves in direction of arrow No. 1 in Figs. 1 and 3, and carries the wire apron to be guided in direction of arrow 2 in same figures. The cam K, attached to the shaft or journal of guide-roll cylinder B, revolves with the same, and works in the notch made in the reciprocating bar J, and causes the said bar to be moved once in each direction at each revolution of said guide-roll cylinder and operate said bar, so as to carry the dogs *n n′* to a full movement back and return at each side of the ratchet-wheel. The ratchet-wheel E being mounted loosely on shaft *b*, and held by its feather so as to turn with said shaft, is adapted to move longitudinally on the same in either direction and between dogs *n n′*. When the wire apron is moving forward uniformly and truly with its side edges in straight lines of direction the said dogs will be moved back and forth without engaging with the teeth of said ratchet-wheel. When the wire apron C begins to shift or run from side A of the machine the off side edge, 1, of the apron will crowd against the rollers *u u* of the guide T, when the shifting-bar P will draw arm M in direction of arrow 4 and cause crank-arm *p* to move in direction of arrow 5, and through pitman *r* and sleeve *t* move ratchet-wheel E toward dog *n*, so that said dog will work in engagement with the teeth *m* of the same. As the revolution of guide-roll cylinder B is continued cam K will impart to bar J a reciprocating movement, by which the dogs *n n′* will be moved back and forth, the dog *n′* being out of engagement with the ratchet-wheel, while the dog *n* will be in engagement with the teeth *m* of the same and at each return movement draw on said teeth and cause the ratchet-wheel to be moved in direction of arrow 6, when the screw *c* on shaft *b* will be turned and cause bearing F to be shifted in direction of arrow 7. This shifting of said bearing will be attended by a gradual shifting also of bar J and its attached dogs *n n′* in the same direction, so that in a short time the dog *n* will be out of engagement with the ratchet-wheel, while dog *n′* will be thrown into engagement and will operate to turn the ratchet-wheel in an opposite direction, and also operate the screw of shaft *b* to shift bearing F, and also the said dogs, in direction opposite to arrow 7.

It will be seen that the dog *n* operates to turn the ratchet-wheel when it is drawn toward the wire apron, and moves the said ratchet-wheel in direction of arrow 6; also, that dog *n′* operates to turn the said ratchet-wheel when it is pushed back, and moves the ratchet-wheel in an opposite direction to that indicated by arrow 6. When the dogs are operated back and forth, and at the same time free from engagement with the teeth of the ratchet-wheel, the said ratchet-wheel will be idle, and there will be no relative shifting of parts. When this idle condition of parts exists the wire apron is running evenly and uniformly straight without its side edges exerting any great pressure on their respective guides T T′, while when the side edge at guide T bears against that guide it will tend to throw the ratchet-wheel toward dog *n* at engagement with the same, when the said dog, operating with teeth *m*, will gradually shift the parts and cause the opposite operating-dog, *n′*, to be carried toward teeth *m′* of the ratchet-wheel, while the dog *n* will be thrown out of engagement with teeth *m*. When the side edge of the wire apron presses against guide T′ the said pressure will operate to slightly move arm M in opposite direction to arrow 4, and cause the crank-arm *p* to operate pitman *r* so as to shift the ratchet-wheel toward dog *n′* and in engagement with the same, when the screw will be turned in an opposite direction and carry bearing F and bar J and dogs *n n′* in direction opposite to arrow 7, when dog *n′* will be released from engagement with teeth *m′* of the ratchet-wheel. These alternate movements or reversals of action of parts operate to hold the ratchet-wheel at nearly one situation, and consequently it is made to resist the excessive pressure of the respective side edges of the wire apron, and be compelled to run with its edges with comparatively uniform lines of movement.

It should be understood that the wire apron does not run around guide-roll B, but is merely supported by the same, and is affected by the slight shifting of its bearing F, in the manner above described. Should the dogs *n n'* from any cause whatever become disarranged or out of working order, an attendant may, by moving the hand-wheel X in alternate directions, readily direct the movement of the wire apron. This is a great advantage, as the machine need not be purposely stopped, but may be continued to run until the web being made is completed or the usual time for stoppage arrives. The support of the bearing F of the guide-roll cylinder directly over the way D removes all weight from shaft *b*, so that said shaft is rendered easy to be turned.

In Fig. 5 dotted lines illustrate the manner in which the bearing F and its adjunctive parts may be turned up. This adaptation of the said bearing to be turned up, as shown, enables the operator to properly set the bearing in line, as required, as he may, by turning the said bearing up without moving the shaft and then turning it down and moving the shaft, gradually adjust the bearing in one direction, while by turning the said bearing up and at the same time moving the shaft in the same direction, and then turning the bearing down while the shaft is held from turning, the said bearing will be shifted in an opposite direction. It will therefore be seen that by this means the said bearing will be set properly.

I am aware that it is not new to construct paper-making machines with a rule provided with plates and connected to a pair of levers, in connection with a screw on which a double toothed wheel is secured, a curved lever carried by another lever, and a crank which imparts motion to the last-named lever. I am also aware that it is not new to provide the mechanism for guiding the wire cloths or belts of paper-making machines with a crank-action for operating a double pawl to engage by draft or thrust a screw-nut ratchet-wheel to slide laterally a slide or purchase; also, the combination, with the journal of a roller, of an adjustable crank to operate double-acting pawls, which operate in either direction a ratchet-wheel; also, the combination of a bed-plate and a fixed screw-bolt with a screw-nut ratchet-wheel to hold and operate a slide by the action of double pawls, which are operated by a crank. I therefore do not claim such constructions.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a wire-guiding device of a paper-making machine, the combination, with the way or bed D, having arms *a a* and shaft *b*, having a screw-threaded section, *c*, and adapted to turn in said arms, of the bearing F, mounted on brackets H, and supported vertically over the said body or way and pivoted to shaft *b*, with the screw-threaded section *c* of said shaft working in a screw-threaded eye made with said bracket, whereby the bearing F will be shifted accordingly as said shaft is revolved, and be supported by said way and be adapted to be turned up and off from said way, substantially as and for the purpose set forth.

2. In a wire-guiding device of a paper-making machine, the combination, with shaft *b*, provided with a screw-threaded section, *c*, adapted to shift the bearing F of a cylinder, supporting the wire apron C when said shaft is revolved, of cam K, revolved by said cylinder, dogs *n n'*, operated by said cam, and duplex ratchet-wheel E, operated by said dogs, whereby the revolving of said cylinder will effect a shifting of bearing F of the same, substantially as and for the purpose set forth.

3. In a wire-guiding apparatus of a paper-making machine, the combination, with the duplex ratchet-wheel E, loosely mounted on shaft *b*, which is adapted to shift bearing F when said shaft is revolved, of guides T T', connected together by shifting-bar P, and adapted to bear against the side edges of the wire apron C, arm M, carrying said guides, vertical shaft L, sleeve *t*, and mechanism intermediate between said sleeve and said vertical shaft, substantially as and for the purpose set forth.

4. In a wire-guiding device of a paper-making machine, the guide T or T', each composed of rollers *u u* and plate *u'*, pivoted to clamping-piece R or R', substantially as and for the purpose set forth.

5. In a wire-guiding device of a paper-making machine, the combination, with bearing F of guide-roll cylinder B and shaft *b*, having a screw-threaded section, *c*, and adapted to shift said bearing when revolved, wheel E, loosely mounted on said shaft and revolved with the same, guides T T', connected together by shifting-bar P, and mechanism intermediate between said guides and wheel E, whereby the former said bearings are shifted, of the hand-wheel X, substantially as and for the purpose set forth.

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