Sheet 1-3 Sheets.

# R. Pilson.

## Sizing and Dressing Frame.

No. 30,543. Patented Oct. 30, 1860.

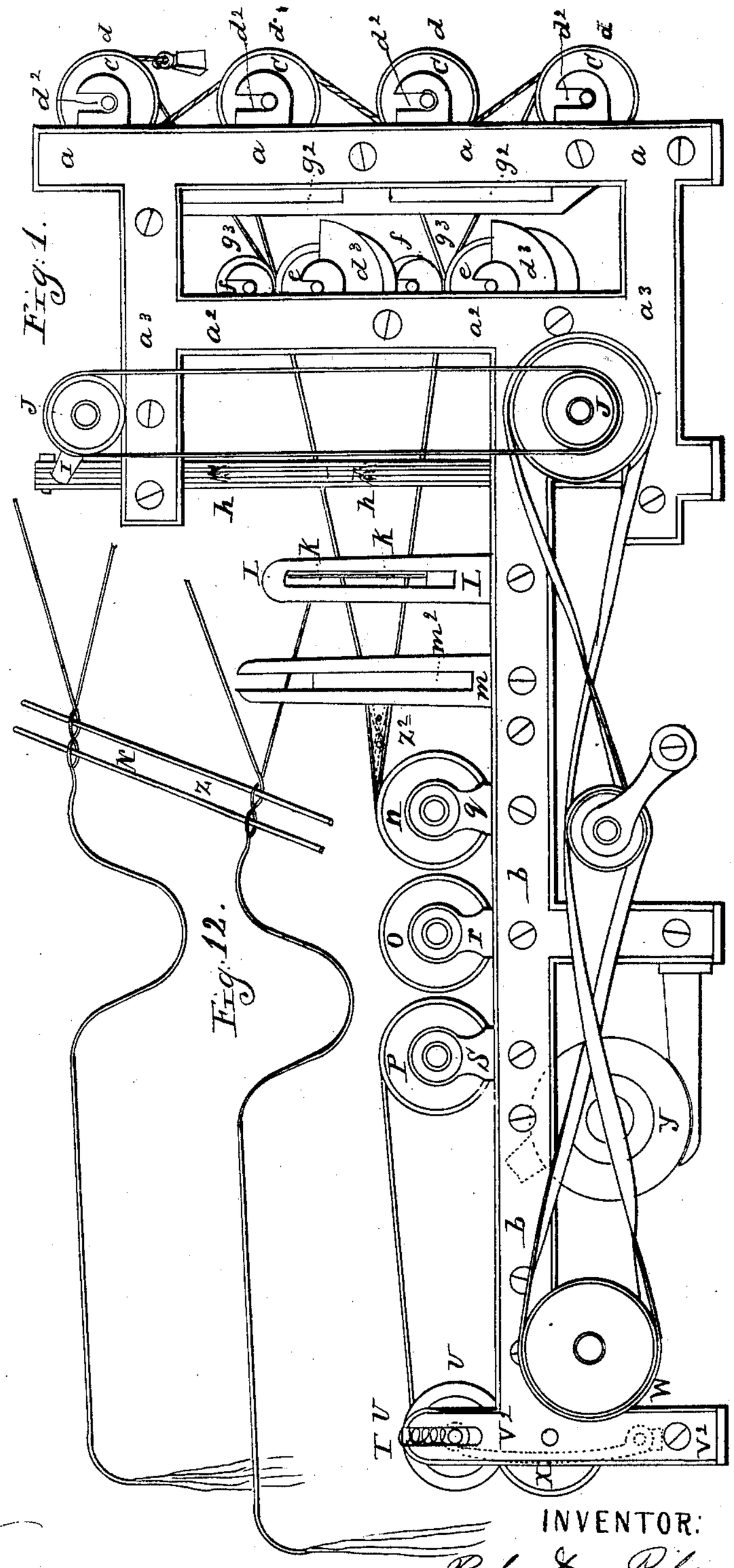

Fig. 1.

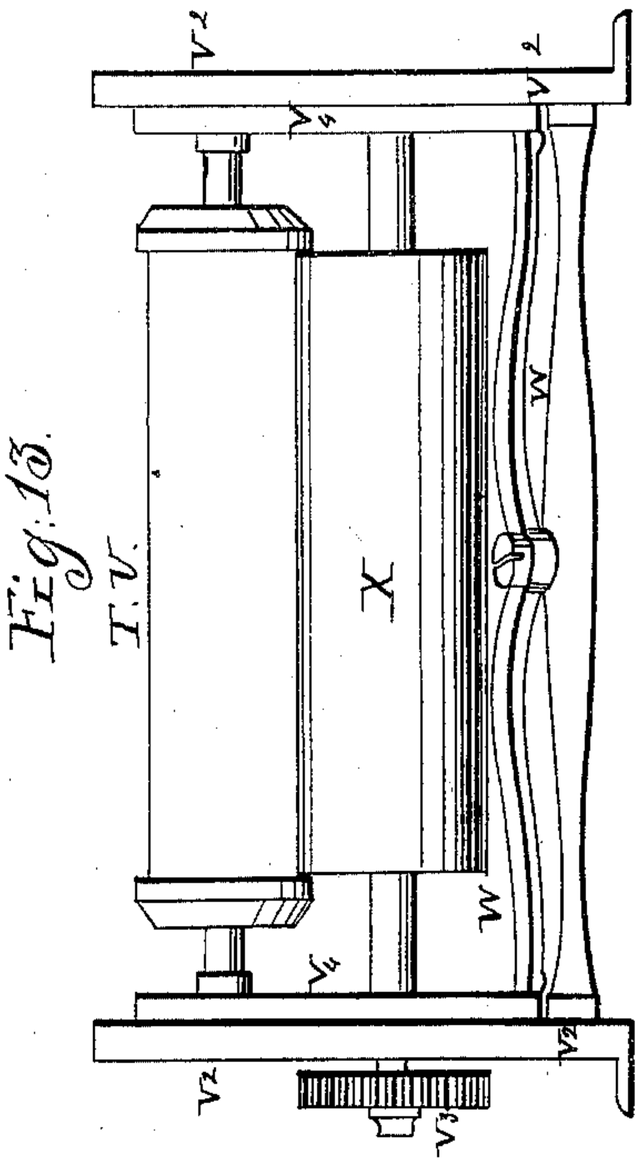

Fig. 13.



Fig. 12.

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Sheet 2 - 3 Sheets.

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# Sizing and Dressing Frame.

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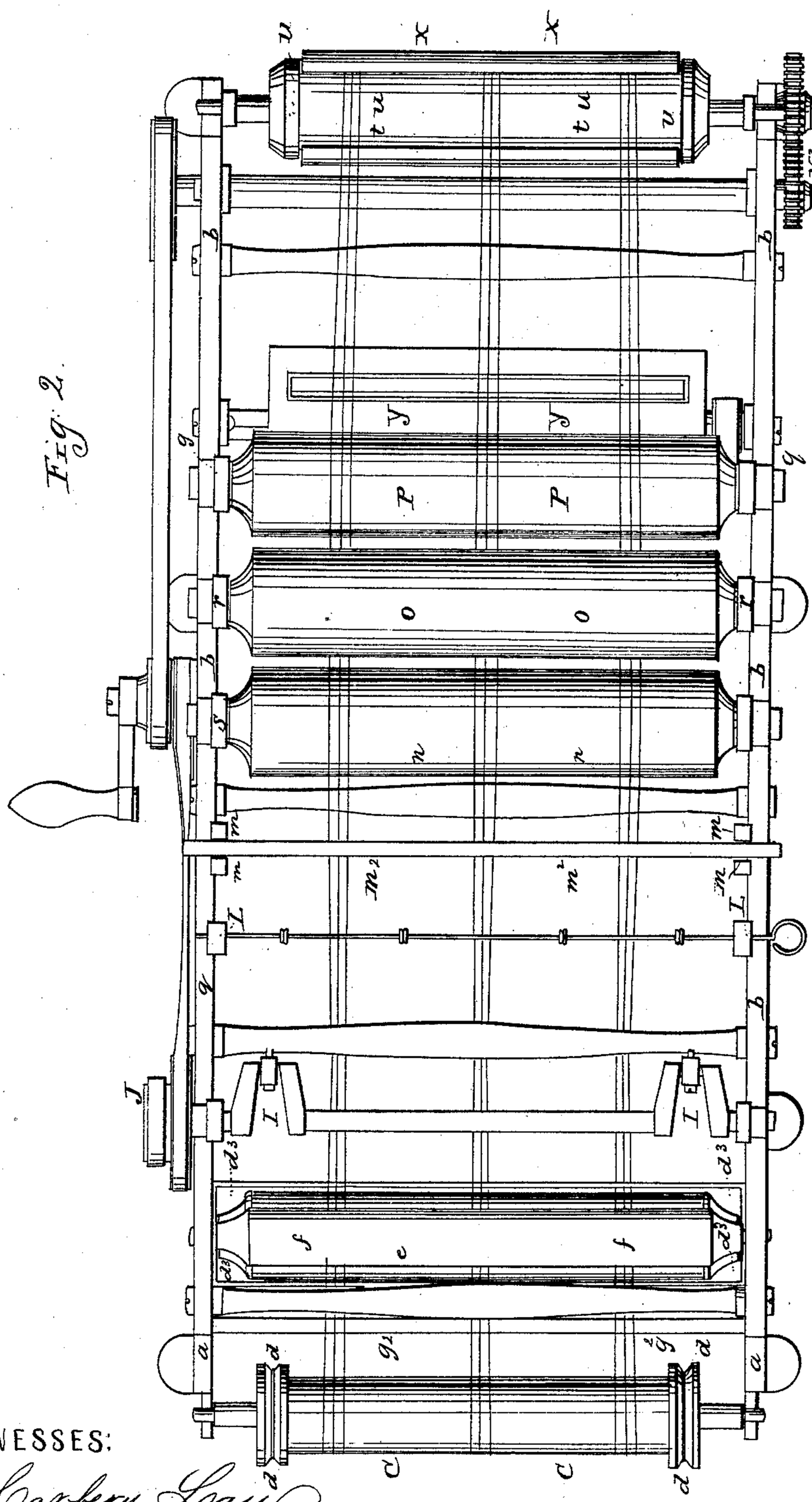
Fig. 2.

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Sheet 3 - 3 Sheets.

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## Sizing and Dressing Frame.

No. 30,543. Patented Oct. 30, 1860.

Fig. 8. Fig. 9.

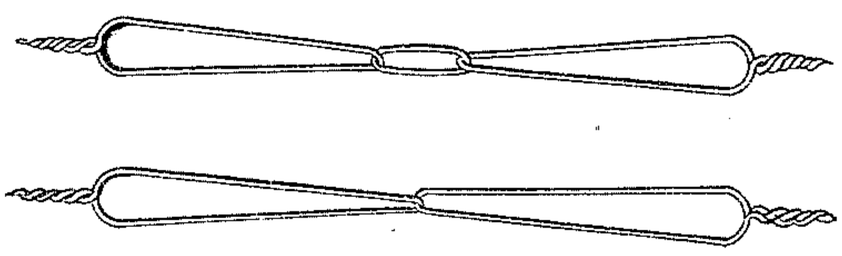


Fig. 10.

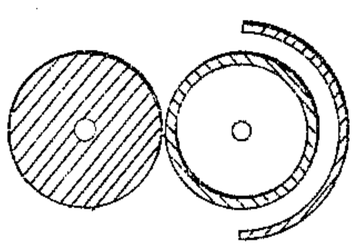


Fig. 11.

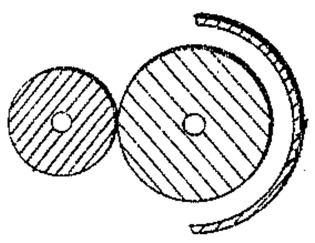


Fig. 6.

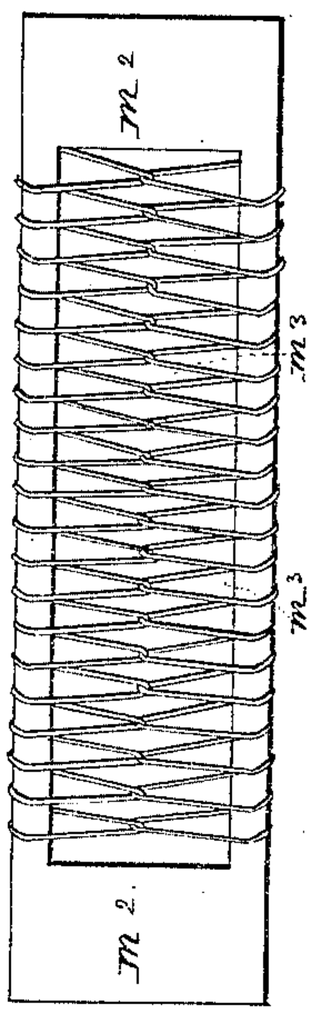



Fig. 5.

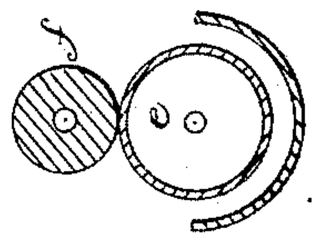



Fig. 4.

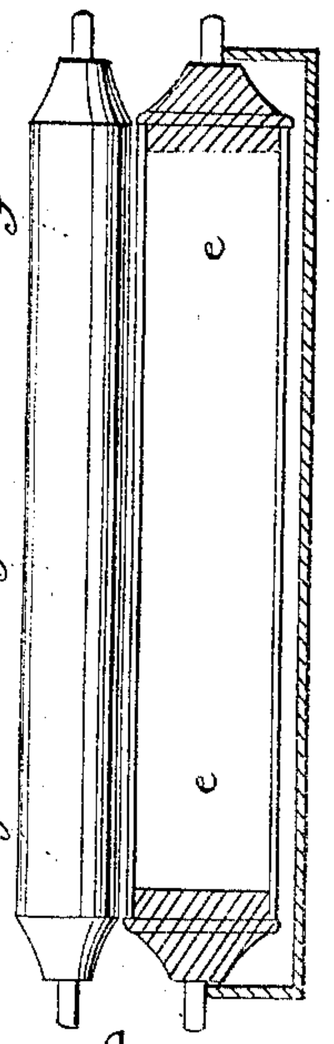



Fig. 7.

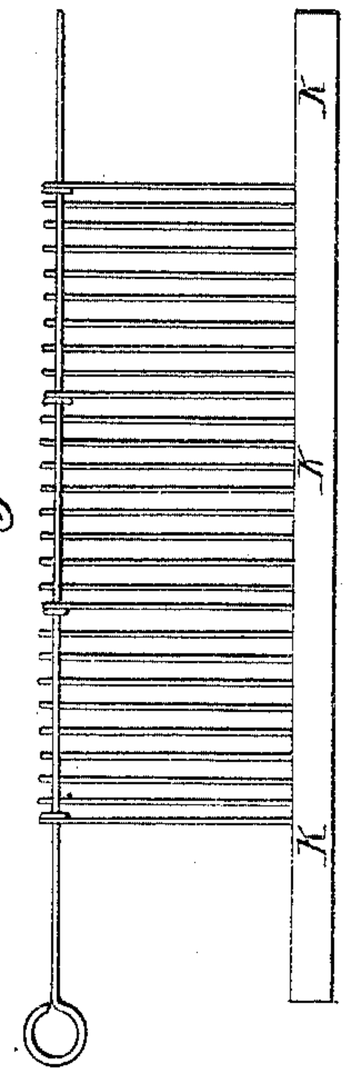
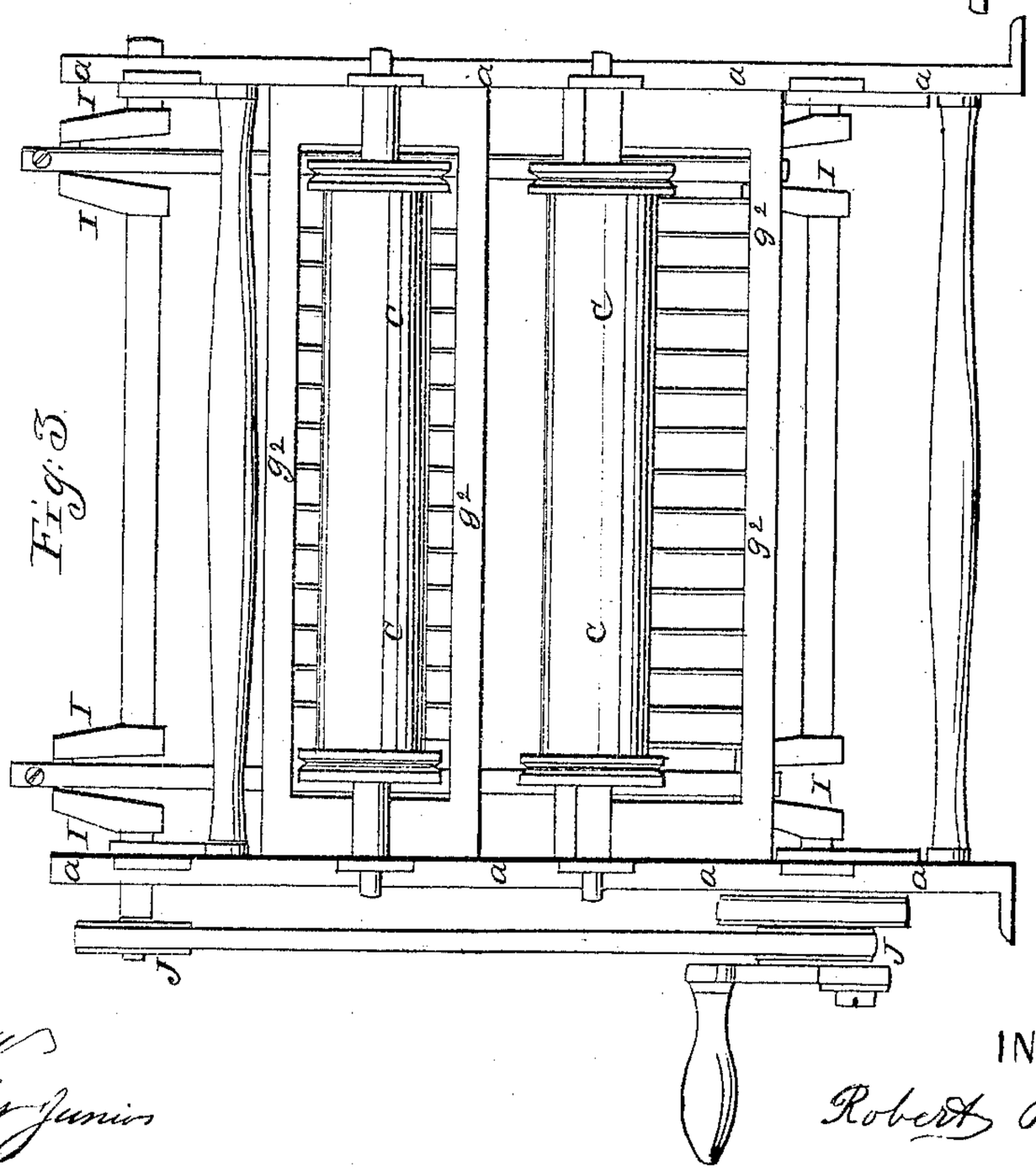



Fig. 3.

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# UNITED STATES PATENT OFFICE.

ROBERT PILSON, OF LAUREL, MARYLAND.

## MACHINE FOR DRESSING WARP.

Specification of Letters Patent No. 30,543, dated October 30, 1860.

*To all whom it may concern:*

Be it known that I, ROBERT PILSON, of Laurel, in the county of Prince George and State of Maryland, have invented and made certain new and useful Improvements in Machinery for Sizing and Dressing Warps; 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 a part of this specification, in which—

Figure 1, is a longitudinal, or side elevation of the sizing frame. Fig. 2, represents a plan view of the sizing and dressing frame. Fig. 3, represents an end elevation of the frame showing only two of the warp beams or cylinders. Fig. 4, represents the lower hollow and upper solid heavier cylinders for sizing. Fig. 5, represents the lower hollow distributing sizing, and the upper solid heavier squeezing cylinders, in transverse section. Fig. 6, represents the metallic frame with wire harness. Fig. 7, represents a modified form of arrangement of a comb-like rack, or guide with unconfined ends, and a detachable rod. Fig. 8, represents the two-loop wire harness of my improvements. Fig. 9, represents the triple-link wire harness sometimes used in weaving. Fig. 10, represents an end view of a lower hollow cylinder, and an upper solid heavier cylinder of the same diameters. Fig. 11, represents the relative sizes of the rollers or cylinders generally used in the old mode of sizing. The heavier larger cylinder being below and the smaller lighter roller being above, though sometimes rollers of the same weight and diameter are used. Fig. 12, represents the position and direction of the chain or warp as passing around the sizing cylinders, and shows also where the lease rods are inserted.

The nature of my improvements consists in constructing a warp sizing and dressing frame in such a manner as to bring about the following new and important results; viz.

In the construction of my improvements, I diminish the frame to about one half the usual size; the frame in general use being about thirty or forty feet in length.

In my improvements the warp is divided into two or more sections or main divisions, and these divisions are sized and pressed between distinct pairs of sizing rollers or cylinders and in separate sizing troughs, instead of passing the warp in one solid mass through but one and the same trough. By thus separating or dividing the warp as described, it receives a more thorough saturation of the size, and the operation of brushing the warp is much more perfect, preventing any sticking or matting together of the lengths of chain or thread.

In my improvements a hollow light distributing cylinder is used to revolve in the sizing trough, while a solid and heavier cylinder or roller is used above, the object of which, is to give the least weight below, with greater circumference and greater distributing surface to the sizing or distributing cylinder, while the upper roller or cylinder being smaller in circumference, will make a greater number of revolutions and shall afford the most weight or pressure on the threads of the warp, so that the size or starch can be forced more thoroughly into the fibers of the warp, and the surplus size squeezed off, using a more dilute quality and requiring about one half the usual quantity, thus saturating the fiber thoroughly and at the same time preventing stiff and thick incrustations of the chain.

I employ metal, sizing and squeezing rollers and cylinders turned perfectly true, and coated with tin, so as not to corrode, and I entirely dispense with the usual costly soap stone roller.

Another feature of my improvement, is the use of a copper wire harness for forming and preserving the "lease" of the warp, after the chain or yarn is sized and brushed and before it goes through any drying process; and in the use of this copper wire harness, all friction and chafing of the threads of the yarn or chain is prevented, which cannot be the case in the use of twine or other fibrous harness; from the fact that the fibrous harness absorbs the size or starch, clogs and chokes more or less, with the hardened size, and lint, causing friction, and, invariably rubbing or wearing off the fiber of the chain or yarn, besides requiring much trouble in keeping the twine harness clean, and also requiring frequent renewals of the loops and links. The wire harness however, presents none of such objections, and does not require the tedious and imperfect process of cleaning and frequent renewal, for the mere application of a brush and water will readily clean the wire loops, and render them free of all roughness.

It must be observed, that the wire harness used in my improvements is different from that sometimes employed in weaving. My wire harness is formed of but two long loops interlocking each other, while the metallic harness used in weaving, is formed of two shorter loops, interlocked with a short link or central eye. My improvements, also present the very great advantage of drying the chain or yarn of the warp on both surfaces simultaneously, the yarn or warp passing over, and under steam heated cylinders or drums.

Another feature of improvement, in my frame, is the combination and arrangement of a cylinder or drum for the winding of the yarn or warp on to the loom beam, and from which cylinder or drum and its gearing, motion is communicated direct to the loom beam, by pressure throughout the length of the beam, and transmitted therefrom throughout the whole extent of the warp, whereby the warp has a regular movement, and the cylinders, drums and rollers have one and the same relative uniform speed or movement. By this combination and arrangement I dispense entirely with all cones, and all intermediate gearing.

In my mode of sizing and dressing warps I take up and form the sheds of the "lease" by aid of the copper wire harness after the warp has passed through the sizing, and brushed but before being dried thoroughly, instead of forming the "lease" on the raw yarn, before being sized, as is the case in Bradley's dressing frame, and those of others.

Another most material improvement produced, is, that I am not only enabled to make a more portable and convenient sizing and dressing frame, but I dispense entirely with twelve soap stone rollers, and sizing troughs, (weighing in the aggregate fourteen or fifteen hundred pounds). Six sizing brushes, six sets of guides and combs, with cones and four gear wheels; four belts; two large fans and wheels. In all fifty-four pieces of costly machinery.

In my improvements the brushes are so arranged as to move rapidly over the surface of the sized warp, so as to produce a smoothness and equality of surface, and owing to the great uniformity of the surface of the yarn or chain, the number of "picks" or threads of filling may be reduced from one to two per inch, while the general texture, appearance, and quality of the woven fabric, is greatly superior to fabrics made of the same identical number or grade of yarn, sized and dressed on the frames ordinarily in use.

The more fully to enable others to construct and use my improvements, I will describe the mechanical principles thereof.

In Fig. 1, which is a side elevation, is represented a suitable framing, composed of uprights $a$, $a$, $a$, $a$, and horizontal connection rails $a^3$—$a^3$, $b$, $b$, said frame being about seventeen feet long.

At $c$, $c$, $c$, $c$, are four cylinders with disk shaped ends, formed with grooves $d$, $d$, $d$, $d$, to answer as pulleys for cords and weights; said cords and weights, being designed to be used as tension weights, to keep the warp in proper draft. The ends or journals of the warp cylinders work in boxes, or sockets $d^2$ $d^2$, $d^2$, $d^2$.

Connected to the uprights $d^2$ $d^2$ are sizing troughs $d^3$, $d^3$, having hollow, distributing sizing cylinders $e$ $e$, and solid heavier pressure or squeezing rollers $f$, $f$, both cylinders are made of cast metal, turned perfectly smooth, and coated with tin over their circumferences.

In front of the sizing troughs are connected racks or guides $g^2$, $g^2$, and immediately in the rear of the sizing troughs are arranged, the cleaning brushes, connected to their frames $h$, $h$, which are suspended in position by cranks I, I, I, I, the journal ends of which have pulleys or cord wheels J, J.

Beyond the brush frame a short distance is the reed rack or guide frame K, K, this rack or guide being formed of copper or copper coated metal wire. The frame is adjusted to slide in grooves or slots formed in the uprights L, L.

Beyond the reed frame a short distance, fitted in grooves or slotted upright pieces or standards $m$, is the metal frame $m^2$, $m^2$, with the copper wire harness, or lease loops formed as in Figs. 6 and 8. In front of the harness is the first drying cylinder or drum N, N, the second or central cylinder O, O, and the third or last drying cylinder P, P. These cylinders or drums, all being hollow to receive hot vapor or steam, are arranged at equal distances apart; their journal ends being hollow to receive the steam, and arranged to work in bearings, or sockets formed in the uprights $q$, $r$, $s$.

At the extreme end of the frame, is arranged the loom beam T U, T U, the ends U, U, being of disk like shape, and larger in diameter than the beam, so as to prevent the warp from slipping off. The journal ends of the loom beam T U, T U, work in slotted places formed in the ends of the uprights $V^2$, the ends of the beam bearing in a link or pendent connection attached to the bow-shaped spring as indicated in dots W, Fig. 1 and as more fully shown in Fig. 13.

Immediately below the loom beam T U, T U, T U, in close contact therewith, is a smoothing or regulating cylinder, or drum X X, Figs. 1 and 2, which may be geared to a smaller driving pinion, as at $V^3$ Fig. 2, to which can be communicated power and motion. This regulating drum or cylinder, is

designed to regulate and press the warp evenly and compactly around the loom beam T U, and at the same time is the medium of transmitting the motion and regulating the speed of the whole machinery of the frame except the fan and brushes.

At Y, Y, between the loom beam and the last drying cylinder is arranged the fan blower, for assisting the drying of the warp. One or more fans being employed, as may be found necessary.

In the use of my improvements the yarn or thread is wound first in equal quantities around the four warp cylinders *c*, *c*, *c*, *c*, the two top ones forming one pair, and the two lower ones another pair. The half-sections of yarn are passed around the cylinders of each pair, in any manner found necessary. The yarn then passes through the racks $Z^2$, $Z^2$, in two equal sections, or sheds as at $Z^3$, $Z^3$, and thence passes between the sizing, and distributing cylinders *e*, *e*,—and squeezing rollers *f*, *f*, and there receives the sizing, the cylinders revolving the while, by the agency of the warp or chain in its movement. The yarn receiving the size, passes out, beneath the brushes *h*, *h*, and thence passes between the bars and guides of the reed rack or guide frame K, K, in equal portions and thence alternately through and between the loops of the wire harness $m^3$, $m^3$, Fig. 6, and passing out therefrom come together in one united warp, over the drying drum N, under the drying drum O, and over the last drying drum P, and finally over and around the loom beam T U, T U.

When the loom beam has sufficient warp enwrapped around it, the wire harness frame $m^2$, $m^2$, is lifted upwardly by which means the mass of warp is divided into two equal sections or sheds, one section or division being lifted by the loops $m^3$, $m^3$, of the harness frame $m^2$, and the other section or division left below and between the outside of the loops; the lease rods Z, Z, are now inserted between the two sections of the yarn as indicated at $Z^2$, Fig. 1, and at Fig. 12, thus producing the "lease," at the point indicated. The rods pass over and beneath the cylinders N, O, P, outwardly toward the loom beam T U, T U, when the warp is severed and the filled beam T U, T U, is detached and another one put in the frame to be filled in like manner.

As the loom beam T U, T U, becomes more and more enwrapped or compactly filled with the warp, the ends of the spring W, yield sufficiently to accommodate the thickness of enwrapped warp, to the motion and pressure of the smoothing cylinder X, and this spring W, as shown in Figs. 1, and 13, is designed also to afford sufficient pressure downwardly, of the loom beam T U, against the laying cylinder X, so as to keep the warp or chain $X^2$—$X^2$—$X^2$—Fig. 1, at the required uniform tension or draft, and to prevent sagging and entanglement thereof, and likewise to cause the necessary motion of the warp cylinders *c*, *d*—the sizing cylinders *e*, *f*, and the drying drums or cylinders N, O, P.

In my mode of producing and taking the "lease" at the point indicated by the lease rods Z, Z, and $Z^2$, they do not pass between the sizing rollers as in many frames; nor is it at all required to lift any of the sizing rollers, as is necessary in William Bradley's mode to admit the rods to pass forward toward the loom beam. Many objections, and disadvantages ensue where the "lease" is taken before the warp is sized, for the "lease" rods then must pass through the sizing, and beneath the brushes, and the warp or chain has to be severed some distance from the loom beam and thus very great inconvenience ensues by the manager of the frame being required to pass at an inconvenient position inside of the frame to accomplish the desired purpose. And another marked advantage in my mode of sizing and taking the "lease" is, that the rods Z, Z, Fig. 12, can have but little, if any of the size adhering thereto, consequently my mode, is not only brought about with less trouble, but is also more cleanly.

I am aware that iron wire harness, or heddles formed of two loops, and a central link, as well as a thin solid single strip of brass metal with a center perforation or eyelet, and also a two looped textile, or twine harness have long been known and used, as hereinbefore referred to, and the same not at all being adaptable to my improvements, nor susceptible of affording the desired results sought after, therefore such I do not claim. Being likewise aware that a patent was granted May 11th, 1858, to William Bradley, and also to Alonzo Bascomb, November 18th, 1851, both for taking the lease on the raw unsized, and undressed yarn or warp, and before the warp is enwrapped over the warp cylinder, of the dressing frame. Therefore such manner or mode I do not claim, as the object sought after by me cannot thereby be attained. I am also aware, that in a cloth folding machine, patented to Z. Allen July 16th, 1850, and also in English patents No. 11 for 1853, and No. 190 for 1854, smoothing cylinders are shown, but such cylinders and arrangements, as therein shown, are considered no portion of my claim.

Now, therefore having described the nature, construction operation and the new improved results of my invention distinguishing them clearly from all others what I do desire to have secured by Letters Patent of the United States, is as follows:

The combination of the sectional warp

beams *c*, *d*, *d*², the racks or guides *g*²—*g*² the distributing cylinders *e*, *e*, and squeezing rollers *f*, *f*;—the brushes *h*, *h*, the copper metal comblike guide or rack K, K, the copper metal harness *m*²—*m*³; the lease rods Z—Z²; the drying drums N, O, P; the loom beam T, U; the smoothing controlling cylinder X and fan Y, when so arranged relative to each other as shown, forming one individual machine, and through all of which intermediate auxiliary cones and cog gearing are dispensed with and all undue, drag, strain, and tension of the threads of the warp are prevented and the several improved results in the manufacture of cotton fabrics hereinbefore recited are attained, substantially as set forth and described.

ROBERT PILSON.

Witnesses:

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M. NOYES.