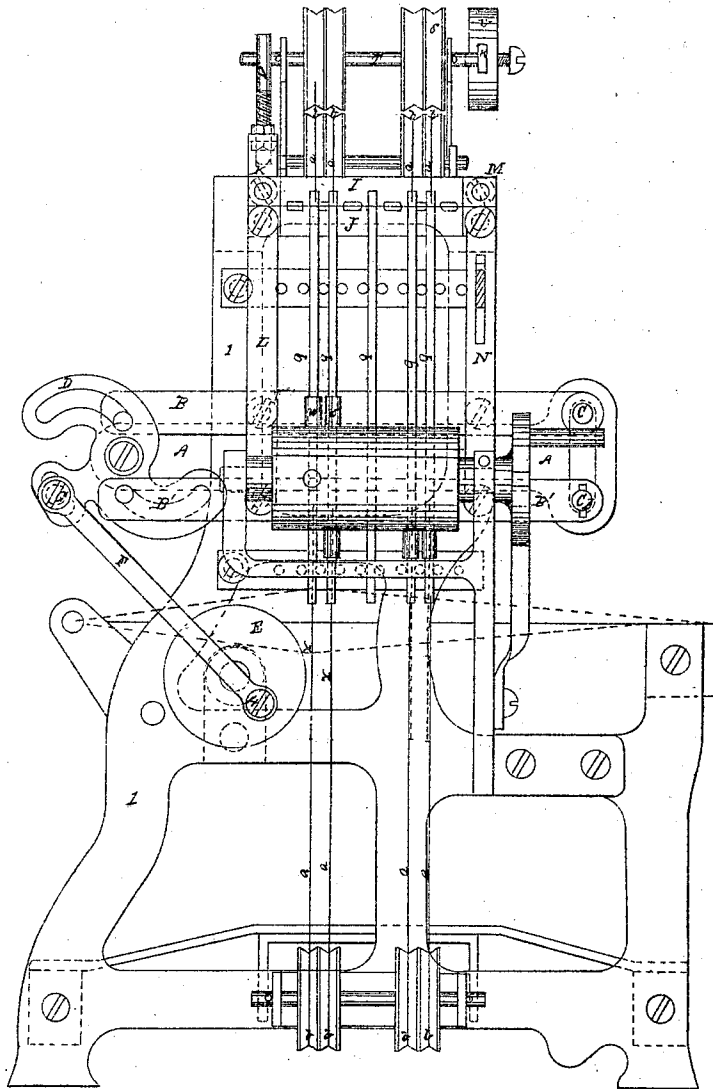


Plummer's Improvement in Looms.

No. 118,969.

Patented Sep. 12, 1871.

Fig 1



Witnesses.

Samuel Smith
Harriet A. Smith

Inventor.

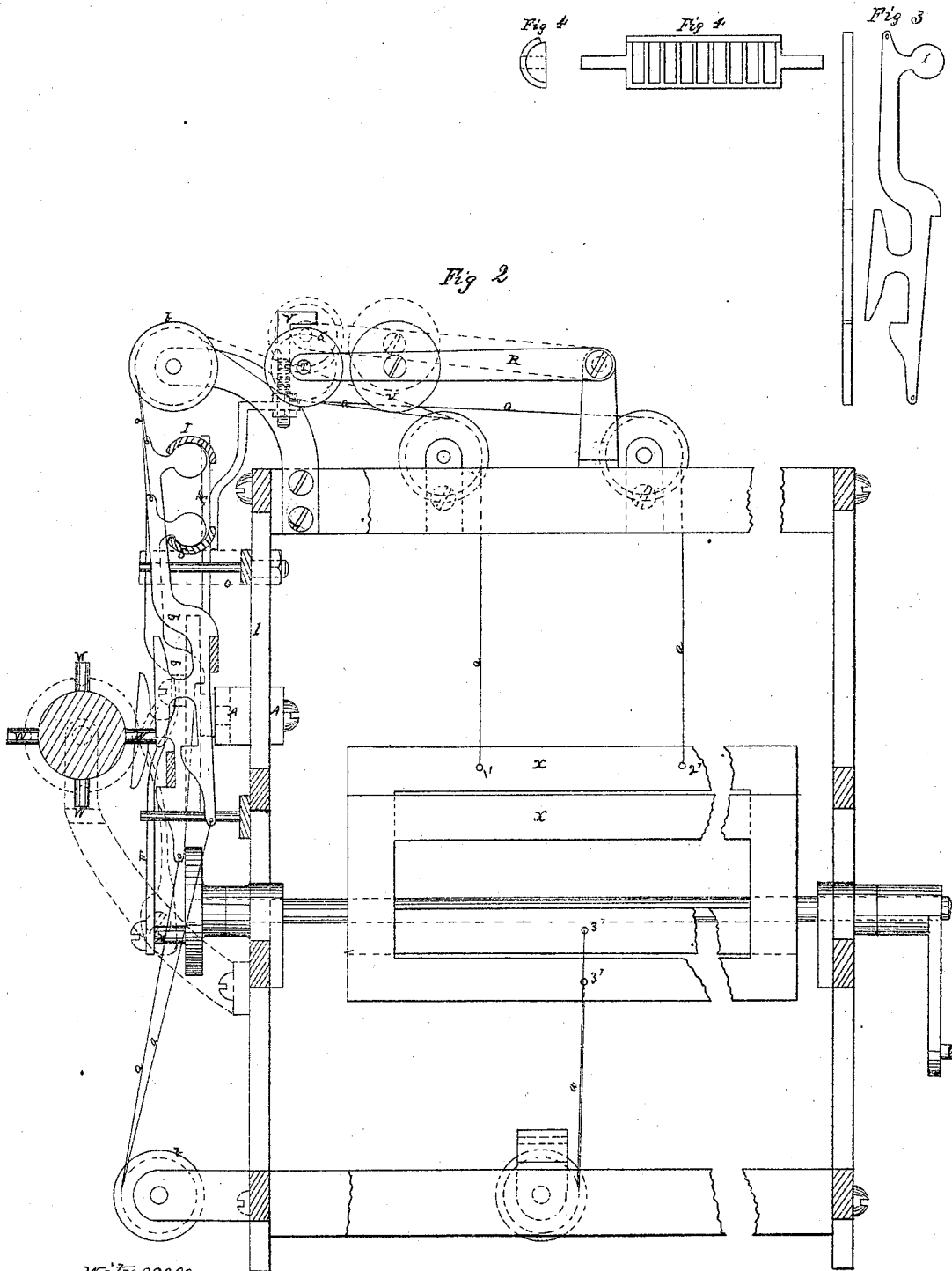
Osgood Plummer

Plummer's Improvement in Looms.

2 Sheets--Sheet 2.

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Harriet A. Smith

Inventor
Osgood Plummer

UNITED STATES PATENT OFFICE.

OSGOOD PLUMMER, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN HARNESS-OPERATING MECHANISM FOR LOOMS.

Specification forming part of Letters Patent No. 118,969, dated September 12, 1871.

To all whom it may concern:

Be it known that I, OSGOOD PLUMMER, of the city of Worcester, county of Worcester and State of Massachusetts, have invented a new and Improved Mode of Operating Harnesses of Looms; and I do hereby declare the following is a full and exact description thereof, reference being had to the accompanying drawings and the letters and figures of reference marked thereon.

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

Figure 1 represents the front elevation of a loom to the extent necessary to show the nature of my invention. Fig. 2 represents a front sectional elevation. Figs. 3 and 4 represent detached parts.

The cross-piece or stand A is fastened to the loom-frame 1, upon which are suspended the raising and depressing levers B and B'. These levers vibrate or swing upon studs C and C', which are secured upon the cross-piece A, and are adjustable up and down, as may be desired in use. The levers B and B' are raised and depressed by connection with the balance-wheel E through connections F and studs G and H. When an upward or downward motion is communicated to the raising and depressing levers B and B' by the cam D and its connections, a simultaneous motion is communicated to eveners I and J, or their equivalents, through connections K, L, M, and N. These eveners, though receiving motion from an oscillating or circular motion, are moved up and down in a perpendicular line, or nearly so, by being guided and kept in position by the guide O, Fig. 2, connected to the loom-frame 1, and passing through the connections M and N. The eveners I and J are concave on one side. (See Fig. 4.) These concave sides are operated to and from each other, and when the loom is evened, as shown in Fig. 1, they form a hollow or pipe in which are held the hooked jacks *q q q q*. A detached view of hooked jack is shown at Fig. 3. The hooked jacks are connected at each end to the leaves of heddles by cords *a a* passing over sheaves *b b* properly secured to the loom-frame and connected to the harness-frames X, thus forming a perfect connection between the leaves of heddles and the working parts. The jacks *q q* vibrate on a peculiar fulcrum or bearing, shown at 1 in Fig. 3, of a circular form

to correspond with the concave sides of eveners I and J. By reference to Fig. 1 it will be observed that the raising and depressing levers B and B' and eveners I and J, being held in position by cam D, are in a line parallel, or nearly so, to each other, and suspended between the eveners I and J are hooked jacks *q q q q q*. When the parts are in position as above described the jacks are susceptible of motion to or from the lifter and depresser to the extent of connecting with or disconnecting from either the lifter or depresser B and B', as the pattern mechanism, which is of the usual form, and may be composed of rolls, tubes, links, and bars, shall indicate. The projections W on the pattern mechanism carry and hold the hooked jacks *q* back and upon the lever B, that imparts a downward movement to the threads of warp connected to those jacks; or, if an upward movement is desired, a depression in the pattern mechanism will allow the spring or tension of the harness connections to throw the hooked jacks *q* forward upon the lever B' and elevate all of the warp-threads connected to these jacks. The concave eveners I and J have a double office to perform: When in position, as shown at Fig. 1, they (the eveners) are in the capacity of bearing and cap to the projection 1 on the hooked jack, (see Fig. 3,) holding it in position and evening it; also, allowing it to vibrate forward or backward, as the pattern requires. When the pattern mechanism has distributed all of the hooked jacks *q* either to be raised or depressed, and motion is communicated to the raising and depressing levers B and B' and eveners I and J through cam D and its connections, then the eveners I and J cease to represent or perform the office of bearing and cap to the above-described projection, and act as guides up and down, as the movement may be, and, in connection with the lifter, depresser, and pattern mechanism, hold the jacks in place until they are all raised and depressed, or depressed and raised again and evened in readiness for redistribution by the pattern mechanism. The eveners I and J are divided into cells on the concave side, (see Fig. 4,) each cell having its own jack to hold and pivot when evened, and to guide when in motion. They may be constructed without the partitions and perform the work, though it may not be as perfectly.

The above-described device or its equivalent may be attached and worked at the top or bot-

tom of the loom-frame with the same result. Or the concave eveners I and J may be suspended on studs at one end, as the lifter and depresser B and B' are, and have motion communicated to them, and, through connections with the raising and depressing levers, also move said levers and obtain the same results as here described with this device, or, in other words, be an equivalent. The lifter and depresser B and B' moving on fixed bearings C and C' and describing the arc of a circle would impart a side or grinding motion to the jacks *q q q q q*. This may be avoided by using a lining or flat plate connected to the lifter and depresser B and B', and moving up and down with them, and guided in a perpendicular line in a similar manner as described for the concave eveners I and J. In all devices where the top and bottom of leaves of heddles are connected by cording there is danger of considerable variation in the tension of the cords as changes in the atmosphere occur. That difficulty is obviated in this invention by means of the sheaves S on the end of the weighted lever R that rests on the cords *a a*. The weight U is adjustable, by means of the screw, at any desired point on the lever R, thus keeping an even and constant strain or tension, except as hereinafter described, regardless of changes in the atmosphere, or other causes that may lengthen or shorten the cords.

The above-described device with its connections also accomplishes another desirable result: When the parts are in position, as shown at Fig. 1, and the pattern mechanism is being operated, and the hooked jacks are being connected and disconnected with the lifter and depresser B and B', it is necessary the tension of the cords *a a* should be sufficient to make the desired movement quickly and with certainty. In the old method this is imperfectly accomplished by straining the cording sufficiently tight at that point for that purpose, but with the disadvantage of having it too tight when the strain of opening the harnesses is added to it. If the cording is de-

sirably loose when the harnesses are opened the slackness increases as they close, which increases the liability of the hooks not being properly caught on the lifter and depresser, and causes what is termed "misspicks." To prevent these undesirable results the rear end of the pin T, which supports the sheaves S, is pressed down when the eveners are closing by the adjustable projection V, that is connected to and passes up and down with connection K. The projection V will give more or less tension by being adjusted to connect sooner or later (in its passage down) with the pin T after the tension has been applied and the pattern mechanism has performed its functions. The connection K in rising carries the projection V up and removes the extra tension, and allows the weighted lever R to regulate as before. This device may be used differently than here represented, and applied to other forms of construction without materially changing the nature of the invention.

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

1. The concave eveners I and J or their equivalents, for the purpose set forth.
2. The hooked jacks with circular projections or their equivalents, substantially as described, and for the purpose set forth.
3. The combination of the concave eveners I and J with the lifters and depressers, as and for the purpose set forth.
4. The eveners I and J, with partitions, as set forth.
5. The combination of the weighted lever R, sheaves S, with the heddles and heddle-connections, all arranged and operating as set forth.
6. The adjustable and reciprocating projection V, in combination with the tension lever R, and the eveners-connections K.

OSGOOD PLUMMER.

Witnesses:

SAMUEL SMITH,
HARRIET A. SMITH.