(No Model.) 2 Sheets—Sheet 1.

I. E. PALMER.

MEANS FOR FORMING WIDE SHEDS OF WARP FROM NARROW OR SHORT SUPPLY BEAMS.

No. 603,407. Patented May 3, 1898.

Fig. 1.

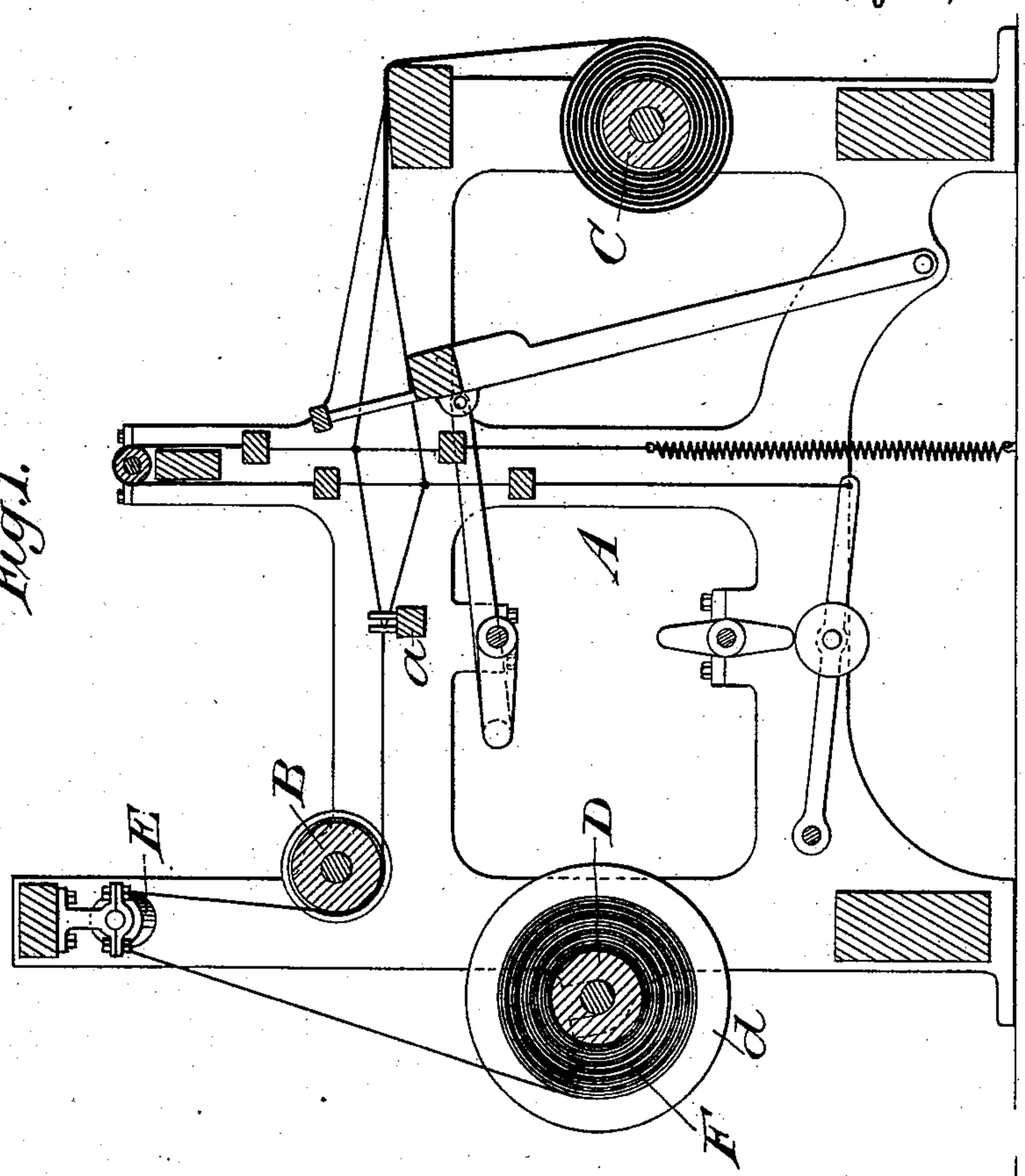
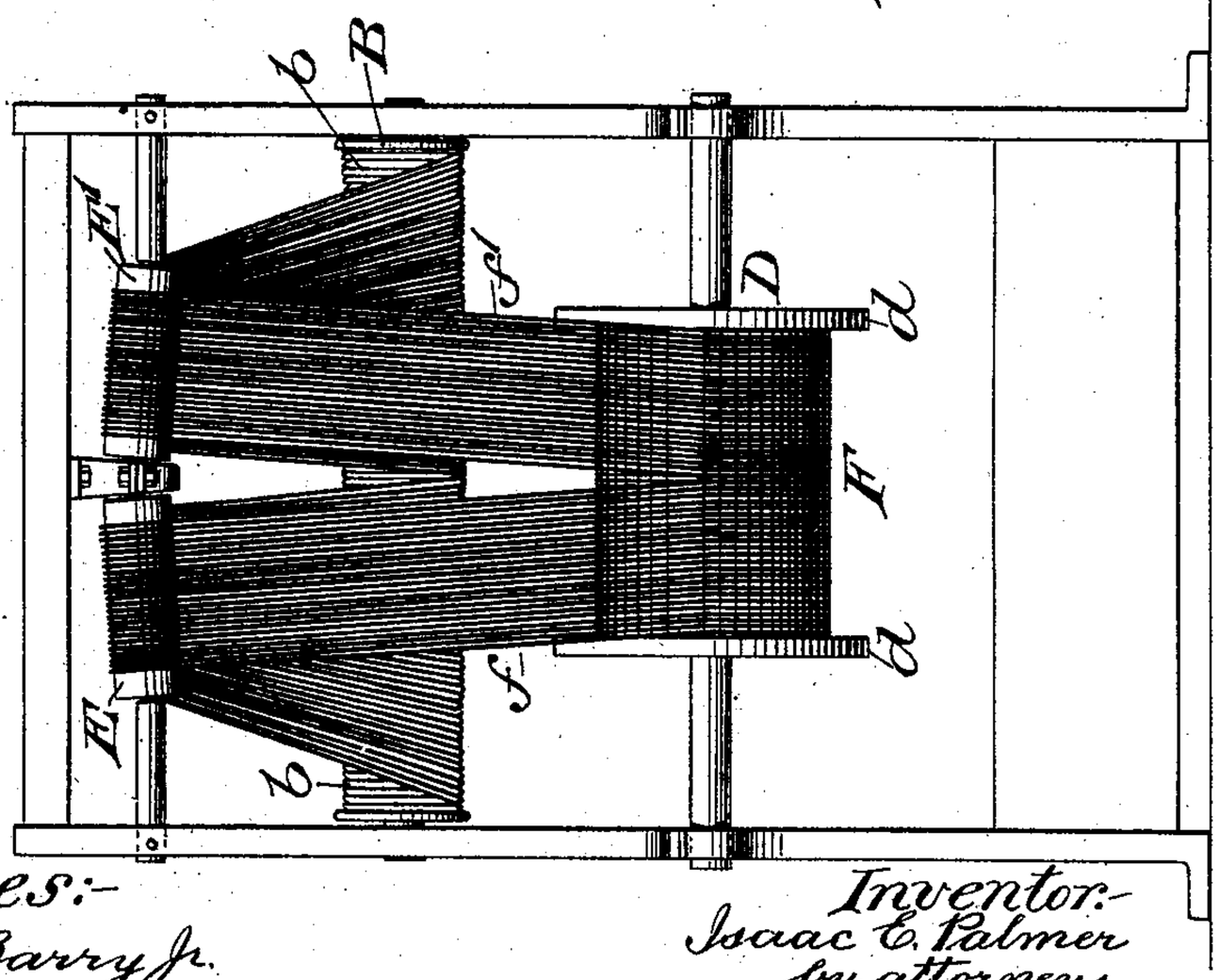


Fig. 2.



Witnesses:-
George Barry Jr.
Edward Viesel

Inventor:-
Isaac E. Palmer
by attorneys
Brown & Seward

(No Model.) 2 Sheets—Sheet 2.

I. E. PALMER.

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Fig. 3.

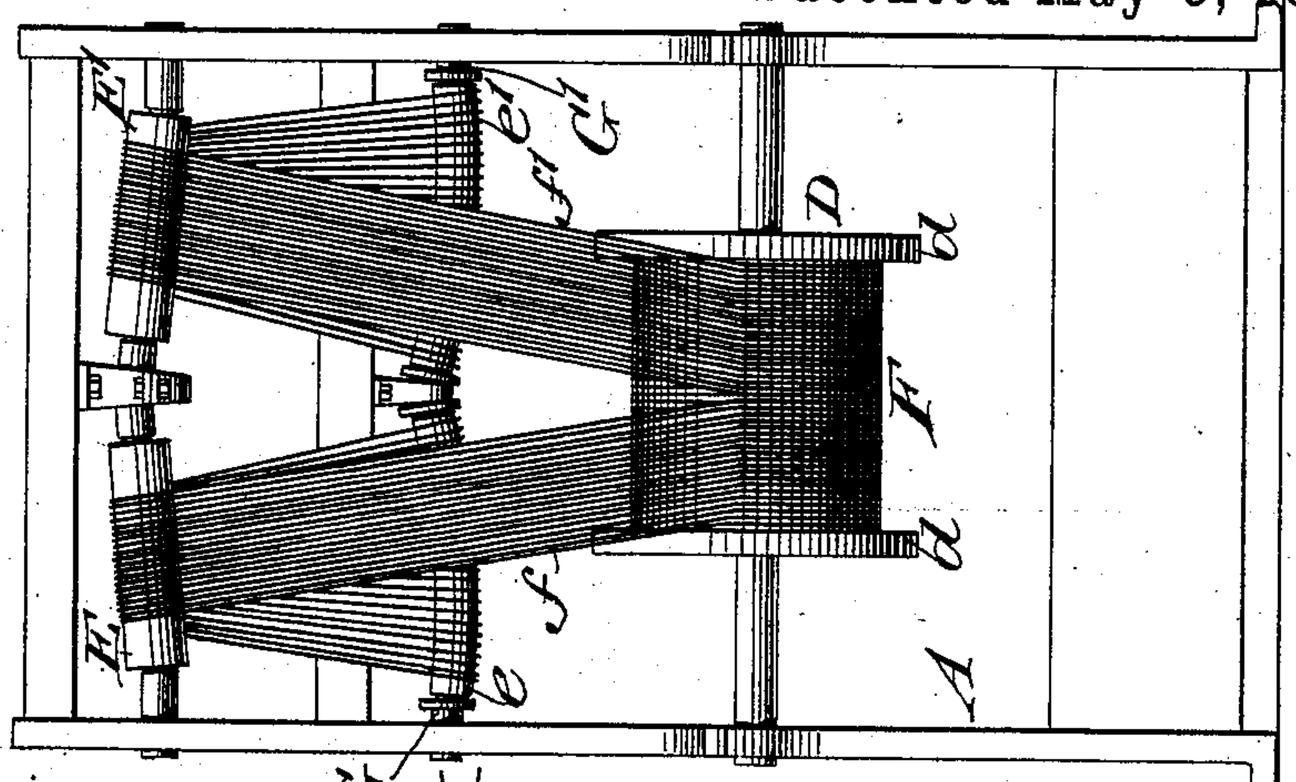


Fig. 5.

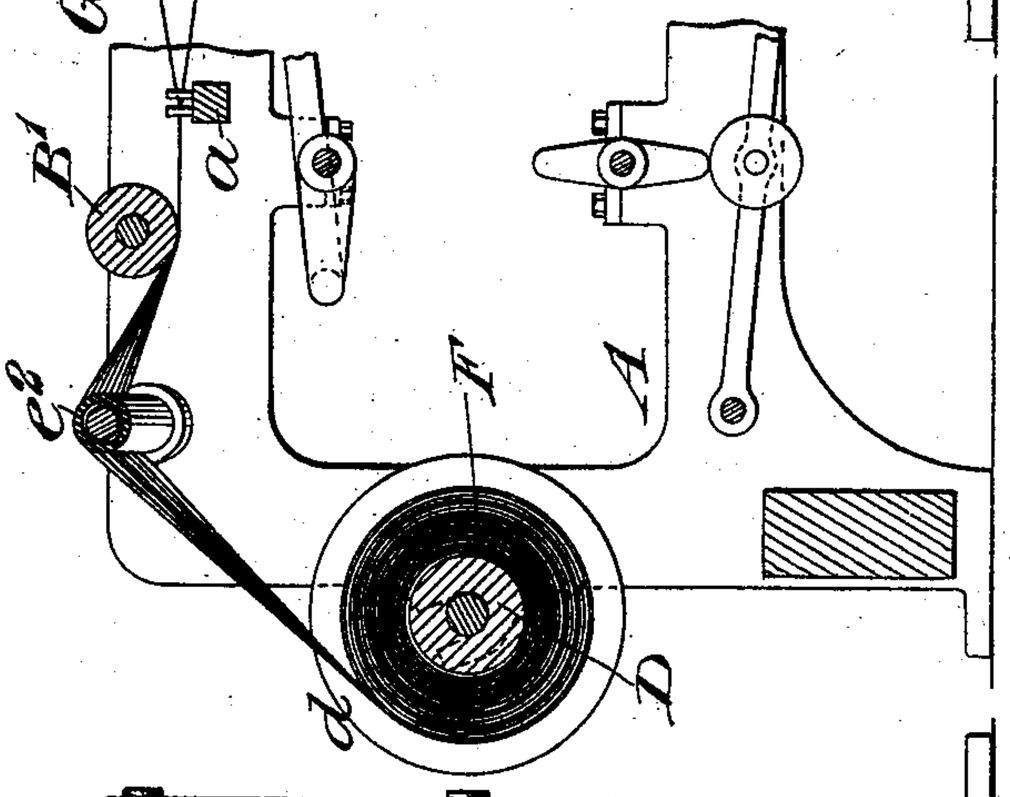
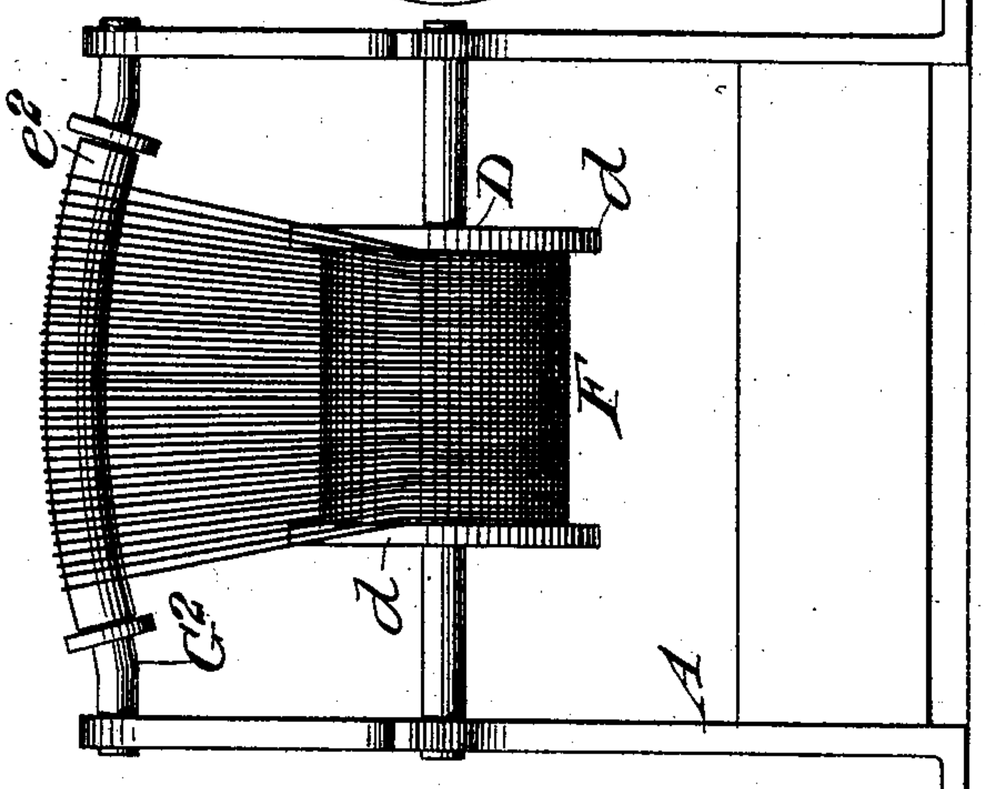


Fig. 4.



Witnesses:-
George Barry Jr.
Edward Viesel

Inventor:-
Isaac E. Palmer
by attorneys
Brown & Seward

UNITED STATES PATENT OFFICE.

ISAAC E. PALMER, OF MIDDLETOWN, CONNECTICUT.

MEANS FOR FORMING WIDE SHEDS OF WARP FROM NARROW OR SHORT SUPPLY-BEAMS.

SPECIFICATION forming part of Letters Patent No. 603,407, dated May 3, 1898.

Application filed December 31, 1896. Serial No. 617,584. (No model.)

To all whom it may concern:

Be it known that I, ISAAC E. PALMER, of Middletown, in the county of Middlesex and State of Connecticut, have invented a new and useful Improvement in Means for Forming a Wide Shed of Warp from a Narrow or Short Warp-Supply Beam, of which the following is a specification.

My invention relates to an improvement in means for forming a wide shed of warp from a narrow or short warp-supply beam, with the object in view of rendering it feasible to ship the warp in a compact roll and at the same time render it feasible to weave goods of any desired width from such compact warp-supply beam.

In the accompanying drawings, Figure 1 represents portions of a loom in vertical section from front to rear for the purpose of showing the application of the warp-spreading device. Fig. 2 is a view in elevation looking at the end of the loom from which the warp is fed. Fig. 3 is a similar view showing a modified form of distributing-roll; and Figs. 4 and 5 represent, respectively, in end elevation and in vertical section a second modification.

Referring to the form shown in Figs. 1 and 2, the loom as a whole is represented by A, the beam which finally distributes the warp to the grid *a* of the loom is denoted by B, and the take-up beam by C. The latter may be driven by any well-known or approved means. The warp-supply beam is denoted by D and is here shown in the form of a spool having end flanges *d* of sufficient diameter to render the beam of great capacity in proportion to its length, a form which is found more practical for storage and shipment than the more elongated form.

The roller B, which finally distributes the warp to the grid *a*, is provided with annular grooves *b* in its periphery, the space between the grooves being rounded on their faces for the purpose of causing the warp to seek the grooves when pressed against the periphery.

Intermediate of the grooved roller B and the supply-beam D, I locate a plurality of distributing-rollers, in the present instance two, and denoted, respectively, by E and E′, mounted with their axes inclined to the axis of the roller or beam D and also inclined with respect to each other, the said axes gradually approaching the axis of the supply-beam D as they recede from the adjacent toward the opposite ends of the rolls E E′, as clearly indicated in Fig. 2.

The warp (denoted by F) on the supply-beam D is separated as it leaves the supply-beam into subdivisions *f f′*, which are led to and over the inclined rollers E E′, respectively, and thence to the distributing roller or beam B, where the two subdivisions *f f′* are so spread in the grooves of the roller B as to engage it throughout its length. The subdivisions of the warp having once been distributed along the length of the distributing roller or beam B tend thereafter to retain their position along the beam B without further attention by gradually creeping into the successive grooves in the periphery of the roller B, and from this point they lead with sufficient directness to the grid *a*, which finally completes their separation for purposes of weaving.

Instead of providing the grooved beam *b* the subdivisions *f f′* may be led from the inclined rollers E E′ to arched rollers *e e′*, preferably set at a slight angle of inclination to one another, as clearly shown in Fig. 3. The arched rollers *e e′* are mounted upon fixed arched spindles G G′ and are formed of some suitable flexible material—such, for example, as gutta-percha—in the form commonly employed as rubber hose. The roller formed of such yielding material will accommodate itself to the curved spindle as it is rotated on the spindle by the friction of the warp, the arched or crown shape of the roller serving to distribute the threads of warp from the center of the arch toward its extremities as it is led from the arched rollers to the grid.

In the form shown in Figs. 4 and 5 the warp F is fed directly from the supply-beam D to an arched roller e^2, which is here arranged to take the place of two inclined rollers E E′, and is mounted upon a fixed arched spindle G^2. The roller e^2, like the rollers *e e′* hereinabove described, is formed of some suitable flexible material—such, for example, as that used for rubber hose—and because of its flexible nature it will accommodate itself to the arched spindle G^2 as it is rotated thereon by the friction of the warp. In this arrange-

ment the warp-threads, after having been spread by passing over the arch or crown roller e^2, are directed to the grid *a* by means of the guide-roller B′, which in this instance may be an ordinary plain-faced roller.

The rollers B and B′ are so located with respect to the inclined distributing-rollers and the supply-beam as to retain the warp in engagement with their faces.

It is obvious that slight changes may be resorted to in the form and arrangement of the several parts without departing from the spirit and scope of my invention. Hence I do not wish to limit myself strictly to the structures herein shown and described; but

What I claim is—

1. The combination with a grid and warp-supply beam, of mechanism for distributing warp as it extends from the supply-beam to form a shed wider than the length of the supply-beam, comprising a distributing device located intermediate of the grid and the supply-beam, said distributing device being provided with a warp-bearing surface which gradually approaches the axis of the warp-beam as it extends from a point opposite a central portion of the warp-beam toward its extremities and means for holding the warp in engagement with the surface of the distributing device and directing it to the grid, substantially as set forth.

2. In combination a warp-supply beam, distributing-rollers having their axes inclined to the axis of the warp-supply beam for distributing the warp as it extends from the beam and means for holding the warp in engagement with the distributing-rollers, substantially as set forth.

3. In combination a warp-supply beam, a grid, distributing-rollers having their axes inclined to the axis of the warp-supply beam for distributing the warp as it extends from the beam and means for further distributing the warp after it leaves the said inclined distributing-rollers and before it reaches the grid, substantially as set forth.

4. The combination with an arched spindle and means for holding it in fixed position, of a roller of flexible material mounted on the arched spindle and means for directing warp along the surface of said roller in engagement therewith for distributing the warp, substantially as set forth.

ISAAC E. PALMER.

Witnesses:
JOSEPH A. O'NEILL,
HENRY C. EDGERTON.