No. 862,654. PATENTED AUG. 6, 1907.

F. C. PFEIFFER.

LOOM FOR WEAVING PILE FABRICS.

APPLICATION FILED NOV. 5, 1906.

2 SHEETS—SHEET 1.

Fig. 1,

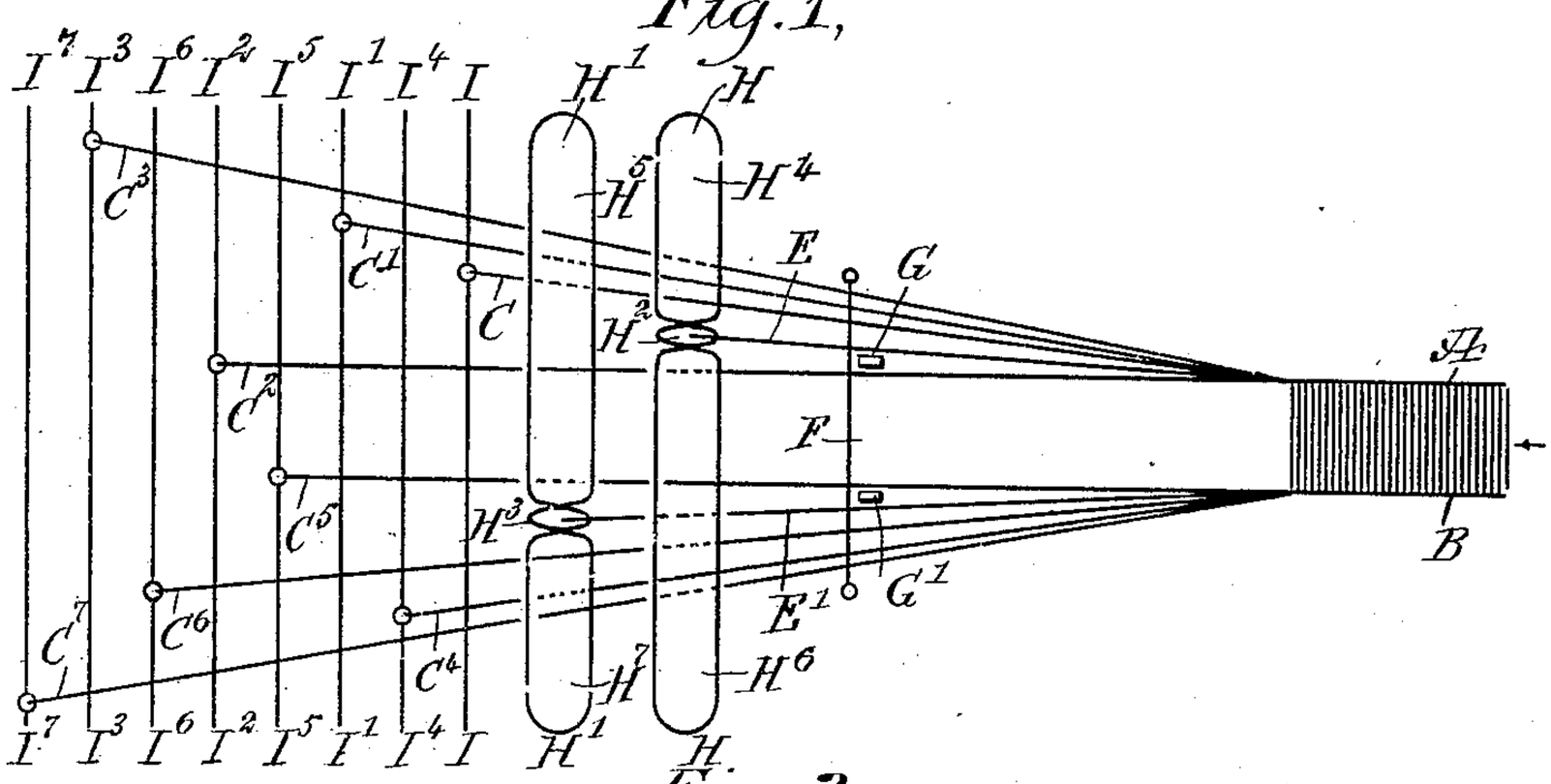


Fig. 2,

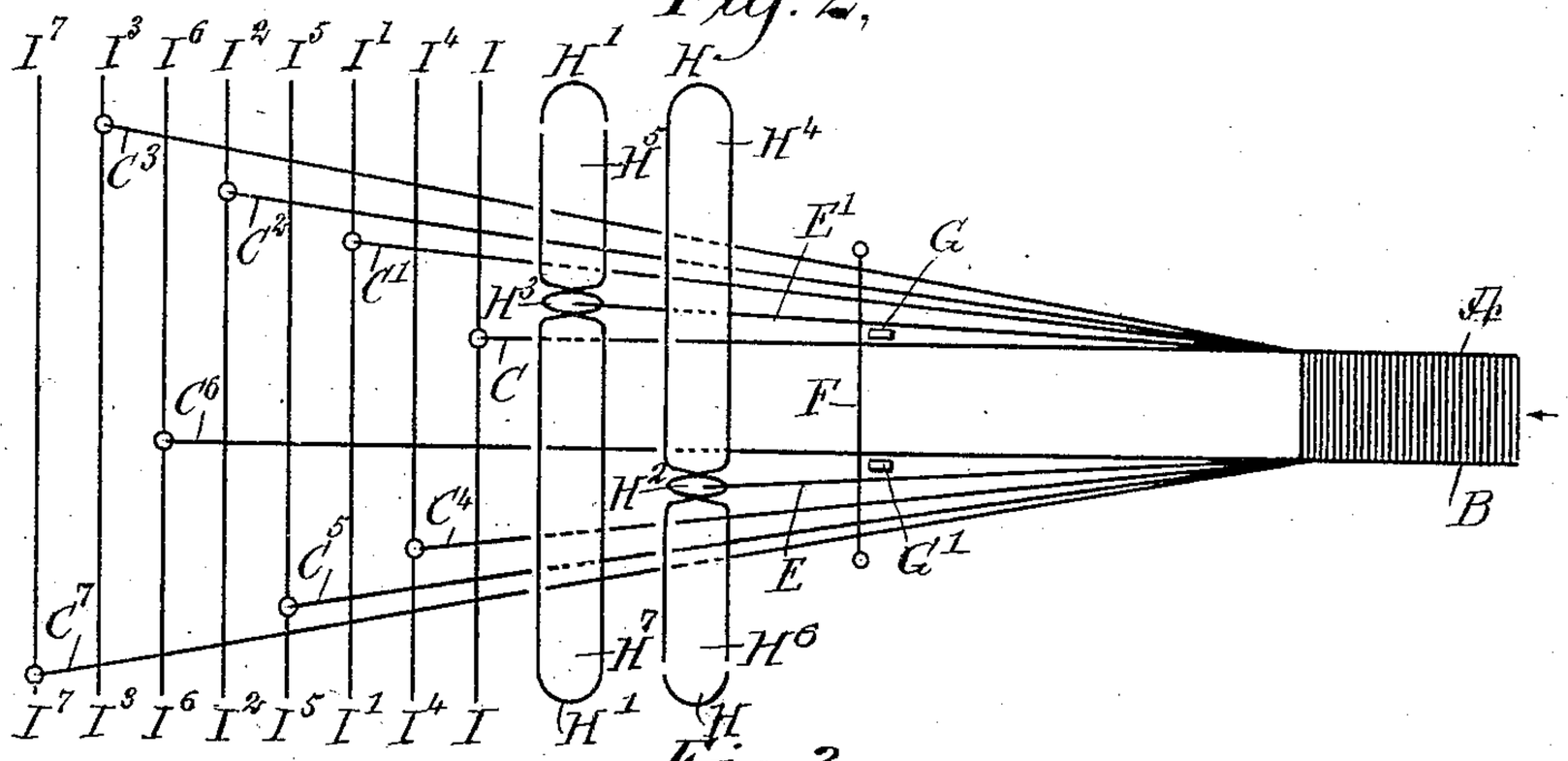
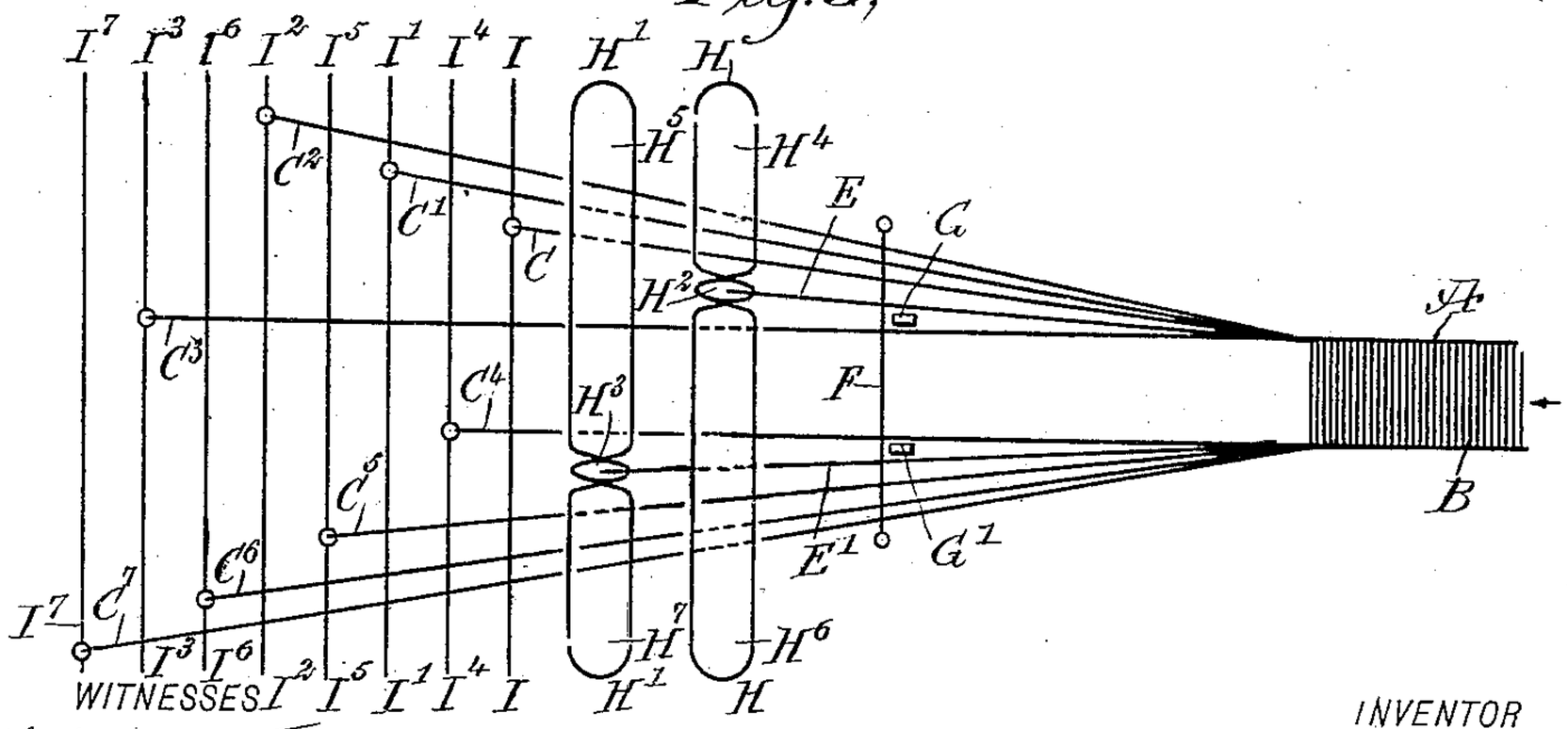


Fig. 3,



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2 SHEETS—SHEET 2.

Fig. 4.

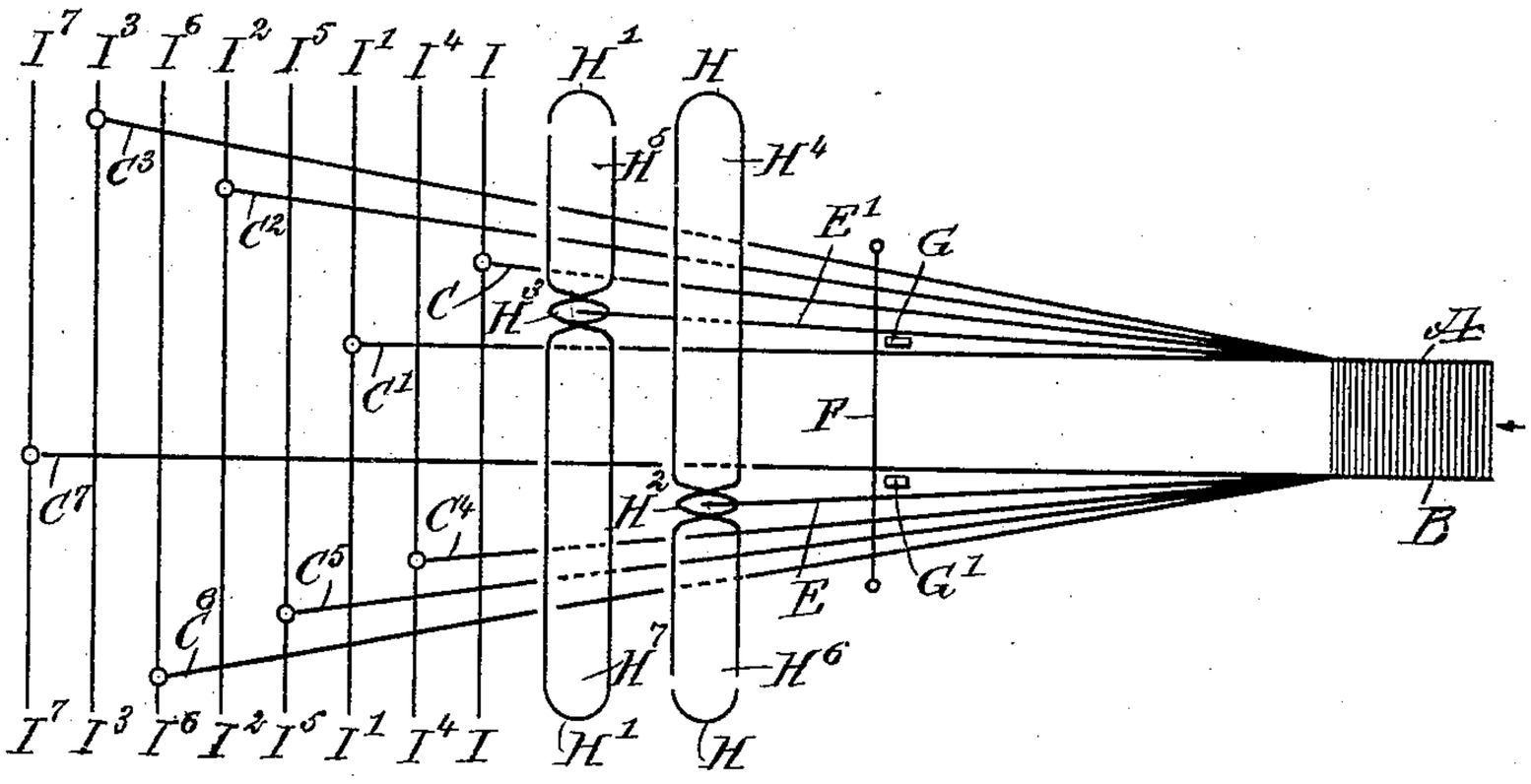


Fig. 5.

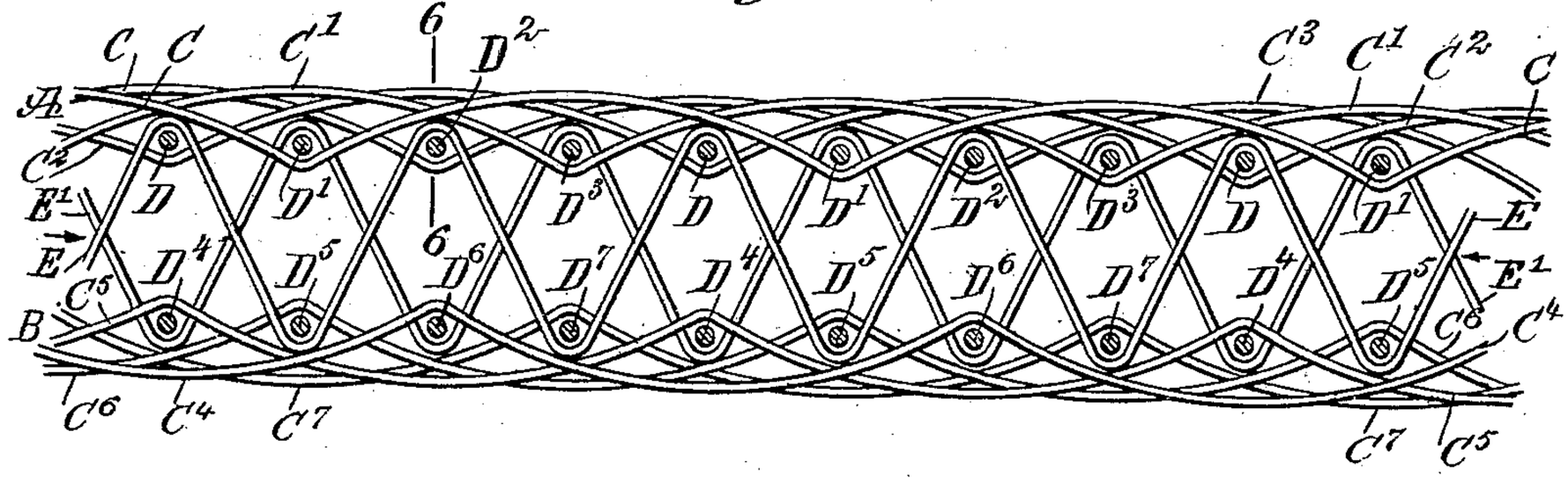
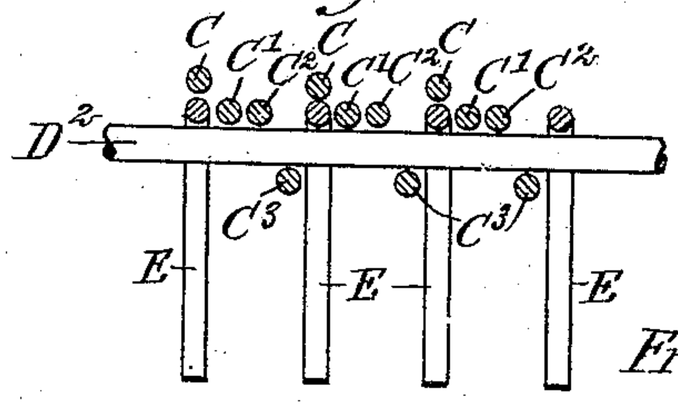


Fig. 6.



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UNITED STATES PATENT OFFICE.

FREDRICK CHRISTIAN PFEIFFER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO E. F. TIMME & SON, OF NEW YORK, N. Y.

LOOM FOR WEAVING PILE FABRICS.

No. 862,654. Specification of Letters Patent. Patented Aug. 6, 1907.

Application filed November 5, 1906. Serial No. 342,040.

To all whom it may concern:

Be it known that I, FREDRICK CHRISTIAN PFEIFFER, a citizen of the United States, and a resident of Philadelphia, Roxborough, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Looms for Weaving Pile Fabrics, of which the following is a full, clear, and exact description.

The invention relates to textiles, and its object is to provide certain new and useful improvements in looms employed for weaving a plush fabric such as shown and described in the application for Letters Patent of the United States, No. 338,423, filed October 11, 1906, by Edward F. Timme, and in which the ground warp threads pass over, cover and bind in place the backs of the pile loops, to prevent the piles from being pushed out at the under side of the fabric when the latter is used and brushed.

The invention consists of novel features and parts and combinations of the same, which will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figures 1, 2, 3 and 4 are diagrammatic views of the improvement and illustrating successive positions of the heddles during the formation of the fabric; Fig. 5 is an enlarged longitudinal sectional elevation of the fabric produced by the loom, and Fig. 6 is a cross section of the same on the line 6—6 of Fig. 5.

The fabric woven by the loom hereinafter more fully described in detail consists of two cloths A and B, of which the cloth A has its body formed of two pairs of ground warp threads C, C′, and C², C³, and weft threads D, D′, D², D³, and the body of the opposite cloth B is formed of two pairs of ground warp threads C⁴, C⁵ and C⁶, C⁷ and the weft threads D⁴, D⁵, D⁶ and D⁷. The ground warp threads of each cloth A and B are interwoven with the corresponding weft threads, three up and one down, so that the weaving is repeated, after each four picks, as will be readily understood by reference to the drawings. The pile threads crossing from one cloth to the other are arranged in sets, two pile threads E and E′ being in each set and looped around alternate weft threads in each cloth A and B. Thus the pile thread E (see Fig. 5) is looped around the weft thread D in the cloth A, then crossed over to the other cloth B and looped around the weft thread D⁵ to then return to the cloth A, and looped around the weft thread D² and so on, and the other pile thread E′ (see Fig. 5) is looped around the weft thread D⁴ of the cloth B and then crossed over to the cloth A and looped around the weft thread D′, then passed back to the cloth B and looped around the weft thread D⁶ and so on.

Of the pair of ground warp threads C and C′ the ground warp thread C (see Fig. 5) passes over and covers the back of the loops formed by the pile thread E on the weft threads D, D², D . . . . in the cloth A, and the other ground warp thread C′ passes over the said weft threads D, D², D . . . . adjacent to the said pile thread E. The next following pair of ground warp threads C², C³ for the cloth A is similarly arranged (see Fig. 5), that is, the ground warp thread C² passes over and covers the backs of the loops of the pile thread E′, at the weft threads D′, D³, D′ . . . . while its mate, the ground warp thread C³, passes over the said weft threads D′, D³, D′ . . . . adjacent to the loops of the said pile thread E′.

The pairs of ground warp threads C⁴, C⁵ and C⁶, C⁷ for the cloth B are arranged similar to the ones for the cloth A and as above described, that is, the ground warp threads C⁴ and C⁵ pass over and cover the backs of the loops of the pile threads E and E′ at the weft threads D⁵, D⁷ . . . and D⁴, D⁶ . . . , respectively, and the ground warp threads C⁶, C⁷ pass over the weft threads D⁵, D⁷ and D⁴, D⁶ adjacent to the loops of the pile threads E and E′, respectively.

It will also be noticed that the weft threads in the cloth A and over which pass the pair of ground warp threads C, C′ and the pile thread E (see Fig. 5) is bound in by and passes between the next following pair of ground warp threads C², C³, and the weft thread in the same cloth A and over which pass the ground warp threads C², C³, and the pile thread E′ is bound in and passes between the next following pair of ground warp threads C, C′. The same arrangement is found in the cloth B relative to the weft threads, the ground warp threads and the pile threads forming this cloth.

In order to produce the desired result the loom is provided with the usual lay (see Figs. 1, 2, 3 and 4), the upper and lower shuttles G and G′ for the wefts D, D′, D², D³ and D⁴, D⁵, D⁶, D⁷, respectively, the heddles H and H′ for the pile threads E and E′ and the heddles I, I′, I², I³, I⁴, I⁵, I⁶ and I⁷ for the ground warp threads C, C′, C², C³, C⁴, C⁵, C⁶ and C⁷. The usual mechanism is provided for actuating the lay F and the shuttles G, G′ and for moving the several heddles up and down in the sequence shown in Figs. 1, 2, 3 and 4 and hereinafter referred to.

The ground warp heddles I to I⁷ are of the usual form, while the pile thread heddles H and H′ are provided with eyes H² and H³ for the passage of the pile threads E and E′ respectively, and the said pile thread heddles H and H′ are provided with elongated loops H⁴ and H⁵ and similar bottom loops H⁶ and H⁷. The ground warp threads C and C′ pass through the elongated loop

H^4; the ground warp threads C^2, C^3 pass through the elongated loop H^5; the ground warp threads C^4, C^5 pass through the elongated loop H^6 and the ground warp threads C^6, C^7 pass through the elongated loop H^7. Thus the ground warp threads pass in pairs through the elongated loops of the pile thread heddles H, H′ and hence are in vertical alinement with the pile threads E, E′ and by this arrangement it is possible to properly interweave the ground warp threads, pile threads and weft threads with a view to cover the backs of the pile loops by the ground warp threads, as above described.

The several parts of the loom, as shown in Fig. 1, are in the position for the first pick, that is, the pile thread E, the warp threads C, C′, C^3 of the upper cloth A are above the first weft thread D passed through the open shed by the shuttle G, while the ground warp thread C^2 is below the said first weft thread D. It will be noticed that the ground warp thread C′ overlies the pile thread E. In a like manner the pile thread E′ and the ground warp threads C^4, C^6, C^7 of the lower cloth B extend under the weft thread D^4, passed through the open shed by the shuttle G′; and the ground warp thread C^5 extends above this weft thread D^4. The ground warp thread C^6 overlies the pile thread E′.

The weft threads D, D^4 are now beaten in by the lay F, after which the heddles H, H′, I^2, I and I^5, I^6 change to the position for the second pick shown in Fig. 2, so that the pile thread E is carried down, while the other pile thread E′ is raised and the ground warp thread C is lowered and the ground warp thread C^2 is raised. The ground warp threads C^5 and C^6 also change positions. The second weft threads D′, D^5 are now passed through the open sheds by the shuttles G. G′ and then the said weft threads D′, D^5 are beaten in by the lay F. At the third pick (see Fig. 3) the heddles H. H′, I, I^3, I^6, I^4 change and the pile threads E, E′ are shifted back to the position shown in Fig. 1, and the ground warp threads C, C^3 and C^4, C^6 now change position. The third weft threads D^2, D^6 are now passed through the open sheds by the shuttles G, G′, and the said weft threads D^2, D^6 are then beaten in by the lay F.

The pile thread heddles H, H′ now again change positions and also the ground warp heddles I′, I^3 and I^4, I^7 to change the position of the ground warp threads C′, C^3 and C^4, C^7 (see Fig. 4). The shuttles G, G′ now pass the fourth weft threads D^3, D^7 through the open sheds, after which the lay F beats in the said weft threads D^3, D^7. The pile thread heddles H. H′ and the ground warp heddles I′, I^2 and I^7, I^5 now change, to bring the pile threads E, E′ and the ground warp threads C′ C^2, C^7, C^5 back to the original position shown in Fig. 1.

Now from the foregoing it will be seen that by passing the ground warp threads through the elongated loops of the pile thread heddles H and H′ in the manner described, the pile threads E, E′ are overlaid at the back in both cloths A and B, and when the cloths are separated by cutting the pile threads E, E′ approximately midway between the cloths A and B, then the piles E, E′ are not liable to back out when pressure is applied to the pile face of either cloth A or B.

Although I have shown and described my improvement for weaving pile fabrics, it is evident that the improvement can be used for weaving fabrics other than pile fabrics, and in this case the pile thread E or E′ becomes a binding warp

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A loom for weaving double pile fabrics comprising a lay, weft shuttles, a series of ground warp heddles for the ground warp threads of each cloth, one heddle being provided for each ground warp thread, a plurality of series of pile thread heddles, each of said pile thread heddles having an eye for the passage of the pile thread and being provided above and below the eye with loops for receiving a pair of ground warp threads from each of the respective cloths whereby the movement of the pile warp heddles to interweave the pile threads with the respective cloths will place a pair of ground warp threads on the back of each of the loops of the pile threads for the purpose set forth.

2. A loom for weaving double pile fabrics comprising a lay, weft shuttles, ground warp heddles, one for each ground warp thread, and pile thread heddles, each having an eye for the passage of the pile thread and two elongated loops for the passage of a pair of the ground warp threads, said eye being intermediate the loop, and said loops being adapted to receive a pair of ground warp threads whereby the movement of the pile warp heddles to interweave the pile threads will place a pair of ground warp threads over the back of each loop of the pile warp threads.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FREDRICK CHRISTIAN PFEIFFER.

Witnesses:

WILLIAM C. PFEIFFER,

EDWARD W. FRANCE.