

(No Model.)

2 Sheets—Sheet 1.

H. J. GRISWOLD.  
MANUFACTURE OF HOSIERY.

No. 472,876.

Patented Apr. 12, 1892.

Fig. 1.

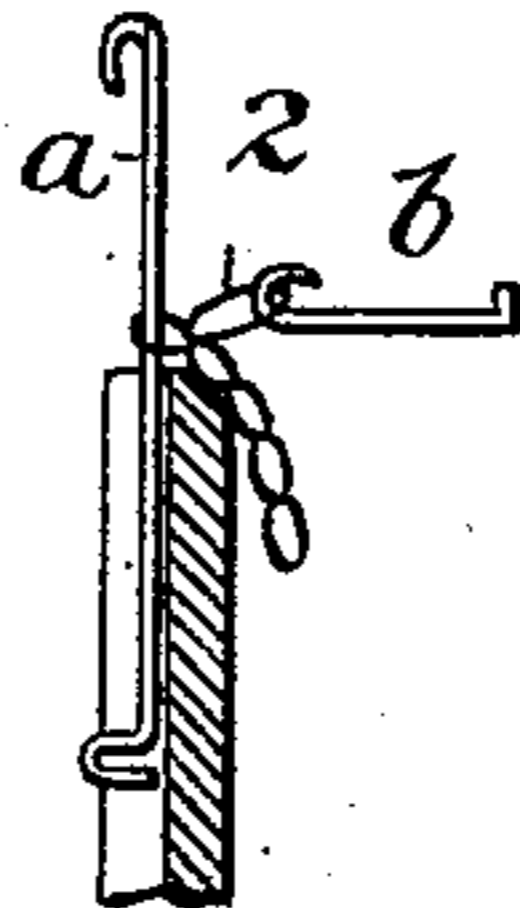


Fig. 2.

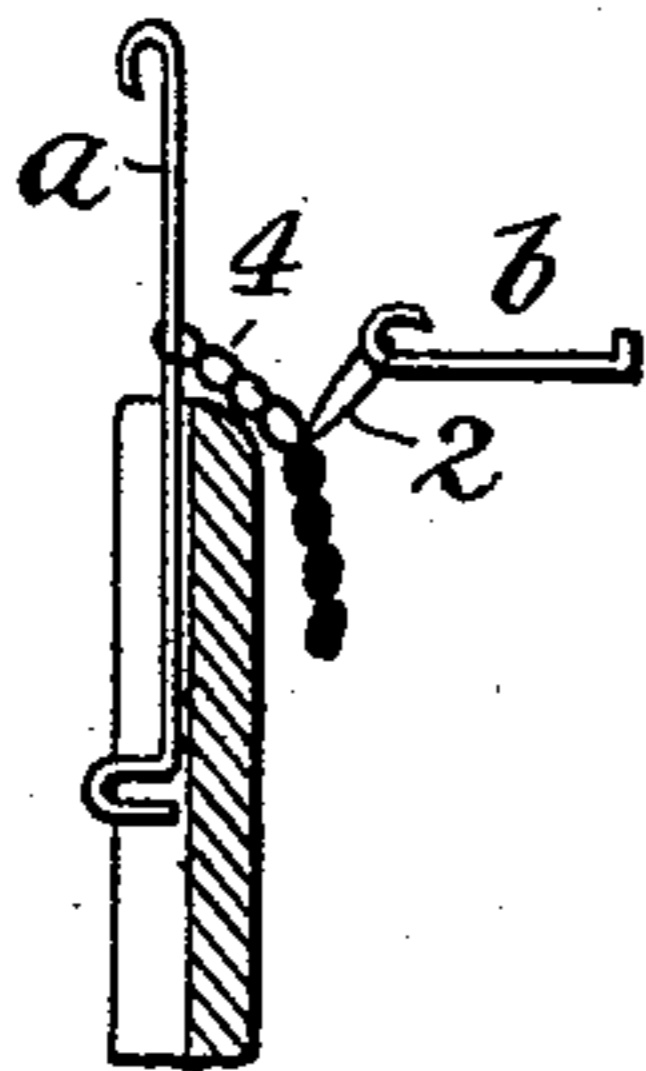


Fig. 3.

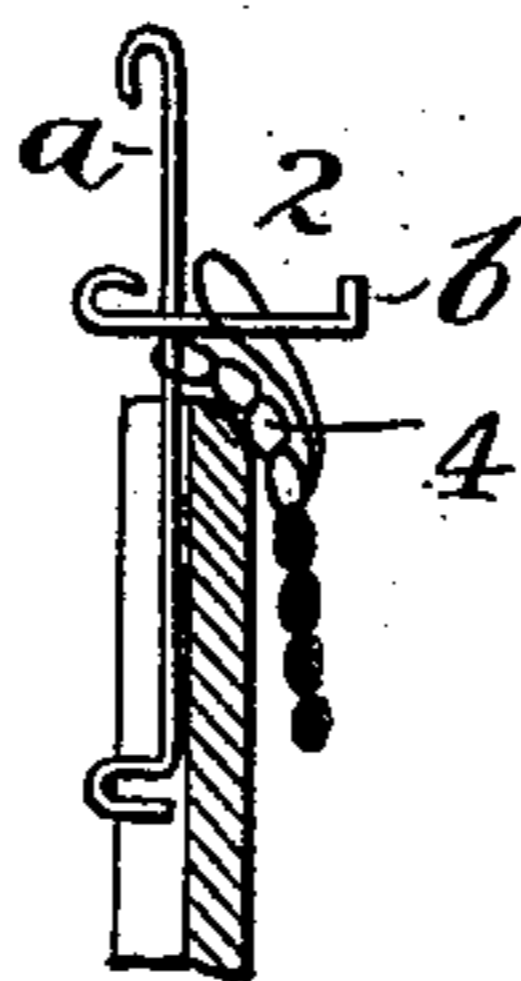


Fig. 4.

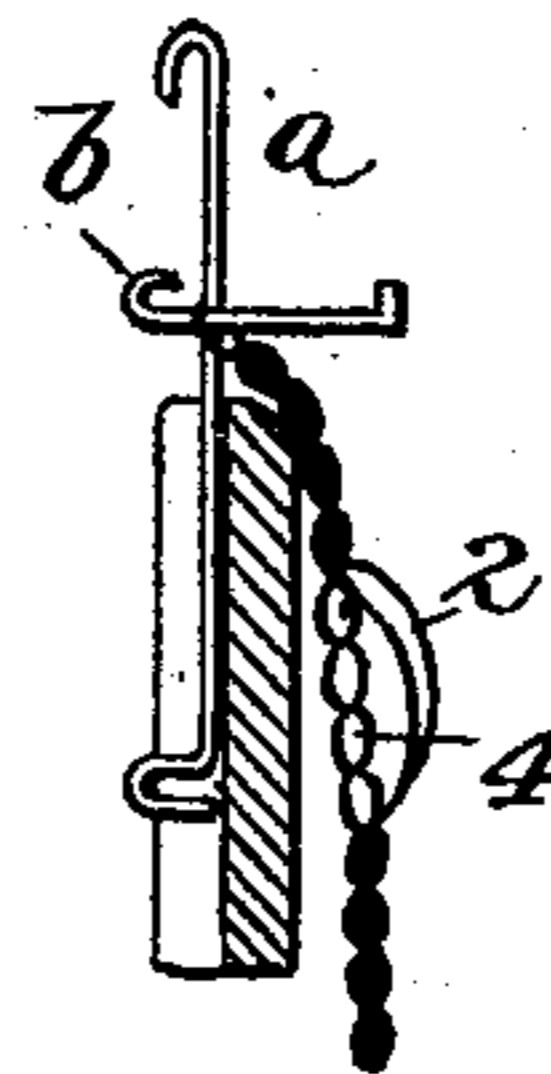
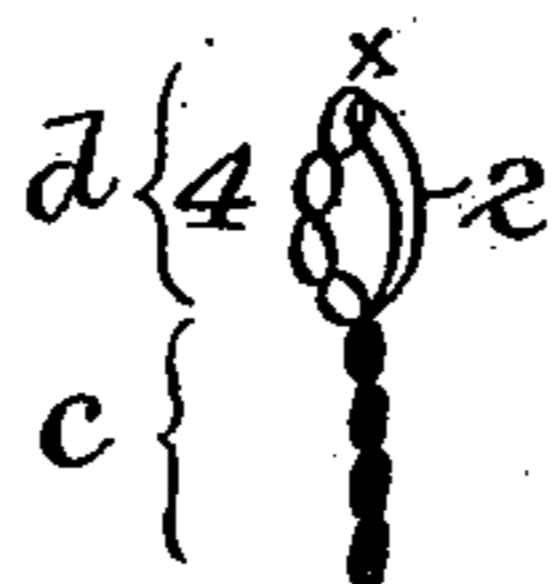


Fig. 5.



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Attorneys.

(No Model.)

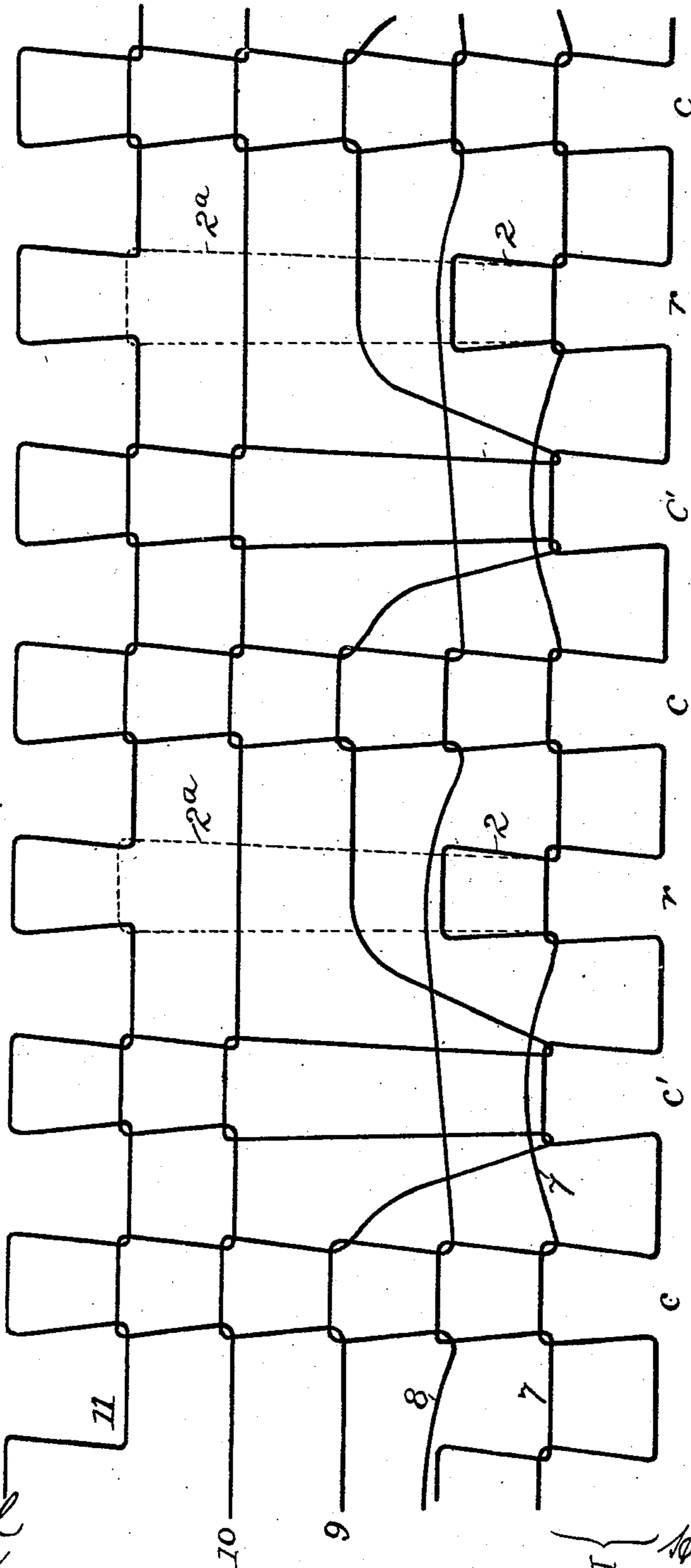
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Fig. B.



Witnesses  
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# UNITED STATES PATENT OFFICE.

HENRY J. GRISWOLD, OF MADISON, CONNECTICUT.

## MANUFACTURE OF HOSIERY.

SPECIFICATION forming part of Letters Patent No. 472,876, dated April 12, 1892.

Application filed July 23, 1891. Serial No. 400,494. (No specimens.)

*To all whom it may concern:*

Be it known that I, HENRY JOSIAH GRISWOLD, a citizen of the United States, residing at Madison, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in the Manufacture of Hosiery, of which the following is a specification.

Heretofore it has been customary to knit the tops of stockings, cuffs, drawer-bottoms, skirts of shirts, and such like articles of one-and-one ribbed fabric having a fast welt at one end; but it has not been thought possible to make a similar fast welt at the top of sections of two-and-one, three-and-one, or other than one-and-one ribbed fabric. When it has been attempted to apply the usual process to, for instance, a two-and-one ribbed welt, one row of stitches in each rib has not been fast, and if not afterward secured by sewing or otherwise these stitches would ravel the whole length of the stocking or other article. I have discovered that this defect may be obviated by simply putting out of action every alternate cylinder-needle during the first one, two, or three courses of the welt, as clearly set forth in the following specification and illustrated in the accompanying drawings, in which—

Figures 1 to 4 each illustrate a part of the cylinder in section, one of the cylinder-needles and one of the ribbing-needles, the different figures showing the progressive formation of the welt. Fig. 5 illustrates a section of the fabric with the welt. Fig. 6 is a magnified diagrammatic view of the welted portion of the fabric.

My improved welted circular-ribbed fabric, illustrated diagrammatically in Fig. 6, may be manufactured upon the machine for which Letters Patent of the United States were granted to me March 17, 1891, No. 448,437, although the use of this special machine is not essential.

I preferably knit the fabric in a series of sections—as, for instance, when knitting stockings—the top of one stocking being joined to the toe of the preceding one, and so on, and cuffs, tops and legs for stockings, and the bottom of drawer-legs and shirts may be likewise so knitted. In each case, however, it is desir-

able to form upon at least one end of the circular-ribbed material or of each section thereof a fast welt, which is done as follows:

To make a fast welt on a two-and-one ribbed fabric, I first start a circular fabric of two-and-one ribbed work with twice as many needles *a* in the cylinder as there are needles *b* in the dial, and I knit a few rows of two-and-one ribbed work upon the cylinder and dial needles to get the work properly started, using cotton or other yarn of little value. I then lift or otherwise put out of action every alternate cylinder-needle, and with the yarn from which the article is to be made knit exactly one row on all the ribbing-needles and the remaining cylinder-needles. I then push back the welting-cam of the ribbing attachment or otherwise put all the ribbing-needles out of action, when the loops 2 of the ribbing-needles will hang upon the latter, as shown in Fig. 1. I then knit exactly one row on the alternate cylinder-needles which remain in action, and I then put into action the remaining cylinder-needles and knit a number of rows—say six or eight—upon all the cylinder-needles *a*, thereby forming a short section of plain fabric 4, while the loops 2 still remain upon the quiescent dial-needles and are elongated by the downward pull of the weight attached to the fabric, the parts then being in the position shown in Fig. 2. The dial-needles are then again brought into action, whereby the ends of the loops 2 are brought to the edge of and knitted onto the section 4 that has just been knit, as shown in Fig. 3, after which the body *C* of the ribbed fabric is knit of two-and-one ribbed web by the joint action of the cylinder and ribbing needles, as shown in Fig. 4, and the knitting is continued until the body-section is of sufficient length, after which a row of cotton yarn may be knit in and another section may be started and finished as before. By the means described I form a body-section of fabric *C*, Fig. 5, with a fast welt *d*, which consists of a section 4 of fabric, to the upper edge of which are secured the ends of the loops 2, that extend to the base of the said section 4, with more or less tendency to tie the outer edge down to the base, according to the tension that has been placed upon the loops.

While I have described the welt as being

formed upon a circular fabric; I do not limit myself thereto, as the fabric may be formed circular in the machine and then cut longitudinally, so as to form a flat fabric with the  
5 welt still at one end.

In forming a fast welt upon a three-and-one ribbed fabric, I remove from the dial every alternate and from the cylinder every fourth needle. The machine will then be knitting  
10 a three-and-one ribbed web. Now to make a fast welt I put out of action the cylinder-needle that is in the middle of each rib while knitting the first one, two, or three rows and proceed as described above. To make a fast  
15 welt on a four-and-one ribbed fabric, I remove from the dial every alternate dial-needle, leaving all the needles in the cylinder, and put out of action every alternate cylinder-needle while knitting the first one, two, or three  
20 rows, exactly as when making the welt on a two and one ribbed fabric.

The arrangement of the stitches resulting from the above-described operation will be understood from the diagrammatic view Fig.  
25 6, in which  $c\ c'$  indicate the loops on the cylinder-needles and  $r$  the loops on the ribbing-needles of the last row of loops upon the body fabric. When one-half the cylinder-needles  $c'$  are thrown out of action, the next row of  
30 yarn 7 knits only into the loops  $c$  and  $r$ , but not into the loops  $c'$ , which remain on the ribbing-needles out of action. Then the ribbing-needles are drawn back and the loops 2 thereon are stretched, forming long loops 2<sup>a</sup>, (shown in dotted lines,) which are held out of action.  
35 The next row of yarn 8 can therefore only knit with the loops  $c$ , but not into the loops  $c'$

and  $r$ . There may be several rows like 8. The needles  $c'$  are then again thrown into action and the next layer of yarn 9 knits into the  
40 loop  $c$  and also into the loops  $c'$  on the needles now thrown into action. The next layer of yarn 10 then knits into the loops  $c\ c'$  of 9, but not into the loops 2 of the ribbing-needles that are still out of action. When the rib-  
45 ring-needles are thrown into action, the next layer of yarn 11 knits into all of the loops. It will be seen, therefore, that between the last row of stitches A and the layer 11 there is a thin or open-work fabric that is not a ribbed  
50 fabric and the base or lower edge of which is connected with the body of the fabric, while the upper portion is connected at intervals to long loops 2 that were upon the ribbing-needles.  
55

I claim as my invention—

1. A knitted fabric having its body composed of two-and-one, three-and-one, or other than one-and-one ribbed work and provided with a fast welt, substantially as set forth.  
60

2. A knitted fabric the body of which is composed of two-and-one, three-and-one, or other than one-and-one ribbed work, with a fast welt consisting of a section 4 and a series of loops 2, extending from the union of the  
65 section 4 with the body to the edge of the section, substantially as set forth.

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

HENRY J. GRISWOLD

Witnesses:

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H. W. HUBBARD.