

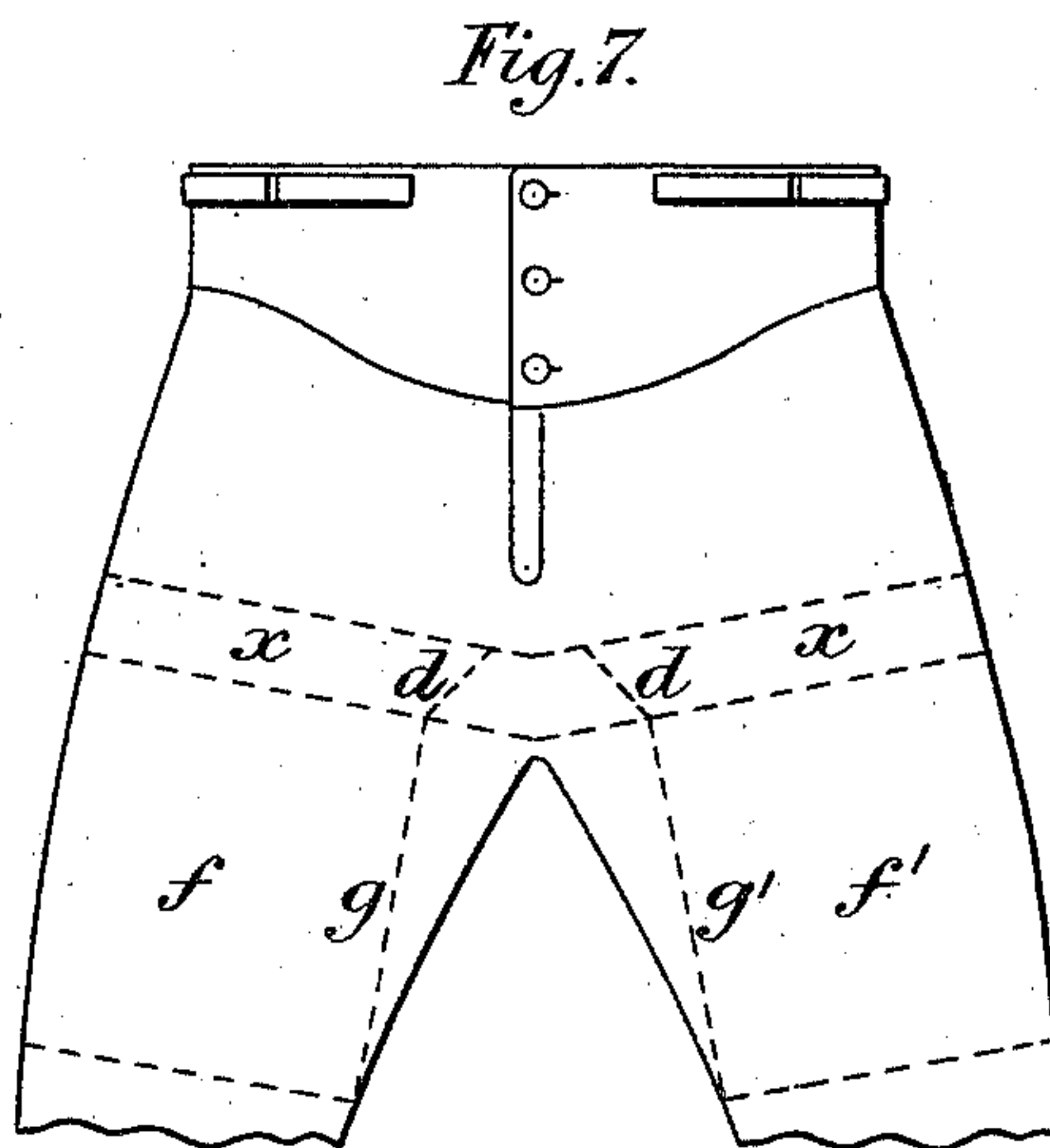
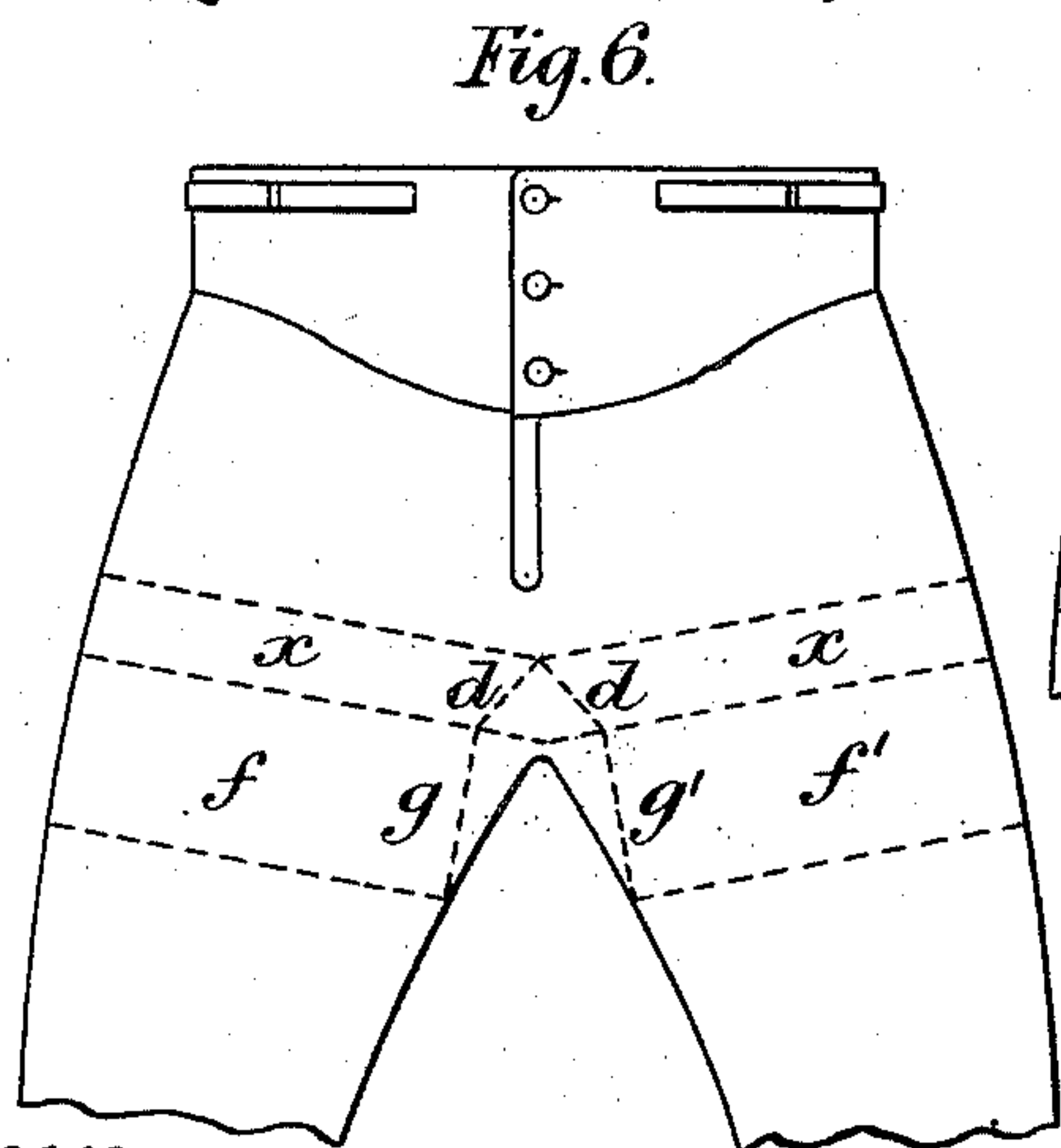
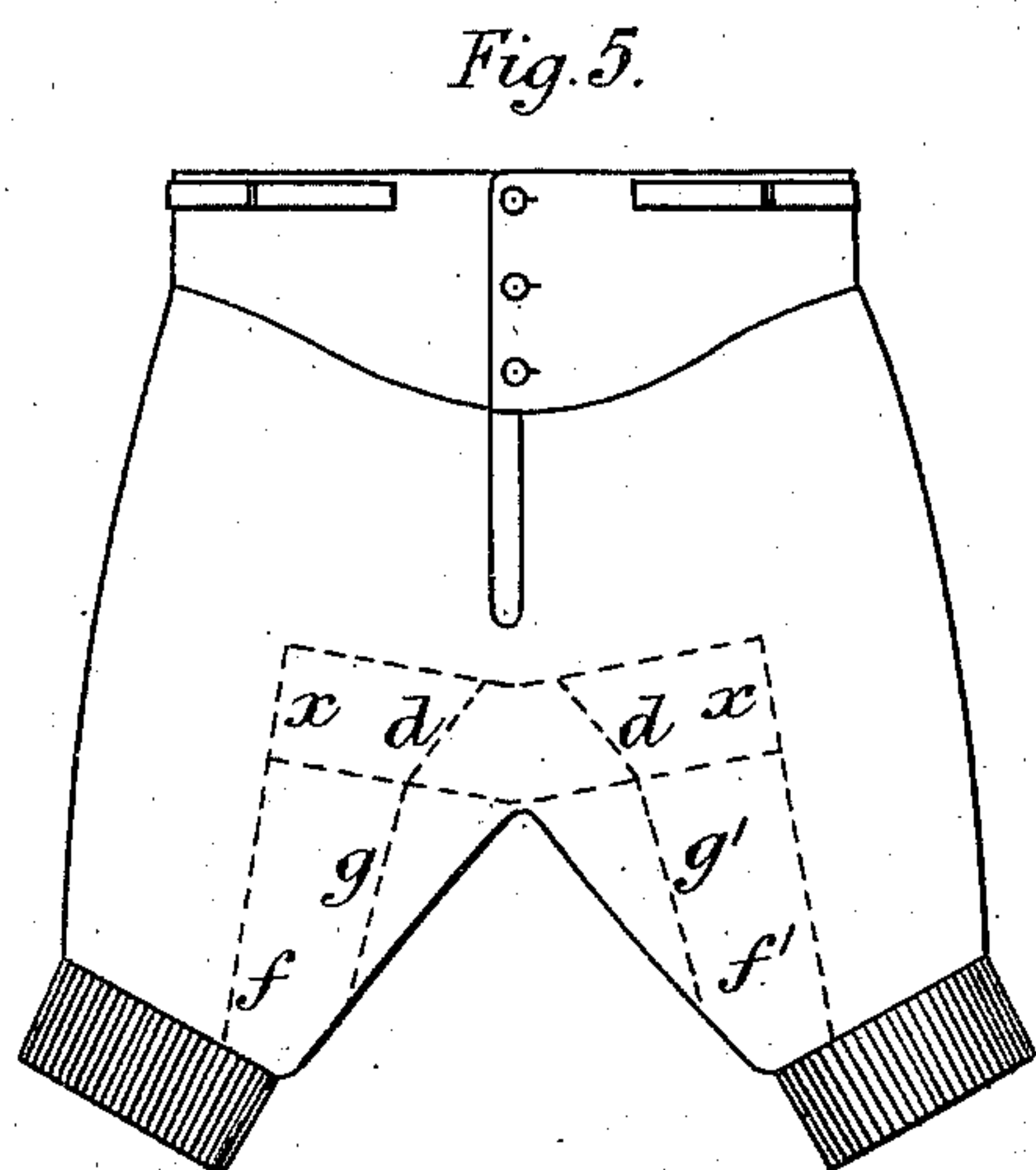
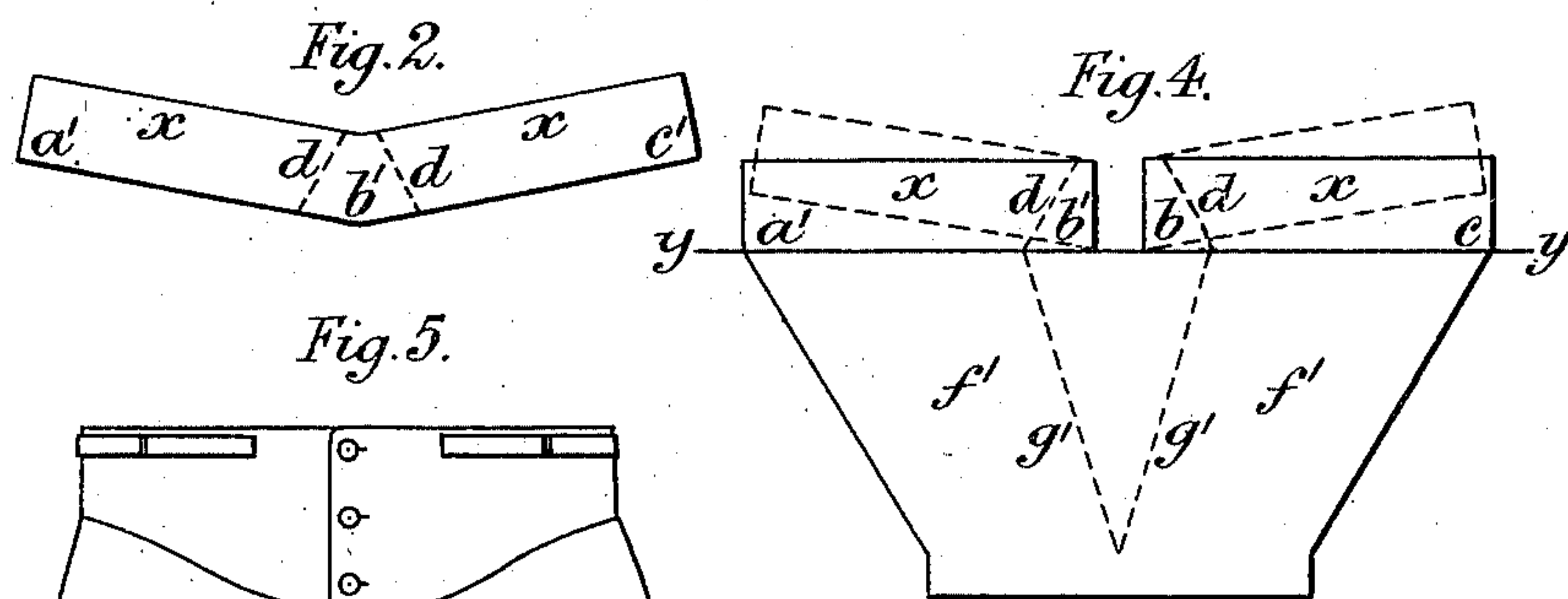
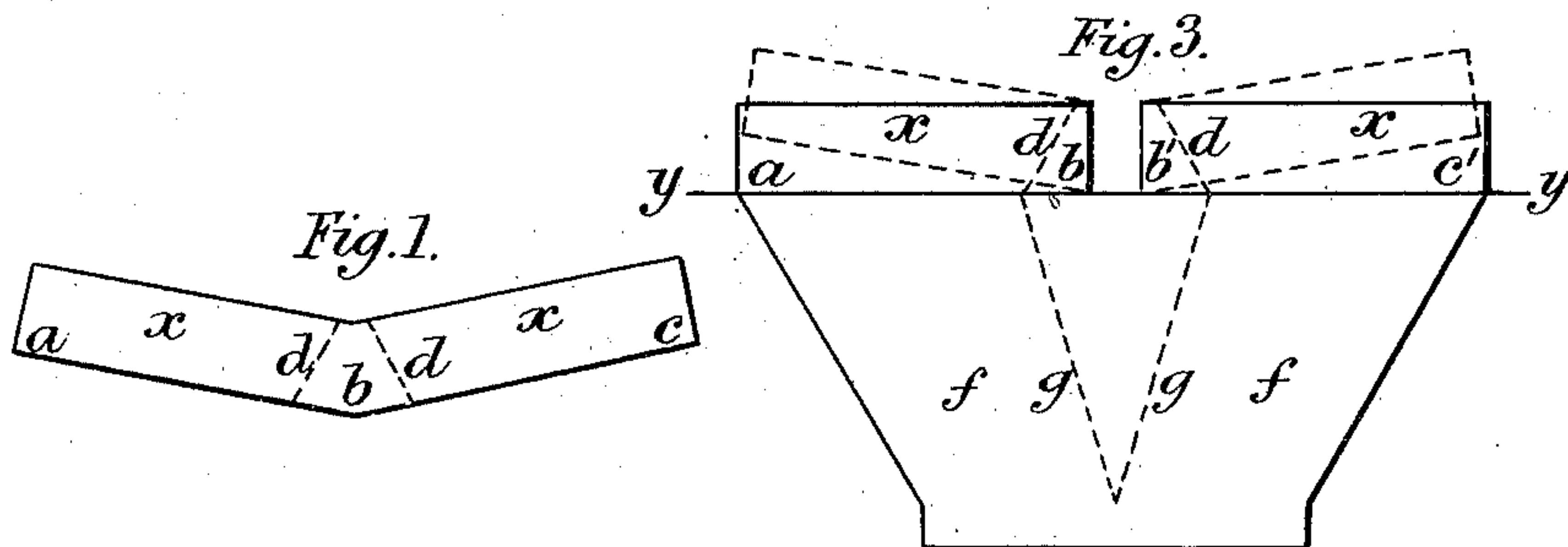
No. 731,381.

PATENTED JUNE 16, 1903.

H. H. MIDDLEDITCH & C. A. GREGORY.
KNITTED PANTS AND THEIR MANUFACTURE.

APPLICATION FILED JUNE 19, 1902.

NO MODEL.



Witnesses

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UNITED STATES PATENT OFFICE.

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KNITTED PANTS AND THEIR MANUFACTURE.

SPECIFICATION forming part of Letters Patent No. 731,381, dated June 16, 1903.

Application filed June 19, 1902. Serial No. 112,348. (No model.)

To all whom it may concern:

Be it known that we, HENRY HOWARD MIDDLEDITCH, hosiery manufacturer, and CHARLES ALSOP GREGORY, factory manager, subjects of the King of Great Britain, residing at Lea Mills, Matlock Bath, in the county of Derby, England, have invented a certain new and useful Improvement in Knitted Pants and in Their Manufacture, of which the following is a specification.

This invention relates to the manufacture of pants with a gusset-piece at the fork, having portions or the whole of the back and front parts of the lower portion of the body and portion or the whole of the upper part of both leg-pieces formed in one piece of work without seam upon a straight-bar-knitting machine.

Our method of construction is illustrated in the drawings annexed.

Figures 1 and 2 show two separately-formed strips of knitted fabric. Fig. 3 shows one half of one strip and the other half of the other strip run onto a row of needles. Fig. 4 shows the other halves of the strips similarly run onto the needles. Fig. 5 shows an example of a completed pants formed in this way. Figs. 6 and 7 show other examples in which the gusset-piece is made to extend to the side edges of the pants.

We first form upon a straight-bar-knitting machine two separate strips of work x , such as shown at Figs. 1 and 2, with two rows of narrowings d in each strip starting at a distance apart from one another on opposite sides of the center of the broad end and approaching one another or meeting at the center of the narrower end. These pieces form part or the whole of the lower portion of the back and front parts of the body. The loops along the edge of one half of the broader end of one strip—say, from a to b , Fig. 1—and the loops along the edge of the broader end of the opposite half of the other strip—say, from b' to c' , Fig. 2—are then run onto a row of needles, (indicated by the line $y y$ in Fig. 3,) leaving a few vacant needles in the center between the needles which have upon them the loops of one half-strip and the needles which have upon them the loops of the other half-

strip. The number of needles so left vacant may be considerably varied. To leave these needles at the center vacant without any loops upon them, we in running on the loops of the two half-strips place two loops instead of one only onto some of the needles at intervals apart near to the center, and thereby leave a corresponding number of needles without any loops upon them in the center of the needle-bar. Onto the needles so left vacant a piece of web, which is separate from the two strips, is run on, so that all these needles may have loops upon them, or a hook-bar carrying the same number of hooks as there are vacant needles might be used. One leg-piece f of the gusset is, as illustrated in Fig. 3, then knitted upon all the needles in a similar manner to that in which the strips were knitted—that is, starting with two rows of narrowings (marked g) at a distance apart from one another on opposite sides of the center and working down more or less gradually to a point. After this leg-piece portion of the gusset has been completed and the work has been removed from the needles the same process of running on is repeated with the other two halves of the strips, as illustrated in Fig. 4, and the loops of web which were before on the central needles are again placed onto these needles. The other leg-piece f' of the gusset is then knitted in the same way as the first, with rows of narrowings g' formed in it. Afterward the upper parts of the body may be completed in any ordinary way, so as to form continuations of the narrower ends of the two strips of work x , the upper parts of the back forming a continuation of one of these strips and the upper parts of the front forming a continuation of the other of these strips. The lower parts of the leg-pieces may also be completed in any ordinary way. The front of a complete pair of pants so formed is shown in Fig. 5.

The manner above described of placing double loops onto some of the needles and leaving a corresponding number of needles vacant without any loops upon them in the center of the needle-bar is most important, as it adds greatly to the strength of the parts at the fork by reason of the framework of the

web being thereby caused to at this part run right through from one leg-piece to the other, or when the seamless gusset-pieces are so formed as to extend to the side edges of the pants, as illustrated in Figs. 6 and 7, the whole of the front and the whole of the back can each be formed in one piece suitably fashioned without seam. The whole of each leg-piece may also, especially if the legs are to be of short length, be completed in one piece in the same way as when forming what we have above called the "leg-pieces" of the seamless gusset.

Figs. 3 and 4 show that one-half of the upper part of each leg-piece measures one-half the distance between a and c' or between a' and c . It will also be observed that the distance between a and b , or b' and c' , or a' and b' , or b and c is less than one-half of this distance. Therefore half the sum of the distance between, say, a and b added to the distance between a' and b' (which equals the width of the lower part of the back or the lower part of the front) must be less than one-half the distance between a and c' or between a' and c .

What we claim is—

1. The hereinbefore-described process of forming knitted pants with a seamless gusset or portion at the crotch or fork such process consisting in first forming two strips of knitted work with two rows of narrowings inclined to one another on opposite sides of the center of each placing the loops of one half of the longer side of one strip onto a row of needles and the loops on the other half of the longer side of the other strip onto a continuation of this row of needles leaving a few vacant needles at the center between them then working a leg-piece as a continuation of the two half-strips upon the row of needles and upon the needles previously left vacant between them and subsequently working the other leg-piece upon the two other half-strips in the same way and by knitting the front and back of the body portion the one onto the shorter side of one strip and the other onto the shorter side of the other strip substantially as described.

2. The hereinbefore-described process of forming a knitted pair of pants with a seamless gusset or portion at the crotch or fork, such process consisting in first forming two strips of knitted work, placing the loops along one half of one edge of one strip onto a row of needles and the loops on the other half of one

edge of the other strip onto a continuation of this row of needles leaving a few vacant needles at the center between them, then working a leg-piece as a continuation of the two half-strips upon the needles carrying the two half-strips and the vacant needles between them and subsequently working the other leg-piece upon the two other half-strips in the same way and by knitting the front and back of the body portion the one onto the opposite side of the one strip and the other onto the opposite side of the other strip.

3. Knitted pants having a seamless gusset or portion at the crotch or fork, each of the leg-pieces being in one piece of knitted work doubled over and seamed together with the fold on the inside of the leg and the seam on the outside, one half of the width of the back forming a continuation of less than one-half of the width of the upper portion of one leg and the other half of the width of the back forming a continuation of less than one-half of the width of the upper portion of the other leg; similarly the two halves of the width of the front forming continuations of less than one-half of the width of the upper portion of the leg-pieces, while the central portion of the top of one leg-piece is in one piece with the central portion of the top of the other leg-piece so that at the fork all the parts are united one with the other in one piece of knitted work without seam.

4. A gusset-piece for the fork portion of knitted pants each of the leg-pieces of such gusset being in one piece of knitted work doubled over so that the fold comes on the inside of the leg, one half of the width of the back forming a continuation of less than one-half of the width of the upper portion of one leg-piece and the other half of the width of the back forming a continuation of less than one-half of the width of the upper portion of the other leg-piece; similarly the two halves of the width of the front forming continuations of less than one-half of the width of the upper portion of the leg-pieces while the central portion of the top of one leg-piece is in one piece with the central portion of the top of the other leg-piece, so that at the fork all the parts are united one with the other in one piece of knitted work without seam.

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