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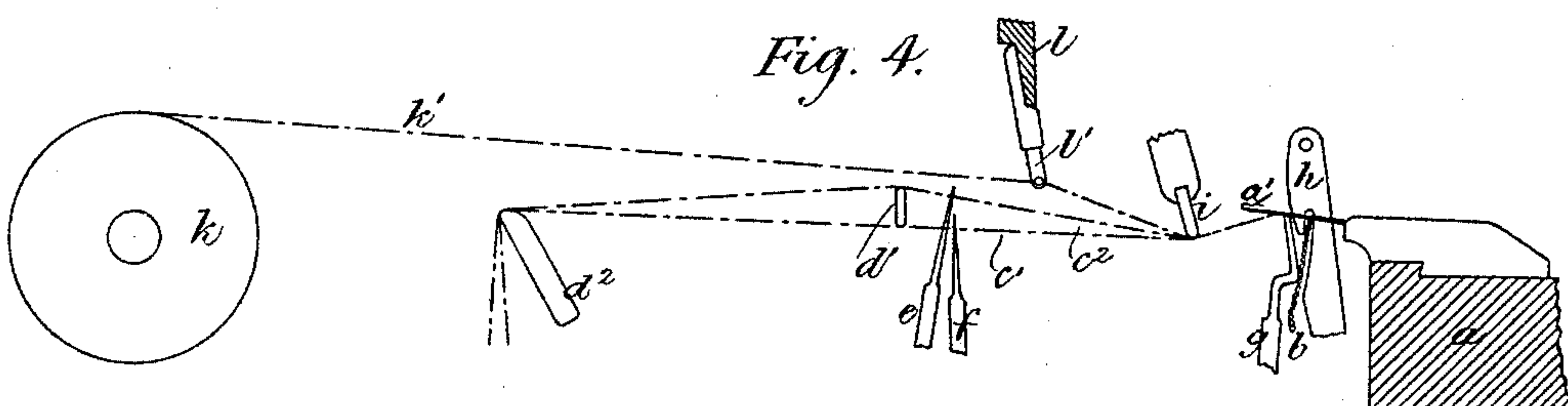
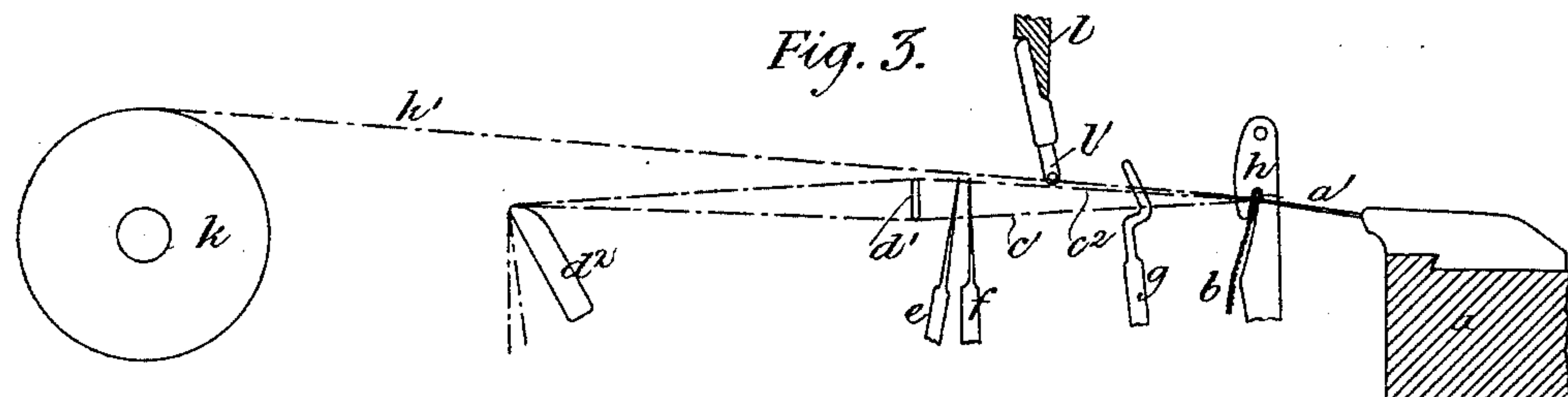
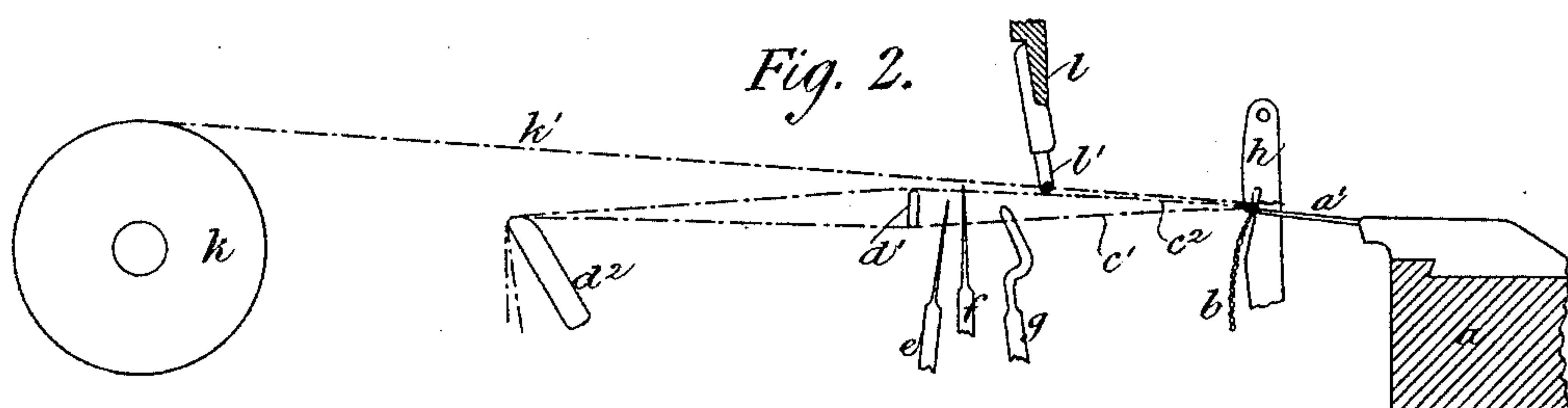
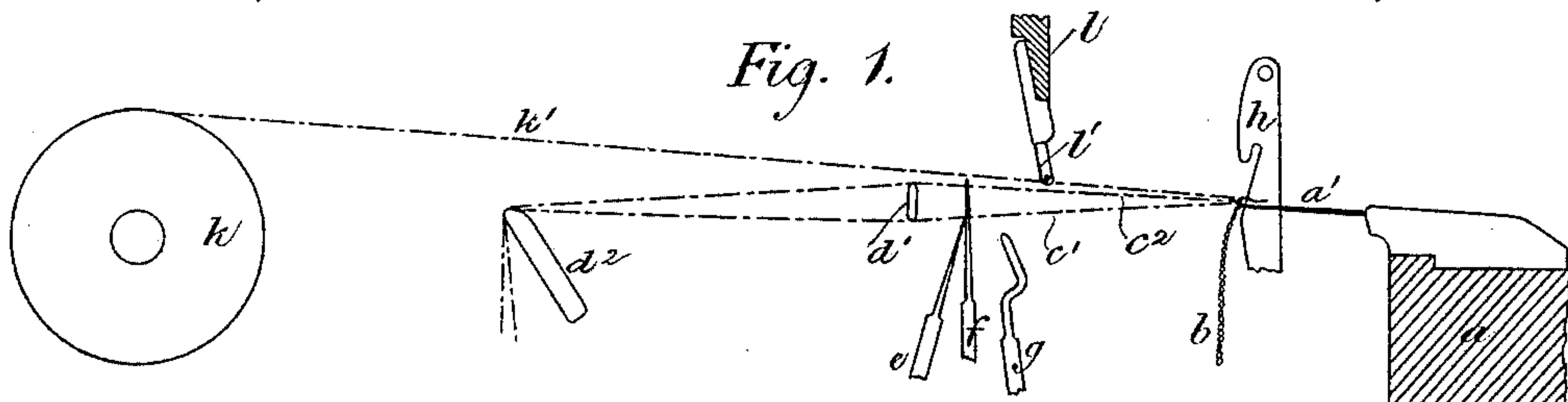
2 Sheets—Sheet 1.

T. W. FLETCHER.

TRAVERSE WARP FABRIC FOR MAKING GLOVES AND FOR OTHER USES.

No. 461,015.

Patented Oct. 13, 1891.



Witnesses.

Baltus D. Long
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Inventor.

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By his Atty's.

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(Specimens.)

2 Sheets—Sheet 2.

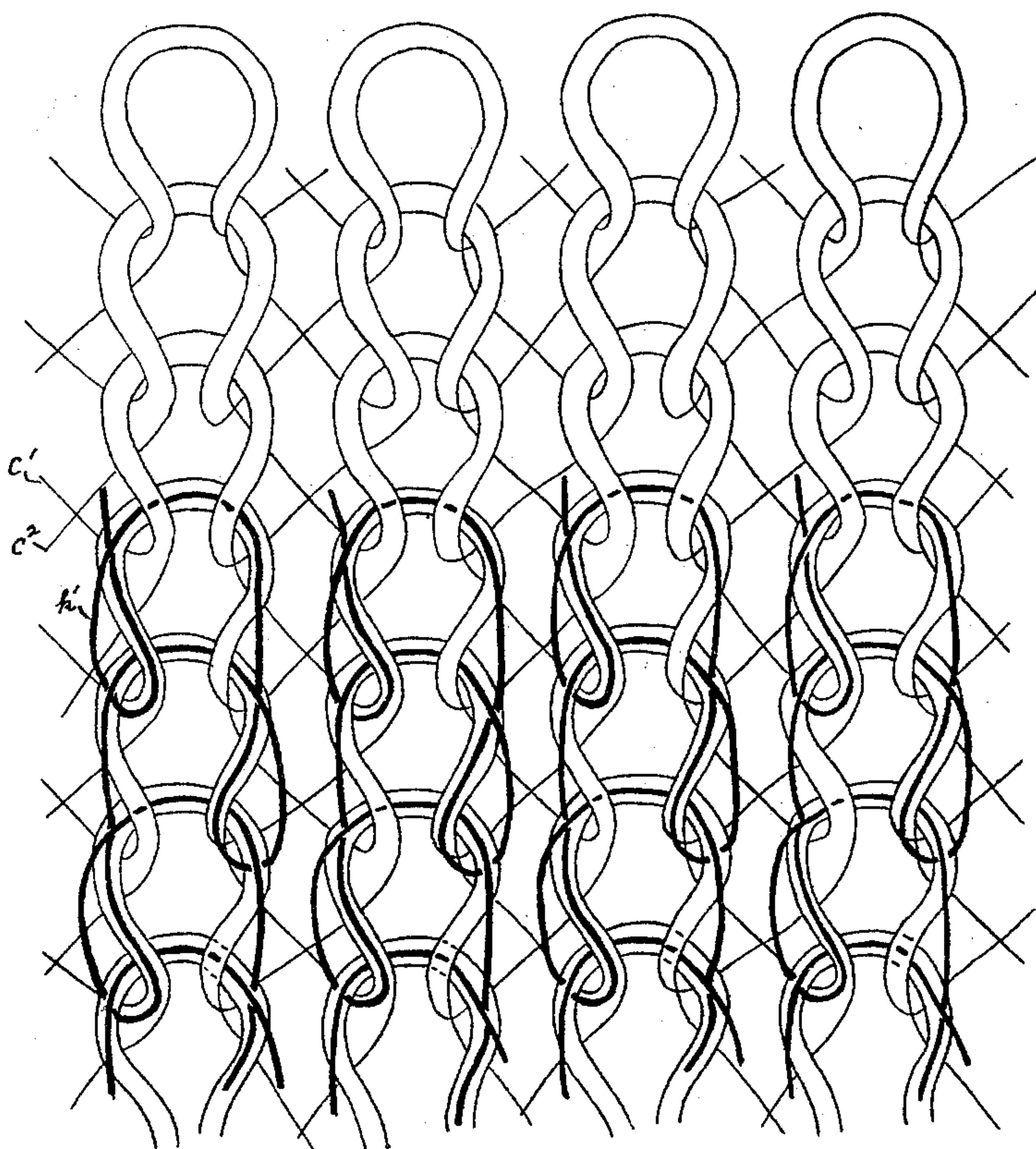
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Fig. 5



Witnesses.

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UNITED STATES PATENT OFFICE.

TOM WALTER FLETCHER, OF ILKESTON, ENGLAND.

TRAVERSE-WARP FABRIC FOR MAKING GLOVES AND FOR OTHER USES.

SPECIFICATION forming part of Letters Patent No. 461,015, dated October 13, 1891.

Application filed July 29, 1890. Serial No. 360,295. (No specimens.)

To all whom it may concern:

Be it known that I, TOM WALTER FLETCHER, textile-fabric manufacturer, a subject of the Queen of Great Britain, residing at Wood Street, Ilkeston, in the county of Derby, England, have invented certain new and useful Improvements in Traverse-Warp Fabrics for Making Gloves and for other Uses, of which the following is a specification.

My improved fabric is made in a traverse-warp machine, which is a machine such as is described in the specification of the British Patent No. 13,635 in the year 1851.

In my improved fabric there are two sets of main threads which are linked or looped together, and which at the same time traverse across the fabric from selvage to selvage, one set of threads traversing in one direction and the other set in the opposite direction. This ground fabric is thickened at intervals where required by a third set of threads which do not traverse and do not interlink, but which link only with the main threads of the fabric.

My improved fabric is intended more especially for the manufacture of gloves, and it is well adapted for this use, as it is uniformly elastic, although thickened in the parts which are most exposed to wear.

In order to produce a traverse-warp fabric which is thickened at intervals, I provide in the traverse-warp machine a guide-bar in addition to the two ordinary point-bars, and the eyes of the guides in this guide-bar are threaded with an additional warp. In the parts where the fabric is to be thickened this guard-bar moves to and fro the distance from one needle to another, and the points taking the threads lap them on the needles, each thread on one needle only. In the parts in which the fabric is not required to be thickened the guide-bar remains stationary or is not so moved as to cause the threads which it carries to be worked into the fabric, but these remain floated on the surface.

In order that my said invention may be fully understood and readily carried into effect, I will proceed to describe the drawings hereunto annexed.

The drawings in Figures 1, 2, 3, and 4 show in several successive positions the operative parts of a traverse-warp machine known commonly as a "Milanese" machine, together

with the parts which I add to this machine in order to make fabrics thickened at intervals in accordance with my invention. Fig. 5 is a diagram or highly magnified view of a fabric made in accordance with my invention.

In Figs. 1, 2, 3, and 4 of the drawings, *a* is the needle-bar, and *a'* is one of a long row of bearded needles which it carries. *b* is the work upon the needles. *c'* *c*² are the traverse warp-threads. After passing the guide-rails *d'* and *d*² they descend to a series of spools on which they are wound. These spools travel parallel to the needle-bar from end to end of the machine, and then return in the opposite direction. The spools on which the threads in the row *c'* are wound travel in one direction, and those which carry the threads in the row *c*² travel in the opposite direction. On arriving at the end of the machine each spool is transferred from one row to the other. *e* is the traverse-point bar. *f* is the still-bar. *g* is the crutch-bar. *h h* are the sinkers.

In Fig. 1 the points of the traverse-bar are just rising between the threads in the row *c'*, and when they have reached the position shown in Fig. 2 the bar traverses endwise the space of two needles, taking the lower row of threads with it. Then the points rise further to the position shown in Fig. 3, and the bar again traverses—endwise this time—the space of one needle and in the opposite direction. The threads of the rows *c'* and *c*² will now, as will be seen, be crossed in the space between the points of the traverse-bar and the points of the still-bar, one set of threads angling in one direction and the other in the contrary direction, over one space either way. The still-bar then descends, and its points pass out of the threads, and immediately the bar rises again with its points close up against the points of the traverse-bar, as seen in Fig. 4, and thereby the crossing of the threads just produced is passed on toward the needles. When the still-bar has completed its upward movement, the traverse-bar descends and returns to its original position. The parts then are again in the position shown in Fig. 1. In this figure the points carried by the crutch-bar are seen rising among the threads to carry the crossings of the threads forward to the nee-

dles. The crutch-bar assumes successively the positions shown in Figs. 2, 3, and 4, and in the latter figure the position of the crutch-bar is such that the crossings of the threads are well to the rear of the beards of the needles. The thread-presser *i* has also descended upon the threads. The crutch-bar now commences to return, and the sinkers *h* follow it, and so the crossings of the threads are carried beneath the beards of the needles. Next the beards of the needles are pressed by a presser-blade, which is not shown in the drawings. The loops of the work are carried over the beards while they are pressed by the continued advance of the sinkers until, when the sinkers arrive at the position seen in Fig. 1, the old loops of the work are thrown off from the needles, and the new loops are retained beneath their beards. In Figs. 2 and 3 the sinkers are seen descending with their nibs in front of the work, and in Fig. 4 the sinkers have receded, carrying the work back, and by means of their nibs they keep the crossings of the threads away from the work, so that the crossings may presently pass beneath the beards of the needles and the loops of the work may pass over them.

All the movements above described are such as are usual in traverse-warp machines. The parts which in accordance with my invention I add to the machine are the warp-beam *k* and the guide-bar *l*.

The warp-beam *k* has warp-threads *k'* wound upon it, one for each needle, and these threads are passed through the eyes of the guides *l'*, carried by the guide-bar *l*. There is a guide for each needle, and they are cast in leads in the same way as the needles and the points. The guide-bar is caused to traverse like the traverse-point bar. It slides endwise in brackets fixed to the needle-bar. The traverse-point bar, as above explained, makes for every course of the work two movements endwise while among the threads and a return movement when out of the threads; but the guide-bar moves once only for each course. It moves in one direction for one course and in the opposite direction for the next course, and the crutch-points enter among the threads *k'*, so that the thread which is to the right of its point in one motion is to the left of it in the next motion. The result is that each thread *k'* works on one needle only and is made to cross to and fro over its stem. It is not my intention, however, to thicken the whole of the fabric by means of warp-threads worked as described, but only at intervals, as may be required. Thus for a glove fabric I knit in the manner above described a length of fabric measuring, say, four and a half inches, while the fabric is on the machine, and then I throw out of gear the mechanism (which is

of the ordinary sort) by which the movement of the guide-bar is produced, so that the threads may stand still in the machine and not be worked into the fabric, but lie loosely on its face, and so I work for a length of, say, thirty-one and a half inches, after which I recommence working, as before, and produce another thickened band of fabric, and so on. Afterward I cut away the loose threads from the face of the work.

In place of allowing the guide-bar *l* to remain stationary when the threads which it carries are not to be worked into the fabric, a movement may be imparted to it as follows: When the parts are in the position shown by Fig. 1, the bar *l* may fall the space of several needles, so as to angle the threads before the nibs of the sinkers enter among them and rise again when the parts are in the position shown by Fig. 2, or before the points on the crutch-bar enter among the threads *k'*. By this precaution I prevent the nibs of the sinkers entering on the wrong side of some of the threads *k'*, which might otherwise occur when the threads are slack from having stood for some time without being worked into the fabric. When the fabric is cut up into gloves, the thickened bands form the finger-tips for two sets of gloves, the band being divided along the middle. The band of thin fabric is similarly divided and forms the remainder of the gloves. The dimensions of the alternate bands of thick and thin fabric will of course be varied according to circumstances.

Fig. 5 illustrates the fabric produced in the manner above described. The upper part of the diagram represents the ordinary unthickened fabric, the lower part the thickened work. It will be observed that the fabric consists of two sets of threads linked or looped together and also traversing across the fabric in opposite directions, and a third set of threads which serve to thicken the fabric at intervals and which neither traverse nor link together, but which interlink with the main threads of the fabric.

What I claim is—

A traverse-warp fabric substantially as described, consisting of two sets of threads linked or looped together and also traversing across the fabric in opposite directions, and a third set of threads, serving to thicken the fabric at intervals, such last-mentioned threads neither traversing nor linking together, but interlinking with the main threads of the fabric.

TOM WALTER FLETCHER.

Witnesses:

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HY. MEDHURST,

Clerks to Notary, Nottingham, England.