

J. B. HIPWELL.  
 INCANDESCENT MANTLE.  
 APPLICATION FILED SEPT. 18, 1912.

1,047,221.

Patented Dec. 17, 1912.

Fig. 1.

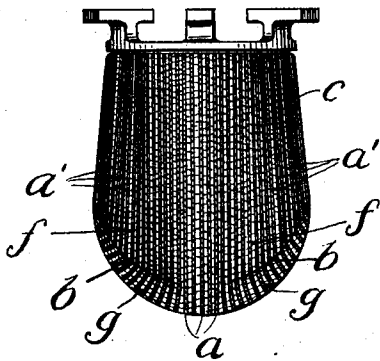


Fig. 2.

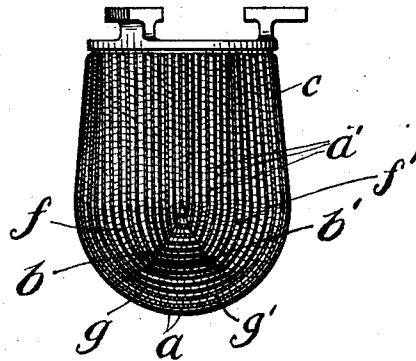


Fig. 3.

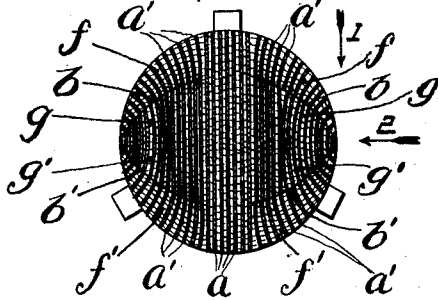
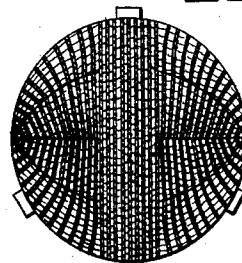


Fig. 4.



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Witnesses

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# UNITED STATES PATENT OFFICE.

JOHN B. HIPWELL, OF PHILADELPHIA, PENNSYLVANIA.

## INCANDESCENT MANTLE.

1,047,221.

Specification of Letters Patent.

Patented Dec. 17, 1912.

Application filed September 18, 1912. Serial No. 720,948.

*To all whom it may concern:*

Be it known that I, JOHN B. HIPWELL, a citizen of the United States, and a resident of the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Incandescent Mantles, of which the following is a specification.

My invention relates to mantles or incandescents employed in connection with gas burning devices, and more particularly to the type of mantle described in my pending application Serial No. 648,043, filed September 7th, 1911, in which is employed a knitted fabric completely formed throughout by a continuous thread and having a seamless closing end upon a seamlessly connected tubular body portion; the present improvement consisting in forming said closing end of a series of successively knitted narrowed and widened portions united by the interlocking of the wales, whereby a more perfect spherical form of continuously knitted seamless product is produced.

The invention is fully described in connection with the accompanying drawing and is specifically pointed out in the subjoined claims.

Figure 1 shows a simple form of my improved mantle attached to an ordinary supporting ring, looking in the direction of arrow 1, Fig. 3. Fig. 2 is a similar view looking in the direction of arrow 2, Fig. 3. Fig. 3 is a plan view of the closed end of the mantle. Fig. 4 is a similar view to Fig. 3, indicating a modified construction.

The wales  $a a'$  of the knitted fabric extend in a general way longitudinally of the fabric as usual; certain of them, as indicated at  $a, a, a$ , extending around the closed end of the fabric in continuous lines and parallel planes so as to form a curved connecting band of wales continuous with those of the tubular body portion  $c$  of the mantle, while others,  $a', a', a'$ , are deflected at junction lines  $b, b'$  formed by separated series of loop-connections lying approximately in a great circle of the spherically closed end of the fabric. As illustrated in Figs. 1, 2 and 3, there are four of these junction lines  $b, b, b', b'$ , symmetrically arranged in approximately diametral planes, formed by the interlocking of the wales at the united edges of the several triangular shaped narrowed portions of the fabric; which portions pro-

vide the requisite fullness to give symmetrical spherical form to the closed end of the fabric. The seamless body portion  $c$  is tubularly knitted as usual, the wales thereof being continuous with those of the closed end portion and the whole fabric being knitted from a continuous thread.

My improved mantle fabric may be produced upon a tubular knitting machine having suitable narrowing and widening mechanism, in the following manner: The machine is first set to reciprocate with approximately half the needles raised out of action for the well known narrowing and widening operation. Thread is supplied to the active needles and several courses are knitted upon them for convenience in transferring later to the idle needles, after which the narrowing mechanism is thrown in and the width of the fabric gradually reduced on each side to form the tapering portions  $f f$ , the converging ends of which are separated by the continuous straight-wales  $a a a$ . The operation is now changed to widening to form the tapering portions  $g g$ , the loops being interlocked along the junction lines  $b b$ , and then again changed to narrowing to form the tapering portions  $g' g'$  (Fig. 3.) Another change to the widening operation forms the final closing end portions  $f' f'$ , similar to  $f f$ , united by connecting loops along the junction lines  $b' b'$ , thus completing the spherical closing end of the fabric. The disengaged half of this hemi-spherically knitted portion is then engaged upon the previously idle needles and tubular knitting proceeded with to form the cylindrical body portion  $c$  of the fabric.

As indicated in Fig. 4, the number of narrowed and widened portions in the series making up the closed end may be increased if desired by more frequently narrowing and widening as stated, but the construction specifically described provides a symmetrical hemispherical closure such as is desired.

What I claim is:—

1. A gas mantle embodying a knitted fabric completely formed throughout by a continuous thread and having a seamless tubular body portion and a seamlessly connected hemi-spherical closing-end, said hemi-spherical closing-end being made up of a series of successively knitted narrowed and widened portions united by the interlocking of the wales.

2. A gas mantle embodying a knitted fabric completely formed throughout by a continuous thread and having a seamless tubular body portion and a seamlessly connected  
5 hemi-spherical closing-end portion of the same texture as said body portion and comprising a body-connected band having parallel wales extending continuous with those of the tubular body, and a series of succes-

sively knitted narrowed and widened portions united by the interlocking of the wales. 10

In testimony whereof, I affix my signature, in the presence of two witnesses.

JOHN B. HIPWELL.

Witnesses:

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W. G. STEWART.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."