3 Sheets—Sheet 1.

H. G. WARBURTON.

Machine for Winding Yarn, &c.

No. 197,912. **Patented Dec. 4, 1877.**

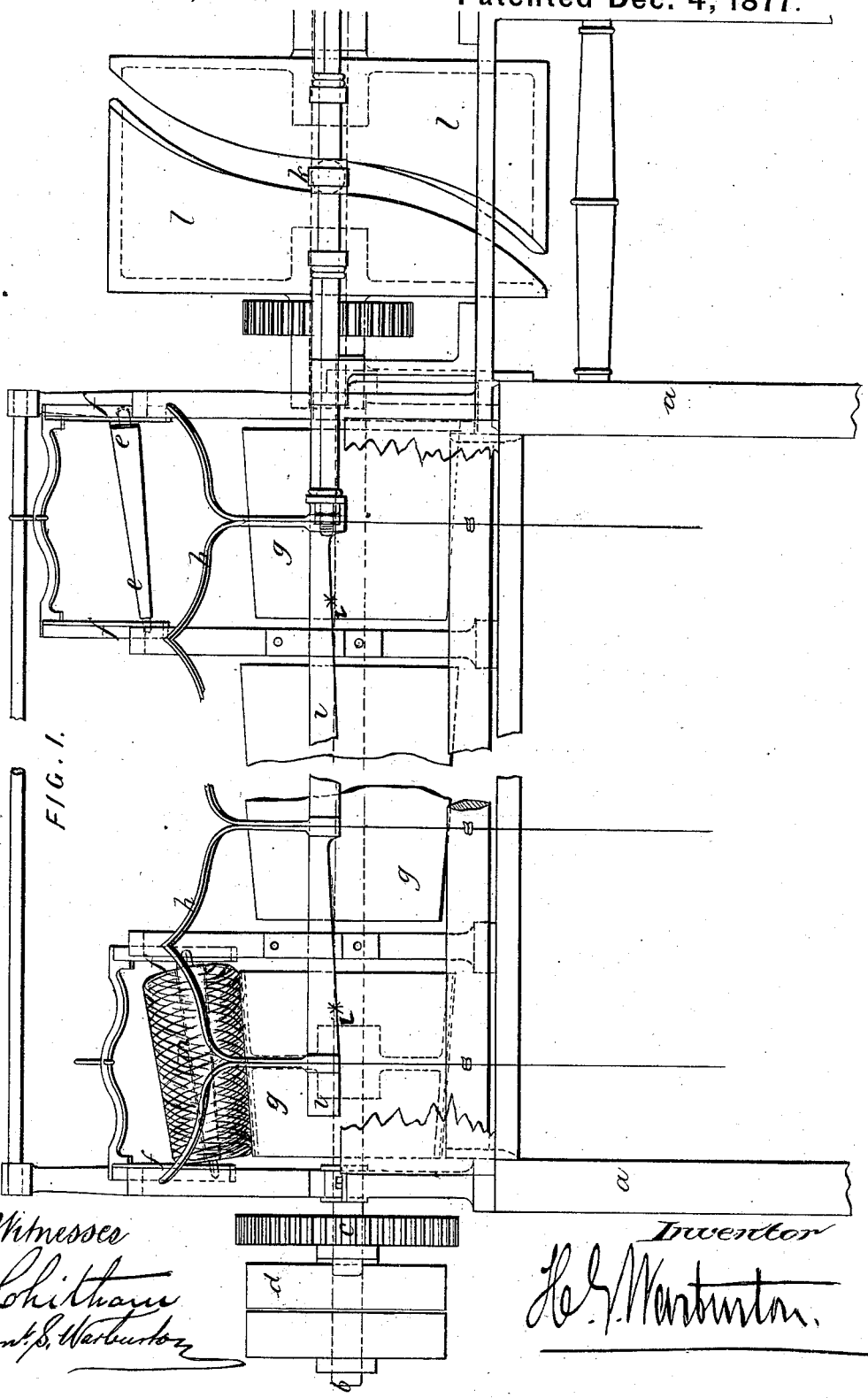

FIG. 1.

Witnesses
J. Chittaway
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Inventor
H. G. Warburton.

3 Sheets—Sheet 2.

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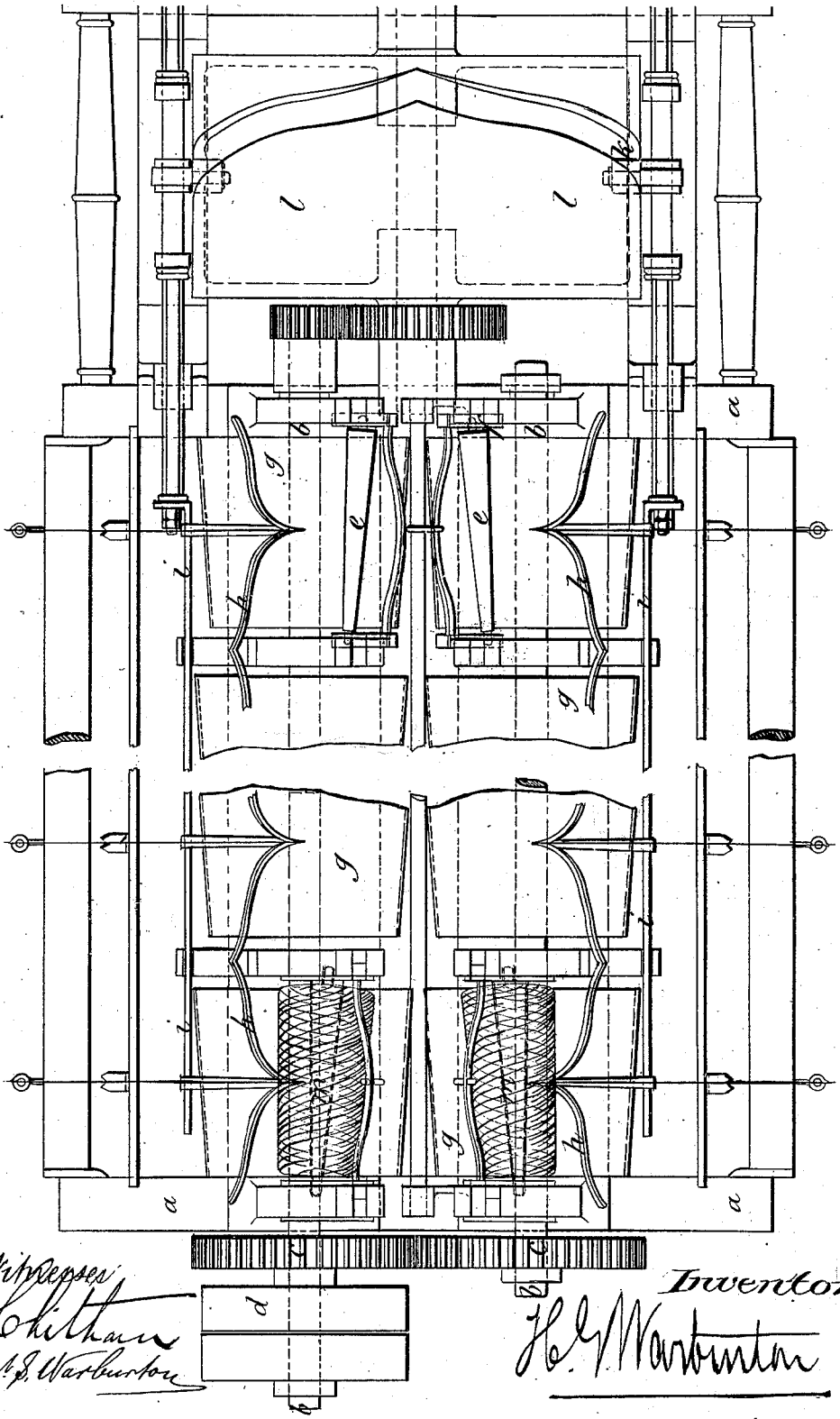

FIG. 2.

Witnesses:
F. Chittenden
Samuel G. Warburton

Inventor:
H. G. Warburton

3 Sheets—Sheet 3.

H. G. WARBURTON.

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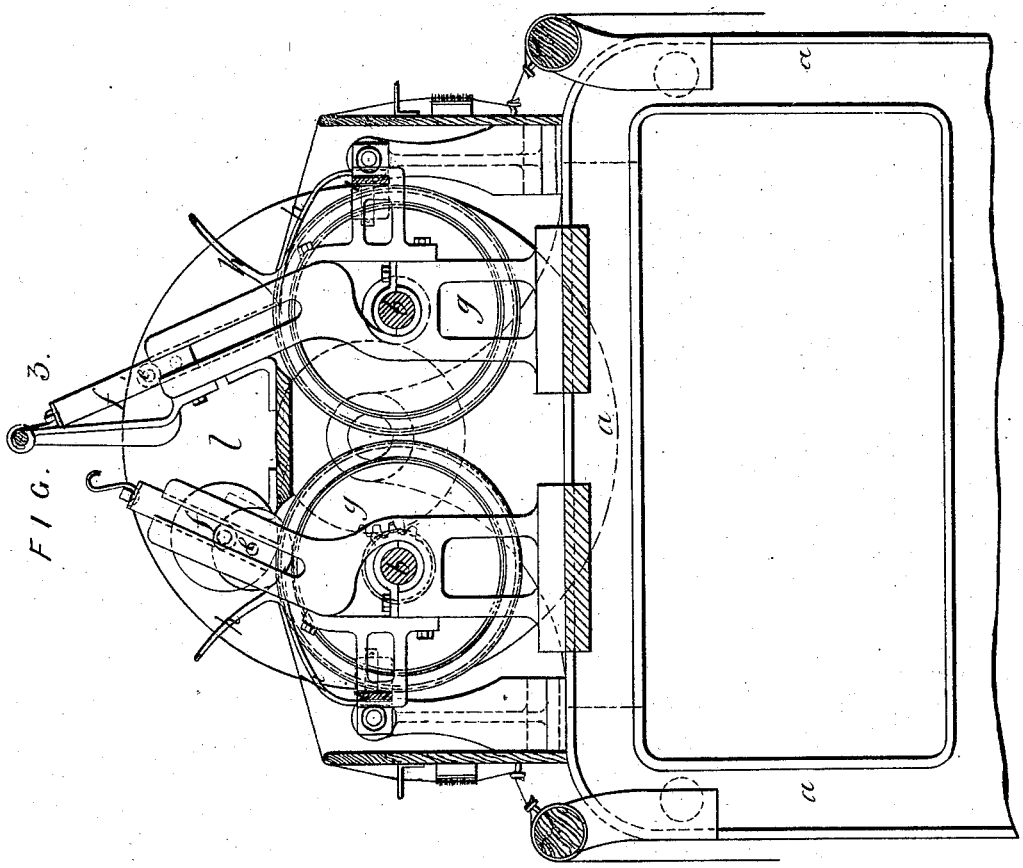

FIG. 3.

Witnesses

J. Chittenden

Saml. G. Warburton

Inventor

H. G. Warburton

UNITED STATES PATENT OFFICE.

HOWGATE G. WARBURTON, OF LEICESTER, GREAT BRITAIN.

IMPROVEMENT IN MACHINES FOR WINDING YARN, &c.

Specification forming part of Letters Patent No. **197,912**, dated December 4, 1877; application filed December 2, 1876; patented in England, September 12, 1876.

To all whom it may concern:

Be it known that I, HOWGATE GREAVES WARBURTON, of Leicester, in the county of Leicester, Kingdom of Great Britain and Ireland, have invented Improvements in Machines for Winding Yarns or Threads, of which the following is a specification:

The object of this invention is principally to enable hosiery-yarn to be wound and transmitted upon paper tubes, instead of upon spools, and at the same time so to wind the yarn that it can be unwound or drawn off with the same facility as from a spool; but the invention may also be employed for other yarns or threads.

My invention consists in a peculiar arrangement of mechanism for effecting the winding of the yarn or thread, in the manner described.

Figure 1 in the annexed drawings represents a front elevation of part of a winding-frame made according to my invention. Fig. 2 is a plan view, and Fig. 3 a transverse section, of the same.

a a is the frame-work of the machine, supporting in suitable bearings two longitudinal shafts, *b b*, which are geared together by the spur-wheels *c c*, one of the shafts being driven by means of a band or strap passing round the driving-pulley *d d*.

I employ a series of taper tubes mounted upon taper spindles *e e*, which run loosely in two inclined end guides, *f f*, and rest upon, and are driven by, taper drums *g g*, keyed on the longitudinal shafts *b b*. The drums *g g* and the spindles *e e* both taper in the same direction, so that, the axis of the drums *g g* being horizontal, the axles of the spindles *e e* will be inclined thereto in a degree proportioned to the amount of taper. (See Fig. 1.)

The thread-guides *h h* are fixed to a rail, *i i*, which has a to-and-fro motion given to it, corresponding with the length of the tube, (or rather shorter,) by means of a bowl, *k*, running in the groove of the cam *l l*, and the consequence is, that as the taper tubes are caused to revolve by frictional contact with the taper drums *g g*, the yarn is wound on in a conical form with truncated ends, and is so crossed backward and forward in the winding that it will retain its form and bulk without coming loose at the ends.

The guide-rail *i i* has also a rising and falling motion given to it, (so as to accommodate itself to the taper form of the drum *g g*,) by having inclined planes *i* i** formed at the places where it passes through its bearings.

When a sufficient amount has been thus wound on in a taper or conical form, the tube is withdrawn from the taper spindle *e e* and another tube substituted, and the operation proceeds as before.

The form in which the yarn is wound is seen clearly at Figs. 1 and 2, and the form of the thread-guide is shown at Figs. 1, 2, and 3.

These taper tubes, with the conical rolls of yarn *m m* thereon, may be packed and carried in the ordinary way without damage, and it will be found that the yarn may be unwound or drawn off from them with the greatest facility.

I claim as my invention—

The combination of the tapering winding-tubes with the thread-guides *h h* and the rail *i*, having inclined planes *i* i**, adapted to bearings in the frame, as specified.

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

H. G. WARBURTON.

Witnesses:

J. CHITHAM,

SAML. S. WARBURTON.