doubling and twisting cotton or linen yarn to form thread is performed.
The view is a transverse section of the machine. \( a \) is the cast-iron frame; \( b \), the creel on which the bobbins \( c \) are loosely

![Thread-Finishing Machine.](image)

supported along the whole line of the machine, their lower ends turning in olive steps, and their upper ends in wire eyes \( d \).

![Fig. 6400.](image)

are glass rods over which the yarn winds as it is unrolled; \( e, e \), oblong narrow troughs, \( f, f \), lined with lead and filled with water, through which the thread passes to moisten it, being drawn through eyes at the bottoms of the forks \( f, f \), which may be lifted out of the trough. \( g, g \) are smooth rollers of iron, and \( h \) rollers of boxwood, between which the thread is pressed. The thread passes from the bobbins \( c, c \) over the rods \( d, d \), thence downward beneath the forks \( f, f \), under the rollers \( g, g \), and upward between them and the rollers \( h, h \), thence downwardly through eyes \( i, i \) to the bobbins \( m, m \), by which it is twisted and on which it is wound. The rollers \( g \) are turned by gearing, and turn the rollers \( h \) by friction. The spindles are driven from the drum \( k \) by a band passing over the pulley \( l \), weighted to keep the pulleys tense. The bobbins are traversed vertically to wind the thread evenly upon them by a gear on the end of one of the lower roller-shafts, which turns a carrier-wheel engaging a wheel on the shaft carrying the heart-mam \( m \); this operates the levers \( a, a \), raising and lowering the bobbins. See also THREAD-POLISHER.

![Fig. 6401.](image)

**Thread-frame.** The doubling and twisting mill by which two or more yarns are combined to form a thread. The yarns as they are unwound from the bobbins or cops are passed beneath the surface of a solution of gum or starch in a trough \( a \) (Fig. 6400); the wetting enables them to be condensed into a more solid thread; they then pass between rollers \( b \), by which they are laid parallel, or nearly so, and are then conducted to the flyer \( c \), by which they are twisted together, and to the bobbin, on which they are wound.

![Fig. 6404 shows a machine similar to the throttle.](image)