This raised the question whether Saint had built even one machine. Nevertheless, the germ of an idea was there, and had the inventor followed through the sewing machine might have been classed an 18th-century rather than a 19th-century contribution.

Figure 4.—WEISENTHAL'S two-pointed needle, 1755.

## 1800–1820

There is no doubt that the successful late-18th-century improvements in spinning and weaving methods, resulting in increased production of fabrics, had a great effect in spurring inventors to ideas of stitching by machinery. Several efforts were made during the first two decades of the 19th century to produce such machines.

On February 14, 1804, a French patent was issued to Thomas Stone and James Henderson for a "new mechanical principle designed to replace handwork in joining the edges of all kinds of flexible material, and particularly applicable to the manufacture of clothing." [7] The machine used a common needle and made an overcast stitch in the same manner as hand sewing. A pair of jaws or pincers, imitating the action of the fingers, alternately seized and released the needle on each side of the fabric. The pincers were attached to a pair of arms arranged to be moved backward and forward by "any suitable mechanism." [8] This machine was capable of making curved or angular as well as straight seams, but it was limited to carrying a short length of thread, necessitating frequent rethreading. The machine may have had some limited use, but it was not commercially successful.

On May 30 of the same year John Duncan, a Glasgow manufacturer, was granted British patent 2,769 for "a new and improved method of tambouring, or raising flowers, figures or other ornaments upon muslins, lawns and other cottons, cloths, or stuffs." This machine made the chainstitch, using not one but many hooked needles that operated simultaneously. The needles, attached to a bar or carrier, were pushed through the vertically held fabric from the upper right side, which in this case was also the outer side. After passing through it, they were supplied with thread from spools by means of peculiarly formed hooks or thread carriers. The thread was twisted around the needle above the hook, so as to be caught by it, and drawn through to the outer surface. The shaft of the needle was grooved on the hook side and fitted with a slider. This slider closed upon the retraction of the needle from the fabric, holding the thread in place and preventing the hook from catching. The fabric was stretched between two rollers set in an upright frame capable of sliding vertically in a second frame arranged to have longitudinal motion. The combination of these two motions was sufficient to produce any required design. The principle developed by Duncan was used on embroidery machines, in a modified form, for many years. Of several early attempts, his was the first to realize any form of success.

A type of rope-stitching machine, which might be

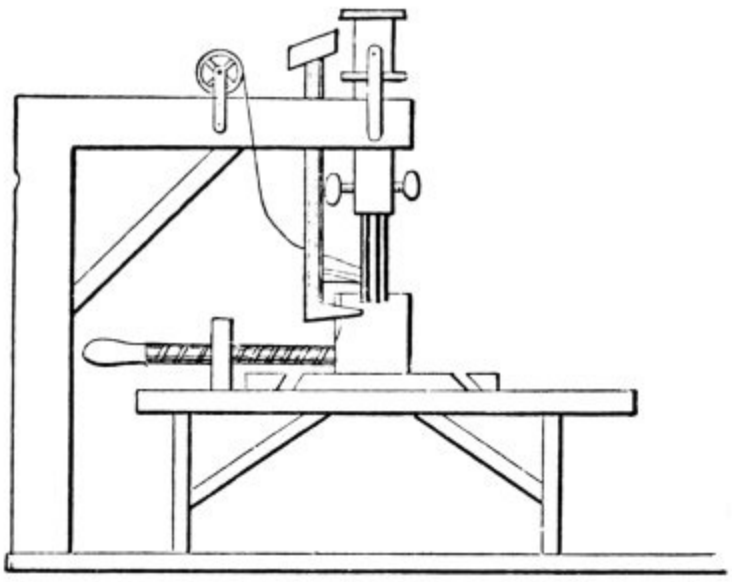

Figure 5.—SAINT'S SEWING MACHINE, 1790.
(Smithsonian photo 42490–A.)

[7] *Sewing Machine News* (1880), vol. 1, no. 8, p. 2.
[8] Ibid.