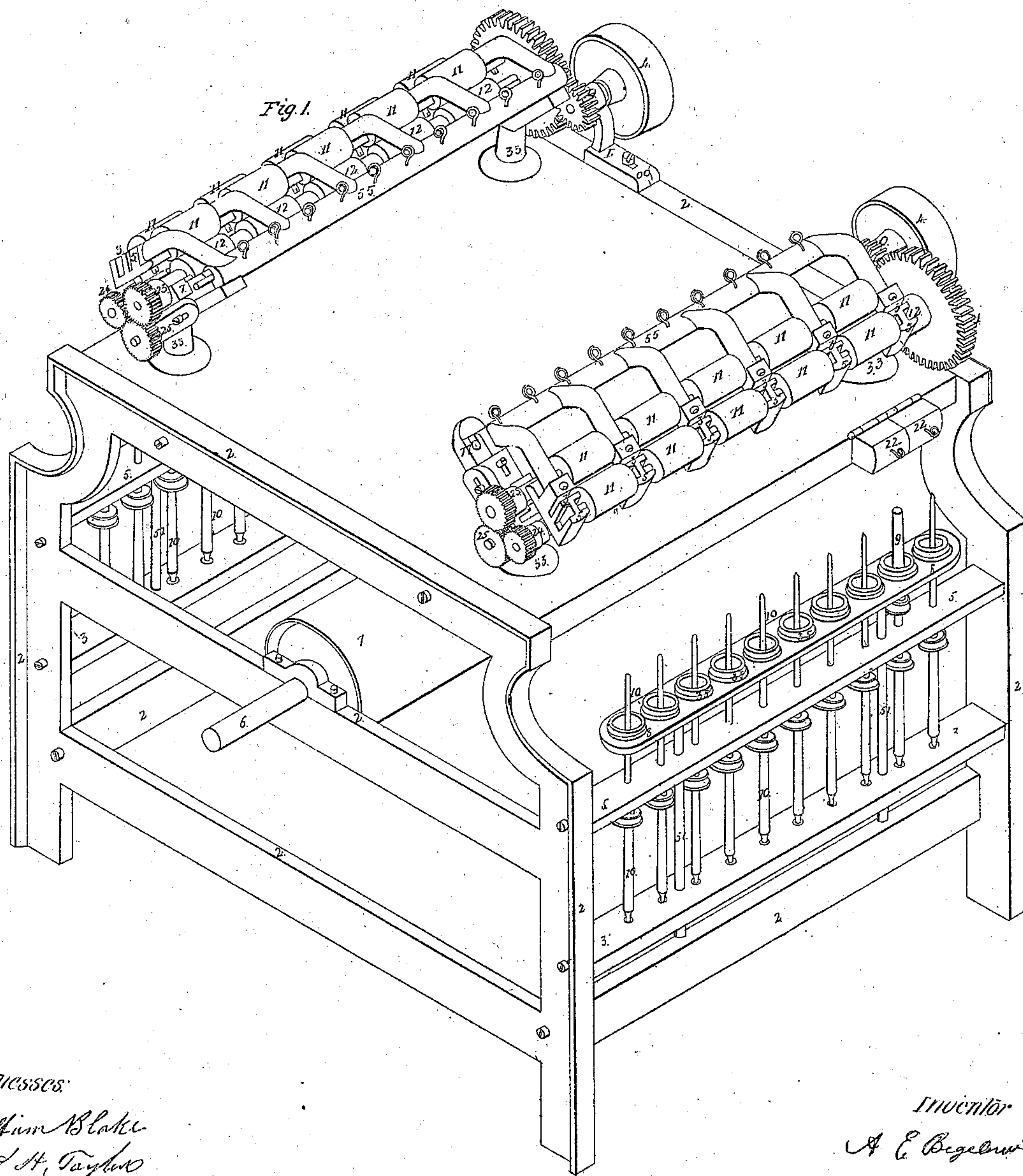


A. E. Bigelow.
Spinning Mach.

Sheet 1-2 Sheets.

N^o 12,581.

Patented Mar. 27, 1855.



Witnesses:
William Blake
Chas H. Taylor

Inventor
A. E. Bigelow

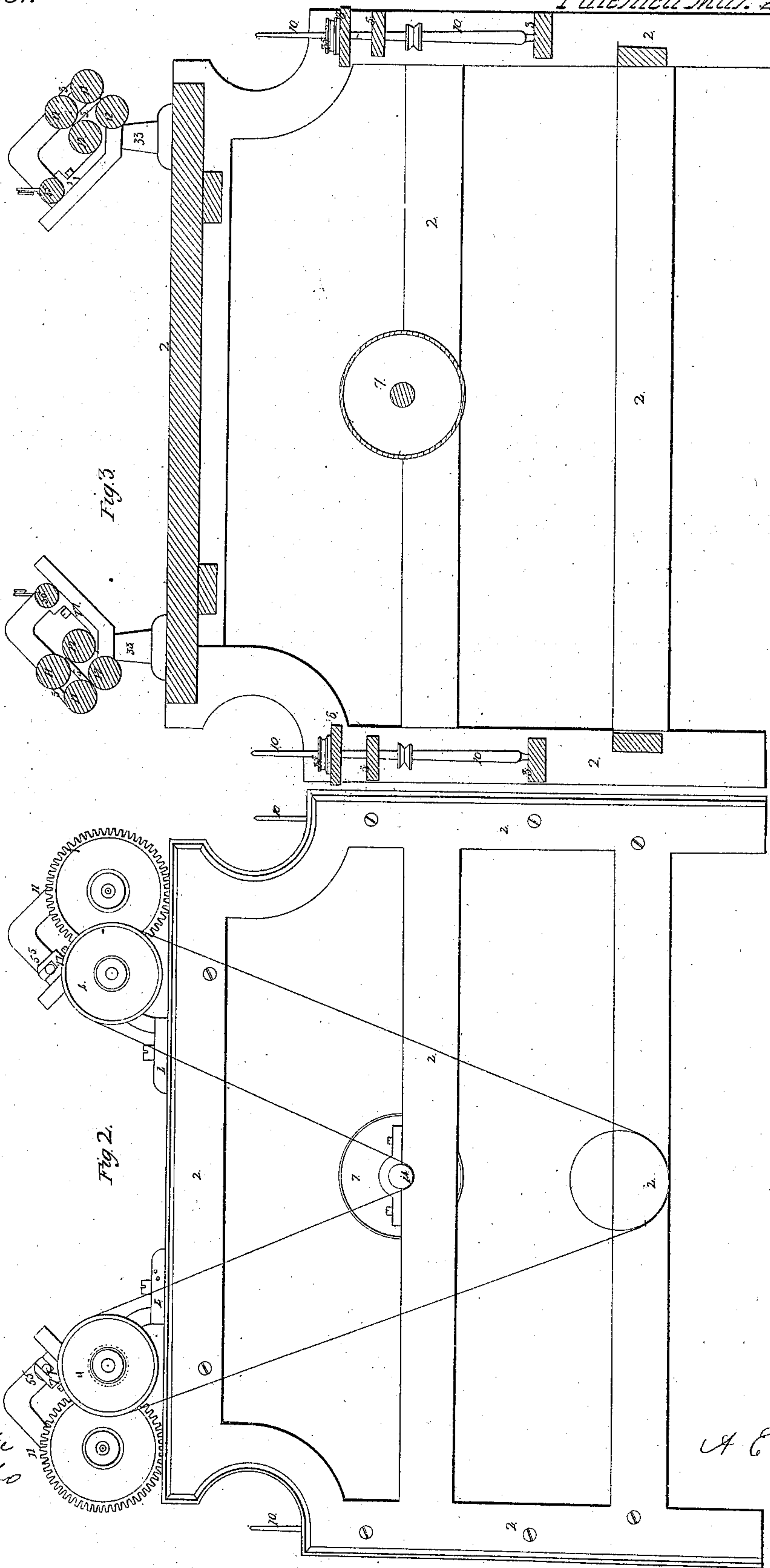
A. E. Bigelow.

Sheet 2-2 Sheets.

Spinning Mach.

N^o 12,581.

Patented Mar. 27, 1855.



Witnesses:
William Blake
Chas H. Taylor

Inventor:
A. E. Bigelow

UNITED STATES PATENT OFFICE.

AUGUSTUS E. BIGELOW, OF CHICOPEE, MASSACHUSETTS.

PREPARING WOOLEN ROVING.

Specification of Letters Patent No. 12,581, dated March 27, 1855.

To all whom it may concern:

Be it known that I, AUGUSTUS E. BIGELOW, of the town of Chicopee, in the county of Hampden and State of Massachusetts, have invented a new and useful Improvement in Spinning Woolen Yarn from Twisted Rovings, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of the spinning frame; Fig. 2, a side elevation; and Fig. 3, a vertical section thereof.

The same letters indicate like part in all the figures.

It is well known that the modes of procedure for spinning cotton and wool are entirely different on account of the difference in the materials. The one has a short, straight and comparatively smooth fiber, and the other a long, curled and barbed or bearded fiber. The one (cotton) is carded and carried through a succession of drawings, without twisting, at each successive operation, putting together several slivers, and again drawing, and then finally it is condensed and drawn through between three pairs of rollers without twisting, and spun. The other (wool) cannot be successfully drawn without the required amount of twist; and, if drawn more than once, at each successive drawing a new twist must be put in.

The mode of spinning wool heretofore universally practised is to give out a given length of roving and draw that out in the act of twisting, and after winding on, the operation is repeated. And the general practice is to spin from roving previously condensed but not twisted, and although formerly it was the practice to spin from rovings previously twisted, in what was known as the "billy" yet, on that plan, it was necessary to take out the twist before drawing, in the process of spinning, by reversing the spinning twist, for the "billy" gave so much twist that the rovings could not be successfully drawn without untwisting.

So far as I have been able to ascertain the fact, nearly all the attempts heretofore made to spin wool according to the continuous method—denominated "throstle spinning"—in contradistinction to the intermittent method by what is called the "jenney," have proceeded on the plan of

imparting the twist to the roving in the act of drawing, and although some attempts have been made to draw the roving before the twisting operation, they have signally failed, because this was attempted on the plan of drawing cotton, by a succession of drawings, without intermediate twist, by using three or more pairs of rollers in succession. According to my improved plan I spin from previously twisted roving, and impart the spinning twist in the same direction as the roving twist. And my said invention consists in spinning wool from previously twisted roving by drawing such previously twisted rovings between two pairs of rollers, and then imparting the spinning twist in the same direction by ring groove (or other) flyers, or any equivalent therefor.

In the accompanying drawings I have represented a double spinning frame on the general principle of the well known ring groove spinner. And in the said drawings 2, represents the frame; 7, the drum or cylinder for driving the spindles 10, passing through rings 35, which are provided with travelers in the usual manner of ring groove supports. Above each range of spindles are mounted the two drawing heads on standards 33, 33, as in other throstle spinning frames, with these exceptions,—that instead of three sets of rollers there are but two sets for each drawing head, each set consisting of one bottom or driving roller 12, with intermediate journals and bearings, and the two so geared together at one end by the cog wheels 22, 24, 25, that the front roller will turn so much faster than the rear one as to give the required amount of drawing between them. And the forward roller receives motion from the driving part of the mechanism in the usual manner by a cog wheel 1, pinion 0, and pulley 4. Above these two bottom or driving rollers are arranged, in the usual manner, two sets of cap or pressure rollers 11, the whole length, divided into sections. The rollers should all be made of iron or other suitable metal, but not covered with leather, and they should be about two inches in diameter, more or less, but I have found that the size generally used for spinning cotton is too small and will not effectually answer the purpose contemplated by me. The ratch or distance between the two sets of rollers must depend upon the length of the fibers, and should therefore be adjustable as in other

drawing heads. The weight of the upper rollers, if two inches in diameter, will be sufficient, but if made of less diameter, or of lighter material, additional weight may be applied in the usual manner.

The machine should be provided with the usual and necessary appendages, which I do not deem necessary to describe.

The spools of twisted rovings prepared according to a mode for which I have made application for Letters Patent, or by any other suitable means, are mounted on the frame and passed through guides and thence between the draw rollers then through the travelers to the spools *g* on the spindles. The twisted rovings in passing between the two sets of rollers will be drawn out or attenuated to the required extent, and as delivered by the last rollers will be still further twisted, in the same direction, and to the extent desired and wound up on the spool.

It is important to specify the effect which will take place in the process of drawing between the two sets of rollers. If an untwisted roving of woolen fibers of whatever length, be taken by the two ends and drawn, instead of the fibers drawing out equally, they will almost invariably yield first in some one part of the length, and where the fibers first yield there the roving will break. For this reason it has been deemed necessary to give the twist in the act of drawing. If, however, a twisted roving be taken in the same way, and drawn, the weakest part will yield first and become attenuated, but the moment one part becomes thinner than another, the twist leaves the thick parts and concentrates in the thin part, which has the effect to bind the fibers together, and prevent them from drawing apart, and the large parts of the roving which have thus parted with their proportion of the twist, in turn become weakest, permitting the fibers to slip and draw out easily. In this way, the drawing is equalized the various parts in turn imparting and receiving the twist to equalize the drawing. Now my improved drawing head avails of this property, and the twisted roving in passing from the back to the front set of rollers, is drawn out equally. As the front set of rollers, by their more rapid travel, draw out the fibers, whilst the back rollers simply hold back, the roving is of the required size for the thread at or near the front rollers, so that the twist is constantly running from the back toward the front rollers, and the roving being thus untwisted near the back rollers, the drawing out of the fibers to elongate the roving, will nearly—if not wholly—take place near the back roller; each fiber, in succession, being

drawn forward the moment its back end is liberated by the back rollers. In this way the two sets of rollers are enabled to perform an operation analogous to that of the fingers in hand spinning. If the roving were not previously twisted, however, the required operation would not take place, for the retaining and equalizing effect of the twist would be wanting.

It may be well, in this connection to state, why three, or more, successive sets of rollers have not—and cannot—answer the required purpose. If the twist be too great, the roving cannot be drawn, for the fibers cannot slip on each other on account of the binding power of the twist; and if the twist be insufficient the drawing will be unequal. Now then, if the twist in the roving be sufficient for the first drawing between the first and second set of rollers, it will be insufficient for the second drawing between the second and third set of rollers, for the first elongation reduces the proportional amount of twist; and, if a sufficient amount of twist be put in at first, to have the required amount for the second drawing, then it will be too great for the first drawing. This is a difficulty which can only be overcome, for the practical business of good spinning, by giving an additional amount of twist for each successive drawing. In this way, by successive spinnings, each, in succession, drawing out and twisting, I am enabled to spin woolen yarns to the very finest numbers, and with a regularity never surpassed, if ever attained, by the method of intermittent spinning on the jenny.

Having thus described the nature of my invention, and the reasons for the mode of operation which I have invented, together with the mode of construction which I have tried with success, and deem the best, I wish it to be distinctly understood that I do not limit myself to such special mode of construction as the same mode of operation may be obtained by the mere substitution of equivalent means.

What I claim as my invention and desire to secure by Letters Patent is—

The mode of operation herein specified of spinning woolen yarns from previously twisted rovings, by drawing the twisted rovings between two sets of draw rollers, substantially as specified, in combination with the subsequent twisting in the same direction by ring groove travelers, flyers or other equivalent devices, substantially as specified.

A. E. BIGELOW.

Witnesses:

WILLIAM BLAKE,
CHAS. A. TAYLOR.