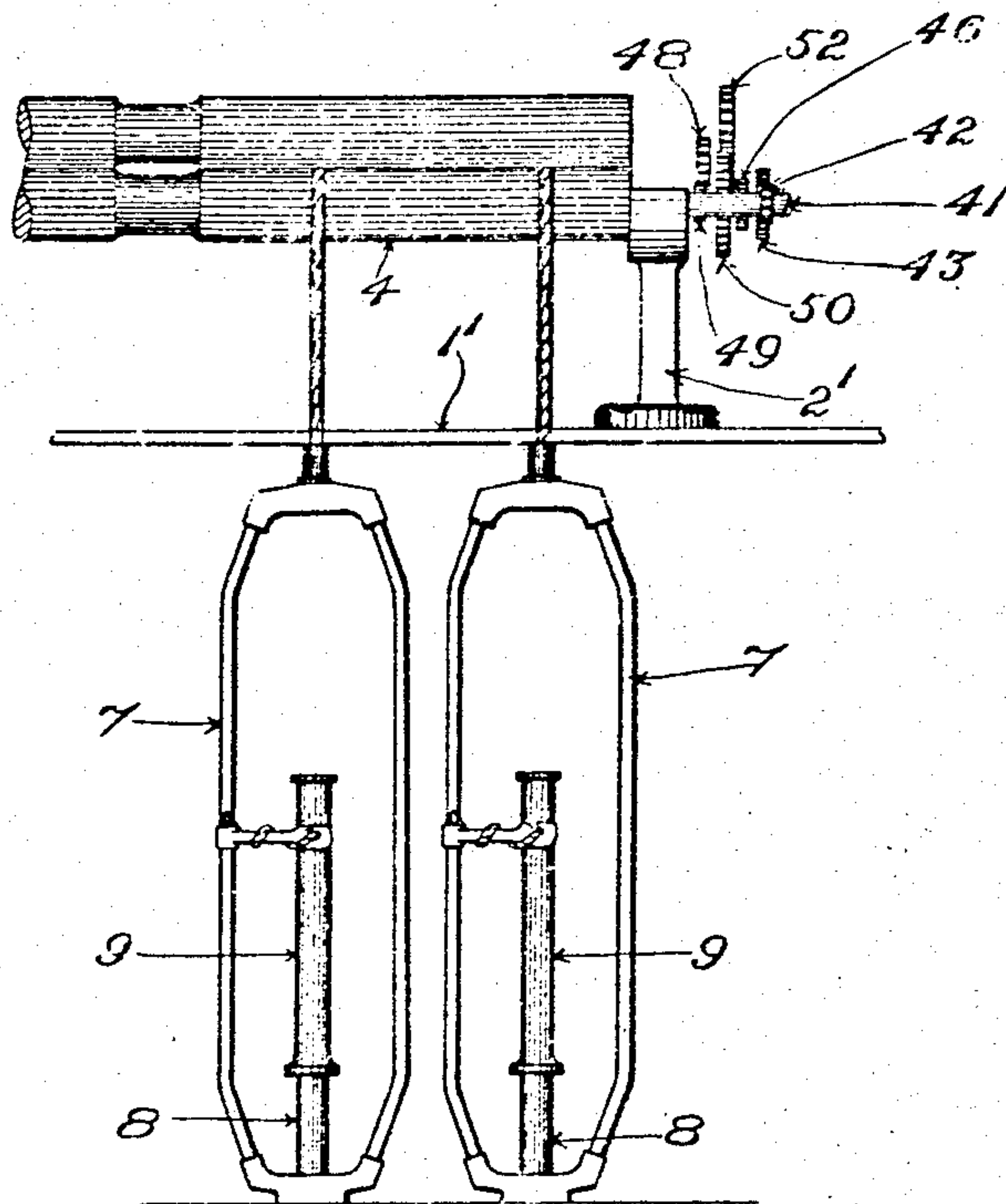


No. 842,824.

PATENTED JAN. 29, 1907.

W. BATTEN.
ROVING AND SPINNING FRAME.
APPLICATION FILED SEPT. 22, 1905.

2 SHEETS—SHEET 1.



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Fig. 1.

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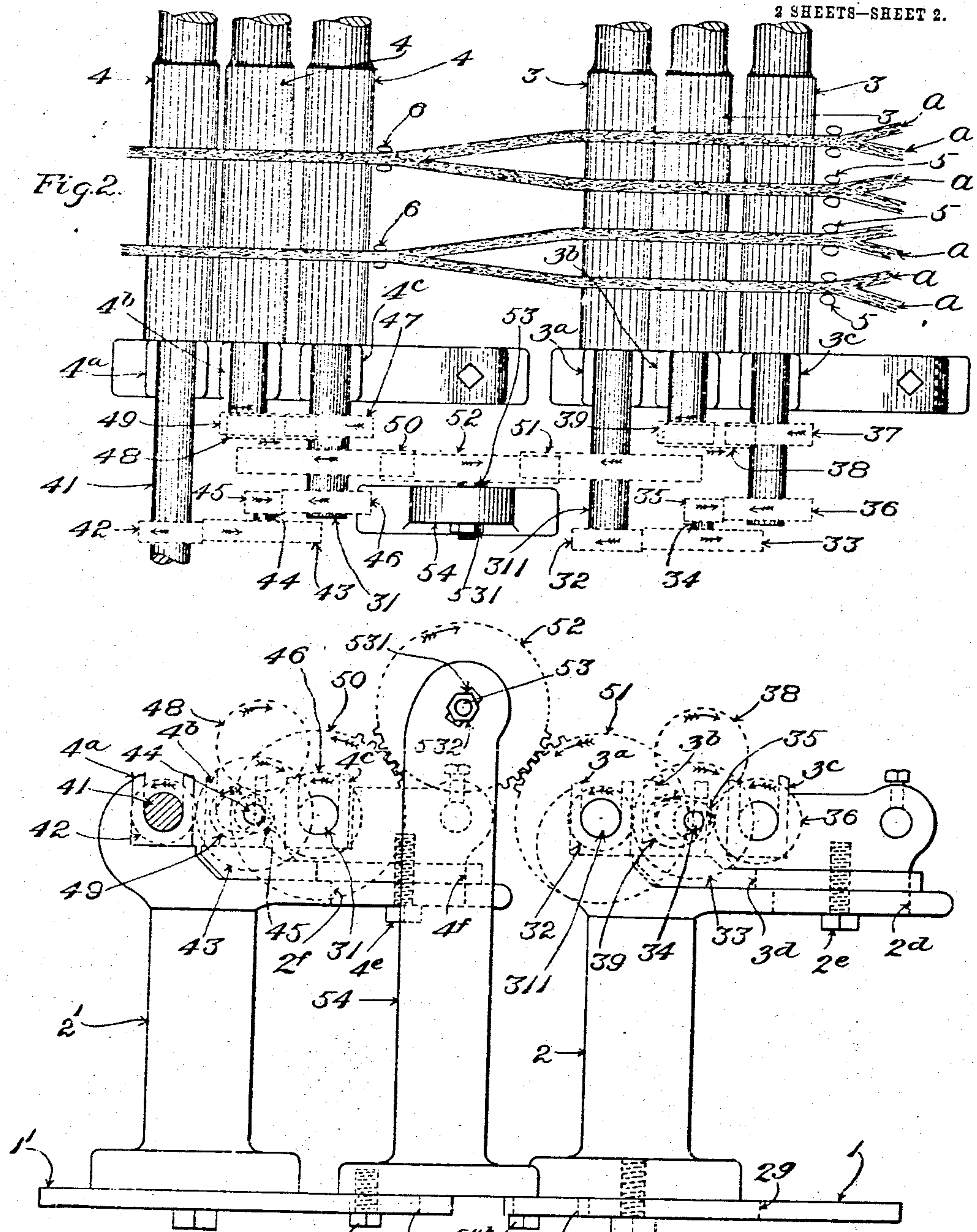
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2 SHEETS—SHEET 2.



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Fig. 3.

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UNITED STATES PATENT OFFICE.

WILLIAM BATTEN, OF AUBURN, MAINE.

ROVING AND SPINNING FRAME.

No. 842,824.

Specification of Letters Patent.

Patented Jan. 29, 1907.

Application filed September 22, 1905. Serial No. 279,642.

To all whom it may concern:

Be it known that I, WILLIAM BATTEN, a citizen of the United States, residing at Auburn, in the County of Androscoggin, State of Maine, have invented a certain new and useful Improvement in Roving and Spinning Frames, of which the following is a specification, reference being had therein to the accompanying drawings.

As is well known, in the manufacture of yarns a series of machines is employed in practice for the performance of the operations subsequent to the "drawing" operation, separately so called, the series comprising in some cases three roving-frames and a spinning-frame and in others four roving-frames and the spinning-frame. The first of the roving-frames is termed, commonly, the "slubber" or "slubbing-frame," and the second is known as the "intermediate" or "intermediate frame." Where three are included in the series, the third thereof is known as the "fine" frame; but where four are employed the third is termed the "second intermediate," and the fourth is known as the "jack-frame." By the slubber untwisted slivers from the final drawing-frame are further drawn and given a slight twist, by which they are converted into roving. By the intermediate two rovings from the slubber are doubled together, drawn, and slightly twisted. In the fine frame in the one case and in the second intermediate in the other rovings from the intermediate are doubled together, drawn, and slightly twisted. In the jack-frame two of the rovings from the second intermediate are doubled together, drawn, and slightly twisted. From the fine frame or the jack-frame the rovings are taken to the spinning-frame.

The object of my invention is to reduce the number of machines that is required to be employed successively for the performance of the necessary operations subsequent to drawing. I attain this object by the combination, in a roving-frame or in a spinning-frame, of two series of drawing-rolls, means between the said two series by which the slivers or rovings which are fed forward from the first series of rolls are doubled together preliminary to their passage through the second series of rolls, and means to twist and wind the fibers as they are delivered from the second series of rolls, thereby enabling

the combined rovings to be drawn, doubled, redrawn, and twisted in one machine and also enabling the number of twisting operations which are performed during the roving process to be reduced.

An embodiment of the invention is illustrated in the drawings, in which latter—

Figure 1 shows in front elevation certain portions of a frame containing the invention. Fig. 2 shows in plan some of the parts which are represented in Fig. 1, but with the top rolls omitted. Fig. 3 is a view in partly sectional side elevation, showing the parts which are represented in Fig. 2.

Having reference to the drawings, at 1 1' are shown roller-beams, forming part of the fixed framework of the machine and on which the roller-stands 2 2' are mounted.

3 3 3 are a series of drawing-rolls which are supported by the rear roller-stand 2, and 4 4 4 are a series of drawing-rolls which are supported by the front roller-stand 2', the series first mentioned being termed the "back" set of rolls, and the series last mentioned being termed the "front" set. At 5 5, &c., are guides located at the rear of the back set of rolls 3 3 3 and by means of which the slivers or rovings entering the machine in order to be operated upon are conducted into the bite of the rearmost pair of rolls of the said back set.

6 6, &c., designate doubling-guides which are located intermediate the two sets of rolls and by means of which slivers or rovings issuing from between the foremost pair of rolls of the back set 3 3 3 are doubled together and conducted into the bite of the rearmost pair of the front set of rolls 4 4 4. At 7 7, Fig. 1, are fliers at the front of the machine, the spindles on which the said fliers are mounted being shown at 8 8, &c.; and 9 9, &c., are receiving-bobbins which are employed in connection with the said spindles and fliers.

The drawing-rolls are adjustable toward and from one another to suit the length of staple. To this end the bearings 3^b and 3^c for the middle and back rolls of the rear set of rolls are made adjustable in usual manner upon the roller-stand 2 independently toward and from the bearing 3^a for the front roll of such set, and the bearings 4^b and 4^c of the corresponding rolls of the front set are made adjustable in usual manner upon roller-stand 2' independently toward and from the bearing 4^a for the front roll of such set.

Roller-stand 2 is made adjustable upon roller-beam 1 toward and from roller-stand 2' to suit the length of staple and strength of the rovings. For the purposes of these adjustments the rearward extensions of roller-stand 2 and bearing 3^b are formed with slots 2^d and 3^d, respectively, to receive the screw 2^c, which secures the bearings 3^b and 3^c in place upon the said roller-stand. Similar slots 2^f and 4^f are formed in the rearward extensions of roller-stand 2' and bearing 4^b for the reception of the stem of screw 4^e, which secures the bearings 4^b and 4^c in place upon the latter roller-stand, and a slot 2^g is formed in roller-beam 1 for the reception of the screw 2^h, which secures roller-stand 2 in place upon the said roller-beam.

For the purpose of communicating motion to the drawing-rolls the lower front roll of the set 4 4 4 is driven in usual or suitable manner, not necessary to be shown or described. Motion is transmitted from the shaft 41 of the said lower front roll by means of the spur-pinion 42, fast on said shaft and meshing with the spur-gear 43, the latter being fast with the short shaft 44, mounted in a suitable stand (not shown) and also having fast therewith the spur-pinion 45, meshing with the spur-gear 46, which is fast on the shaft 31 of the lower roll of the rearmost pair of rolls of the set 4 4 4, the said shaft also being provided with a spur-pinion 47, meshing with a carrier-gear 48, the latter in turn meshing with the spur-gear 49, fast with the lower roll of the middle pair of rolls of the set 4 4 4. The said carrier-gear 48 is in practice suitably mounted upon a supporting-stud that is carried by a stand (not shown) in connection with the fixed framework of the machine. Motion is transmitted from the lower roll of the rearmost pair of rolls of the front set 4 4 4 to the lower roll of the front pair of rolls of the back set 3 3 3 by means of a spur-gear 50, which is fast upon the shaft 31 of the lower roll first mentioned, a spur-gear 51, which is fast upon the shaft 311 of the lower gear last mentioned, and an intermediate or carrier gear 52, meshing with both of the gears 50 and 51 and itself mounted upon a stud 53, which is carried by a stand 54, rising from and affixed to the roller-beams 1 1'. The rearmost pair of rolls of the back set 3 3 3 and the middle pair of rolls of such set are driven from the said shaft 311 of the lower front roll of the back set of rolls by a train of operative connections 32, &c., to 39, corresponding in character and arrangement with the train which has been described in connection with the front set of rolls.

To compensate for adjustment of the rolls and of the rear roller-stand, the stud 53 is placed in a curved slot 531 in stand 54, the said slot being concentric with the axis of rotation of the lower front roll of the back set 3 3 3, and the said stud 54 is adjustably se-

cured in place upon the roller-beams 1 1 by the screws 54^b 54^b passing through slots 54^g 54^g in the said roller-beams. The stud is secured in the desired position in such slot 531 by means of a nut 532. When, therefore, the rearmost pair of rolls of the front set is shifted forward or rearward upon the front roller-stand 2' in making adjustment of the distances intervening between the successive pairs of rolls of the respective sets and the rear roller-stand is shifted forward or rearward, the carrier-gear 52 is maintained in driving engagement with the gears 50 51 by adjustment of the said stand 54 and of the stud 53 in the said slot 531.

The drawings show two rovings *a a* entering each of the back guides 5 5, &c., and passing thence between the successive pairs of rolls of the back set of rolls 3 3 3. In advance of the foremost rolls of the said back set two of the resulting doubled and drawn rovings are shown led through a single intermediate guide 6 and passed thence together between the rolls of the successive pairs of the front set 4 4 4. On leaving the front rolls of the said front set the combined or quadrupled and drawn roving extends to one of the fliers to be twisted and wound upon the corresponding bobbin.

My invention enables one machine to accomplish, essentially, the same results which heretofore have required the use of two roving-frames, or of a roving-frame and a spinning-frame. Thus in the drawings the machine is represented as performing the operations which heretofore have been performed by the intermediate and the fine frame in the so-called "three-process" arrangement—namely, that process in which the fibrous material passes through three roving-frames in succession. Thereby the results which heretofore have been attained by the said three-process arrangement are enabled to be attained by means of two machines—namely, a slubber, which may be of the usual construction and arrangement, and a machine embodying the invention. By conducting a drawing-frame sliver into the machine through each of the back guides 5 5, &c., the machine which is shown in the drawings will perform the operations which heretofore have been employed by the slubber and first intermediate operating in succession. Hence it will be perceived that the operations which heretofore have been performed in the so-called "four-process" arrangement by means of four roving-frames may be attained by reason of my invention by two machines embodying the latter, one thereof performing the work of the slubber and first intermediate combined and the other thereof performing the work of the second intermediate and jack-frame combined. It will further be perceived that the operations which heretofore have been performed by means of a

roving-frame and separate spinning-frame may be performed in a single machine taking the place of the two machines.

I claim as my invention—

- 5 1. The combination of a series of drawing-rolls, guides at the entrance to the said series, a second series of drawing-rolls, doubling-guides between the two series of drawing-rolls, means to twist and wind the doubled
 10 and drawn rovings, gearing operatively connecting together the rolls of the first series, gearing operatively connecting together the rolls of the second series, driving connections intermediate the two series in operative en-
 15 gagement with a roll of each series means to adjust the two series toward and from each other, and means to adjust the said intermediate driving connections to correspond with changes in the setting of the rolls.
- 20 2. The combination, in a machine for the manufacture of twisted rovings or yarns, of a series of drawing-rolls, guides at the entrance

to the said series, a second series of drawing-rolls, doubling-guides between the two series of drawing-rolls, means to twist and wind the
 25 rovings, means to adjust the rolls of the two series to suit different lengths of staple, &c., gearing operatively connecting together the rolls of the first series, gearing operatively connecting together the rolls of the second
 30 series, means to drive one of the said series from the other embracing a carrier-gear in driving engagement with gears on the lower back roll of the second series and on the lower front roll of the first series, respectively, and
 35 means to adjust the said carrier-gear to maintain such engagement under the adjustments of the rolls of the two series.

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

WILLIAM BATTEN.

Witnesses:

CHAS. F. RANDALL,
 EDITH J. ANDERSON.