

(No Model.)

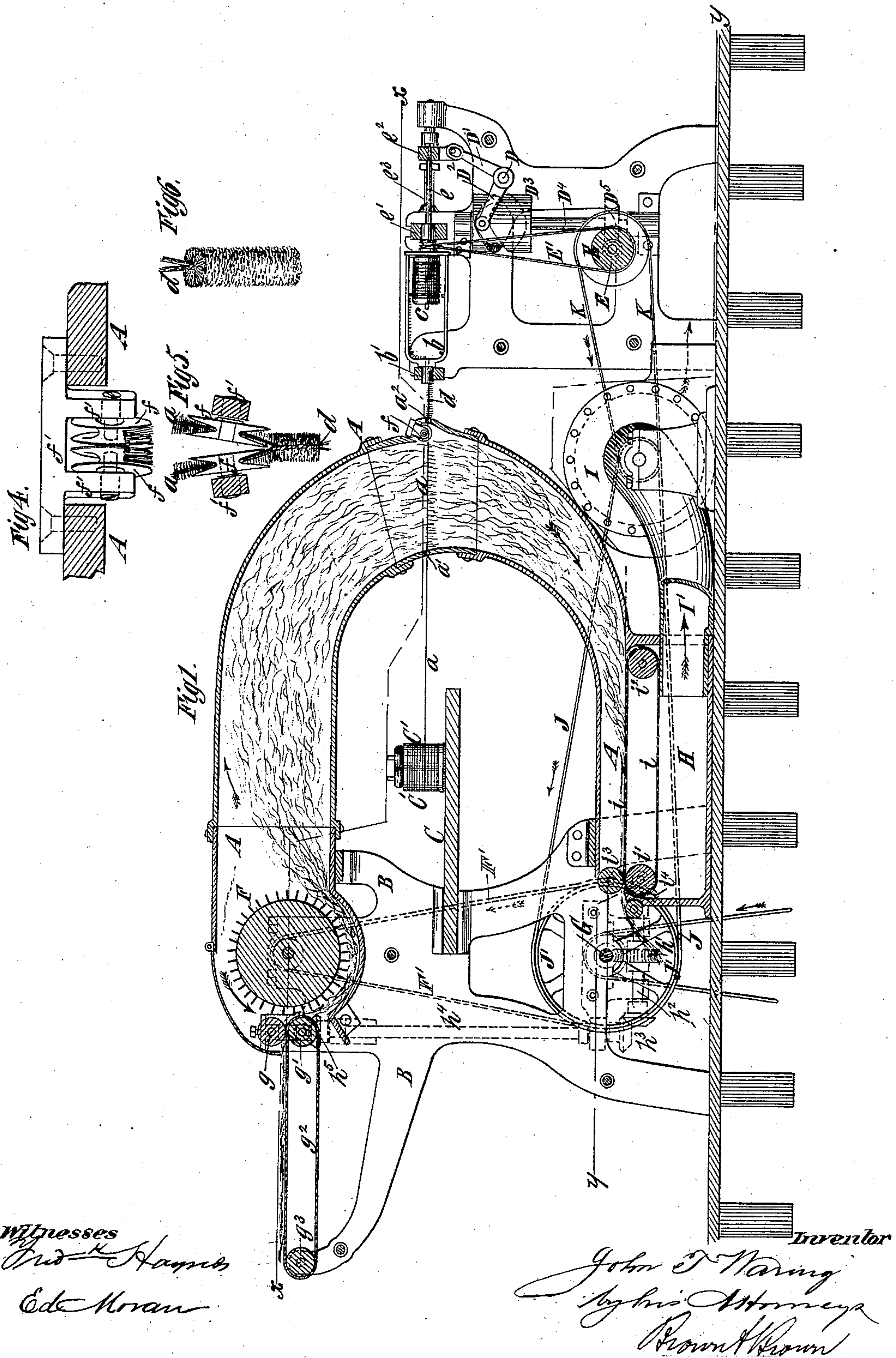
2 Sheets—Sheet 1.

J. T. WARING.

APPARATUS FOR MANUFACTURING NAPPED OR FILLED YARNS OR THREADS.

No. 279,997.

Patented June 26, 1883.



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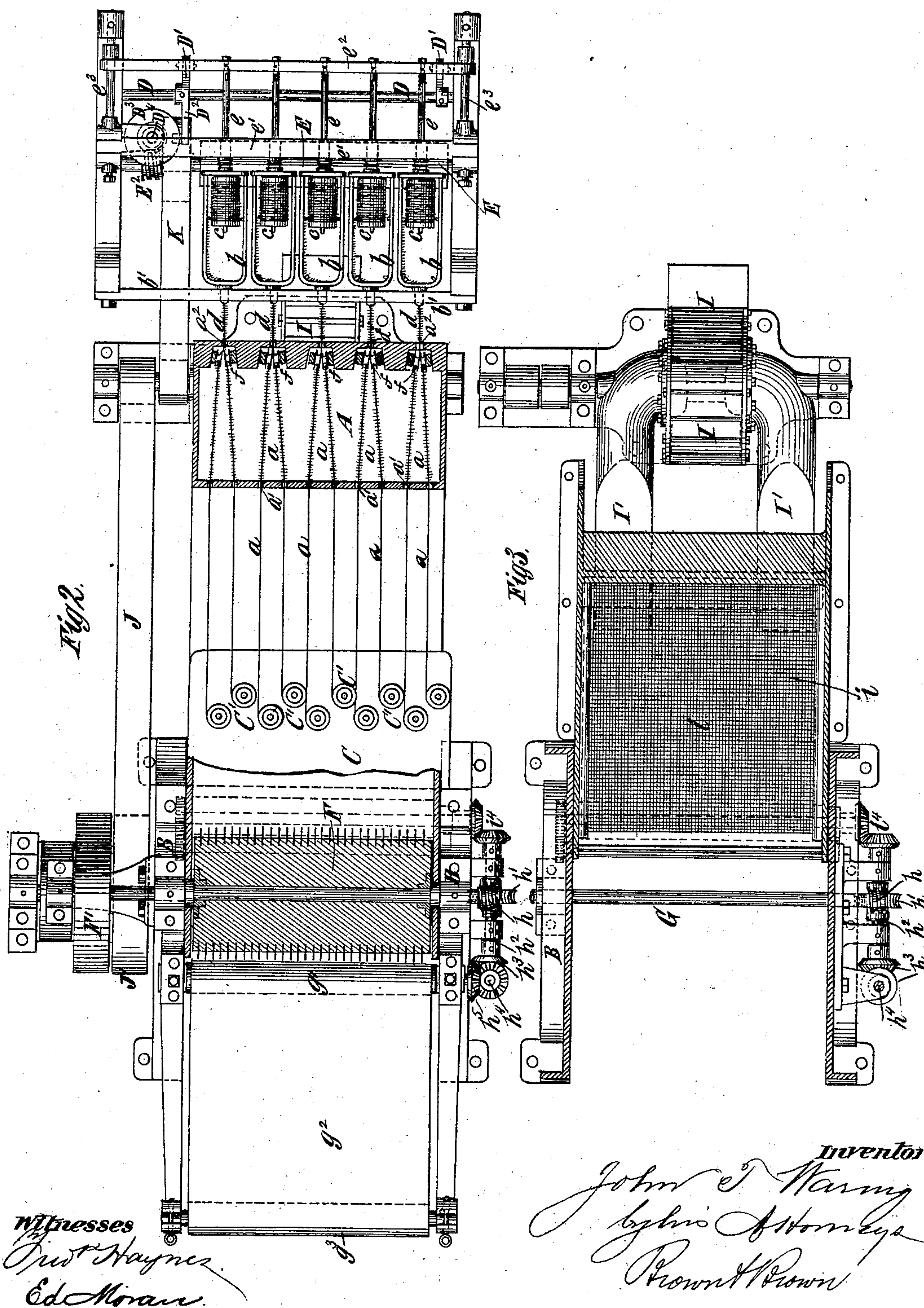
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UNITED STATES PATENT OFFICE.

JOHN T. WARING, OF NEW YORK, N. Y.

APPARATUS FOR MANUFACTURING NAPPED OR FILLED YARNS OR THREADS.

SPECIFICATION forming part of Letters Patent No. 279,997, dated June 26, 1883.

Application filed December 28, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. WARING, of the city and county of New-York, in the State of New York, have invented a new and useful
5 Improvement in Apparatus for Manufacturing Napped or Filled Yarns or Threads, of which the following is a specification.

My invention relates to the art of producing yarns or threads which are severally composed
10 of two or more single yarns, rovings, threads, or strands doubled and twisted together, and nap or filling material secured between them by the operation of doubling and twisting them together. Such napped or filled yarns or
15 threads may be employed in producing woven or knitted fabrics, the surfaces of which may be made to resemble natural fur-skins; or they may be employed in the manufacture of woven or knitted goods or fabrics for various pur-
20 poses.

The principal object of my invention is to provide a machine for rapidly and cheaply making napped or filled yarns or threads of the kind above described, to provide for dou-
25 bling and twisting the single yarns or threads, and for depositing on one or more of them or between them the nap or filling material while they are on their way to the doubling and twisting spindles.

To this end the invention consists in appa-
30 ratus of novel construction for producing yarns or threads of the kind above described, comprising, generally, a picker or brush cylinder for preparing the nap or filling material, dou-
35 bling and twisting spindles or mechanism, a conduit for receiving the prepared nap or fill- ing material from the picker-cylinder, and through which the separate threads or strands which are to be twisted are conducted on their
40 way to the spindles of the twisting mechanism, and an exhauster or other means for passing the nap or filling material through the conduit past the several threads or strands, and there-
45 by causing the nap or filling material to be de- posited between and on said threads or strands.

The invention also consists in novel details of construction and combinations of parts, to be hereinafter described.

In the accompanying drawings, Figure 1 rep-
50 resents a vertical longitudinal section of my improved apparatus, certain parts which are

removed in taking the section being repre-
sented in dotted outline. Fig. 2 represents a horizontal section on the dotted line $x x$, Fig. 1. Fig. 3 represents a similar section on the
55 dotted line $y y$, Fig. 1. Fig. 4 represents a sectional view, on a larger scale, of a small por- tion of the wall of the conduit and converging pulleys attached thereto for keeping the threads or strands separate from each other
60 while passing through the conduit. Fig. 5 represents a plan of such pulleys, showing two threads or strands and a piece of the finished yarn or thread produced by twisting said threads or strands; and Fig. 6 represents a
65 perspective view of a piece of the finished napped or filled yarn made according to my invention.

Similar letters of reference designate corre-
sponding parts in all the figures.

A designates a conduit, here shown as con-
70 sisting of a semicircular bent or curved por- tion, the two ends of which are extended hori- zontally.

Near the ends of the conduit A are erected
75 standards B, and in them is secured a board, C, supporting the bobbins or spools C', which are adapted to rotate freely on skewers or pins, and which constitute carriers for the separate threads or strands a , of which two are to be
80 twisted together to form each napped or filled yarn. Of course any number of threads or strands greater than two might be used for making each yarn. After leaving the spools C' the threads or strands a are conducted
85 through eyes a' in the wall of the conduit A, and each two threads or strands are conducted through a single eye, a'' , and conducted through a flier, b , to a bobbin, c , on which they are wound as they are twisted together. As here
90 represented, the conduit A is of sufficient width to receive five pairs of threads or strands a and five bobbins c , and their fliers are employed for producing a like number of napped or filled yarns, d , simultaneously, as seen clear-
95 ly in Fig. 2. The fliers b are all adapted to rotate in a rail, b' , and the spindles e , on which are the bobbins c , are mounted in bearings in a rail, e' , and are all connected to a rail, e'' , which may be moved backward and forward
100 on guides e''' , to produce the necessary traverse of the bobbins c .

D designates a rock-shaft, arranged parallel with the rail e^2 , and connected therewith by arms D^1 , and upon the said rock-shaft is another arm, D^2 , which engages with a grooved cam, D^3 , upon an upright shaft, D^4 , and by said cam the rail e^2 and spindles e are moved backward and forward to produce the proper traverse of the bobbins c .

E designates a drum, from which the spindles e are driven by belts E^1 , and upon the shaft of said drum is a screw or worm, E^2 , which engages with a worm-wheel, D^5 , on the upright shaft D^4 . I will describe hereinafter how the drum E is rotated.

The twisting mechanism just described is of common form, and I do not claim it as of my invention. The arrangement of the spindles and bobbins horizontally permits the yarns d to be conducted from the conduit A straight through the fliers b ; but any other suitable arrangement of doubling and twisting mechanism may be employed.

In order to prevent the twist in the yarn d from running back into the conduit, and to keep the several strands or threads a separate while passing through the conduit A, I employ pairs of deep-grooved pulleys f , which are arranged so that they converge toward the eyes a^2 , as seen in Fig. 5, and which are journaled on studs projecting from a stock-piece, f^1 , which is fitted in an opening in the wall of the conduit A. These deep-grooved pulleys keep the strands or threads a separate while in the conduit A, and the nap or filling deposited on the said strands or threads, as hereinafter described, is not displaced in passing over said pulleys.

In the upper end of the conduit A is arranged a studded or toothed picker-cylinder, F, which is mounted in bearings in the standards B, and the end of the conduit is constructed so as to form a case for receiving the said cylinder.

The picker-cylinder F may be rotated by means of a belt, F^1 , driving from a pulley on the main driving-shaft G, as best shown in Fig. 1.

Adjacent to the picker-cylinder are arranged feeding-rollers g g^1 ; and g^2 designates a feeding-apron, which passes around the lower roller, g^1 , and the roller g^3 , and over which the fur, wool, shoddy, or hair to be used for the nap or filling is fed to the picker-cylinder F.

On the end of the driving-shaft G is a screw or worm, h , which engages with and operates a worm-wheel, h^1 , on a transverse shaft, h^2 , and by means of bevel-gears h^3 , an upright shaft, h^4 , and other bevel-gears, h^5 , the lower feed-roller, g^1 , is rotated, and the apron g^2 is operated from the driving-shaft G.

It is obvious that the construction of the picker-cylinder, the arrangement of the feed-rollers and feeding-apron, and the mechanism for driving them might be varied as might be necessary or desirable.

The mechanism just described for operating

the feeding-rollers and feeding-apron from the driving-shaft G is shown in Figs. 2 and 3 and in dotted outline in Fig. 1.

Below the lower end of the conduit A is a chamber, H, which is separated from the conduit only by a reticulated, perforated, or foraminous endless apron, i , which passes around rollers i^1 i^2 , and above the roller i^1 is a second roller, i^3 , which rotates by frictional contact with the apron i . The lower roller, i^1 , is rotated positively by bevel-gears i^4 from the shaft h^2 , as shown in Figs. 2 and 3.

I designates an exhaust-fan, the suction-pipes I^1 of which are connected with the chamber H, and which may be rotated by a belt, J, from a pulley, J^1 , on the main driving-shaft G. By means of this exhaust-fan the nap or filling material prepared by the picker-cylinder F is drawn rapidly through the conduit A, and in its passage past the strands or threads a a suitable and sufficient quantity of the nap or filling material is deposited between and on the said strands or threads, and by twisting them is securely fixed in the yarns d . All the nap or filling material which is not deposited on the strands or threads will pass downward and be deposited on the apron i , and will be passed between the rollers i^1 i^3 , after which it may be taken and again subjected to the action of the picker-cylinder F to again prepare it for use.

The drum E, before described, may be rotated by a belt, K, from the shaft of the exhaust-fan I, or in any other suitable way. The rapid rotation of the picker-cylinder F produces more or less draft or blast through the conduit. The nap or filling material may be deposited on only one of the two or more strands or threads which are to be twisted together. It may be deposited by the draft or current in an upward or horizontal direction instead of downward, as shown in the drawings, and while the threads or strands are passing in any direction, either vertical, horizontal, or inclined.

In order to assist the adhesion of the nap or filling material to the strands or threads, said material or said strands or threads may be moistened with water or other liquid, or have adhesive substance applied.

Napped, filled, or tufted yarn, or even ropes of considerable size, may be produced by my process. For the strands or threads which are to be twisted I may use wool, cotton, flax, hemp, various kinds of grasses, wire, or narrow loosely-woven tape, and for the nap or filling material may use any kind of hair or fur, grass, cotton, silk-waste, wool-waste, rags, excelsior, or wood-shavings.

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

1. The combination, with two or more thread-carriers and a twisting-spindle for receiving threads or strands from said carriers and doubling and twisting them together, of means for depositing napping material on or

between said threads or strands as they pass from said carriers to the twisting-spindle, substantially as specified.

2. The combination, with two or more
5 thread-carriers and a twisting-spindle for receiving threads or strands from said carriers and doubling and twisting them together, of a conduit between said carriers and the twisting-spindle, through which the threads or
10 strands may be conducted separately for receiving napping material between or on them, substantially as specified.

3. The combination, with one or more twisting-spindles, of a conduit through which
15 strands or threads to be doubled and twisted are to be conducted, and a picker or brush cylinder for supplying nap or filling material to said conduit, substantially as specified.

4. The combination of the conduit A, the
20 twisting-spindles *e*, the picker-cylinder F, and

the feeding-apron *g*² and feeding-rollers *g g'*, substantially as specified.

5. The combination, with two or more thread-carriers and a twisting-spindle for receiving threads or strands from said carriers
25 and doubling and twisting them together, of a conduit through which the threads or strands are to pass before being doubled and twisted, and means for producing a draft or blast in said conduit, substantially as specified. 30

6. The combination of the conduit A, one or more twisting-spindles, *e*, the chamber H, the apron *i*, and the fan I and suction-pipes I', communicating with said chamber H, substantially as specified.

JOHN T. WARING.

Witnesses:

FREDK. HAYNES,

EDWARD GLATZMAYER.