(No Model.) 4 Sheets—Sheet 1.

J. CHEYNE.

MACHINE FOR FINISHING AND COMPLETING TWINE OR CORD.

No. 412,070. Patented Oct. 1, 1889.

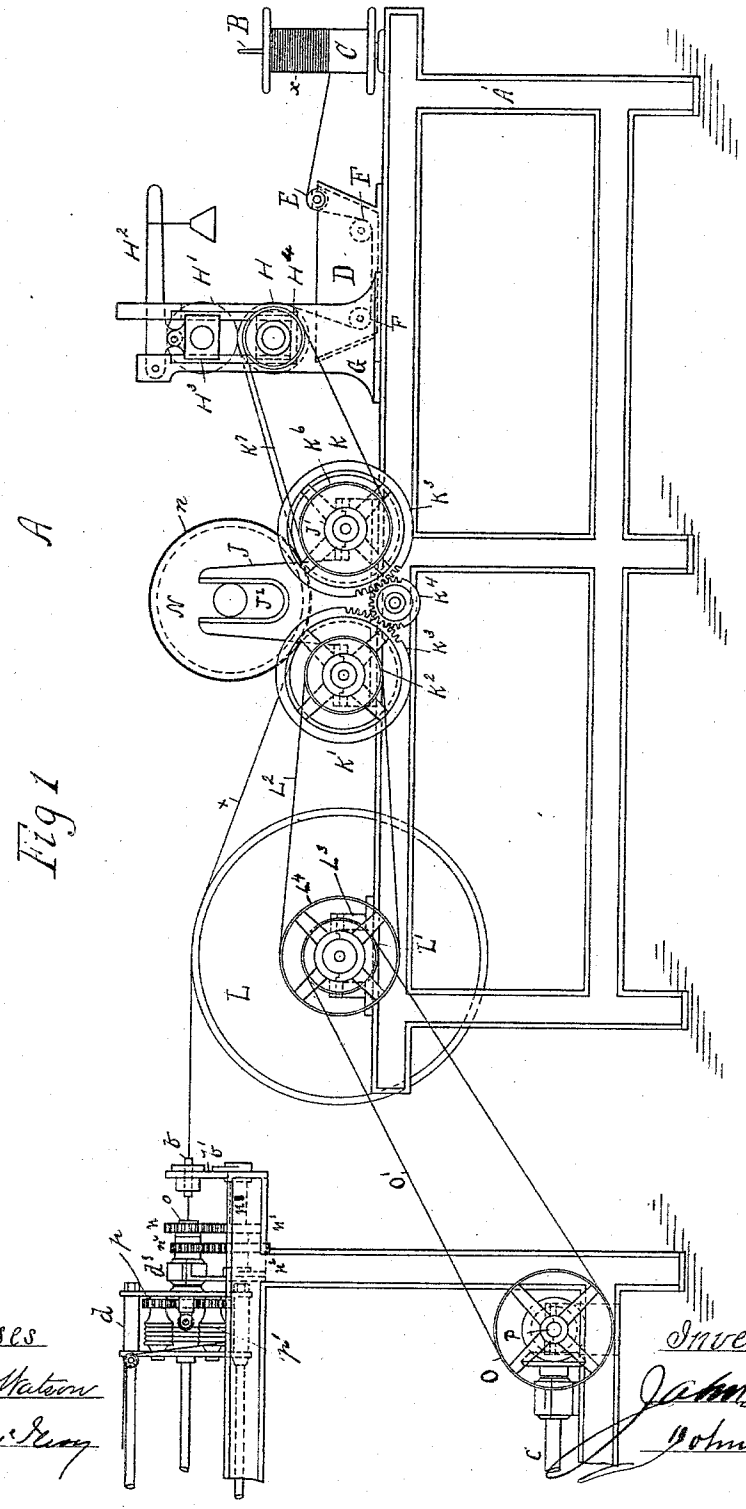


Fig 1

Witnesses
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(No Model.) 4 Sheets—Sheet 2.

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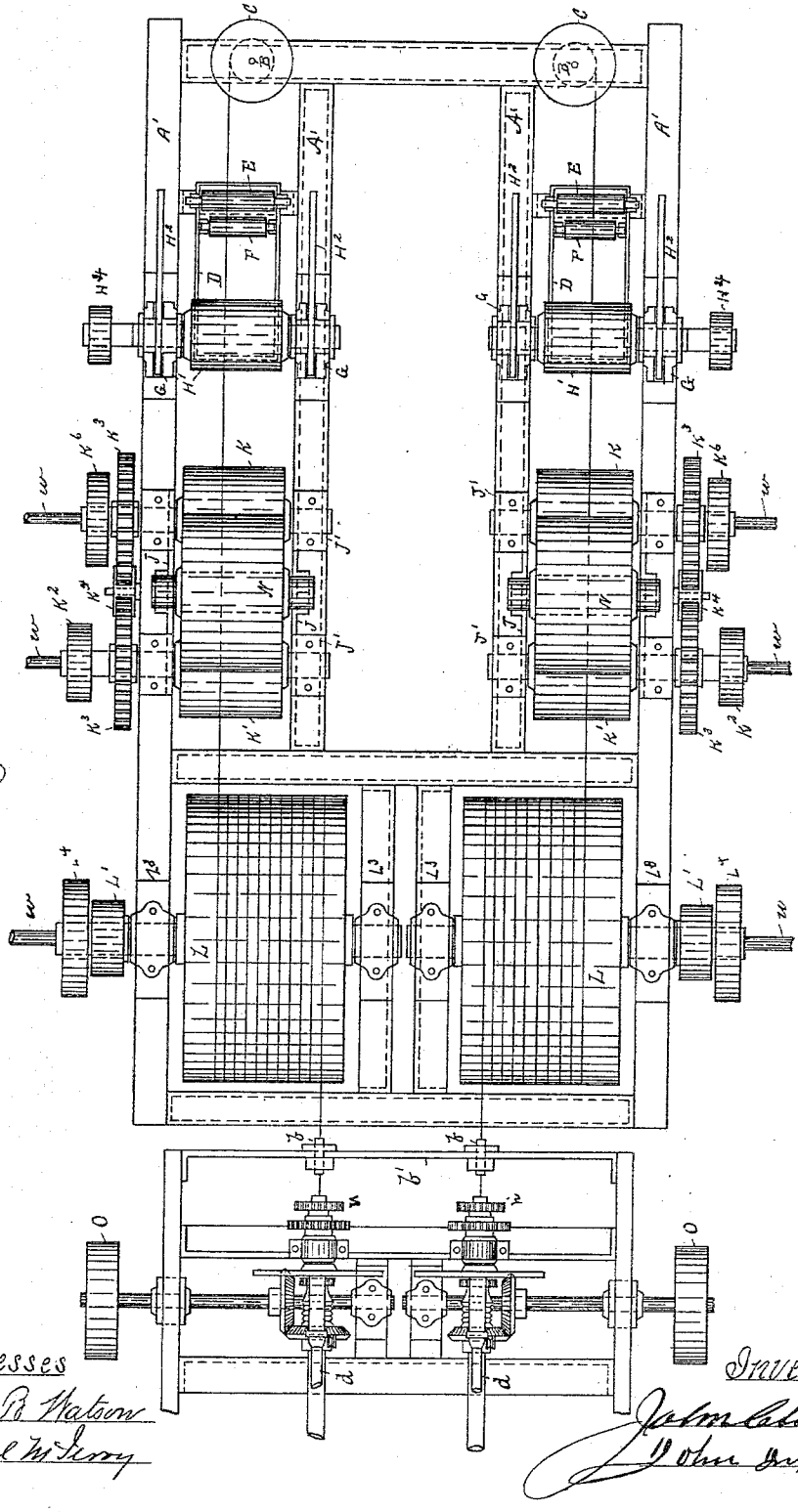


Fig 2

Witnesses
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(No Model.) 4 Sheets—Sheet 3.

J. CHEYNE.

MACHINE FOR FINISHING AND COMPLETING TWINE OR CORD.

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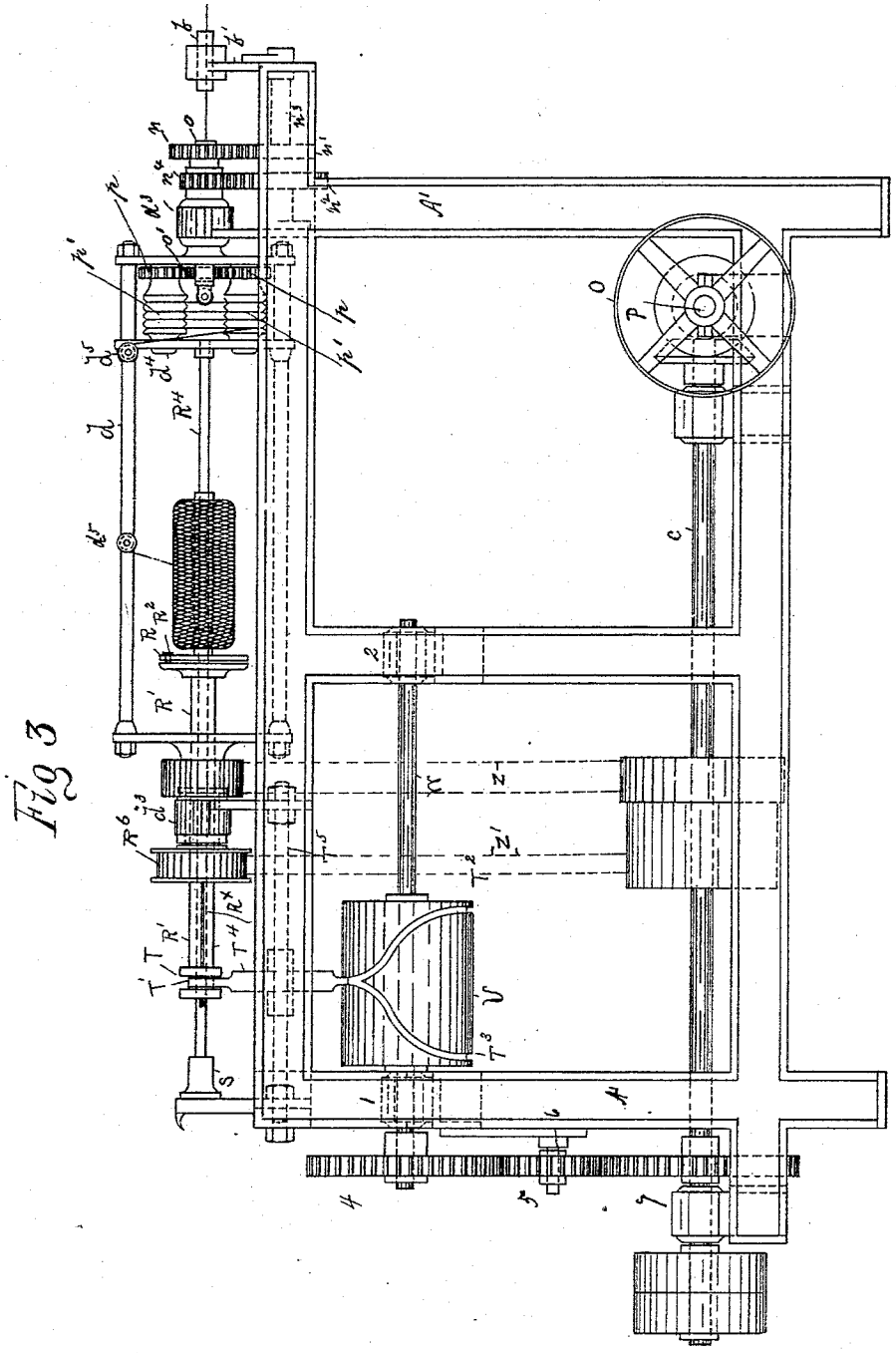


Fig 3

Witnesses
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(No Model.) 4 Sheets—Sheet 4.

J. CHEYNE.

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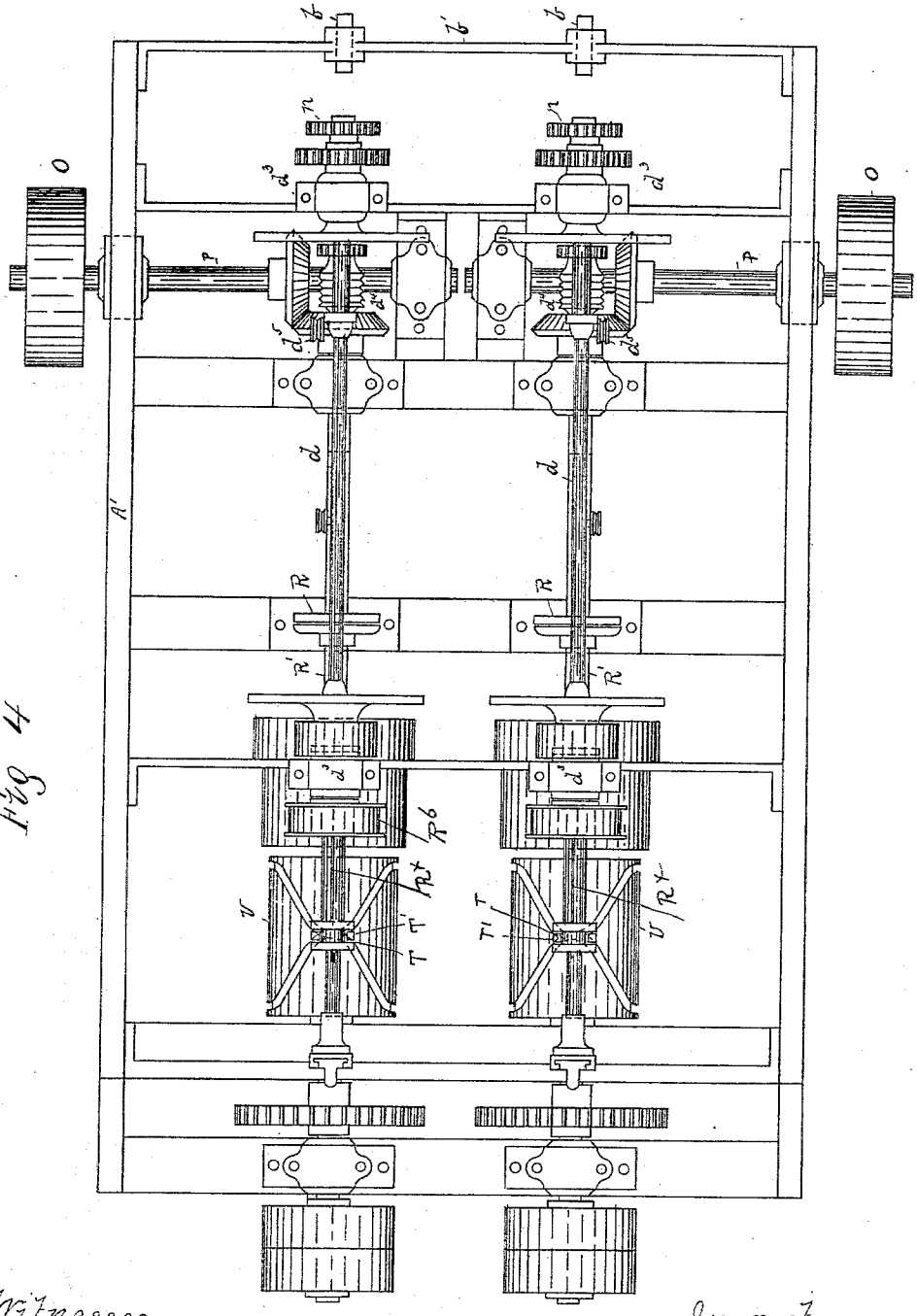


Fig 4

Witnesses
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UNITED STATES PATENT OFFICE.

JOHN CHEYNE, OF PATERSON, NEW JERSEY.

MACHINE FOR FINISHING AND COMPLETING TWINE OR CORD.

SPECIFICATION forming part of Letters Patent No. 412,070, dated October 1, 1889.

Application filed March 13, 1889. Serial No. 303,073. (No model.)

To all whom it may concern:

Be it known that I, JOHN CHEYNE, a citizen of the United States, residing at Paterson, Passaic county, State of New Jersey, have invented a new and useful Improvement in Machines for Finishing and Completing Twine or Cord, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The object of my invention is to finish and complete twine or cord by one continuous operation with less machinery and with a class of machinery less expensive than that now employed in twine-finishing, in which several operations are required.

I attain the object sought by devices that are illustrated in the accompanying drawings, which will be hereinafter fully described and claimed.

Figure 1 is a side elevation of the rear portion of a twine-finishing machine, a portion of the frame-shaft, flier, spindle, &c., being removed in such figure. Fig. 2 is a plan of the same. Fig. 3 is a side elevation of the front portion of the machine, and Fig. 4 is a plan of the same.

A represents a portion of a twine or cord finishing machine of ordinary build, having the usual frame A′, forming-tube *b*, shaft *c*, and flier *d*.

On the frame A′ of the machine A, and at the rear end of the same, I arrange and suitably fix one or more supporting-pins B, the number of which pins will correspond with the number of strands required to form the twine or cord to be finished and completed. The pin or pins B, which are adapted to support the supply-bobbins, are provided with bobbins C, which bobbins contain the roving *x* in its unfinished state and as the same leaves the roving-machine. At a suitable distance in front of the pin or pins B and the bobbin or bobbins C thereon I arrange and fix a size or solution box D, which box is adapted to hold the size or solution prepared for and through which the roving or unfinished and incomplete twine or cord *x* passes.

The box D, containing the size or solution with which the roving is treated and through which it passes, is provided with a roller E and two additional rollers F, the former of which rollers is arranged on the edge of the box D and is adapted to support the roving *x*, drawn from off the bobbin or bobbins C preparatory to entering the box D and the size or solution therein. After the roving has passed over the roller E and has entered the size or solution in the box D, it passes under the rollers F, arranged near the bottom of the box D and remote from each other, in which positions the rollers F are adapted to keep the roving *x* immersed in the size or solution to saturate the same therewith. At the opposite side of the box D, in front of roller E and projecting over the size or solution box D, I arrange in slotted standards G and one above another rollers H and H′, which rollers, owing to a weighted lever H^2, arranged to act upon the slide-bearings H^3 of the roller H′, are adapted by pressure to press out of the roving *x* and return into the box D any excess of the size or solution which the roving may carry after leaving the box D and the size or solution therein.

In front of the standards G, and at a suitable distance therefrom on each side of the machine-frame, is arranged and fastened by bolts or otherwise a standard J, having bearings J′, in which bearings are journaled heated rolls K K′, which rolls are provided with gears K^3, that intermesh with an intermediate gear K^4, which latter is arranged on a stud fixed in the frame A′, as shown. The roller K is provided with a pulley K^6, that connects with a pulley H^4 on the roller H by a belt K^7, which adapts the roll K to impart motion to the roller H, while the roll K′, by means of pulley K^2, belt L^2, and gear K^3, is adapted to rotate the gear K^4 and roll K, while the absorbing-roll N is turned by the heated rolls K K′.

The roll N, which is provided with one or more coverings of flannel, felt, or other absorbing material *n*, is arranged in a slot J^2, formed therefor in the standards J, and rests upon the heated rolls K K′, and is adapted by means of said covering or coverings of flannel, felt, or other absorbing material *n* to absorb and take up any remaining moisture upon the roving or partly-finished twine or cord *x* after the same has passed from between the rollers H H′ and is passing over and between the absorbing-roll N and heated rolls K K′

preparatory to the roving or partly-finished twine or cord x passing from the rolls K, K′, and N to a drying-cylinder L.

The drying-cylinders L, to which the roving or partly-finished twine or cord passes from the rolls K, K′, and N, and around which the roving, twine, or cord passes one or more times to dry the same, are arranged in front of the rolls K K′ in bearings L^3 prepared therefor, and are adapted to dry the roving or partly-finished twine or cord while the same is passing one or more times around the cylinder, and from which the roving or partly-finished twine or cord x passes to a forming-tube b in a dry and heated state.

The cylinders L and rolls K K′ are made hollow, and are provided with pipes w, as shown in Fig. 2, through which steam is introduced for the purpose of heating them.

The forming-tube b, which is arranged in a rail b', transversely fixed in the machine, as shown, is adapted to receive the dried, heated, and partly-finished twine or cord, and which, while the twine is passing through the same, lays and, by the friction created in the passage, glazes the roving or partly-finished twine or cord x previously dried and heated by the cylinder, and which is twisted by the flier in its passage through the same and preparatory to the finished twine or cord being laid by the flier d on a metal forming-spool R. The forming-spool R is arranged on a tube R′, which latter is provided with a groove on its surface to accommodate a feather $R^\times$, arranged therefor in a driving-pulley R^6, upon which the tube slides. Upon spindle R^4 the forming-spool R and tube R′ are mounted, and which is supported at one end in a standard S and at the other end in the flier d, as shown. The tube R′ is provided at the outer end of the same with a recess T, to accommodate the upper and bifurcated end T′ of a traverse-bar T^4, which latter is arranged to slide on and over a rod T^5, while the lower end of the said traverse-bar enters and is adapted to work in grooves T^2 T^3 of a face-cam V, which cam is fixed on a shaft W, journaled in bearings 1 and 2, fastened to the machine-frame, and which is adapted, by means of the traverse-bar T^4, to reciprocate tube R′ and forming-spool R back and forth on the spindle R^4. This enables the forming-spool R to receive the finished twine or cord x from the flier d and to cause the flier to lay the finished twine or cord on and over the length of the forming-spool R to complete the twine or cord, as shown in Fig. 3.

The cam-shaft W is provided with a gear 4, that gears with an intermediate gear 5, which latter is arranged on a stud 6, fastened in the frame A′, and which gears with a gear 7 on the driving-shaft c.

The drying-cylinder L, around which the roving or partly-finished twine passes to be dried preparatory to its entering the forming-tube b, receives its motion from a pulley O on a transverse shaft P by means of a belt O′, while the belt L^3 gives motion to roll K′ from the pulley L^4 on the cylinder L.

The tube R′ and flier d are actuated from the shaft c by means of belts z' z, as shown in Fig. 3, and at different rates of speed, the tube moving endwise over feather $R^\times$. The flier d, arranged in bearings d^3, has arms d^4, around which the finished twine or cord x passes before passing over grooved pulleys d^5 to the forming-spool R, on which the finished twine or cord is wound and completed by one continuous operation and by machinery costing less than one-half of the machinery now employed in twine-finishing.

The twine or cord x, finished and completed as shown in Fig. 3, when taken from the forming-spool by removing the spindle R^4 from the flier, is ready for the market without further manipulation.

The belt z drives the flier, and with it the toothed wheel n^4, which gears into the toothed wheel n^2, mounted on shaft n^3. A second toothed wheel n' is secured to wheel n^2 and gears into the toothed wheel n, mounted on a sleeve o. A toothed wheel o' is secured on the other end of sleeve o and gears into the two toothed wheels p, which are fast to the grooved cylinders p', around which the yarn is conducted in its passage from tube b to the flier d.

What I claim is—

1. In a twine-machine, the combination, with the sizing-trough, the press-rolls H H′, the rollers K K′, and the roller N, covered with absorbent material and bearing on said rollers, and the drying-cylinder L, all supported on a common frame, of the flier d, the spool-tube R′, and the grooved face-cam and the traverse-bar T^4, for reciprocating said spool-tube, all supported on a common frame, a single main driving-pulley, and intermediate driving mechanism connecting the said press-rolls, rollers, drying-cylinder, flier, and face-cam with the said main driving-pulley, whereby all the said devices are combined to form a single compound machine and are driven simultaneously at appropriate speeds, substantially as set forth.

2. In a twine-machine, the combination, with the supporting-frame, of the sizing-trough, the press-rolls H H′, supported over said trough, the rollers K K′, provided with toothed wheels K^3, the toothed wheel K^4, intergearing with both of said wheels K^3, the cylinder N, covered with absorbent material and bearing on said rollers, the drying-cylinder L, and intermediate driving devices connecting the drying-cylinder and press-roll shafts with the shafts of rollers K K′, whereby all the said devices may be driven simultaneously and at appropriate speeds, substantially as set forth.

JOHN CHEYNE.

Witnesses:
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WILLIAM STEWART.