

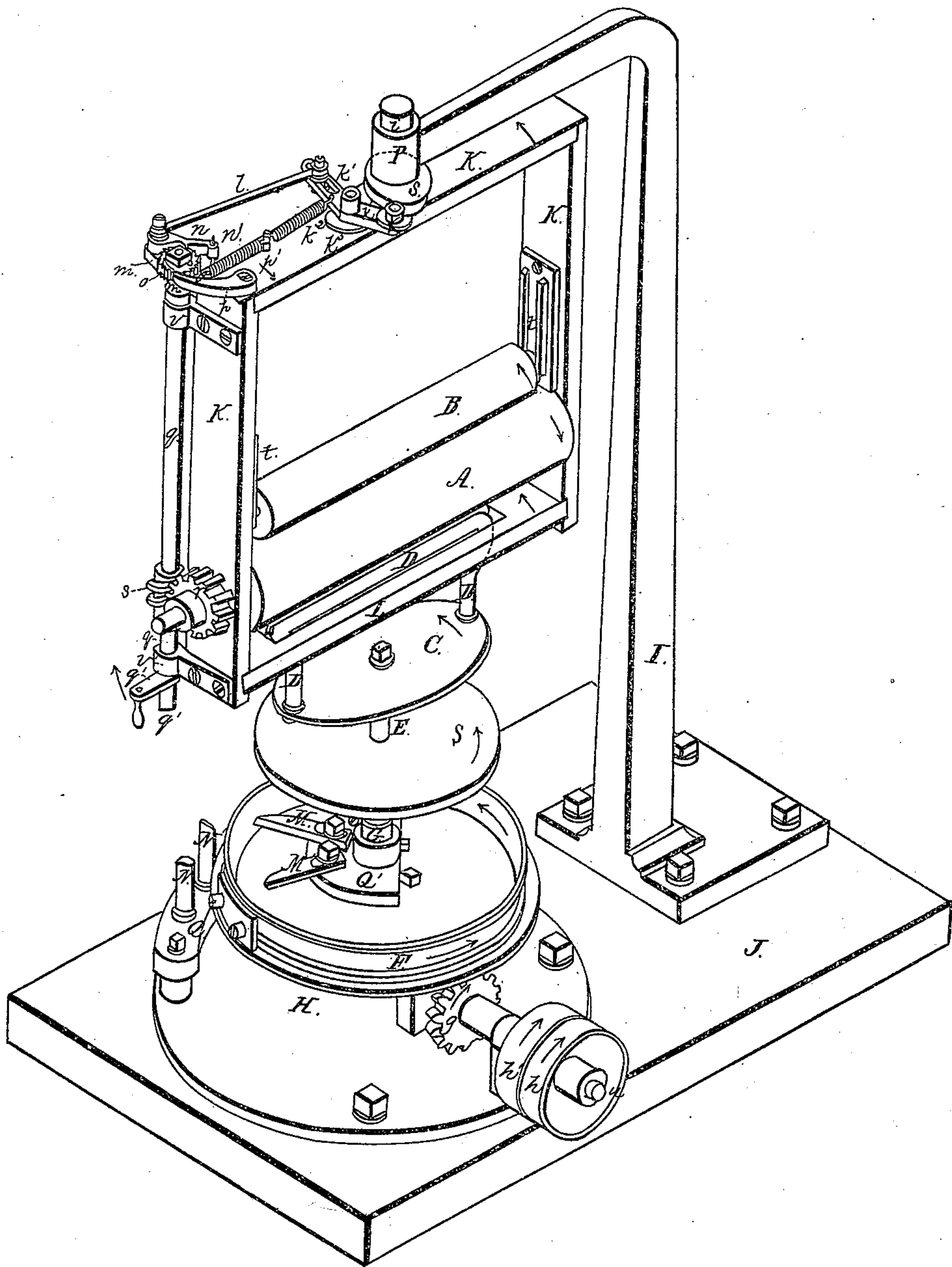
Sheet 1. 2 Sheets.

Tompkins & Johnson.
Knitting Mach.

N^o. 13,586.

Patented Sept. 18, 1855.

Fig. 1.



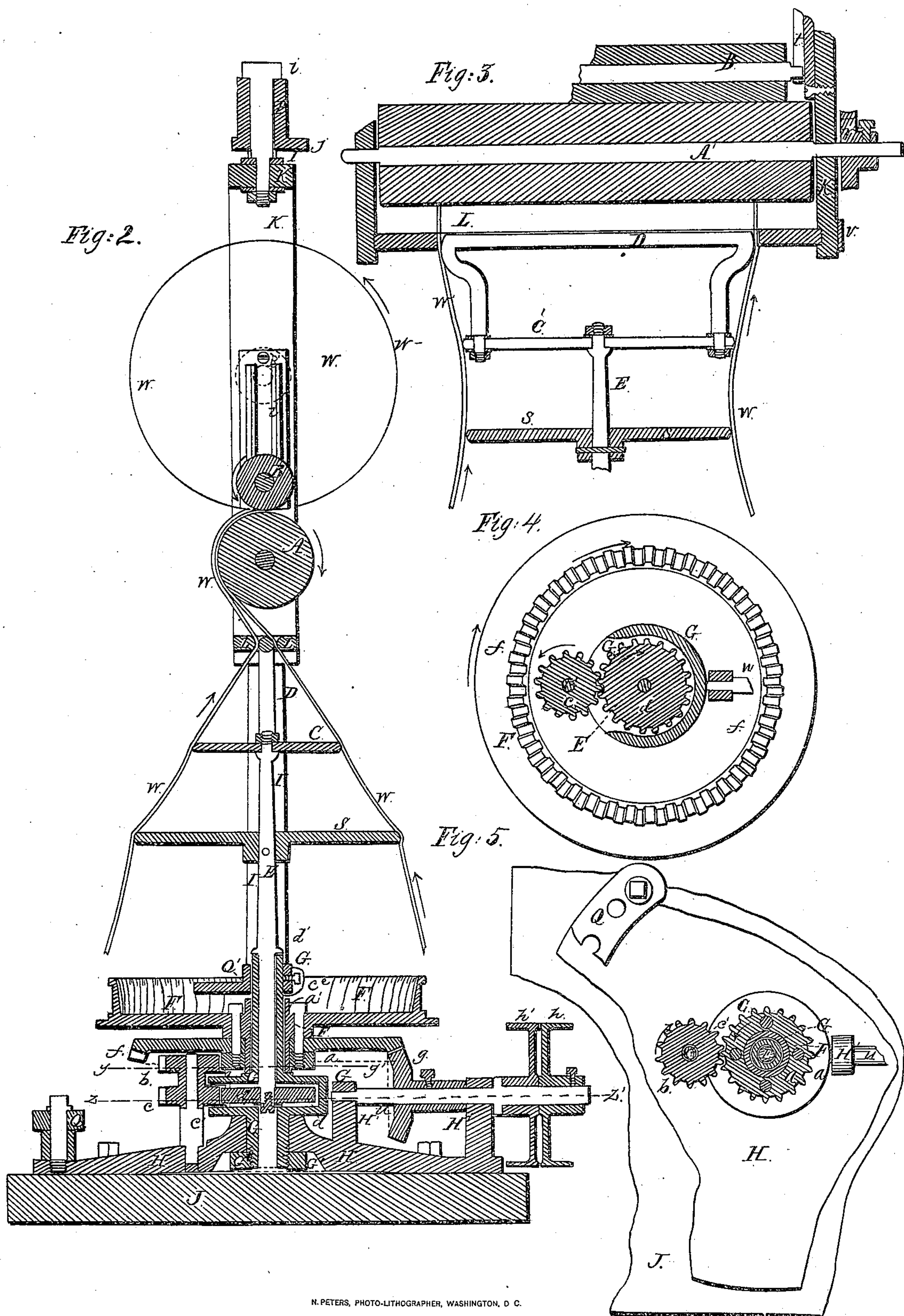
Sheet 2. 2 Sheets.

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Knitting Mach.

N^o 13,586.

Patented Sep. 18, 1855.



UNITED STATES PATENT OFFICE.

C. TOMPKINS AND JNO. JOHNSON, OF TROY, NEW YORK.

KNITTING-MACHINE.

Specification forming part of Letters Patent No. 13,586, dated September 18, 1855; Reissued May 15, 1860, No. 963.

To all whom it may concern:

Be it known that we, CLARK TOMPKINS and JOHN JOHNSON, of Troy, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Rotary Knitting-Machines; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is an isometrical representation; Fig. 2, a vertical section through the center of the machine, transverse the frame which carries the take-up rollers; Fig. 3, a longitudinal vertical section of the lower portion of the take-up frame, and the parts adjacent thereto; Fig. 4, a view from beneath of a horizontal section through z, z' in Fig. 2; and Fig. 5 a top view of a horizontal section through y, y' in Fig. 2.

The same letters refer to like parts in all the figures; and the directions of motion of the several revolving parts are indicated by their respective arrows.

Our improvements in upright rotary knitting machines consist: first, in the peculiar manner in which we cause the frame which carries the take-up mechanism to revolve in the same direction, and simultaneously with the needle cylinder; second, in the manner in which we cause each portion of the knit fabric to extend longitudinally in the same direction from the needles, when presented to the action of the knitting wheels; and otherwise keep the tubular web in proper shape while being drawn off and taken up; so as to make the goods more even in elasticity than otherwise is the case.

The construction and operation of a rotary knitting machine as improved by us, is specifically as follows, viz:

J is the common bed plate of all the works of an upright rotary knitting machine; H, the base block of the knitting mechanism proper; and I a bent standard from which the take-up frame, K, is suspended by the spindle i , turning within the socket P; so that said frame shall be free to be revolved.

F is the usual needle cylinder, fitted to be turned upon the stationary hollow stud or standard G, secured to the base-block H.

N', N, are the ordinary posts (seen broken

in Fig. 1,) rising from the stand Q, for the support of the usual cloth-depressor, sinker, and presser wheels; and M, M', the usual arms, (seen broken in Fig. 1,) for holding the common inside knitting wheels, extending from the stand Q', which is fastened to the hollow stud G. Power to drive the machine is applied to the pulleys h, h' , on the shaft u , which turns in the standards H', H'.

g is a bevel pinion fixed on the shaft u , to give motion to the bevel wheel f , fastened to the hub of the needle cylinder.

a is a small spur wheel fastened to and revolving with the needle cylinder, and giving motion to the spur pinion b , fastened to its equal pinion c , and turning with it upon the stud c' . The spur pinion c , drives the spur wheel d , which is equal in size to the wheel a , and is fastened to the lower end of the central spindle E; which spindle is fitted to turn freely within the stud G; consequently the spindle E, is revolved in the same direction and with the same velocity as the needle cylinder.

We enlarge the hollow stud G, so as to partly inclose the spur wheel d , leaving one side of the thus formed case open; so that said wheel may be passed to the inside thereof, and be driven by the pinion c , through said open side; as seen by Figs. 5, 4, and 2.

S is a circular horizontal plate, fastened to the spindle E, and thus revolving inside of, and simultaneously with the knit fabric, w ; so that all parts of the web shall extend from the circular row of needles in a uniform direction toward the axis of the machine; and thus make the action of the knitting wheels more equal than has been the case heretofore.

C is a horizontal oval plate, fastened to, and revolving with, the spindle E; to give such shape to the web that the circular rows of stitches shall be drawn off evenly, and laid in straight lines upon the take up roller. The web-flattening bent rod D, is fastened to the plate C, and extends to within the slotted bottom bar of the take-up frame: thus causing the take-up frame to positively revolve in the same direction as, and simultaneously with the needle cylinder, to keep the knit fabric straight or without twist while being drawn off and wound up by the take-up rollers A, B.

The roller A is made to positively revolve on its axis, in consequence of the rotation

of the take-up frame, by means of the fixed cam j , in connection with the combination shown in the drawings of the following elements, carried by the frame K, viz: The
 5 lever k' , with cam-follower k , spring k^2 , and fulcrum k^3 ; to drive the ratchet wheel o fixed on the shaft q ; by means of the rod l , vibrating pawl n , with spring n' , and stop-click p , with spring p' ; the endless screw s
 10 fixed on q and driving the worm wheel r on the shaft of the roller A.

By using a larger or smaller ratchet wheel o , the work is taken up faster or slower; for the cylindrical surface of the
 15 roller A is made so rough, by coating it with sand or emery, that it does not slip at all on the knit fabric; but takes up, and winds upon the incumbent roller B, exactly equal lengths of the web at every revolution of
 20 said roller A; while B rises within the guides t, t , as the size of the roll of goods increases.

Having thus described an upright rotary knitting machine as improved and constructed by us, we will now proceed to point
 25 out our invention more distinctly:—

First, in regard to giving motion to the take-up frame.—It has heretofore been usual to cause the frame which carries the take-
 30 up mechanism to revolve simply by the drag of the web; there being sometimes employed, as a help to the operation, a fixed rod, extending from the stationary axis of the needle cylinder, within the tubular web, to
 35 within a long oval opening through the bottom bar of the take-up frame, and a corresponding oval plate, arranged horizontally within said oval opening, and fitted to turn freely upon the said central rod; so as to
 40 distend and flatten the web previous to being taken up; and thus lessen the twist therein occasioned by driving the take-up frame.

Now it will be seen that our improvement in the manner of giving motion to the take-
 45 up frame, consists in making the central rod revolve simultaneously with the needle cylinder and fastening a modification of the oval plate heretofore used to the central rod or spindle; so that the inclosing take-up
 50 frame shall be positively revolved independently of the web.

We are aware that Daniel Tainter has heretofore caused the draft and take-up mechanism employed by him to revolve with
 55 the same velocity as the needle cylinder, by applying the driving power primarily to the

take-up frame, as well as to the needle cylinder:—but it will be seen that his mode is substantially different from our method; wherein; the take-up frame extends down
 60 and embraces a web-inclosed expansion of a revolving central spindle.

Second, in reference to shaping the web while being drawn off.—Heretofore the several longitudinal parts of the knit fabric
 65 have been allowed to extend from the circular row of needles toward the take-up frame in various directions. Hence the action of the knitting wheels thereon has been irregular, producing variations in the elasticity
 70 of the several parts of the web.—To remedy this defect in, and also to increase the velocity and smoothness of, the operations of the machine, we fasten the plates S and C to the revolving central spindle, in the po-
 75 sitions shown in the drawings.

We will here remark that it is not essential that the web-shaping plates S, and C, should be immovably fastened to the central
 spindle; for if the oval plate C, with a pro-
 80 jection extending to within the take-up frame, and the circular plate S, were each arranged in the positions represented in the drawings, but so as to be free to be turned on the central spindle; and so that the plate
 85 C should be revolved by the rotating take-up frame, and the plate S by the action of the fabric, the central spindle serving only as a support and stationary axis for these plates, the purposes for which we use them
 90 would be fulfilled thereby; and we consider such arrangement of the plates, as equivalent to our hereinbefore described method of combining them with the take-up mech-
 95 anism.

What we claim as our invention and desire to secure by Letters Patent is:—

1. The manner in which we cause the frame which carries the take-up mechanism to revolve in the same direction, and with
 100 the same velocity, as the needle cylinder, as herein specified, and for the purpose set forth.

2. Combining the web-shaping plates S, and C, with the take-up mechanism; sub-
 105 stantially as described, and for the purposes specified.

CLARK TOMPKINS.
 JOHN JOHNSON.

Witnesses:

JOHN MORAN,
 AUSTIN F. PARK.