W. J. CAREY.

WRAPPING, TWISTING, AND POLISHING MACHINE.

APPLICATION FILED NOV. 2, 1908.

930,039.

Patented Aug. 3, 1909.

4 SHEETS—SHEET 1.

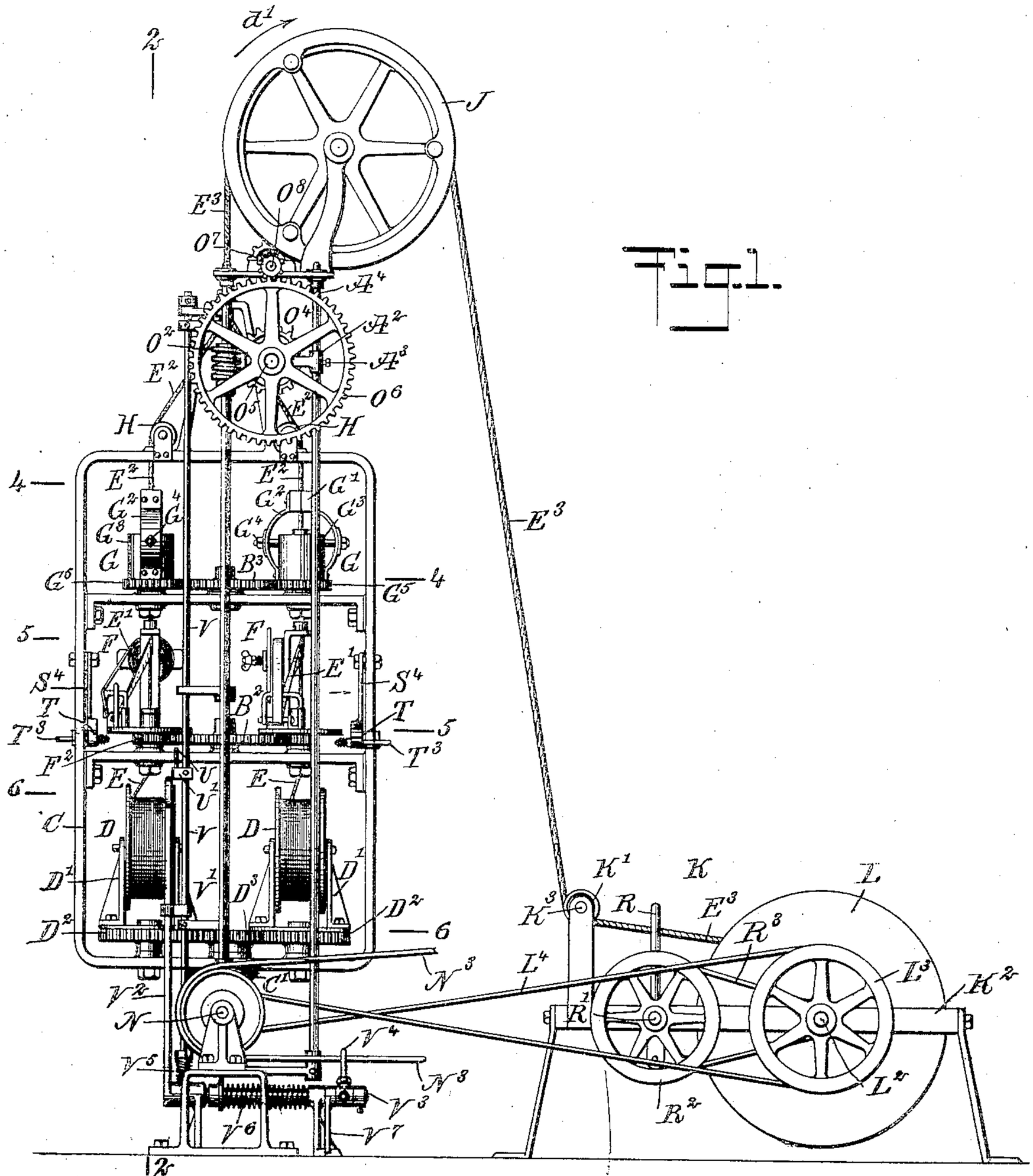

Fig. 1.

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4 SHEETS—SHEET 2.

Fig. 2.

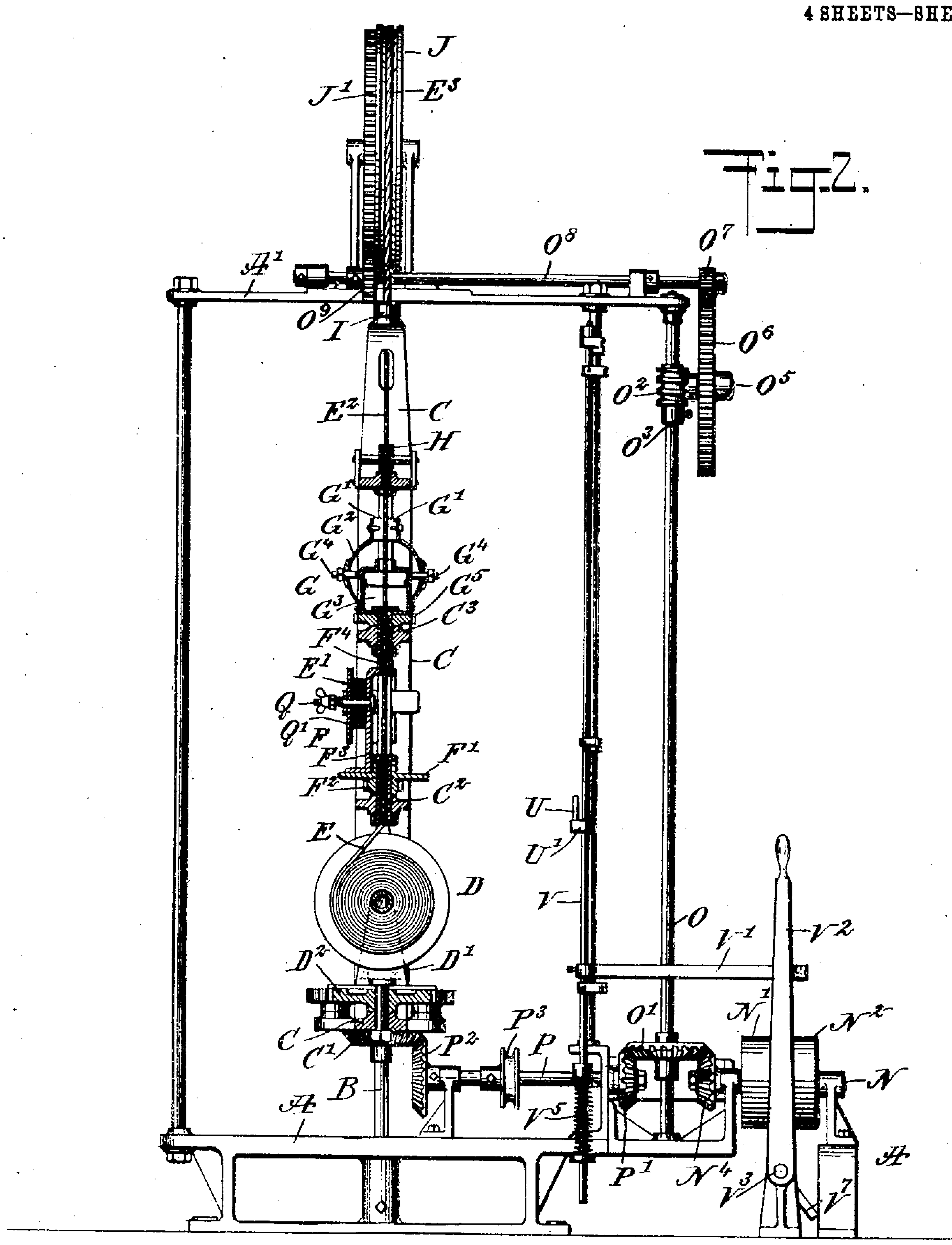

Fig. 3.

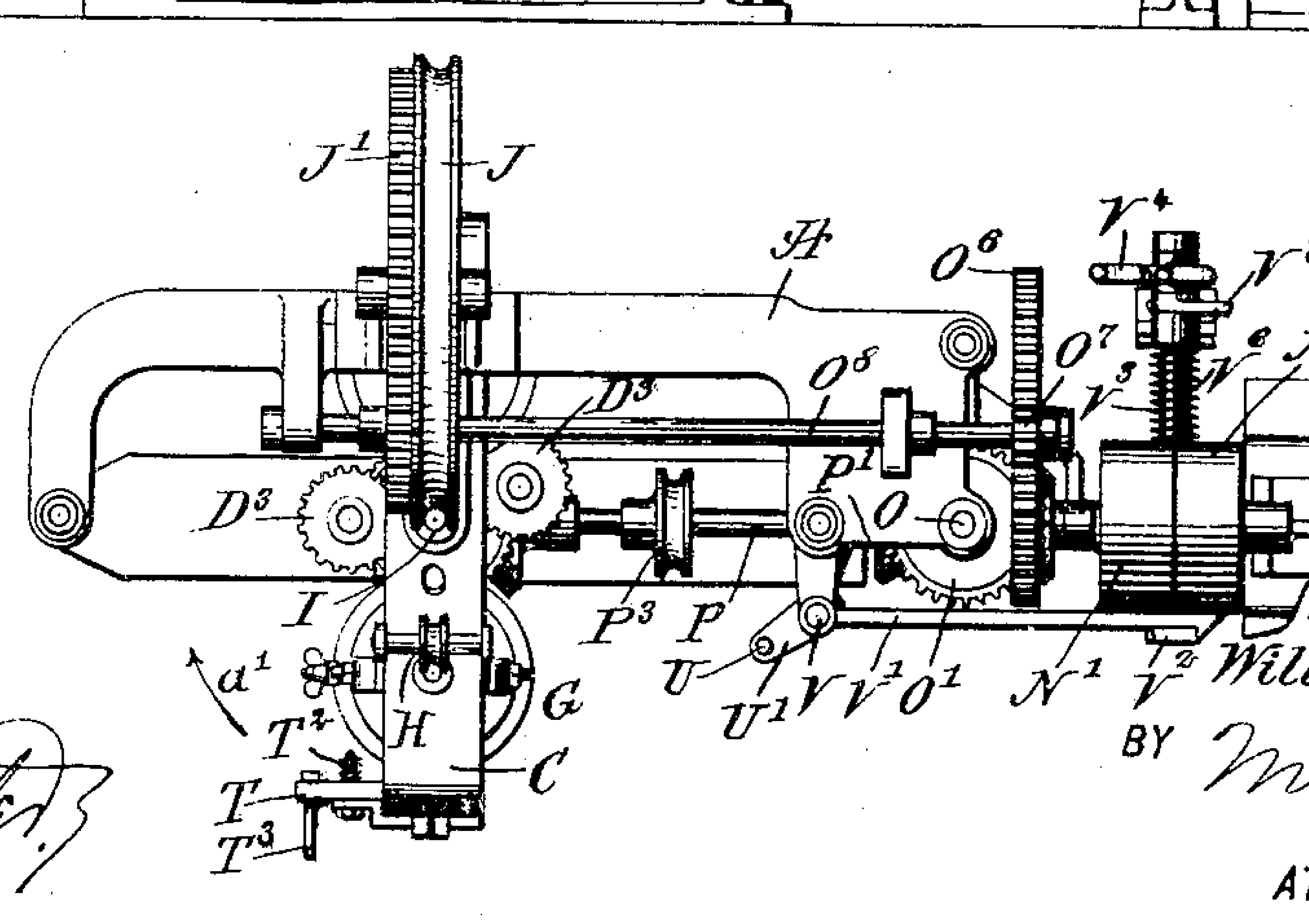

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Fig. 4.

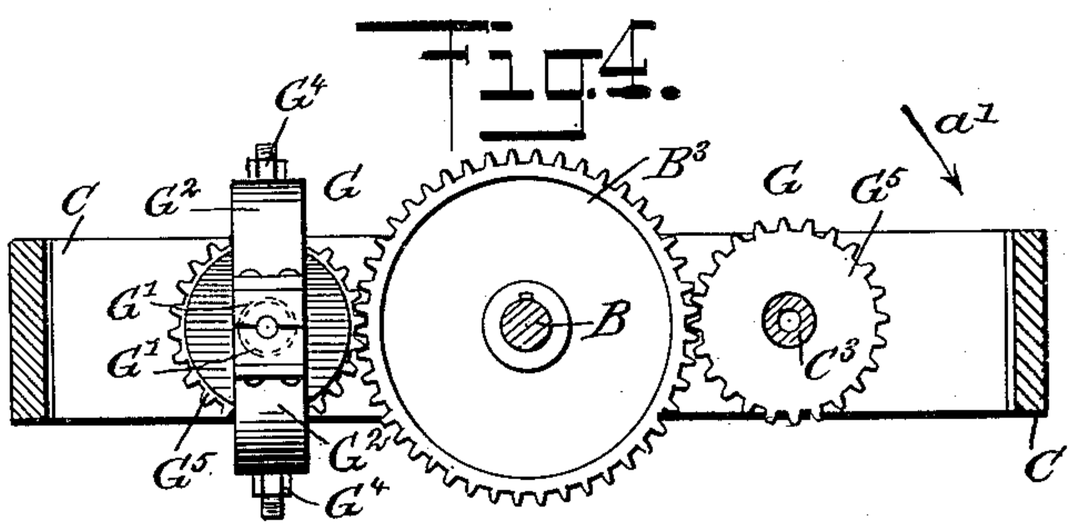


Fig. 6.

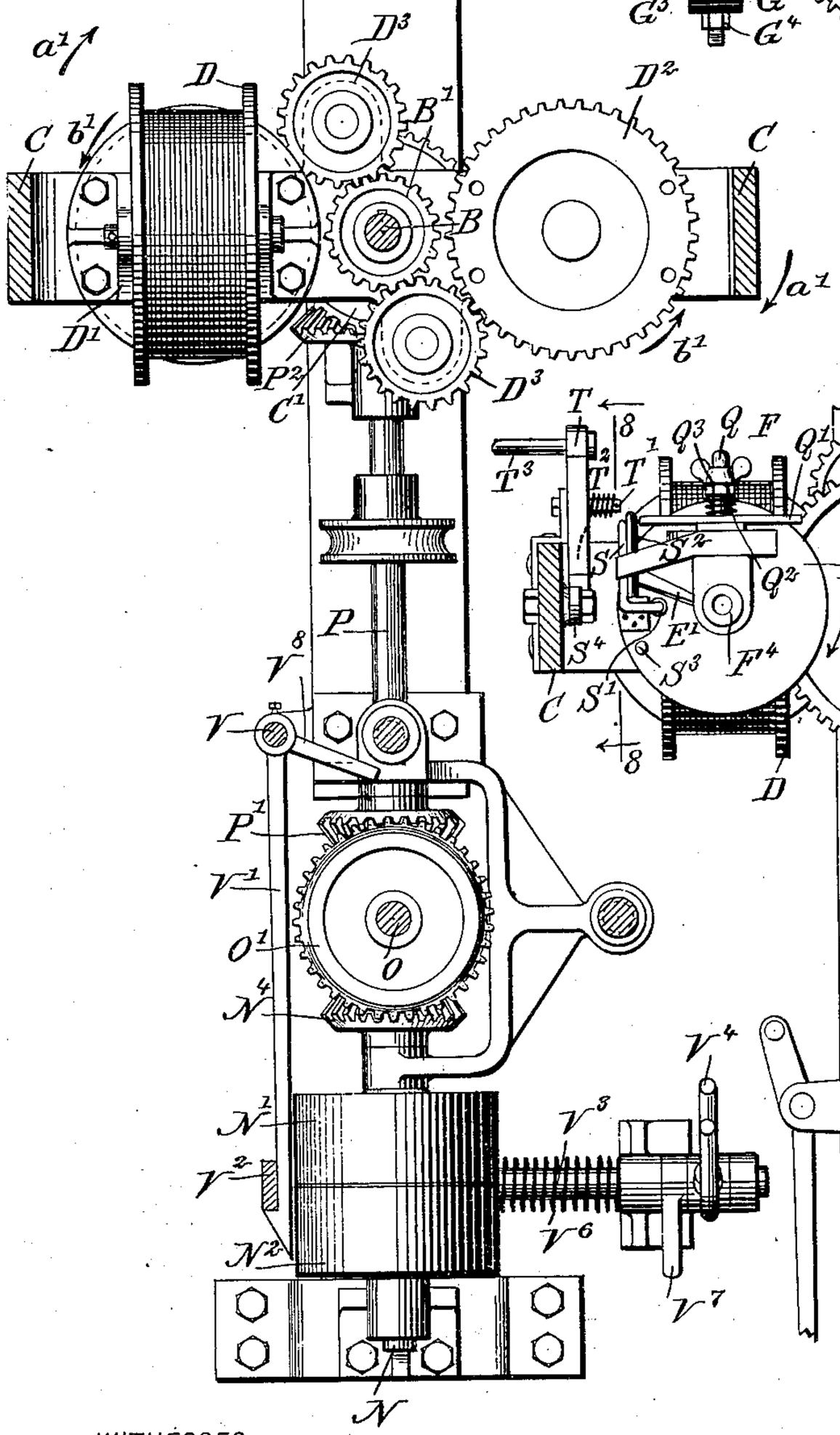
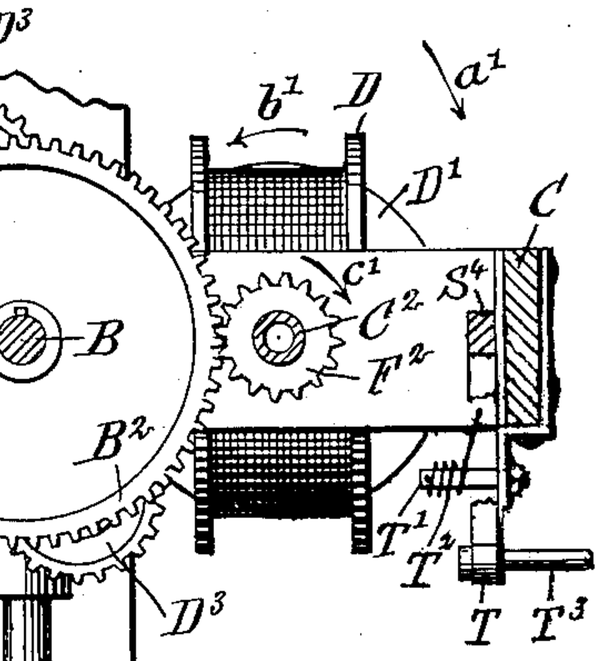


Fig. 5.



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4 SHEETS—SHEET 4.

Fig.7.

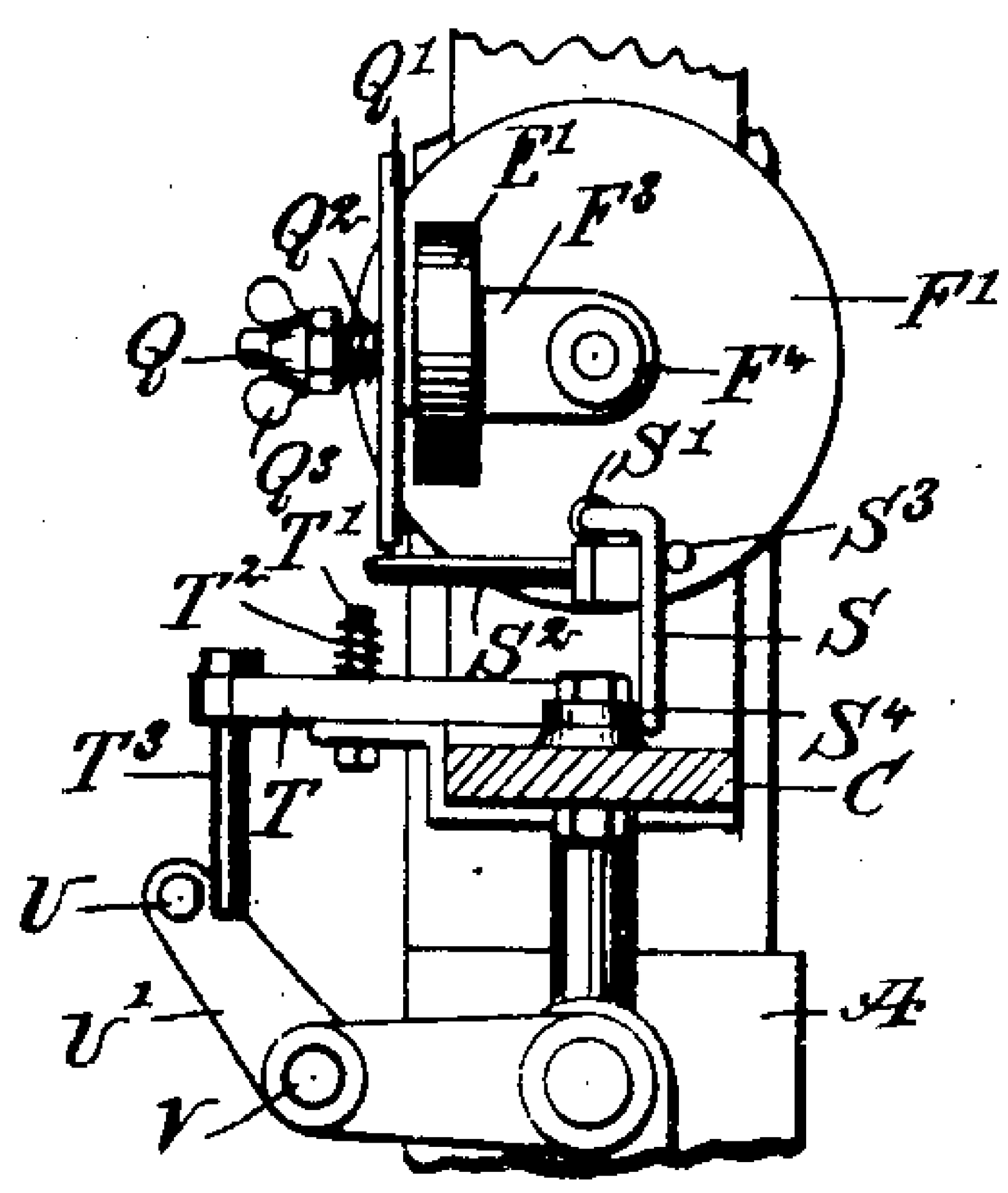


Fig.8.

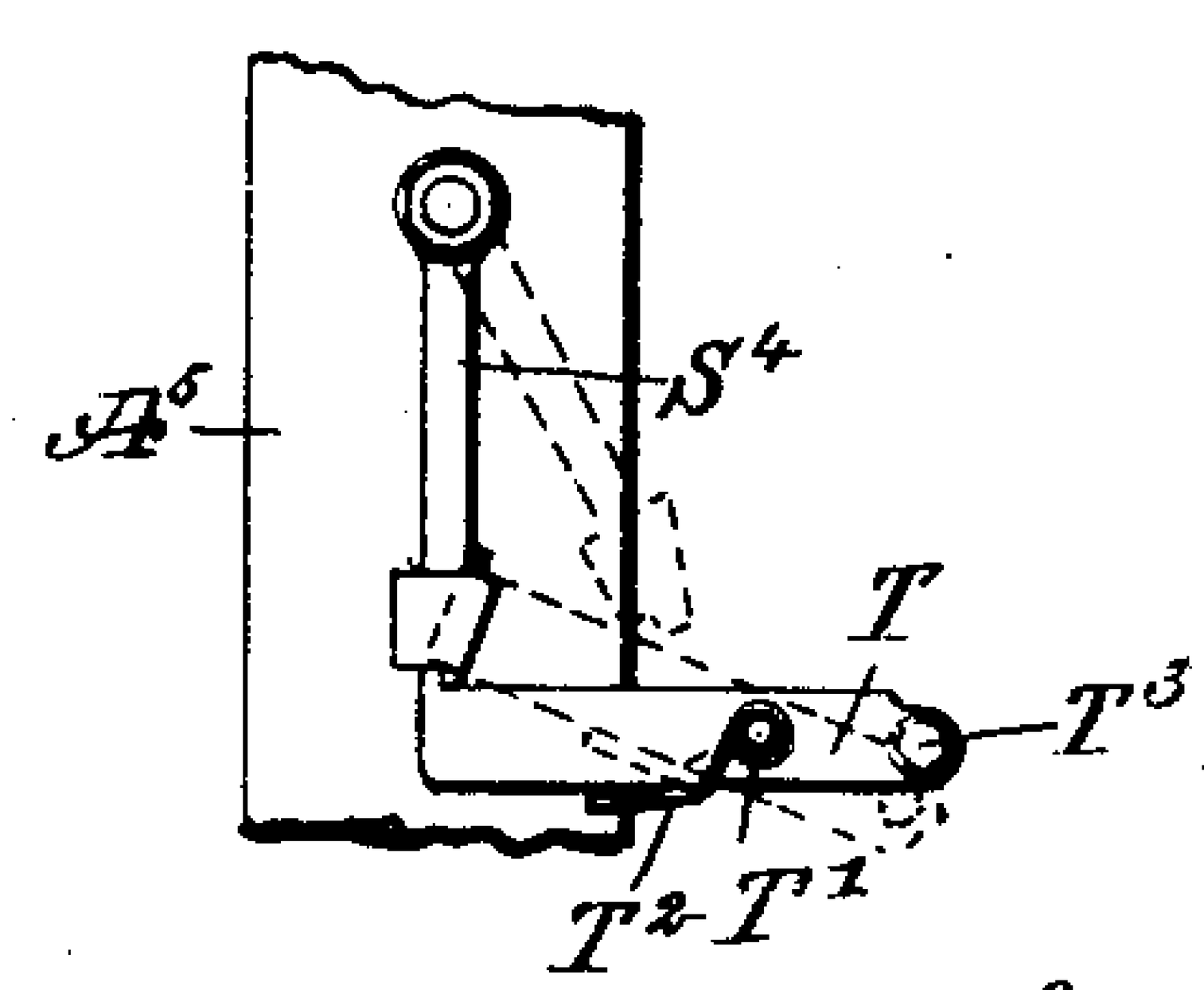
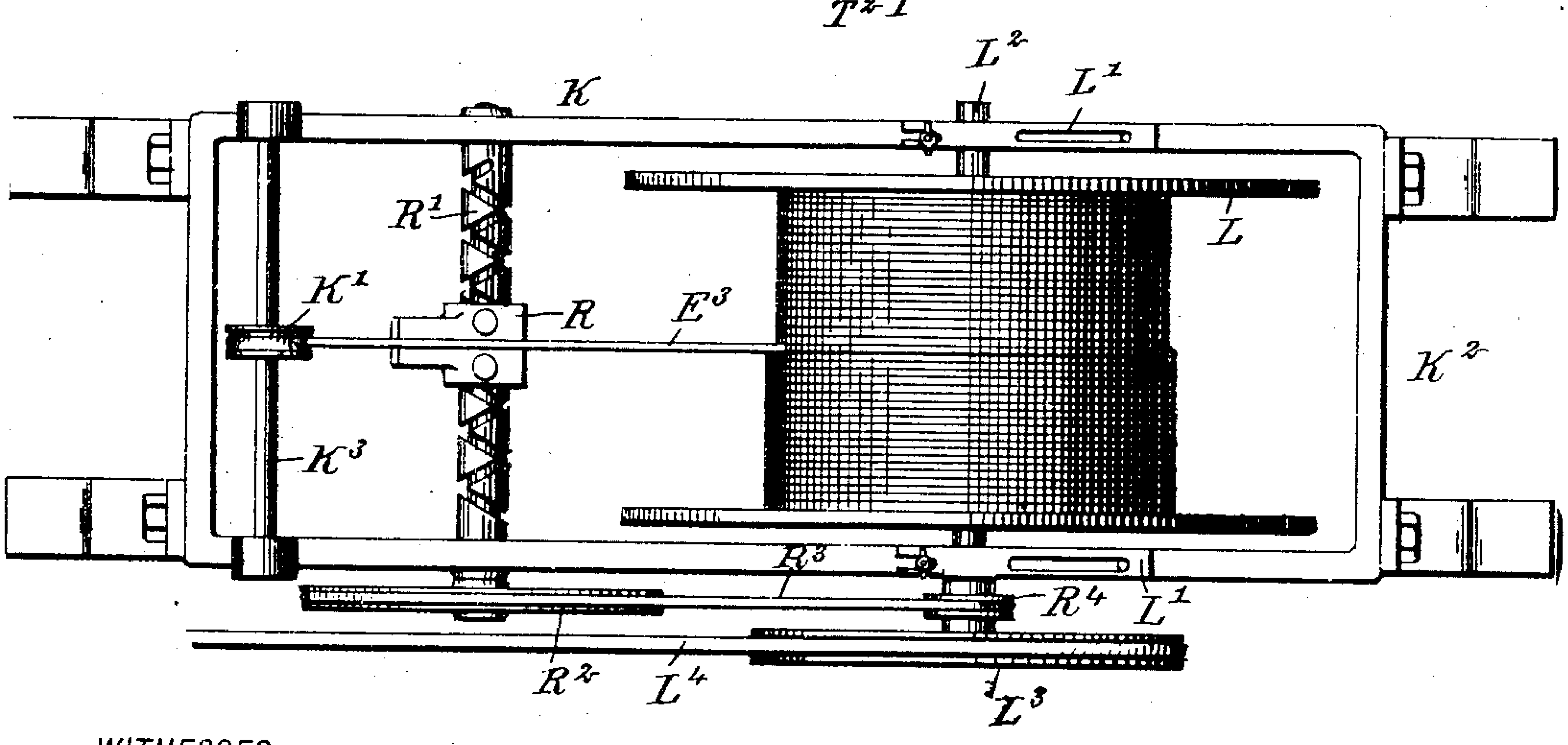


Fig.9.



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UNITED STATES PATENT OFFICE.

WILLIAM J. CAREY, OF TRENTON, NEW JERSEY.

WRAPPING, TWISTING, AND POLISHING MACHINE.

No. 930,039. Specification of Letters Patent. Patented Aug. 3, 1909.

Application filed November 2, 1908. Serial No. 460,801.

To all whom it may concern:

Be it known that I, WILLIAM J. CAREY, a citizen of the United States, and a resident of Trenton, in the county of Mercer and State of New Jersey, have invented a new and Improved Wrapping, Twisting, and Polishing Machine, of which the following is a full, clear, and exact description.

The invention relates to machines for spirally wrapping paper or other insulating material around wires, and its object is to provide a new and improved wrapping, twisting and polishing machine, arranged to cover a plurality of wires or cores with paper or like wrapping material, and then polish the covered cores and twist the same into a single strand, in an exceedingly simple manner and at one operation.

The invention consists of novel features and parts and combinations of the same, which will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the improvement; Fig. 2 is a cross section of the same on the line 2—2 of Fig. 1; Fig. 3 is a plan view of the same; Fig. 4 is an enlarged sectional plan view of the polishing device, the section being on the line 4—4 of Fig. 1; Fig. 5 is a similar view of the wrapping devices, the section being on the line 5—5 of Fig. 1; Fig. 6 is a like view of the improvement on the line 6—6 of Fig. 1; Fig. 7 is an enlarged plan view of one of the wrapping devices and the stop motion, the latter being in actuating position; Fig. 8 is a side elevation of part of the stop motion, looking in the direction of the line 8—8 of Fig. 5: and Fig. 9 is an enlarged plan view of the winding up device for the covered and polished strand.

On the base A of a suitably constructed main frame is secured a vertical shaft B, on which is mounted to turn the twisting frame C, carrying in its lower portion the spools D, D, preferably located on opposite sides of the shaft B, and from the said spools D, D unwind the wires or cores E, E, around which are spirally wound the strips of paper or other wrapping materials E′, E″ by the use of wrapping devices F, F, arranged on the revolving twisting frame C on opposite sides of the shaft B and directly above the spools D, D, as plainly shown in Figs. 1 and 2. The wrapped cores E^2, E^2, after leaving the wrapping devices F, F pass upward and through the polishing heads G, G arranged on the twisting frame C above the wrapping devices F, F, and serving to polish the wrapped cores E^2, E^2. The wrapped cores E^2, E^2, after leaving the polishing heads G, G extend upward and pass over guide rollers H, H, journaled on the twisting frame C, and the wrapped and polished cores E^2, E^2 converge from the guide rollers H, H to an eye I held centrally on the top of the revolving twisting frame C, so that the wrapped and polished cores E^2, E^2 are twisted together to form a single strand E^3, which passes through the eye I and extends upward and passes over a driven grooved drawing wheel J journaled on the top A′ of the main frame. The strand E^3 extends from the drawing wheel J downward, then passes under a guide roller K′, to finally wind up on a spool L of a winding-up device K. Movement is given to the twisting frame C, the drawing wheel J and the winding up device K from a main shaft N, journaled in suitable bearings on the base A, and the said main shaft N is provided with fast and loose pulleys N′, N^1 connected by a belt N^3 (see Fig. 1) with other machinery for rotating the pulleys N′, N^2.

On the inner end of the main shaft N is secured a bevel gear wheel N^4 in mesh with a bevel gear wheel O′ secured on a vertically-disposed shaft O, journaled in suitable bearings arranged on the base A and the top A″ of the main frame. The bevel gear wheel O′ (see Fig. 2) is in mesh with a bevel gear wheel P′, secured on a shaft P, journaled in suitable bearings on the base A, and on the inner end of the shaft P is secured a bevel gear wheel P^2 in mesh with a bevel gear wheel C′ secured to the under side of the twisting frame C, and arranged loosely on the fixed shaft B. Now when the belt N^3 is in engagement with the fast pulley N′ and the main shaft N is rotated, then a rotary motion is given to the shaft O by the gear wheels N^4, O′, and a rotary motion is transmitted to the shaft P by the gear wheels O′, P′, and the rotary motion of the shaft P is transmitted by the gear wheels P^2 and C′ to the twisting frame C, to turn the latter in the direction of the arrow *a*′

The spools D, D are journaled in bearings D′, secured to the upper faces of spur wheels D², mounted to rotate on the twisting frame C, and in mesh with intermediate gear wheels D³ in mesh with a gear wheel B′ secured to the fixed central shaft B, as plainly indicated in Fig. 6. Now when the twisting frame C is rotated in the direction of the arrow *a*′ then the gear wheels D² and with them the spools D are carried bodily around, and as the gear wheels D² are in mesh with the gear wheels D³ and the latter are in mesh with the fixed gear wheel B′, it is evident a rotary motion is given to the gear wheels D² and to the bearings D′ carrying the spools D, to rotate the same in the direction of the arrow *b*′, that is, in the inverse direction in which the frame C is turning. By the arrangement described, the wires or cores E are prevented from being individually twisted and consequently weakened when the machine is in use.

The wires or cores E, E, unwinding from the spools D, D, extend upward through eyes C² carried on the twisting frame C, and on the eyes C² are mounted to rotate loosely disks or supports F′ carrying the wrapping devices F, F, both alike in construction, so that it suffices to describe but one in detail. On the under side of each support F′ is secured a pinion E² in mesh with a gear wheel B³ fixed on the stationary shaft B, so that when the frame C is rotated in the direction of the arrow *a*′, as previously explained, then a rotary motion is given to the supports F′ in the direction of the arrow *c*′ (see Fig. 5), to spirally wrap the wrapping materials E′, E′ around the cores E, E. On each of the supports F′ is attached a bracket F³ carrying a horizontally-disposed bolt Q, on which is mounted the roll of paper or other wrapping material E′ (see Fig. 2), and in order to prevent the wrapping material E′ from unwinding too fast, a friction device is provided, consisting of a disk Q′ held on the bolt Q and pressed against the roll of wrapping material by a spring Q² coiled on the bolt Q and resting on nuts Q³ on the outer end of the bolt Q. Thus by adjusting the nuts Q³ the tension of the spring Q² is regulated, to press the disk Q′ with more or less force against the face of the roll of wrapping material E′, to prevent the latter from unwinding too fast, at the same time winding the wrapping material around the core E with sufficient tension to securely hold the wrapping material in place on the corresponding core E. On the upper end of the bracket F³ is arranged an eye F⁴ in vertical alinement with the eye C², and through the eye F⁴ passes the wrapped core E², to then pass through an eye C³ held on the twisting frame C in alinement with the eyes F⁴ and C², as plainly indicated in Fig. 2.

The wrapped cores E² after leaving the eyes C³ pass through the polishing heads G, alike in construction, and each arranged as follows: Each covered core E² passes between polishing blocks G′ of wood or other suitable material, and attached to the upper free ends of springs G², secured at their lower ends on a support G³, provided with bolts G⁴, engaging the springs G² at or near the middle thereof, to give more or less tension to the springs with a view to cause the blocks G′ to engage the wrapped core with sufficient force to polish the same and to cause the wrapped material E′ to firmly adhere to the core. The support G³ is secured to the upper face of a gear wheel G⁵ mounted to rotate loosely on the eye C³, and in mesh with a gear wheel B³ (see Fig. 4) fixed on the shaft B, so that when the twisted frame C is rotated in the direction of the arrow *a*′, as previously mentioned, then the gear wheels G⁵ roll off on the fixed gear wheel B³, thus turning the polishing heads G and thereby rotating the blocks G′ around the covered core for the purpose previously mentioned. By the arrangement described, the polishing heads G are rotated, to cause the polishing blocks G′ to give a high polish to the wrapping material, and to cause the same to firmly adhere to the core.

The drawing wheel J is geared with the shaft O previously mentioned, and driven from the main shaft N, and for this purpose the shaft O is provided near its upper end with an adjustable worm wheel O², fastened in place by a set screw O³ and in mesh with a worm gear O⁴ secured on a shaft O⁵, journaled in a bracket A² secured by a set screw A³ on a vertical rod A⁴, forming part of the main frame A (see Fig. 1). On the shaft O⁵ is secured a gear wheel O⁶ in mesh with a pinion O⁷ secured on a shaft O⁸ journaled in suitable bearings on the top A′ of the main frame, and on the said shaft O⁸ is secured a gear wheel O⁹ in mesh with a gear wheel J′ secured to or formed on one face of the drawing wheel J. Now when the machine is running and the shaft O is rotated, then the worm wheel O² in mesh with the worm gear O⁴ rotates the shaft O⁵, which by the gear wheel O⁶ and pinion O⁷ rotates the shaft O⁸, and the latter by the gear wheels O⁹ and J′ rotates the drawing wheel J in the direction of the arrow *d*′, to draw the strand E³ upward, thus causing an upward pull on the cores E, to unwind the same from the spools D and to cause the cores to move upward through the wrapping devices F and the polishing heads G for the purpose previously explained. By having the worm O² adjustable on the shaft O and the bracket A² adjustable on the rod A⁴, a gear wheel O⁶ of larger or smaller diameter may be used, to rotate the drawing wheel J with more or less speed, according to the nature of the cores E and the wrapping materials E′ spirally wrapped around the said cores.

The winding up device K is mounted on a frame K^2 (see Figs. 1 and 9), carrying adjustable bearings L′ for the shaft L^3 of the winding up spool L, to permit of conveniently removing the spool when filled and to replace the same with an empty one whenever it is necessary. On the shaft L^2 of the spool L is secured a pulley L^3, connected by a cross belt L^4 with a pulley P^3 on the shaft P, previously mentioned, so that when the machine is running and the shaft P is rotated then a rotary motion is given to the spool L to wind up the strand E^3. The strand E^3 between the pulley K′ mounted on the shaft K^3, and the spool L, passes over a traverse R mounted to travel on a traverse screw R′ journaled in the frame K^2, and provided with a pulley R^2 connected by a belt R^3 with a pulley R^4, secured on the spool shaft L^2, so that when this shaft L^2 is rotated a rotary motion is given to the traverse screw R′, to cause the traverse R to move transversely and thereby lay the convolutions of the strand E^3 on the spool L, one alongside the other forward and backward, as will be readily understood by reference to Fig. 9. The pulley K′ is preferably mounted to turn loosely on its shaft K^3, so as to be free to slide transversely on the said shaft to follow the traverse R.

In order to shift the belt N^3 from the fast pulley N′ onto the loose pulley N^2, in case either of the wrapping materials E′ breaks, the following stop motion is provided, controlled from the wrapping devices F: The wrapping material E′ of each wrapping device F, after unwinding from its roll, passes over a horizontal arm S (see Figs. 5 and 7) on the upper end of a vertical shaft S′ journaled on the support F′. The wrapping material after leaving the arm S passes down and under an arm S^2 fixed on the support F′, and from this arm S^2 the wrapping material extends up and to the core E, directly under the eye F^4. In case the wrapping material breaks between its roll and the core E, then the swing arm S swings back by the centrifugal force of the rotating support F′, until the arm S is stopped on a stop pin S^3, held on the support F′ (see Fig. 7). The arm S now projects radially beyond the support F′, and its outer end is now in the path of a latch S^4, fulcrumed at its upper end on the side of the twisting frame C (see Fig. 8). The lower end of the latch S^4 normally engages and locks one end of a lever T, fulcrumed at T′ on the side of the twisting frame C, and pressed on by a spring T^2, to hold the lever T normally in locking engagement with the latch S^4, as shown in Fig. 8. On the outer end of the lever T is held a horizontally-disposed pin T^3, normally clearing the upper end of a pin U on an arm U′, secured to a vertical shaft V journaled in suitable bearings on the main frame, and on this shaft V is secured a horizontally-extending hook arm V′ normally engaging an upright shifter arm V^2 secured on the shifter shaft V^3, carrying a shifting fork V^4, engaging the belt N^3, for shifting the latter from the fast pulley N′ to the loose pulley N^2, or vice versa, according to the direction in which the shifter arm V′ is moved.

The shaft V is pressed on by a torsion spring V^5, to hold the hook arm V′ normally in engagement with the shifter arm V^2, and the shaft V^3 is pressed on by a torsion spring V^6, to turn the shaft V^3 as soon as the hook arm V′ releases the shifter arm V^2, so that the shifting fork V^4 moves the belt N^3 from the fast pulley N^2, to stop the machine. A stop arm V^7 on the arm V^3 limits the return swinging motion of the shifter shaft V^3, so that the belt N^3 remains on the loose pulley N^2, and a stop arm V^8 (see Fig. 6) limits the swinging motion of the shaft V. When the machine is running the hook arm V′ engages the shifter arm V^2, so that the shifting fork V^4 holds the belt N^3 on the fast pulley N′. Now when the wrapping material E of either wrapping device F breaks then the arm S swings outward, as previously explained and shown in Fig. 7, so that this arm strikes the latch S^4 and swings the same out of engagement with the lever T, whereby the latter is unlocked and swings into the position shown in dotted lines in Fig. 8. When this takes place, the pin T^3 moves downward into the path of the pin U, and carries the latter along, so that the shaft V is turned and with it the hook arm V′, whereby the latter releases the shifter arm V^2 and the spring V^6 now turns the shaft V^3, so that the shifting fork V^4 shifts the belt N^3 from the fast pulley N′ onto the loose pulley N^2, and the machine comes to a stop. The operator now makes the necessary repairs to the broken wrapping material E′, and swings the arm S back for engagement by the wrapping material, as previously explained. The operator also swings the lever T back into engagement with the latch S^4 and shifts the arm V^2, so that the latter is reëngaged by the hook arm V′ and the shifting fork V^4 moves the belt N^3 from the loose pulley N^2 back onto the fast pulley N′, to restart the machine.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A machine of the class described, comprising a main frame, a vertical shaft fixed in the main frame, a revoluble frame, a gear wheel secured to the under side of the revoluble frame and mounted to turn loosely on the fixed shaft, a main shaft, a driving connection between the main shaft and said gear wheel, spur wheels mounted to rotate on the revoluble frame, a gear wheel secured to the said fixed shaft, intermediate gear wheels in mesh with said spur wheels and said fixed gear wheel, bearings secured to the upper

faces of said spur wheels, core-carrying spools journaled in said bearings and carrying the cores to be covered, wrapping devices mounted on the said revoluble frame and through which pass the said cores, the winding devices spirally wrapping the wrapping material around the cores, and a central eye on the said revoluble frame for twisting the wrapped cores into a single strand.

2. A machine of the class described, comprising a main frame, a vertical shaft fixed in the main frame, a revoluble frame, means for rotating the same, core carrying spools mounted on the said frame and carrying the cores to be covered, eyes carried on the revoluble frame and through which the cores extend, supports mounted to rotate loosely on said eyes, a pinion on the underside of each support and in mesh with a gear wheel fixed to said stationary shaft, wrapping devices consisting of brackets on said supports, horizontally disposed bolts carried by said brackets and on each of which is mounted a roll of wrapping material, and a friction device held on each of said bolts, the said wrapping devices spirally winding the wrapping material around the cores, a central eye on the said revoluble frame for twisting the wrapped cores onto a single strand, and a drawing device engaging the strand for imparting movement to the cores and the wrapping material and for drawing the strand along.

3. A machine of the class described, comprising a revoluble frame mounted to turn on a stationary shaft, core-carrying spools mounted on the said frame on opposite sides of the said shaft, wrapping devices mounted on the said frame on opposite sides of the said shaft and geared with the latter to rotate the wrapping devices on rotating the said frame, the said cores passing centrally through the said revolving wrapping devices and the latter spirally winding the wrapping materials around the cores, polishing heads comprising supports mounted on the said frame on opposite sides of the said shaft and geared with the latter, for rotating the supports, springs secured at their lower ends on said supports, polishing blocks attached to the free ends of said springs, and means for regulating the tension of said springs, the wrapped cores passing centrally through the said heads after leaving the said wrapping devices, and a central eye on the said frame for twisting the wrapped cores into a single strand.

4. A machine of the class described, comprising a revoluble frame mounted to turn on a stationary shaft, core-carrying spools mounted on the said frame on opposite sides of the said shaft, eyes carried on said frame, supports mounted to rotate loosely on the eyes, on opposite sides of the said shaft and geared with the latter to rotate the supports on rotating the said frame, wrapping devices carried by said supports and rotating therewith, the said cores passing centrally through the said revolving wrapping devices and the latter spirally winding the wrapping materials around the cores, a central eye on the said frame for twisting the wrapped cores into a single strand, a driving gear for the said frame, and a stop motion controlled by the winding mechanism and connected with the said driving gear to stop the latter on the breaking of the wrapping material.

5. A machine of the class described, comprising a revoluble frame mounted to turn on a stationary shaft, core-carrying spools mounted on the said frame on opposite sides of the said shaft, eyes carried on said frame, supports mounted to rotate loosely on the eyes, on opposite sides of the said shaft and geared with the latter to rotate the said supports on rotating the said frame, wrapping devices carried by said supports and rotating therewith, the said cores passing centrally through the said revolving wrapping devices and the latter spirally winding the wrapping materials around the cores, a central eye on the said frame for twisting the wrapped cores into a single strand, a drawing and winding up device for the said strand to draw the cores along, and means for changing the speed of the said drawing and winding up mechanism.

6. A machine of the class described, comprising a revoluble frame mounted to turn on a stationary shaft, core-carrying spools mounted on the said frame on opposite sides of the said shaft, eyes carried by said frame, supports mounted to rotate loosely on the eyes, on opposite sides of the said shaft and geared with the latter to rotate the said supports on rotating the said frame, wrapping devices carried by said supports and rotating therewith, the said cores passing centrally through the said revolving wrapping devices and the latter spirally winding the wrapping materials around the cores, a central eye on the said frame for twisting the wrapped cores into a single strand, a grooved wheel over which passes the said strand after leaving the said eye, a gearing for driving the said frame, and a gearing for driving the said wheel.

7. A machine of the class described, comprising a revoluble frame mounted to turn on a stationary shaft, core-carrying spools mounted on the said frame on opposite sides of the said shaft, eyes carried by said frame, supports mounted to rotate loosely on the eyes, and located on opposite sides of the said shaft and geared with the latter to rotate the said supports on rotating the said frame, wrapping devices carried by said supports and rotating therewith, the said cores passing centrally through the said revolving wrap-

ping devices and the latter spirally winding the wrapping materials around the cores, a central eye on the said frame for twisting the wrapped cores into a single strand, a grooved wheel over which passes the said strand after leaving the said eye, a winding up device for the said strand after leaving the said wheel, and a driving gear for the said frame, the said wheel and the said winding up device.

8. A machine of the class described provided with a revoluble frame, a fixed shaft on which the said frame revolves, eyes carried on said frame, supports mounted to rotate loosely on the eyes, on opposite sides of the said shaft and geared with the same to rotate the said supports, wrapping devices carried by said supports and rotating therewith, and means for imparting lengthwise movement to the cores and centrally through the said wrapping devices for the latter to wrap the wrapping material spirally onto the said cores.

9. A machine of the class described provided with a revoluble frame, a fixed shaft on which the said frame revolves, eyes carried on said frame, supports mounted to rotate loosely on the eyes, on opposite sides of the said shaft and geared with the same to rotate the said supports, wrapping devices carried by said supports and rotating therewith, means for imparting lengthwise movement to the cores and centrally through the said wrapping devices for the latter to wrap the wrapping material spirally onto the said cores, a driving gear for the said frame, and a stop motion controlled by the wrapping materials of the said wrapping devices and connected with the said driving gear, to stop the frame on the breaking of one of the wrapping materials.

10. A machine of the class described, provided with a revoluble frame, a driving gear for the same and having fast and loose pulleys and a driving belt, a revoluble wrapping device mounted on the said frame and provided with a swing arm over which passes the wrapping material, a stop for the said swing arm, a spring-pressed lever, means for normally locking the same, the said locking means being controlled by the said swing arm, a belt-shifting device for the said belt and means actuated by the said lever when the latter is released for controlling the said belt shifting device.

11. A machine of the class described provided with a revoluble frame, a driving gear for the same and having fast and loose pulleys, and a driving belt, a revoluble wrapping device mounted on the said frame and provided with a swing arm over which passes the wrapping material, a stop for the said swing arm, a spring pressed lever a device for normally locking the lever and controlled by said swing arm, a spring controlled shaft mounted to turn, a spring pressed belt shifting mechanism, means on said shaft for normally holding said mechanism in position, and means for turning said shaft from said lever when the latter is released to release the said belt shifting mechanism.

12. A machine of the class described, provided with a revoluble frame, a driving gear for the same and having fast and loose pulleys and a driving belt, a revoluble wrapping device mounted on the said frame and provided with a swing arm over which passes the wrapping material, a stop for the said swing arm, a shaft, a hook arm on the said shaft, means controlled by the said swing arm for turning said shaft, and a spring-pressed belt shifting mechanism normally held in position by the said hook arm.

13. A machine of the class described, provided with a revoluble frame, a driving gear for the same and having fast and loose pulleys and a driving belt, a revoluble wrapping device mounted on the said frame and provided with a swing arm over which passes the wrapping material, a stop for the said swing arm, a latch on the said frame and adapted to be engaged by the said swing arm, a spring-pressed lever mounted on the said frame and normally locked in place by the said latch, a shaft outside of the path of the revoluble frame and adapted to be turned by the said lever when the latter is released, a hook arm on the said shaft, and a spring-pressed belt shifting mechanism normally held in position by the said hook arm.

14. A machine of the class described, provided with a revoluble frame, a driving gear for the same having fast and loose pulleys and a driving belt, a revoluble wrapping device mounted on the said frame and provided with a swing arm over which passes the wrapping material, a stop for the said swing arm, a latch on the said frame and adapted to be engaged by the said swing arm, a spring pressed lever mounted on the said frame and normally locked in place by the said latch, a pin carried at one end of said lever, a vertical shaft provided with an arm having a pin adapted to be engaged by the pin on the lever, when the lever is released, to turn the said shaft, a hook arm on the said shaft, and a spring pressed belt shifting mechanism normally held in position by the said hook arm.

15. In a machine of the class described, a main frame, a vertical shaft fixed in the main frame, a revoluble frame, means for rotating the same, eyes carried on the revoluble frame, supports mounted to rotate loosely on said eyes, a pinion on the under side of each support, and in mesh with a gear wheel fixed to said stationary shaft, and wrapping devices comprising brackets on said supports, a horizontally disposed bolt carried by each bracket, and on which

is mounted a roll of wrapping material, a disk held on the bolt, a coiled spring on the bolt for pressing the disk against the roll of wrapping material, means for adjusting the tension of said spring, and means for drawing the cores centrally through the said wrapping devices.

16. In a machine of the class described, a main frame, a stationary shaft, a revoluble frame mounted to turn on said shaft, wrapping devices on the said revoluble frame, eyes held on the said frame above the wrapping devices, gear wheels mounted to rotate loosely on the said eyes, supports on said gear wheels, the said gear wheels being in mesh with a gear wheel fixed on the stationary shaft, springs secured at their lower ends to each of said supports, polishing blocks carried by the upper or free ends of said springs, and means for drawing cores centrally through the said wrapping devices and between the said polishing blocks.

17. In a machine of the class described, a main frame, a vertical shaft fixed in the main frame, a revoluble frame mounted to turn on the fixed shaft, means for turning said frame, core-carrying spools mounted on the said frame and carrying the cores to be covered, wrapping devices mounted on the revoluble frame and through which pass the said cores, eyes held on the revoluble frame above the wrapping devices, gear wheels mounted to rotate loosely on the said eyes, supports on said gear wheels, the said gear wheels being in mesh with a gear wheel fixed on the said stationary shaft, springs secured at their lower ends to each of said supports, polishing blocks carried by the upper or free ends of said springs, and means for adjusting the tension of said springs, the wrapped cores passing between said polishing blocks.

18. A machine of the class described comprising a main frame, a frame mounted to revolve on the main frame, core carrying spools, mounted on the said revoluble frame and carrying the cores to be covered, eyes carried on the revoluble frame above the core-carrying spools, wrapping devices mounted to turn on the said eyes the cores passing through the said eyes and the said wrapping devices, the wrapping devices spirally winding the wrapping material around the cores, eyes held on the revoluble frame above the wrapping devices, polishing heads mounted to turn on the said eyes for polishing the wrapped cores after the latter leave the said wrapping devices, guide rollers journaled on the revoluble frame above the polishing heads, and over which the cores pass, a central eye on the said revoluble frame to which the said wrapped and polished cores converge from said guide rollers for twisting the wrapped cores into a single strand, a drawing wheel carried by the main frame and over which the said strand passes from said eye, a winding up device to which the strand passes from the drawing roller, a main driving shaft, and means for imparting movement to the revoluble frame, the drawing wheel and the winding up device from said main shaft.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM J. CAREY.

Witnesses:
WILLIAM J. CONNOR,
W. H. GERAGHTY.