J. E. PHILLIPS.

REELING MACHINE.

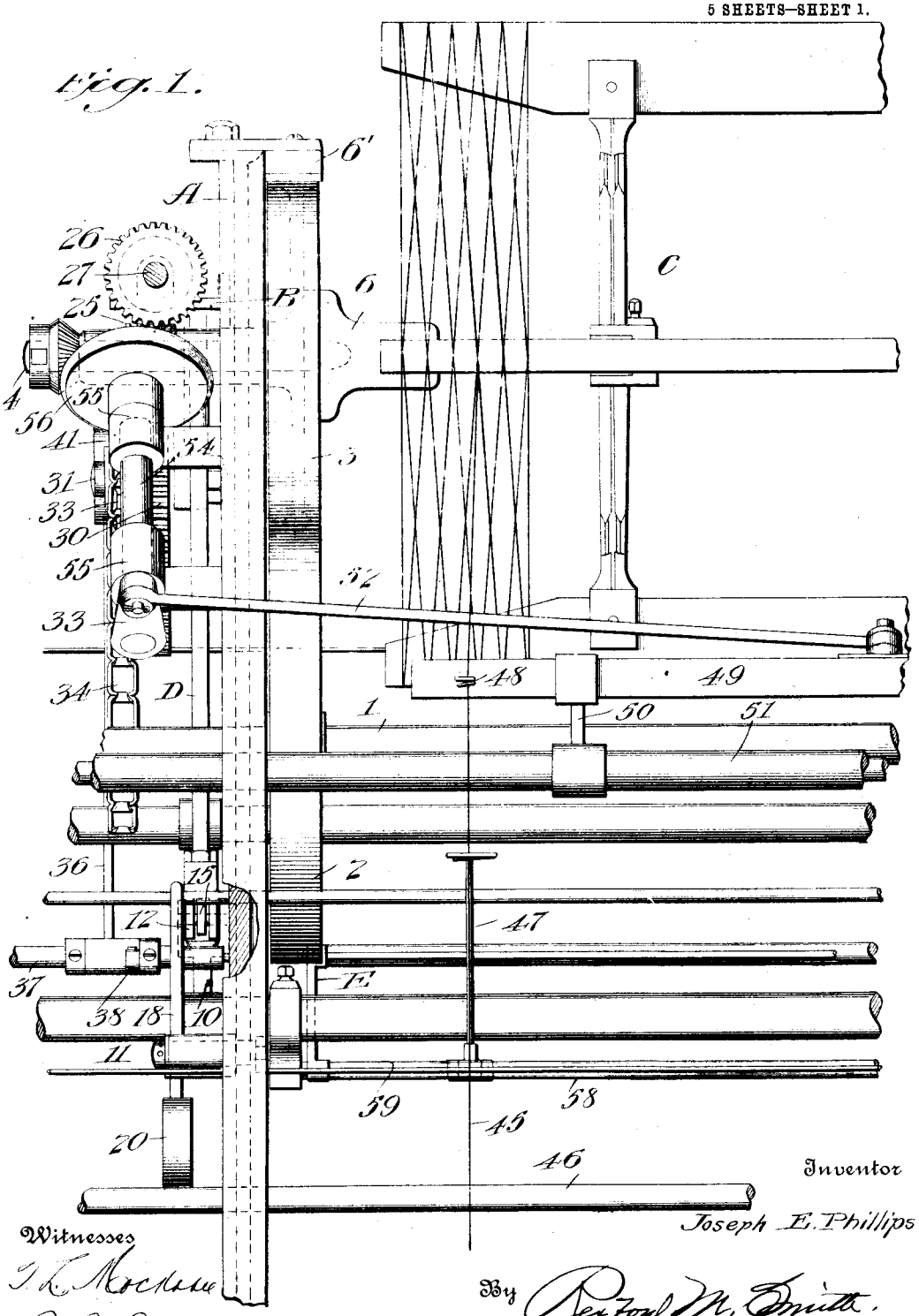
APPLICATION FILED MAR. 22, 1912.

1,066,143.

Patented July 1, 1913.

5 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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5 SHEETS—SHEET 2.

Fig. 2.

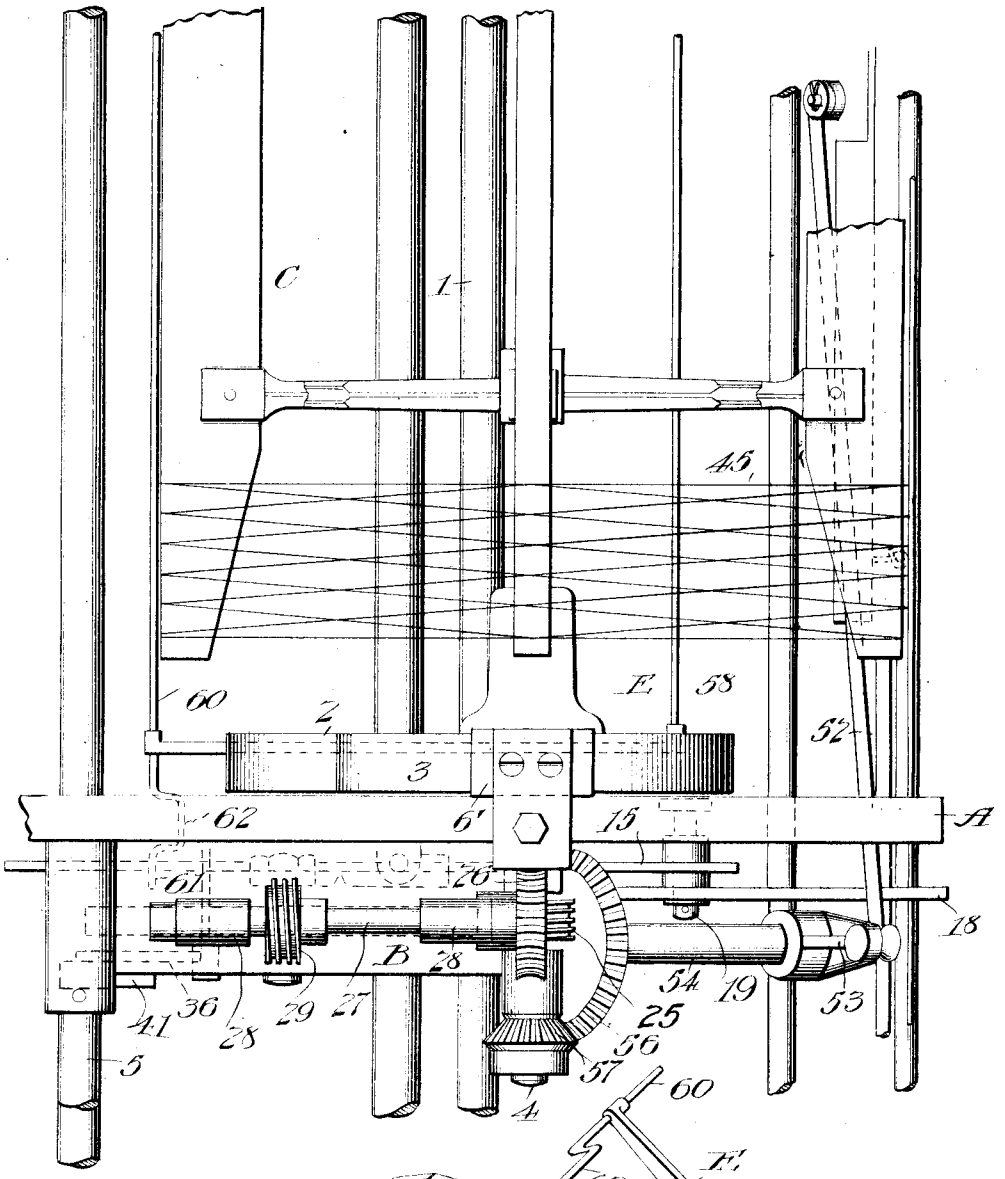


Fig. 10.

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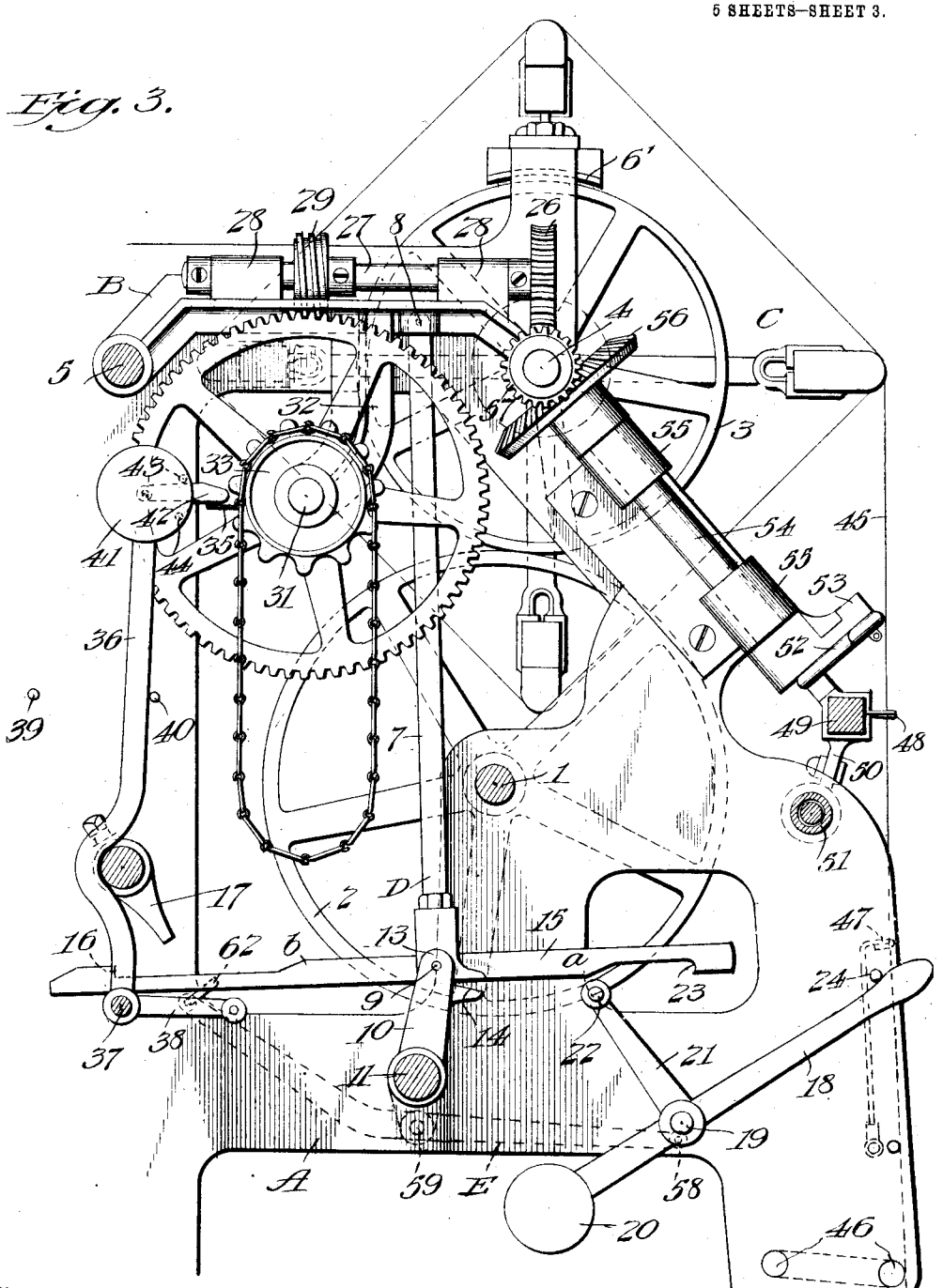
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5 SHEETS—SHEET 3.

Fig. 3.



Witnesses

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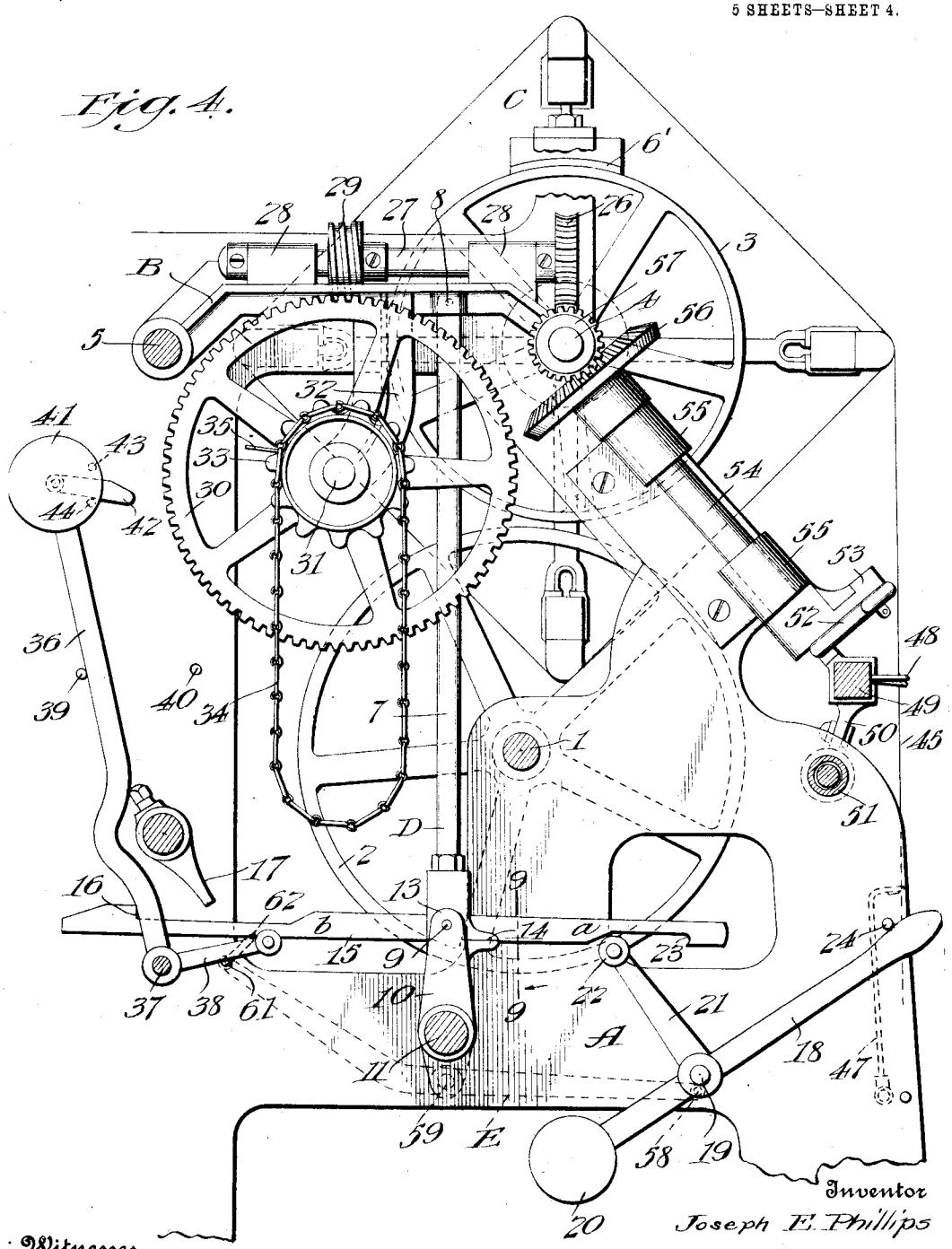
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5 SHEETS—SHEET 4.

Fig. 4.



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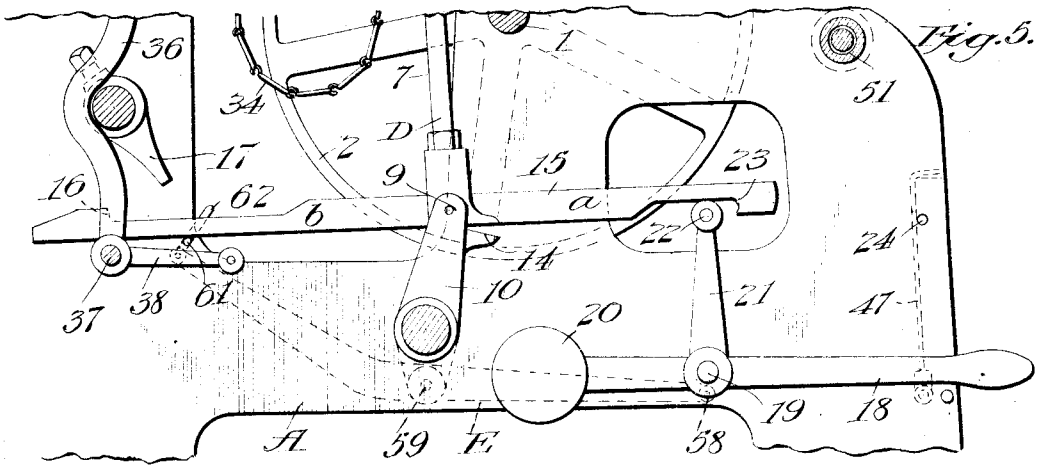
APPLICATION FILED MAR. 22, 1912.

1,066,143.

Patented July 1, 1913.

5 SHEETS—SHEET 5.

Fig. 5.



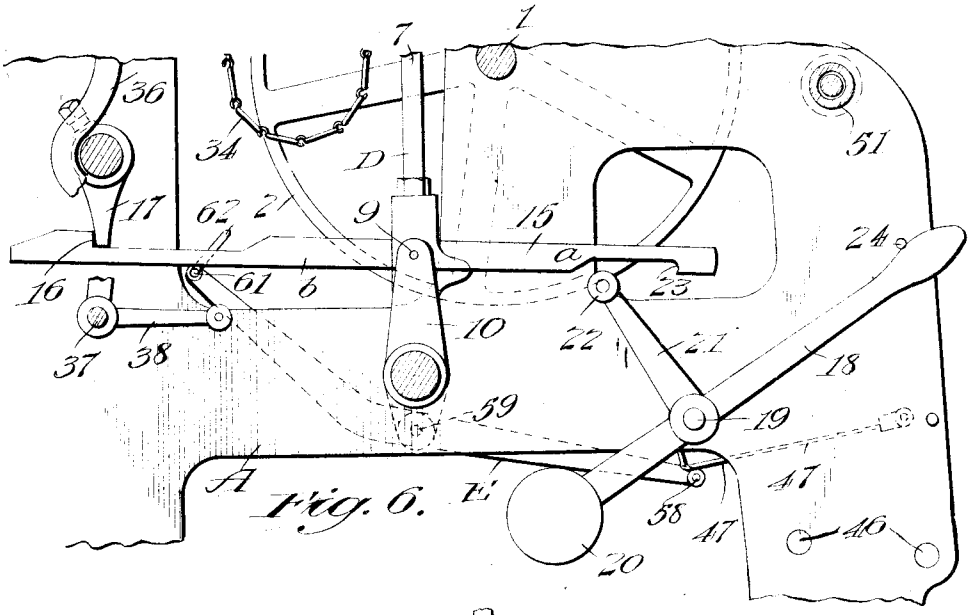


Fig. 6.

Fig. 7.

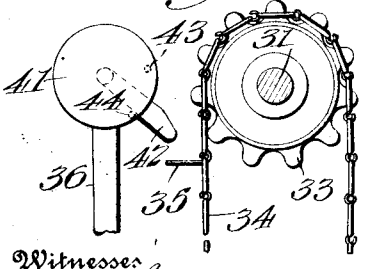


Fig. 9.

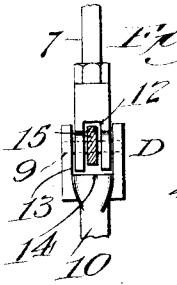
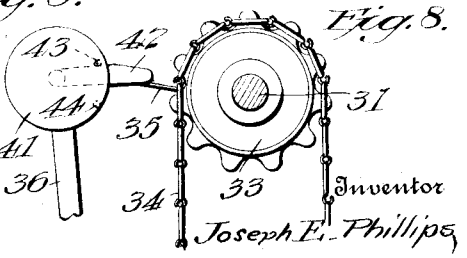


Fig. 8.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOSEPH E. PHILLIPS, OF YORK, PENNSYLVANIA.

REELING-MACHINE.

1,066,143. Specification of Letters Patent. Patented July 1, 1913.

Application filed March 22, 1912. Serial No. 685,504.

To all whom it may concern:

Be it known that I, JOSEPH E. PHILLIPS, a citizen of the United States, residing at York, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Reeling-Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a machine for reeling silk thread or the like and the improvements are directed to a novel, simple and effective driving means for the reel flies, including mechanism for throwing off the power when any thread breaks or when the desired number of yards have been reeled so that the flies can be abruptly stopped at the right time without the attention of the attendant.

In carrying out the invention, the friction driven pulley is carried by a swinging frame which, upon being lowered, engages the driven pulley with the driving pulley, and when raised, engages the driven pulley with a stationary brake shoe. The driven pulley is permanently carried by the swinging frame and one pulley may serve to drive a plurality of flies. The measuring or counting mechanism, whereby the machine is stopped when a given number of yards of thread are wound on the fly, is carried by the swinging frame so that when once adjusted, no changes are required or attention given thereto, as is necessary with that type of machine where the counting worm is mounted on the reel fly shaft and always removable therewith, and since the parts that go to make up the counting mechanism are always retained in their relative position and cannot get out of place, there is no danger of imperfect work being done by the machine. By mounting the friction-driven pulley on a swinging frame, as described, a better contact with the driving pulley is obtainable, and as one driven pulley will suffice for a number of flies, the individual flies are lightened so that they can be more easily handled, and as the result of the improved arrangement, the machine will run smoother and produce more and better work and can be more easily operated. The traverse mechanism has its bevel drive gear mounted on the shaft of the friction driven pulley and hence is carried by the swinging frame that carries the latter. In other words, the traverse bevel drive gear is no longer mounted on the fly wheel shaft but remains always in operative relation between the friction driven pulley and the traverse bar, so that no adjustment of the parts after the initial adjustment is required, and furthermore the danger of the teeth of the bevel gears slipping or jumping is obviated, so that imperfect traverse in the skeins, as sometimes happens in other machines, is overcome. The swinging frame that carries the driven pulley is raised and lowered by a toggle device so arranged that when the joint is broken, the driving and driven pulleys are in engagement and when the joint is straightened or closed, the driving engagement is discontinued and the driven pulley brought into engagement with the brake shoe. This toggle device is operatively related with a controlling lever whereby the power can be thrown on and operatively related with the thread break stop mechanism and the full skein stop mechanism, so that the toggle device can be straightened either when a thread breaks, or when the skeins are completed, to throw off the power.

For a more complete understanding of the invention, its objects and details of construction, reference is to be had to the accompanying drawings, which illustrate one embodiment of the invention, and in which:—

Figure 1 is a front view of that portion of a reeling machine to which the invention is applied. Fig. 2 is a plan view of Fig. 1. Figs. 3 and 4 are transverse sections taken on the same plane and to the right of Fig. 1, Fig. 3 showing the parts in the position they occupy when the machine is operating and when the power is about to be thrown off by the full skein stop mechanism, while Fig. 4 shows the parts in the position when the power is thrown off by said mechanism. Fig. 5 is a detail view of the lower portion of Fig. 3, showing the means for throwing on the power. Fig. 6 is a similar view showing how the power is thrown off by the breaking of a thread. Fig. 7 is a detail view of a part of the measuring or counting mechanism just prior to the finishing of the skeins. Fig. 8 is a similar view showing the parts at the instant the power is being thrown off. Fig. 9 is a detail sectional view on line 9—9, Fig. 4. Fig. 10 is a detail per-

spective view of a portion of the thread break stop mechanism.

Similar reference characters are employed to designate corresponding parts throughout the views.

It is to be understood that the improvements herein set forth are especially adapted for reeling machines of that type having two or more sets of flies disposed side by side, the flies of each set being in axial alinement and one driving mechanism is employed for each set, and the flies are independently removable so that new flies can be substituted for those filled with skeins. It is deemed unnecessary to show the complete machine, as the invention herein relates only to the frictional drive for the flies, the traverse mechanism, the automatic means for throwing off the power when the thread breaks and when the skeins are completed, and the operator's mechanism for throwing on the power, all of which parts are arranged at one place in the machine, where they take up little room and can be incased in a dustproof housing.

Referring to the drawings, A designates a portion of the frame structure in which is journaled the main driving shaft 1 that has secured thereto the driving pulley 2 from which the power is derived for operating the flies. Disposed above the driving pulley 2 and in such relation as to rest on the latter is the driven pulley 3 which is secured to a short shaft 4 that is journaled in the free end of a swinging frame B which is pivoted to swing on a shaft 5 that extends longitudinally of the machine inwardly or behind the driven pulley. A coupling means 6, Fig. 1, detachably connects the fly C with the driven pulley 3 which always remains in place and is not removed with the fly, as is common in machines with which I am acquainted.

Situated above the pulley 3 and fixed on the frame A is a stationary brake shoe 6′ spaced from the driving pulley 2 a distance slightly greater than the diameter of the driven pulley so that when the latter is in engagement with the driving pulley, it will be out of engagement with the brake shoe and vice versa.

To throw the driven pulley 3 into and out of engagement with the driving pulley, a toggle device D, Figs. 3, 4, 5 and 6, is employed, the same consisting of a rod 7 which has its upper end pivoted at 8 with the swinging frame or arm B and its lower end pivotally connected at 9 with an arm 10 which turns on the shaft 11 as an axis. The meeting or joined ends of the members 7 and 10 of the toggle device are bifurcated as shown in Fig. 9, and the bifurcations 12 of the upper member 7 extend between the bifurcations 13 of the lower member 10, and the bifurcations 12 are adapted to coöperate with the surface 14 of the lower member to form a knuckle joint so that the toggle device can collapse or break only in one direction or toward the right from the position shown in Fig. 4 to that shown in Fig. 3. When the toggle device collapses, the driven pulley drops into engagement with the driving pulley and receives rotation from the latter, and when the toggle joint is straightened, the driven pulley is disengaged from the driving pulley and engaged with the brake shoe so that the rotation of the flies is abruptly stopped.

Passing between the bifurcations 12, Fig. 9, is a lever 15 which has its arm *a* lighter than the arm *b* and this lever is fulcrumed on the pintle 9 of the knuckle joint of the toggle device. On the rear or heavier arm of the lever 15 is an upstanding shoulder or abutment 16 that is adapted to be engaged with the lower end of a rocking actuator or knock-off 17 which is constantly rocking, the engagement of the rocking knock-off 17 with the shoulder 16 being possible only when the rear end of the lever 15 is raised through the agency of the thread-break stop mechanism or the full skein stop mechanism, as will be hereinafter more fully described. By the knock-off 17 engaging the shoulder 16, the lever 15 is moved longitudinally rearwardly to straighten the toggle device and throw off the power. The power is thrown on by means of a controller or lever 18 which is fulcrumed at 19 on the frame A and has a weight 20 for retracting it to inoperative position after being actuated, and on the lever is an arm 21 which extends upwardly under the front end of the lever 15 so that the upper end of the arm, which may be equipped with a roller 22, may engage with the shoulder 23 on the under side of the lever 15, the shoulder being so positioned that by depressing the handle of the lever 18, the arm 21 will move toward and engage the shoulder 23 and impart longitudinal movement of the lever 15 to the right, Fig. 4, and thereby cause the toggle joint to break, as shown in Fig. 5, to throw on the power. When the power is thrown on, the operator releases the lever 18 which gravitates to the position shown in Fig. 4, where it is arrested by a stop 24 with which the handle end of the lever engages. When the lever is in retracted position, there is sufficient space between the upper end of the arm 21 and the shoulder 23 that the lever 15 is free to move under the action of the knock-off 17 when the breaking of a thread or the completion of the skeins necessitates throwing off of the power.

The mechanism which measures the thread or yarn as it is wound on the fly and interrupts the running of the machine when a given length is wound, is driven from the

friction driven pulley 3, there being on the shaft 4 of the latter a worm 25, Fig. 2, which meshes with the worm gear 26 on a shaft 27 that is rotatable in journals 28 on the swinging frame B, and on the shaft 27 is a worm 29 which in turn meshes with the large gear wheel 30 rotatable on a stub shaft 31 that is supported on a hanger or depending arm 32 carried by the swinging frame B. On the shaft 31 is a sprocket wheel 33 with which engages an endless chain 34 that travels continuously in one direction as the flies rotate. When the fly has rotated a sufficient number of times to wind a given length of thread, the chain will have traveled a sufficient distance to throw off the power by means of one or more lugs or fingers 35 carried by and projecting from the chain. This finger 35 is adapted to operate on a throw-off lever 36 which is fulcrumed on the structure A, at 37, said lever having an arm 38 which engages under the arm *b* of the lever 15 so that such arm *b* will be raised into the path of the rocking knock-off 17 to effect the stopping of the machine. The lever or device 36 is movable between two stops 39 and 40 on the main frame A, the said stops being located at sides of the vertical line passing through the pivotal center 37. The throw-off lever 36 carries at its upper end a weight 41 which holds the lever to one side or the other of a vertical line and against either stop 39 or 40. Projecting from the weight is a pivoted finger or equivalent device 42 which has a limited swinging movement between stops 43 and 44 on the weight, and this finger is in the path of the finger 35 on the chain when the lever 36 bears against the stop 40 so that as the finger 35 ascends at the left side of the chain 34, it will approach the finger 42, as shown in Fig. 7 and engage under the same as shown in Fig. 3, as the chain continues its movement and eventually raise the finger and cause the lever 36 to swing laterally to and beyond a neutral or vertical position from which it will gravitate to the position shown in Fig. 4, and rest against the stop 39, thereby raising the lever 15 into a position where the rocking knock-off 17 will operate on the toggle device D to change the parts from the position shown in Fig. 3 to that shown in Fig. 4, and as the result, the machine is stopped. When new or empty reel flies are put into the machine, the operator throws the weighted knock-off lever 36 outwardly where it will bear against the stop 40, and the finger 42, which is now in its lowered position, will pass under the finger 35 on the chain so that the chain can continue to make another flight as the new skeins are wound on the flies, the movement of the sprocket wheel 33 and hence chain 34 being clockwise. The speed reduction between the driving pulley and sprocket wheel is of such ratio and the length of the sprocket chain of such dimension, according to the scale used in the drawings, that five hundred yards of thread to each link of the chain will wind on the flies before the power is thrown off automatically.

Taking up now the traverse mechanism, the thread 45 is supplied from spools or other carriers arranged as in the usual manner at the bottom of the machine, and after passing around tension bars 46, the threads extend through fallers 47 and through traverse guides 48 on the traverse bar 49, which reciprocates in the usual manner and lays the threads in proper relation on the fly. The traverse bar slides in supports 50, one of which is shown in Fig. 1, said supports being mounted on a shaft 51. The reciprocation of the bar is effected by a connecting rod 52 which is attached to a rotating crank arm 53 fastened to the lower end of a shaft 54, said shaft being journaled in bearings 55 on the main frame A and having at its upper end a driven bevel gear 56 with which meshes a driving gear 57 on the shaft 4 of the driven pulley 3 so that as the pulley rotates, there will be a continuous reciprocation of the traverse bar. It will be observed that as the driving bevel gear 57 is not attached to the fly shaft, as is commonly the case in machines with which I am acquainted, the relation of the traverse device with the driven pulley 3 is never altered, and as the result, perfect work can be done and slipping of the cogs is prevented. Provision is made to operate the toggle device D by the dropping of any faller 47 through a frame E which extends horizontally of the machine under the main driving shaft 1. This frame E has a front horizontal bar 58, Fig. 2, so located that when any faller drops, it will strike the bar 58 and cause the frame to rock on a shaft 59, Fig. 1 as a center, thus throwing the rear bar 60 of frame E, Figs. 2 and 10, upwardly, said rear bar 60 having one end extended into a member 61 which engages under the toggle-operating lever 15, thus elevating the lever when the frame E is elevated and bringing the shoulder 16 into the path of the rocking knock-off 17, and consequently the power will be thrown off when any faller drops. When the device is re-set after the ends of the broken thread are connected, the frame E will return with the other parts to normal or operative position. As shown in Figs. 2 and 10, the bar 60 has an offset 62 so as to straddle and pass beyond the main frame A, as the faller-operated frame E is located at one side of the main frame A while the lever 15 is at the opposite side.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily

apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described the invention, what I claim as new, is:—

1. In a reeling machine, the combination of a driving pulley, a driven pulley, a fly operated thereby, a movable frame on which the driven pulley is mounted, a brake shoe, a toggle device connected with the frame for moving the driven pulley from the driving pulley to the brake shoe or vice versa, said device comprising upper and lower members hingedly connected together with the lower end of the lower member relatively fixed and the upper end of the upper member connected with the movable frame, a member connected with the toggle device, a manually operated controller under and engageable with one end of the member for collapsing the toggle device to engage the pulleys, and an automatic stop mechanism engageable with the other end of the member for disengaging the pulleys and engaging the driven pulley with the brake shoe.

2. In a reeling machine, the combination of a driving pulley, a brake shoe, a driven pulley engageable with the driving pulley or brake shoe, a movable frame supporting the driven pulley, a toggle device connected with the said frame for moving the same to engage the driven pulley with the brake shoe or driving pulley, a member connected with the joint of the toggle device and extending therefrom in opposite directions, a starting lever normally disconnected from the member and engageable with one end thereof for breaking the joint of the toggle device, a constantly moving actuator, and means for automatically throwing the other end of the member into engagement with the actuator to move the toggle device to a position to stop the machine.

3. In a reeling machine, the combination of a driving pulley, a brake shoe, a driven pulley engageable with the driving pulley or brake shoe, a movable frame supporting the driven pulley, a toggle device connected with the said frame for moving the same to engage the driven pulley with the brake shoe or driving pulley, a lever connected at an intermediate point with the joint of the toggle device, a starting means engageable with one end of the lever for breaking the joint of the toggle device to start the machine, a constantly moving actuator, and separate means for moving the opposite end of the lever into coöperative relation with the actuator for straightening the joint of the toggle device when the power is to be thrown off.

4. In a reeling machine, the combination of a driving pulley, a driven pulley, a fly rotated thereby, a swinging frame supporting the driven pulley, a measuring device carried wholly by the said frame and operatively connected with the driven pulley, means for moving the said frame to engage and disengage the pulleys, a starting controller operating through the said means to engage the pulleys, a throw-off means operated by the measuring device and operating through the first-mentioned means for disengaging the pulleys.

5. In a reeling machine, the combination of a driving pulley, a driven pulley, a fly rotated thereby, a movable frame supporting the driven pulley, a measuring device carried entirely by the said frame and operatively connected with the driven pulley, means for moving the frame to engage and disengage the pulleys, a starting controller operating through the said means for engaging the pulleys, a throw-off means operated by the measuring device and operating through the first-mentioned means for disengaging the pulleys.

6. In a reeling machine, the combination of a driving element, a driven element frictionally engageable therewith, a reel fly operated by the driven element, a brake shoe, a swinging frame carrying the driven element, a measuring device operated by the driven element and mounted on the said frame whereby the weight of the device and said frame are added to the driven element to maintain the latter in frictional engagement with the driving element, means for moving the said frame for shifting the driven element from the driving element to the brake shoe or vice versa, and means controlled by the measuring device and operating through the first-mentioned means for moving the said frame in a direction to disengage the said elements.

7. In a reeling machine, the combination of a driving element, a driven element disposed over the driving element to bear thereon, a reel fly rotated by and detachable from the driven element, a movable frame in which the driven element is permanently supported, a worm operated by the driven element, a gear meshing with the worm, a second worm, a gear driven thereby, said gears and worms being carried by the said frame to supplement the weight of the latter and of the driven pulley for maintaining the latter in frictional driving contact with the driving pulley, means for moving the frame to throw the driven element into and out of engagement with the driving element, a throw-off device operating through the means to disengage the elements, and

means operated by the last mentioned gear wheel for actuating the throw-off device when a given length of thread is wound on the fly.

8. In a reeling machine, the combination of a driving pulley, a driven pulley, a fly rotated thereby, a movable carrier for the driven pulley, a rod connected with the carrier, a movable arm, a knuckle joint between the arm and rod, a lever connected with the knuckle joint and having one arm heavier than the other, a constantly moving actuator away from which the heavier arm gravitates, means for throwing the heavier arm into engagement with the actuator to move the lever longitudinally for closing the knuckle joint and disengaging the pulleys, and means operatively related to the lighter arm of the lever to break the joint for engaging the pulleys.

9. In a reeling machine, the combination of a driving pulley, a driven pulley, a fly rotated thereby, a brake shoe, a frame carrying the movable pulley, a toggle device connected with the said frame, a lever connected with the joint of the toggle device, shoulders on the levers, a manually operated means for engaging one shoulder to break the toggle device to engage the pulleys, a constantly moving actuator adapted to engage the other shoulder for straightening the toggle device and throwing the driven pulley from the driving pulley to the brake shoe, a thread break stop for moving the lever into engagement with the said actuator to stop the machine, and a full skein stop also for throwing the lever into engagement with the actuator to stop the machine.

10. In a reeling machine, the combination of a driving pulley, a driven pulley, a fly rotated thereby, a brake shoe, a frame carrying the movable pulley, a toggle device connected with the said frame, a lever fulcrumed intermediate its ends at the joint of the toggle device, shoulders on opposite ends of the lever, a starting lever normally retracted from and engageable with one of the shoulders to move the lever longitudinally to break the toggle device and thereby engage the driven with the driving pulley, a constantly moving actuator normally out of engagement with the other shoulder of the lever, and means for automatically engaging said other shoulder with the actuator when the driven pulley is to be disengaged from the driving pulley to stop the machine.

11. In a reeling machine, the combination of a driving pulley, a driven pulley, a fly rotated thereby, a brake shoe, a frame carrying the movable pulley, a toggle device connected with the said frame, a lever fulcrumed intermediate the ends at the joint of the toggle device, shoulders on opposite ends of the lever, a starting lever normally retracted from and engageable with one of the shoulders to move the lever longitudinally to break the toggle device and thereby engage the driven with the driving pulley, a constantly moving actuator normally out of engagement with the other shoulder of the lever, a throw-out lever adapted when in one position to engage the first-mentioned lever with the actuator, and a measuring device operated by the driven pulley for controlling the throw-out lever.

12. In a reeling machine, the combination of a driving pulley, a driven pulley, a fly rotated thereby, a brake shoe, a movable carrier for the driven pulley, means for moving the carrier for shifting the driven pulley from the driving pulley to the brake shoe and vice versa, a lever connected with the said means for actuating the same, a controller normally disengaged from the lever and engageable therewith for moving the said means in one direction, a continuously rocking actuator with which the lever is adapted to engage to move the said means in the opposite direction, separate devices for moving the lever into engagement with the said rocking actuator, a measuring mechanism operatively related with the driven pulley for controlling one of the said devices, and fallers arranged to operate the other device when any thread breaks.

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

JOSEPH E. PHILLIPS.

Witnesses:

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MARY E. LEADER.