

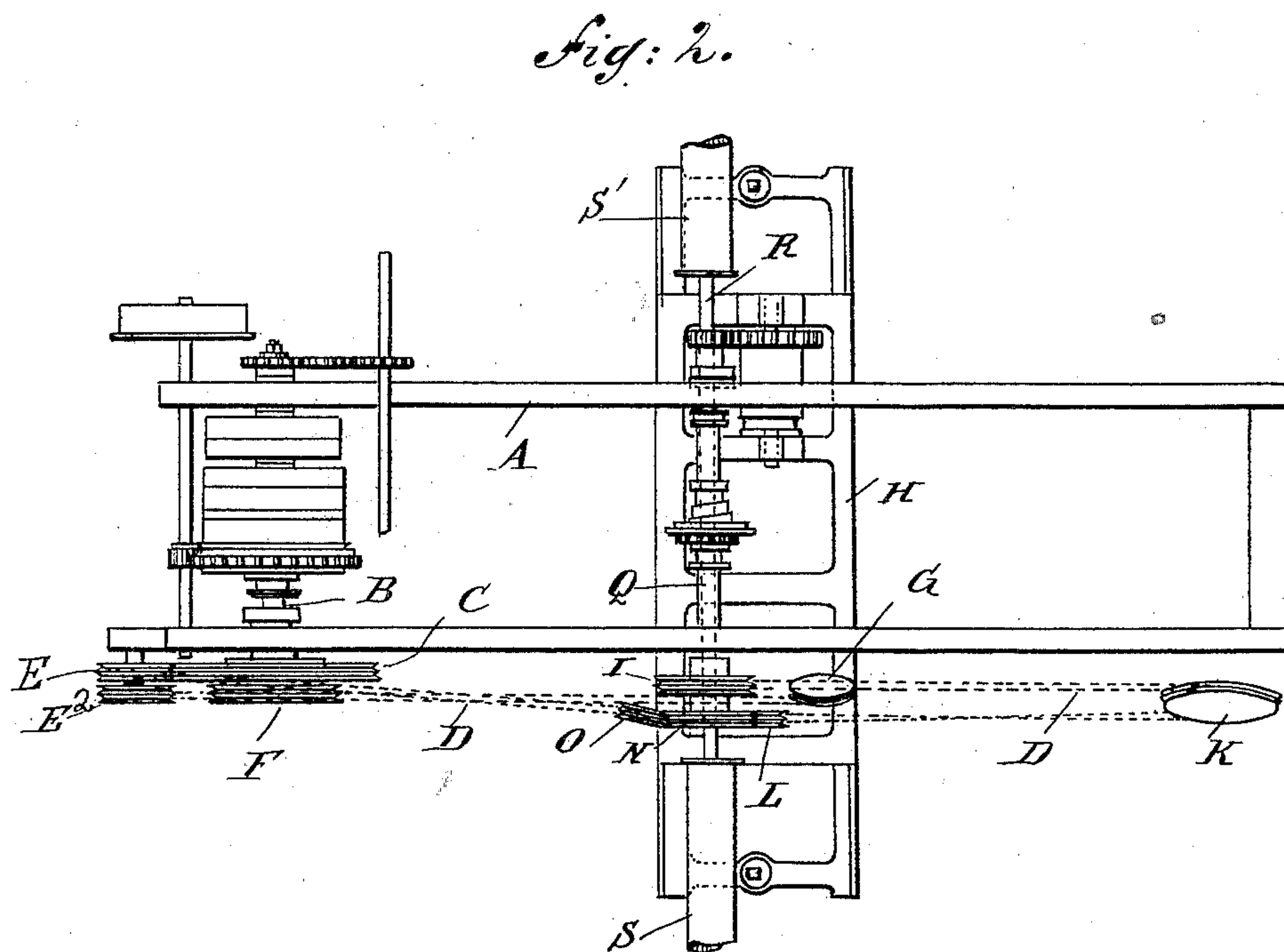
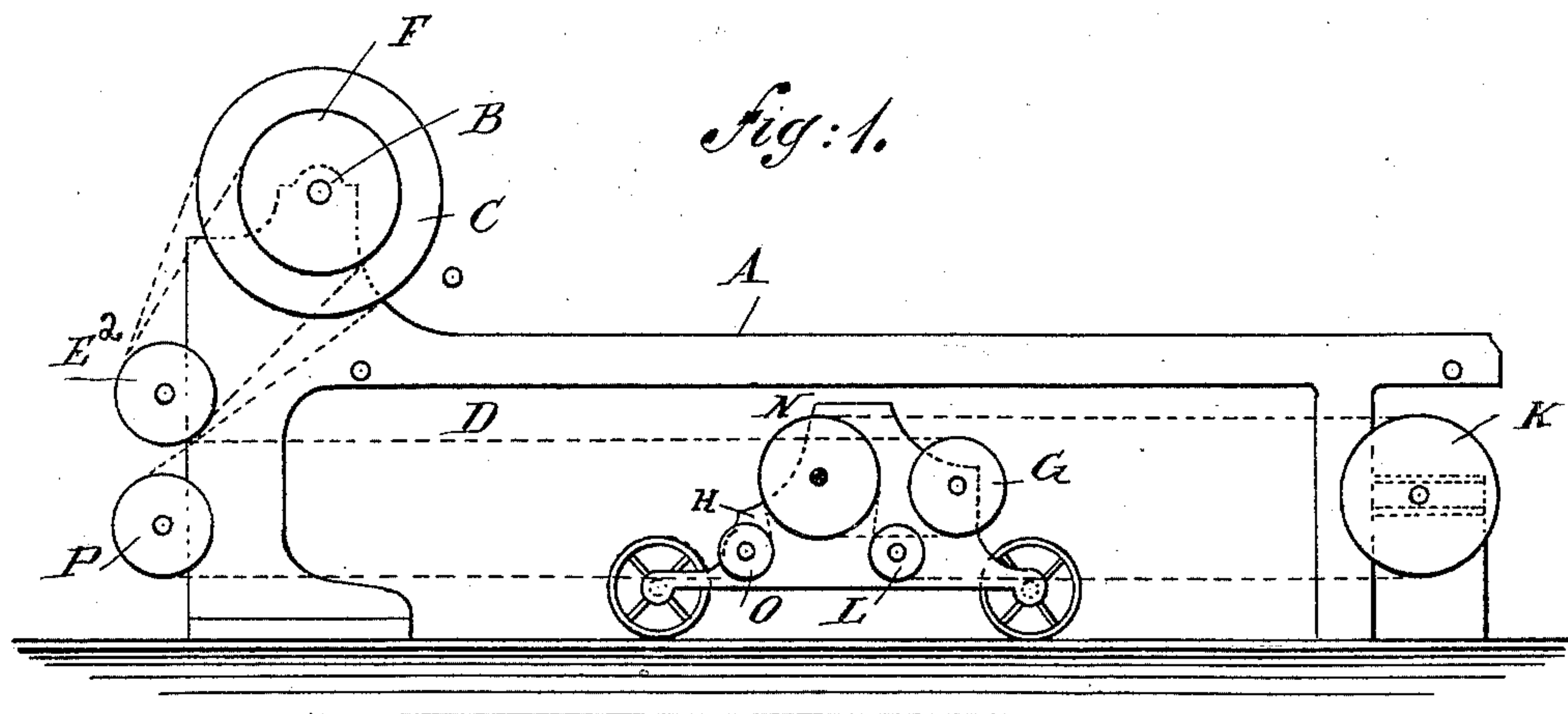
(No Model.)

2 Sheets—Sheet 1.

R. SCHNEIDER.
SELF ACTING MULE.

No. 462,167.

Patented Oct. 27, 1891.



WITNESSES:

Chas. Nida.
E. M. Clark

INVENTOR:

R. Schneider
BY
Munn & Co
ATTORNEYS

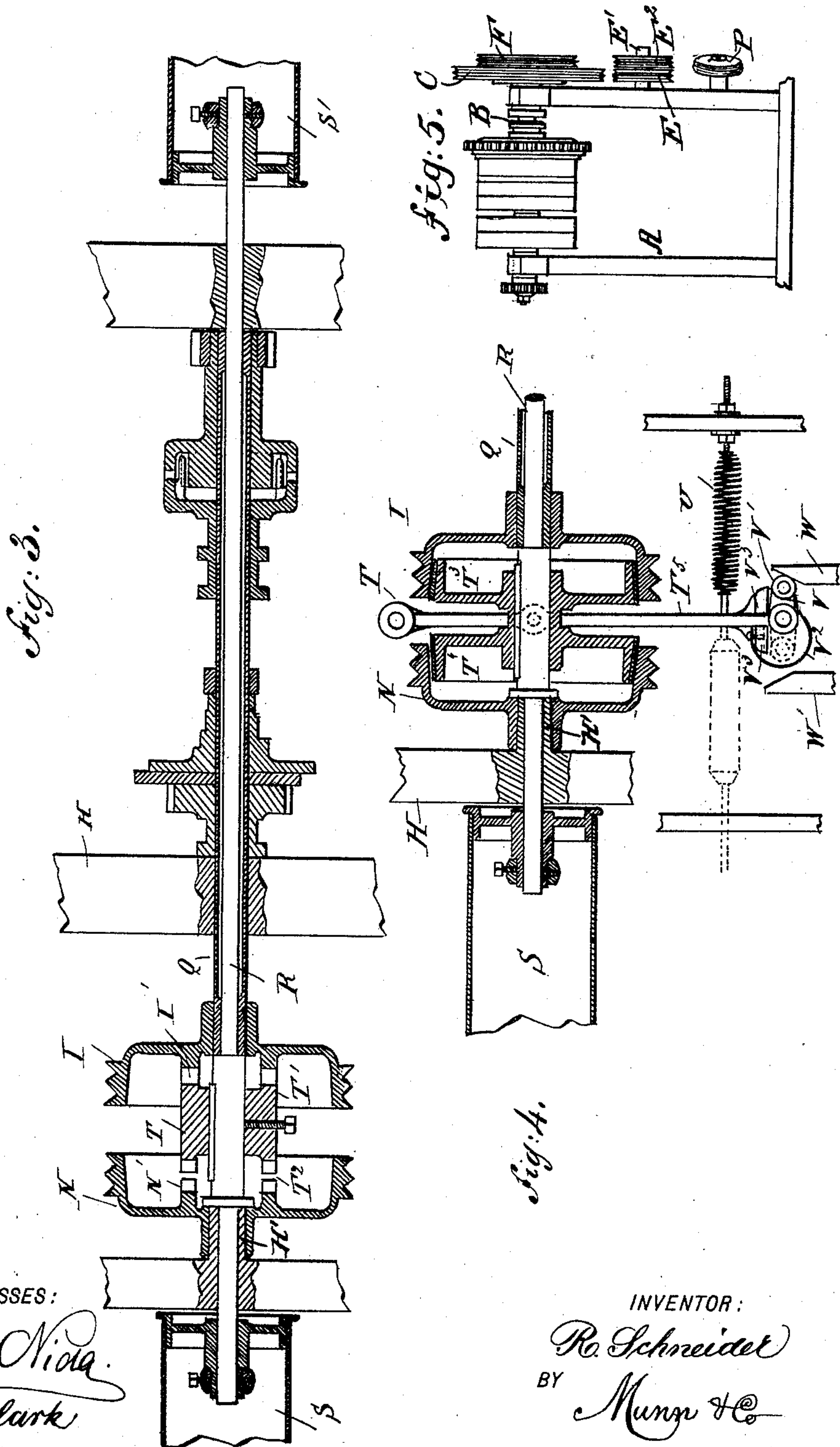
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UNITED STATES PATENT OFFICE.

ROBERT SCHNEIDER, OF BIELA, NEAR BIELITZ, AUSTRIA-HUNGARY,
ASSIGNOR TO ALBERT HOEHNE, OF NEW YORK, N. Y.

SELF-ACTING MULE.

SPECIFICATION forming part of Letters Patent No. 462,167, dated October 27, 1891.

Application filed July 26, 1890. Serial No. 360,048. (No model.)

To all whom it may concern:

Be it known that I, ROBERT SCHNEIDER, of Biela, near Bielitz, Galicia, Austria-Hungary, have invented a new and Improved Self-Acting Mule, of which the following is a full, clear, and exact description.

The invention relates to spinning-machines; and its object is to provide a new and improved self-acting mule especially designed to rotate the spindles at the same speed and either to the right or to the left, for spinning thread right or left hand, as desired, and for double spinning, and to produce from low-priced material good thread by first spinning the material to the right hand and then to the left hand, or vice versa.

The invention consists of a driving-band passing over a series of double-grooved pulleys, of which two pulleys are loosely mounted on the spindle-driving shaft and are each adapted to be alternately engaged with or disengaged from the said spindle-driving shaft.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement with the spindle-driving shaft in section. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged transverse section of part of the carriage and its shaft. Fig. 4 is a similar view of a modified form of the coupling between two grooved pulleys on the carriage-shaft, and Fig. 5 is an end view of the improvement.

The improved self-acting mule is provided with the usual frame A, on one end of which is mounted a shaft B, receiving a rotary motion in the usual manner. On the shaft B is secured a double-grooved pulley C, over which passes a driving band or belt D. The said band after passing over the first groove in the pulley C passes over the first groove in the double-grooved pulley E, mounted to turn loosely on a stud E', carrying a second grooved pulley E² and secured on one end of the frame A. The band then passes from the first groove

of the pulley E to the first groove of the pulley F, secured on the shaft B alongside the pulley C, previously mentioned. Then the band passes from this first groove of the pulley F to the first groove of the pulley E² and from the latter to the first groove of a double pulley G, mounted to turn in suitable bearings on the carriage H, which is mounted to travel in the usual manner in the frame A. From the first groove in the pulley G the band passes to the first groove of a double pulley I and from the latter to the first groove of a double-grooved tension-pulley K, fitted to slide longitudinally, so as to give the proper tension to the belt D. From the first groove in the pulley K the belt or band passes to the second groove of the double pulley L and from the latter to the second groove of the double pulley N, from which the band passes to the second groove of the double-grooved pulley O, which, with the pulleys I, N, G, and L, is mounted on the carriage H and travels with the same. From this pulley O the band or belt D passes to the second groove of a double-grooved pulley P, mounted to turn in suitable bearings on the end of the frame A, directly below the pulley E, previously mentioned. From the pulley P the band passes upward to the second groove of the pulley C, then to the second groove of the pulley E, then to the second groove of the pulley F, then to the second groove of the pulley E², and from there back to the carriage over the several pulleys thereon, in the same order as above mentioned, with the difference that instead of passing to the first groove it passes to the second groove of the said pulleys, or vice versa.

The double-grooved pulleys I and N are of the same diameter and are placed in axial line with each other. The grooved pulley I (see Fig. 3) is secured on a sleeve Q, mounted to turn in suitable bearings in the carriage H. Through the sleeve Q passes a shaft R, carrying at its ends the spindle-drums S and S', connected in the usual manner with the spindles. The pulley N is mounted to turn loosely on a sleeve H', secured on or integral with the frame of the carriage H and surrounding the shaft R.

Between the two pulleys I and N is located a coupling device T, which may be of

the construction shown in Fig. 3, or like that illustrated in Fig. 4. The coupling T turns with and is splined on the shaft R, so that it can be thrown in contact with either the pulley I or the pulley N. As shown in Fig. 3, the coupling T consists of a double-faced clutch-wheel having at opposite ends teeth T' and T² adapted to engage similar clutch-teeth I' and N', respectively formed on the webs of the pulleys I and N. On the coupling T is held a set-screw, which, when screwed up, serves for fastening the coupling in place on the shaft R, when the coupling is in mesh with either of the pulleys. This is at times desirable, especially when a certain quantity of yarn is spun having a twist in the direction in which the respective pulley turns. By fastening the coupling in place by the set-screw the coupling is not liable to accidentally slide on the shaft R to disengage the respective pulley and to engage with the other pulley. As illustrated in Fig. 4, the coupling T is provided with two conical friction-wheels T³ and T⁴, adapted to be thrown in contact with the inside of the similarly-shaped rims of the pulleys I and N, respectively. A lever T⁵ is loosely connected with the coupling T and is fulcrumed on the carriage H. The coupling T serves to alternately engage and disengage either of the two pulleys I and N until the parts operating the lever T⁵ are reversed, when the said coupling alternately engages and disengages the other pulley. The free end of the lever T⁵ is acted on by a spring U for holding the lever in position, which spring U can be changed from right to left, as illustrated in dotted lines in Fig. 4, so as to hold the said lever in a right or left hand position. On the free end of the lever T⁵ is pivoted an arm V, carrying a friction-roller V', and against which presses a spring V², so as to hold the said arm in position against the projection V³, located at the rear of the arm V. When the lever T⁵ is in the position shown in Fig. 4, the arm V stands to the right and its friction-pulley is adapted to be engaged when the carriage moves to one end of the frame A by a beveled fixed arm W, so that the position of the lever T⁵ is shifted and the coupling T is disconnected from the pulley I, whereby the shaft R ceases to rotate. When the position of the arm V is changed, as illustrated in dotted lines in Fig. 4, and the spring V² shifted to the opposite projection V³, then the friction-roller V' is adapted to be engaged by a beveled fixed arm W', held opposite the arm W and serving to disconnect the coupling T from the grooved pulley N, it being understood that the coupling T had been in such a position as to connect the pulley N with the shaft R.

The operation is as follows: When the shaft B is rotated, a rotary motion is transmitted by the driving band or belt D to the pulleys I and N, so that the latter rotate in opposite directions. The pulley I rotates the sleeve Q, which is connected in the usual

manner with other parts of the mechanism of the spinning-machine, in order to set the said parts in motion in the usual manner. When the coupling T is in gear with the pulley I, the shaft R is rotated in the same direction in which the pulley I turns, so that the spindle-drums S and S' rotate in the same direction. Now when it is desired to change the movement of the spindles driven from the drums S and S' the coupling T is disconnected from the pulley I and connected with the pulley N, which rotates in an opposite direction from the pulley I. The shaft R consequently now turns in the same direction with the pulley N, and the motion of the drums S and S' and the spindles driven from the same is reversed. As previously described, an intermediate position of the coupling takes place when the friction-roller V' travels up the bevel of the fixed arm W or W'. Thus it will be seen that by simply changing the position of the coupling T the motion of the spindles can be readily reversed without changing the position of the driving bands or belts on the pulleys, as has been necessary heretofore in order to accomplish the same result. In working low-priced material to produce a high grade of yarn it is necessary to twist the material first in one direction and then it is spun a second time, but with the twist in the opposite direction, thus subjecting the material to a double spinning. By the above apparatus this double spinning is readily accomplished on the same machine by the shifting of the several parts, as described, and without changing the position of the driving-belt on the several pulleys.

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

1. In a self-acting mule, the combination, with a spindle-driving shaft, of a coupling fitted to slide on and to turn with the said shaft, grooved pulleys fitted to turn loosely on the said shaft and either adapted to be alternately engaged and disengaged by the said coupling, and a driving-belt passing over said pulleys in opposite directions, substantially as shown and described.

2. In a self-acting mule, the combination, with a driving-band, of a spindle-driving shaft carrying the spindle-drums, a reversing mechanism comprising a coupling mounted to turn with and to slide on the said shaft, and pulleys adapted to be driven from the said band in opposite directions, the coupling and pulleys being arranged so that the former alternately engages and disengages either of the said pulleys, substantially as shown and described.

3. In a self-acting mule, the combination, with grooved pulleys mounted on the main frame, and a driving band or belt passing over the said pulleys, of a carriage mounted to travel and carrying a series of grooved pulleys, over which passes the said driving band or belt, a spindle-driving shaft mounted

on the said carriage and carrying the spindle-drums, on which are also mounted to rotate loosely two of the said carriage-pulleys, and a coupling fitted to slide on and to turn with
5 the said shaft and adapted to alternately connect and disconnect with either of the said two pulleys with the said shaft, substantially as shown and described.

10 4. In a self-acting mule, the combination, with grooved pulleys mounted on the main frame, and a driving band or belt passing over the said pulleys, of a carriage mounted to travel and carrying a series of grooved pulleys, over which passes the said driving
15 band or belt, a spindle-driving shaft mounted on the said carriage and carrying the spindle-drums, on which are also mounted to rotate loosely two of the said carriage-pulleys, and a coupling fitted to slide on and to turn with
20 the said shaft and adapted to alternately engage or disengage either of the said pulleys or to assume an intermediate position, wherein it is disconnected from both pulleys, substantially as shown and described.

25 5. In a self-acting mule, the combination, with grooved pulleys mounted on the main frame, and a driving band or belt passing over the said pulleys, of a carriage mounted to travel and carrying a series of grooved pul-
30 leys, over which passes the said driving band

or belt, a spindle-driving shaft mounted on the said carriage and carrying the spindle-drums, on which are also mounted to rotate loosely two of the said carriage-pulleys, a coupling fitted to slide on and to turn with
35 the said shaft and adapted to alternately engage or disengage either of the said pulleys or to assume an intermediate position, wherein it is disconnected from both pulleys, and means, substantially as described, for moving
40 the said coupling into an intermediate position, as set forth.

6. In a self-acting mule, the combination, with a driving-band, of a spindle-driving shaft carrying the spindle-drums, a reversing
45 mechanism comprising a coupling mounted to turn with and to slide on the said shaft, and pulleys adapted to be driven from the said band in opposite directions, the coupling and
50 pulleys being arranged so that the former engages and disengages either of the said pulleys, and means, substantially as described, for alternately engaging the said coupling with either of the said pulleys or disengaging it from the same, as set forth.

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Witnesses:

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SALOMON BELVY.