(No Model.) 3 Sheets—Sheet 1.

A. A. WOOD.

SPRING MOTOR.

No. 458,123. Patented Aug. 18, 1891.

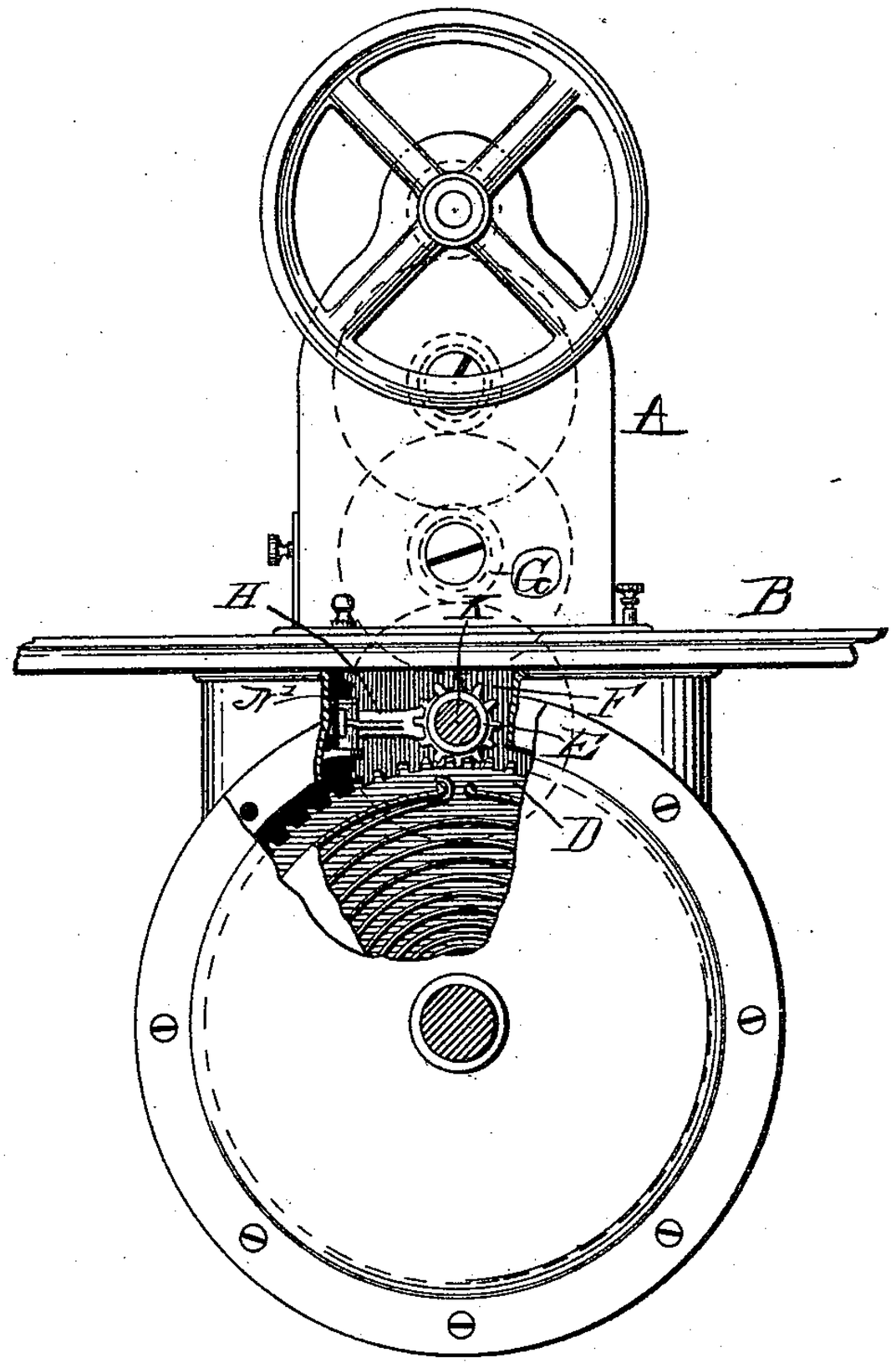

Fig. 1.

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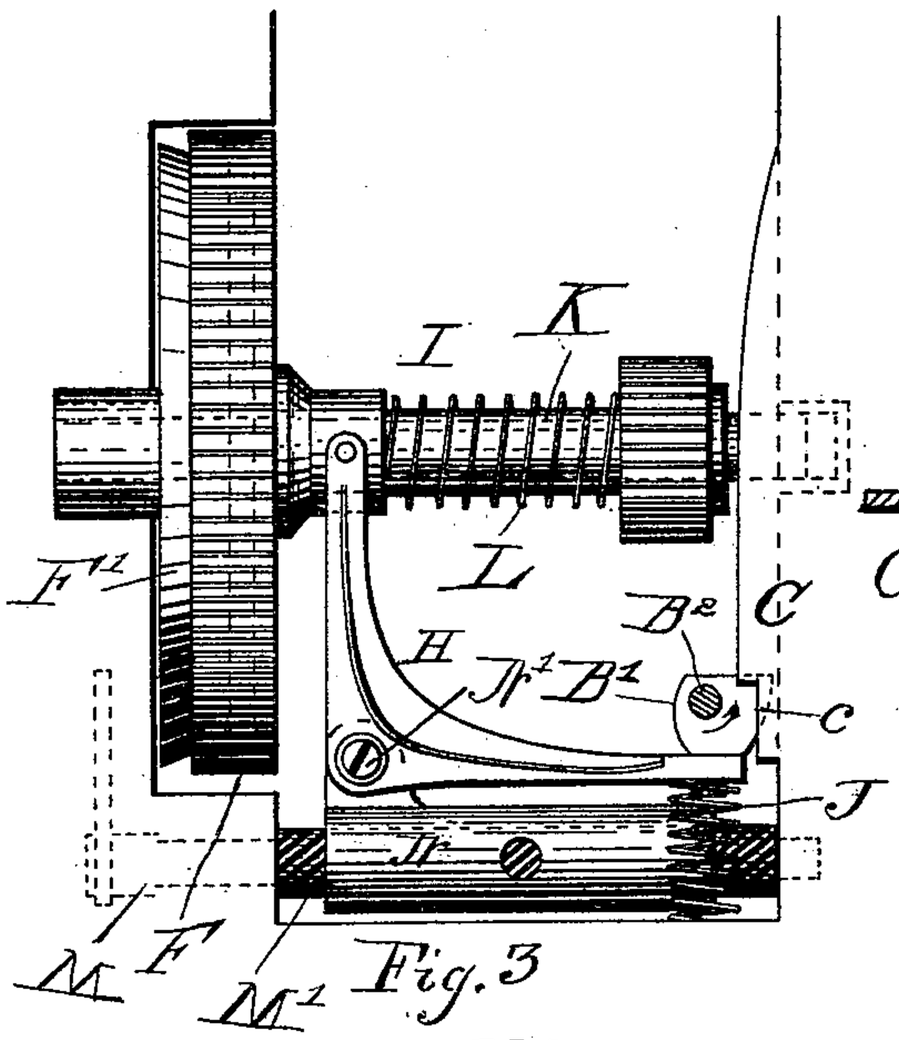

Fig. 3

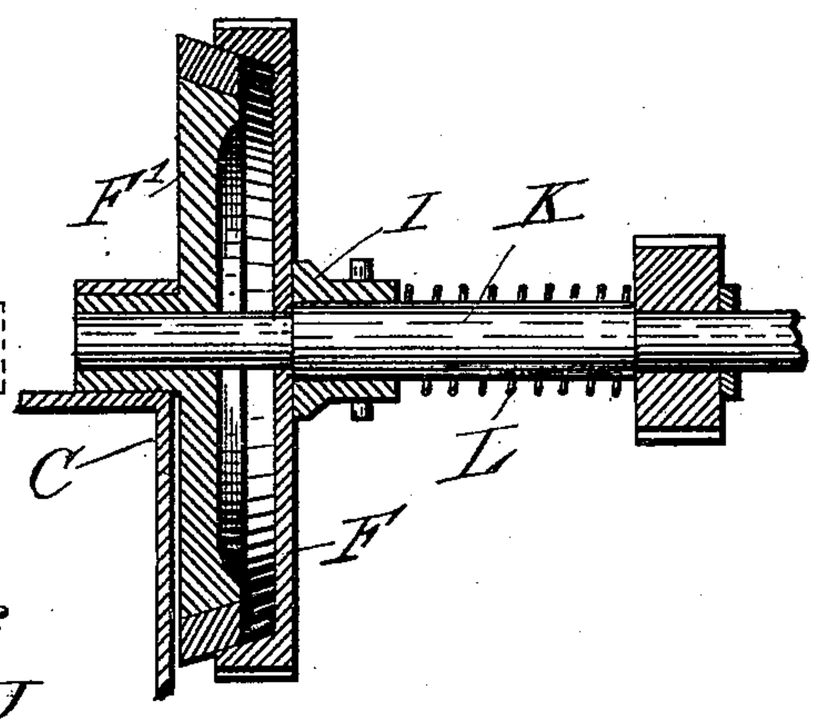

Fig. 2.

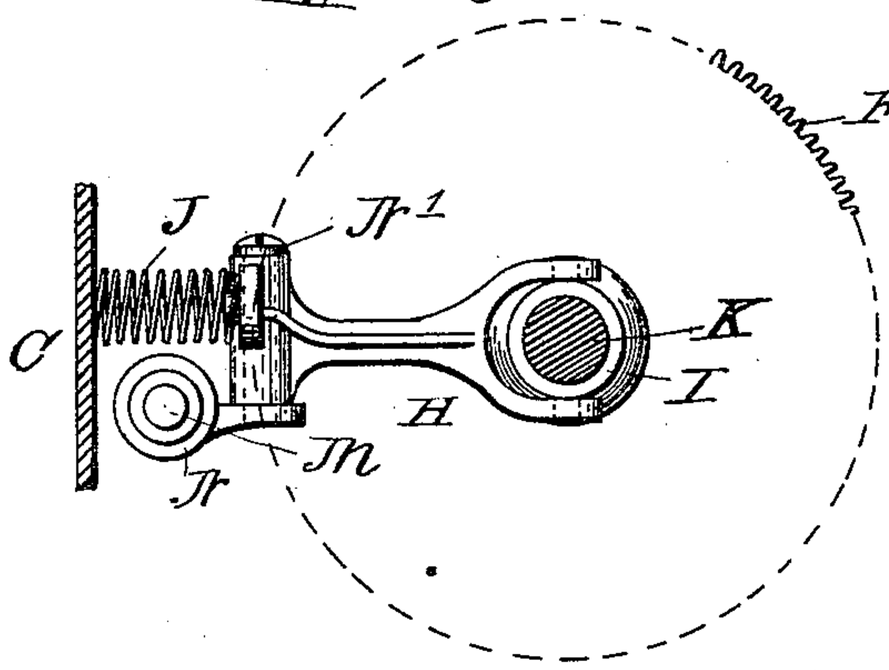

Fig. 5.

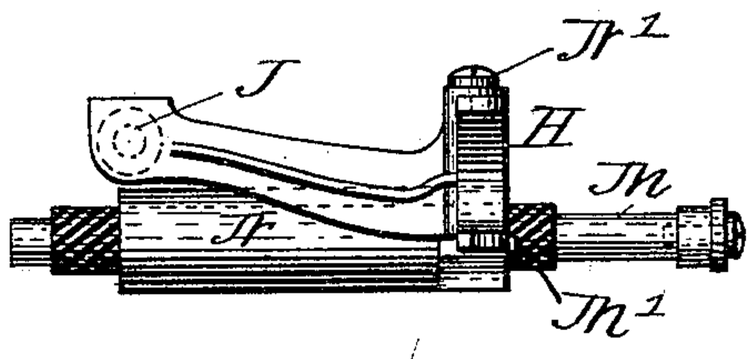

Fig. 4.

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SPRING MOTOR.

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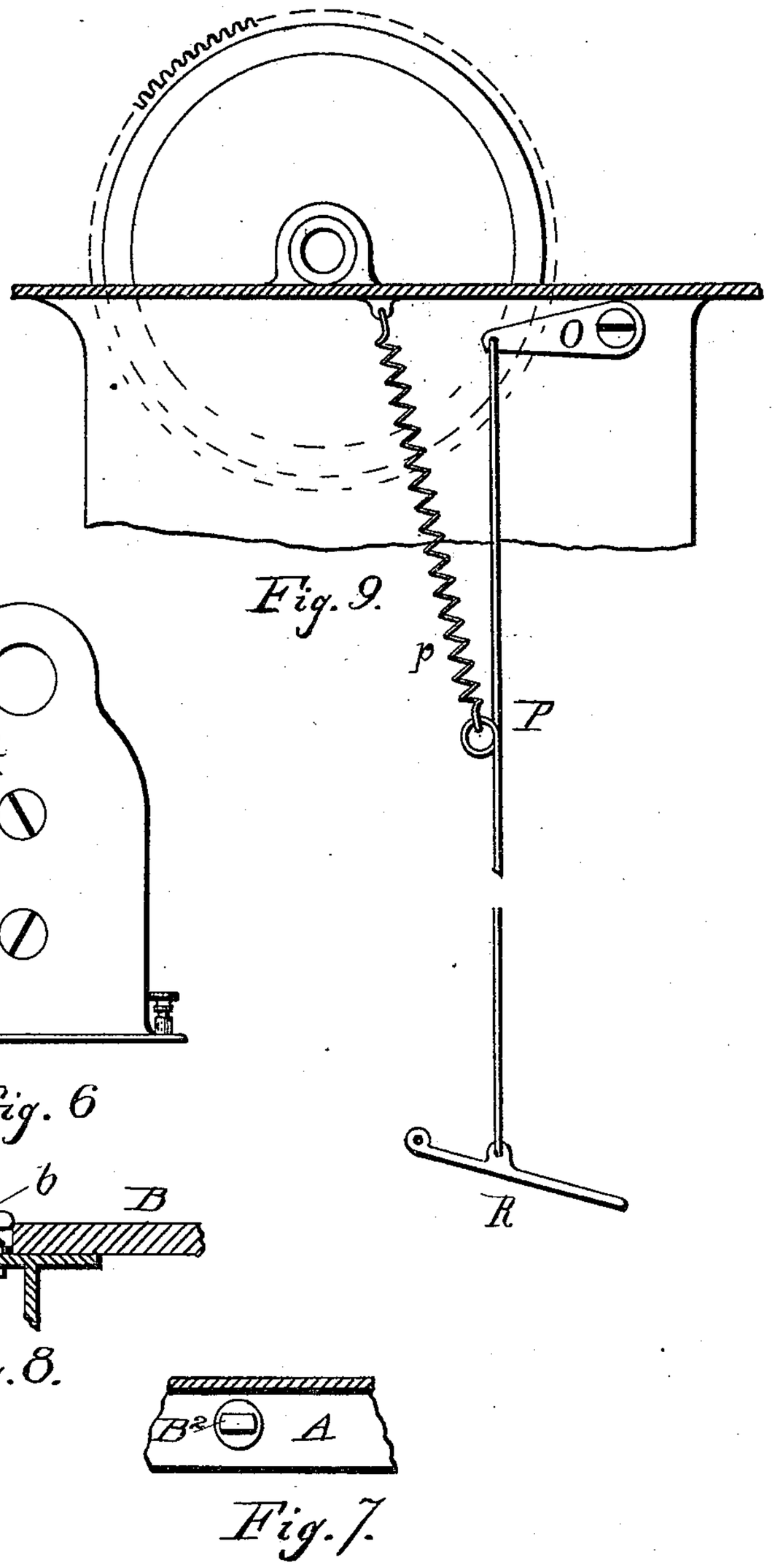

Fig. 9.

Fig. 6

Fig. 8.

Fig. 7.

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UNITED STATES PATENT OFFICE.

ALBERT A. WOOD, OF ATLANTA, GEORGIA, ASSIGNOR TO THE BROSIUS MOTOR SEWING MACHINE COMPANY, OF SAME PLACE.

SPRING-MOTOR.

SPECIFICATION forming part of Letters Patent No. 458,123, dated August 18, 1891.

Application filed February 24, 1891. Serial No. 382,655. (No model.)

To all whom it may concern:

Be it known that I, ALBERT A. WOOD, a citizen of the United States, and a resident of Atlanta, in the county of Fulton and State of Georgia, have invented certain new and useful Improvements in Sewing-Machine Motors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to motors that are connected with sewing-machines by a train of gearing from the spring or other motive device so constructed as to require the breaking or parting of said train whenever the head of the sewing-machine shall be turned back. It is obvious that the breaking of the train of gearing by the turning back of the sewing-machine head would remove the greater part of the resistance to the motive power and allow it to expend itself while the sewing-machine is disconnected. The object, therefore, is to lock down the head and to prevent the waste of motive energy while the head shall be turned back by automatically locking or preventing the running or waste of the motive power by the act of unlocking the machine-head.

To this end the invention consists of a device for that purpose, the preferred form being hereinafter fully described.

In the drawings that accompany this specification are the following figures: Figure 1 is an end elevation of a sewing-machine table and head, and showing a spring-motor attached underneath and connected to the mechanism of the sewing-machine head by a train of gearing. This figure also shows the location of most of the parts by which the object above described may be accomplished. Fig. 2 shows a central vertical axial section through the pinion that engages with the spur-gear on the spring-shaft and on the same plane through the spur-gear on the shaft with said pinion, and also through a stationary friction-disk, the coniform peripheral surface of which engages by friction with a correlative internal surface on the said spur-gear, and through the collar that causes the engagement of said frictional surfaces, and a spiral spring between said collar and pinion. Fig. 3 is a plan showing all the parts shown in Fig. 2, and showing also the lever through which pressure is applied from a spiral spring that causes the engagement of the frictional surfaces on the gear and disk, and the cam by which said pressure is removed and at the same time the head is locked down by the cam turning under a flange that is also shown. This figure also shows a screw passing through the fulcrum of said lever and its crank, by which the fulcrum of the lever is moved and applies the said pressure without turning the cam that locks down the machine head. Fig. 4 is a side view of the lever, from the direction of the shaft, that is shown in Fig. 3, and also of the screw by which the fulcrum of said lever may be moved. Fig. 5 is another figure in elevation of the lever shown in Figs. 3 and 4 with its fulcrum. This figure also shows the spring shown in Fig. 3 and the collar-and-spur gear and their connection with the lever. Fig 6 is an end view of the machine-head, showing the cam by which it is locked down. Fig. 7 shows the top end of the locking-down cam and a portion of the base of the head through which it passes. Fig. 8 is a vertical cross-section through the base of the machine-head and the table, showing one of the hinges by which the head is hinged to the table. Fig. 9 shows the crank of the screw-shaft that is shown in Figs. 3, 4, and 5 as passing through the fulcrum of the lever and its connection with a pedal.

In the figures immaterial details, like the legs of the stand and most of the mechanism in the machine-head, are omitted, and only such parts will be described as are connected with this invention and its operation.

The sewing-machine head A is hinged to the table B by hinges *b*, as shown in Fig. 8, and is locked in the position shown in Fig. 1 by a button that performs the additional function of a cam, as will be hereinafter described, and will therefore be called the "cam

B′." The cam B′ is attached to a shaft B^2, that is adapted at its upper end to receive a wrench, and that locks down the machine-head by being turned under a flange *c*, Fig. 3. The flange *c*, shown in Fig. 3, is an integral part of the casing C, and projects inwardly at the point in said casing that is broken away in Fig. 1. The cam B′ locking under the flange prevents the disengagement of the gears, to be hereinafter described.

The casing C is attached under the table, and carries the springs and mechanism sufficient to generate or store up power enough to drive the sewing-machine, which power is communicated through the spur-gear D, the pinion E, the spur-gear F, the pinion G, and a sufficient number of additional gears and pinions to reach a main shaft of the machine and give the required velocity to the same, as shown in Fig. 1.

By reference to Fig. 1 it will be seen that the turning back of the head will part the gear F and the pinion G. It is therefore obviously necessary to control the power of the motor whenever the resistance of the sewing-machine proper shall be removed, as just described. By reference to Fig. 3 it will be seen that the turning of the cam B′ in the direction indicated by the arrow will release the lever H and allow the spring J to turn the lever and press, by the collar I, the internal-frictional surface of the gear F against the exterior surface of the stationary disk F′, the shaft K having enough end-play in its bearings to allow a back-and-forth lateral movement of said gear. The form of the cam B′ should be such as to cause its complete disengagement from the flange *c* before it releases the lever H, in order that no time may elapse between the disengagement of the machinery of the sewing-machine proper and the application of the friction-brake to the motive power. It will be observed that whenever the cam B′ is in a position to release the frictional contact of the gear and disk, the machinery of the sewing-machine will be connected by the engagement of the gears F and G with the driving mechanism, and that the turning of the cam B′ in a direction opposite to that shown by the arrow, Fig. 3, will first lock the head down by passing under the flange and then release the pressure of the gear against the disk. On the releasing of this pressure and the forcing back of the lever H by the cam B′, the collar I will be brought with it and compress the coil-spring L, which by pressure against the pinion E will force the gear away from the disk and hold it back with a light pressure.

To cause the engagement of the frictional surfaces of the gear F and the disk F′ without turning the cam B′, the shaft M passes through and engages by its screw M′ with the sleeve N, carrying the fulcrum-screw N′. The crank O, Figs. 3 and 9, is connected by a rod P with the pedal R.

The depression of the crank O by the pedal will revolve the shaft M and move the fulcrum to the left, (see Fig. 3,) which will cause the frictional surfaces of the gear and the disk to engage to reduce the speed or stop the machine. A slight effect can be produced by allowing these surfaces to just touch, which effect can be increased even to the extent of releasing the lever from the effect of the cam and getting the full force of the spring J. On releasing the treadle, the spring P will raise the crank and return the fulcrum to its normal position.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a device of the class specified, the shaft K, having end-play, parts having frictional surfaces that engage by the endwise movement of said shaft, the collar I, the lever H, the spring J, the flange *c*, the cam B′ on shaft B^2, the machine-head A, hinged to the table B, and a train of gearing connecting said machine-head with a motor.

2. In a device of the class specified, the shaft K and parts having frictional surfaces that engage by the longitudinal movement of said shaft, the collar I, the lever H, the spring J, the cam B′, the sleeve N, carrying fulcrum N′, and the shaft M, having a screw-thread M′, that engages with an internal screw-thread in the sleeve N, for the purpose specified.

3. In a device of the class specified, the parts having frictional surfaces forming a clutch, a bell-crank lever connected with one of the clutch elements and held normally from revolving on its pivot, an internally-screw-threaded sleeve, a revoluble screw upon which said sleeve works, and means for revolving said screw, for the purpose specified.

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

ALBERT A. WOOD.

Witnesses:
A. P. WOOD,
S. M. WOOD.