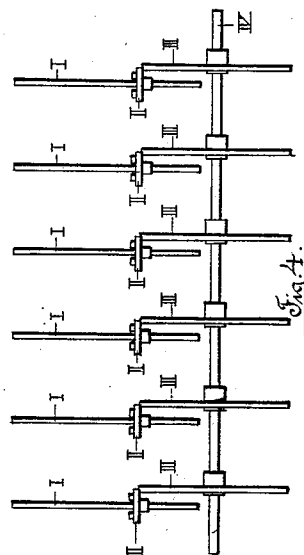
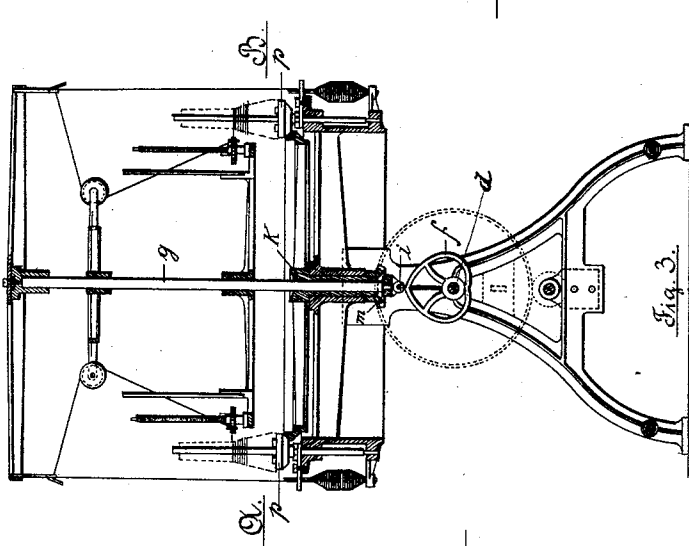
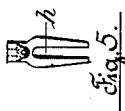
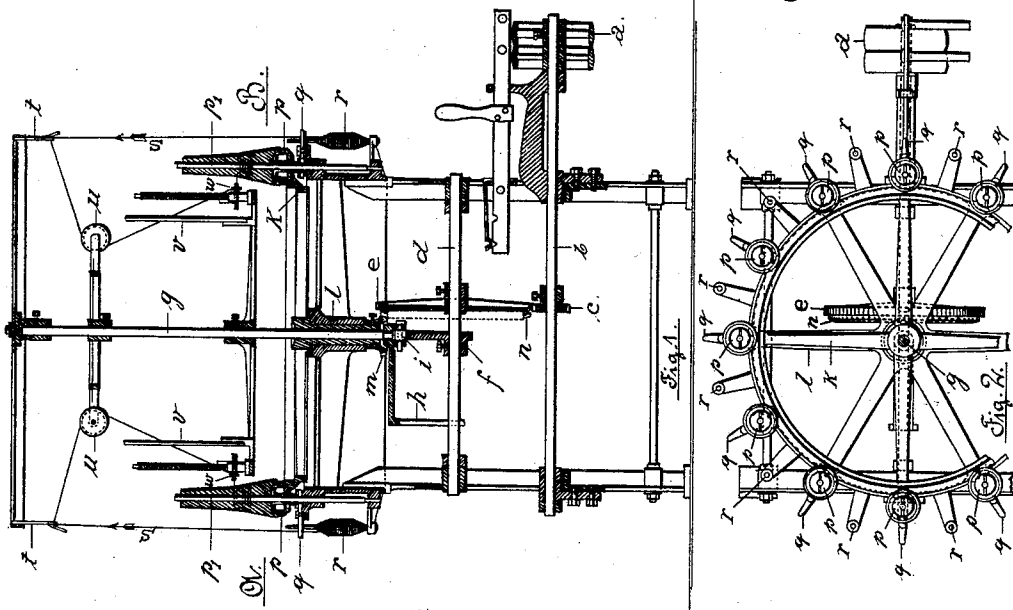


(No Model.)

F. A. LUDWIG.
DRIVING MECHANISM FOR THE SPINDLES OF CIRCULAR
WINDING MACHINES.

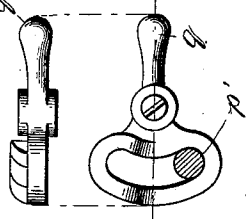
No. 481,329.

Patented Aug. 23, 1892.



Witnesses:
George Ludwig
R. E. Jahn.

Fig. 6.



Inventor:

Friedrich Anton Ludwig
by W. Bantze Attorneys.

UNITED STATES PATENT OFFICE.

FRIEDRICH ANTON LUDWIG, OF CHEMNITZ, GERMANY.

DRIVING MECHANISM FOR THE SPINDLES OF CIRCULAR WINDING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 481,329, dated August 23, 1892.

Application filed June 10, 1891. Serial No. 395,800. (No model.)

To all whom it may concern:

Be it known that I, FRIEDRICH ANTON LUDWIG, a subject of the German Emperor, and a resident of Chemnitz, in the German Empire, have invented a new and useful Improvement in Driving Mechanism for the Spindles of Circular Winding-Machines, of which the following is a specification.

The object of my present invention is to construct a winding-machine in which all spindles are driven simultaneously from one driving-wheel and which is so arranged as to occupy much less floor-room than the winding-engine known until now. I attain these objects by arranging the spindles circularly around the driving-wheel and by the details of construction hereinafter more particularly described and illustrated.

In the accompanying drawings, Figure 1 is a sectional elevation of my improved circular-winding engine. Fig. 2 is a plan view with the parts above line A B, Fig. 1, removed. Fig. 3 is a sectional side elevation of the machine, and Fig. 4 is a diagrammatical view of arrangement of machines until now in use. Fig. 5 is a detail view of the guide-fork *h*, and Fig. 6 is a detail view of the switch.

In winders previously in use, Fig. 4, each spindle was provided with a separated driving-wheel III, and as the spindles were arranged in a row it was impossible to reduce the floor-room occupied by such winders. Moreover, it was necessary that the spindles should be arranged in a row in order to be able to mount the driving-gears III of the spindle-wheels II on one horizontal shaft IV. A further disadvantage of such winders is that in a machine having a large number of spindles it is impossible for the attendant or driver to notice a breakage of the thread immediately, as it is practically impossible to overlook the whole engine at one and the same time.

In my winder, as shown in Figs. 1, 2, and 3, I have so constructed the same as to save sixty per cent. of the floor-room, and the arrangement of the parts is such that the attendant can watch all spindles and threads running simultaneously and conveniently.

Referring to Fig. 1, I preferably drive the

drive-shaft *b* by means of the pulleys *a*. Keyed on the main driving-shaft *b* is the pinion *c*, driving the spur-gear *e*, arranged on the shaft *d*, mounted in the machine-frame. The heart-shaped cam *f* is also mounted on the shaft *d* and revolves with the same, moving the vertical bar *g* up and down.

The fork *h*, which is shown in detail in Fig. 5, embraces the shaft *d* and serves to prevent the bar *g* from revolving, said fork *h* rising and falling with bar *g*. The roll *i*, against which the cam *f* plays, is mounted in the fork *h*. The main driving-wheel *K* for the spindles is mounted on the central sleeve *l* of the machine-frame, and the bevel-wheel *m* is attached to and revolves with the said wheel *K*. Bevel *n* drives *m*, and with it the main driving-wheel *K*. This main driving-wheel *K* gears into each and every bevel-wheel of the spindles *p'*. Each spindle *p'* may be disengaged from the driving-gear by means of its switch *q* at any time and independently of all other spindles.

The switch *q*, Fig. 1, consists of a flat piece of metal pivoted to the machine-frame and inclosing the shaft or spindle of each bobbin in a curved slot. The upper surface of the switch has an inclined surface, so that on moving the same on its pivot the inclined surface wedges under the boss *p* of the bevel, raising the same and disengaging it from the driving-wheel *K*. The bobbins *r* hold the yarn-cops, and the threads *S* pass from the yarn-cops to the hooks *t*, thence over the wooden whirles *u*, through the thread-cleaner *v*, over the automatically upwardly-moving hooks *w* to the wooden bobbin on the spindles *p'*.

Having now particularly described and ascertained the nature of my said invention and the manner of performing the same, what I claim is—

In a circular winding-machine, the combination of a horizontal driving-cog *K* and sleeve *l*, carrying the same, with the bobbin-supporters *p'*, arranged around said cog, bevel-gears *p*, engaging in the same and disengaging switches *q*, a vertically-movable bar *g*, whirles *u*, thread-cleaner *v*, and adjustable guide-hooks *w*, all mounted on said bar *g*, as

specified, and a guide-fork *h*, having a horizontal arm keyed to said bar *g*, said fork embracing the shaft *d*, and the shaft *d*, operated from a driving-shaft by means of intermediate gearing *m e n c*, arranged substantially
5 as and for the purpose set forth.

In testimony whereof I have signed this

specification in the presence of two subscribing witnesses.

FRIEDRICH ANTON LUDWIG.

Witnesses:

GEORG LUDWIG,

R. E. JAHN.