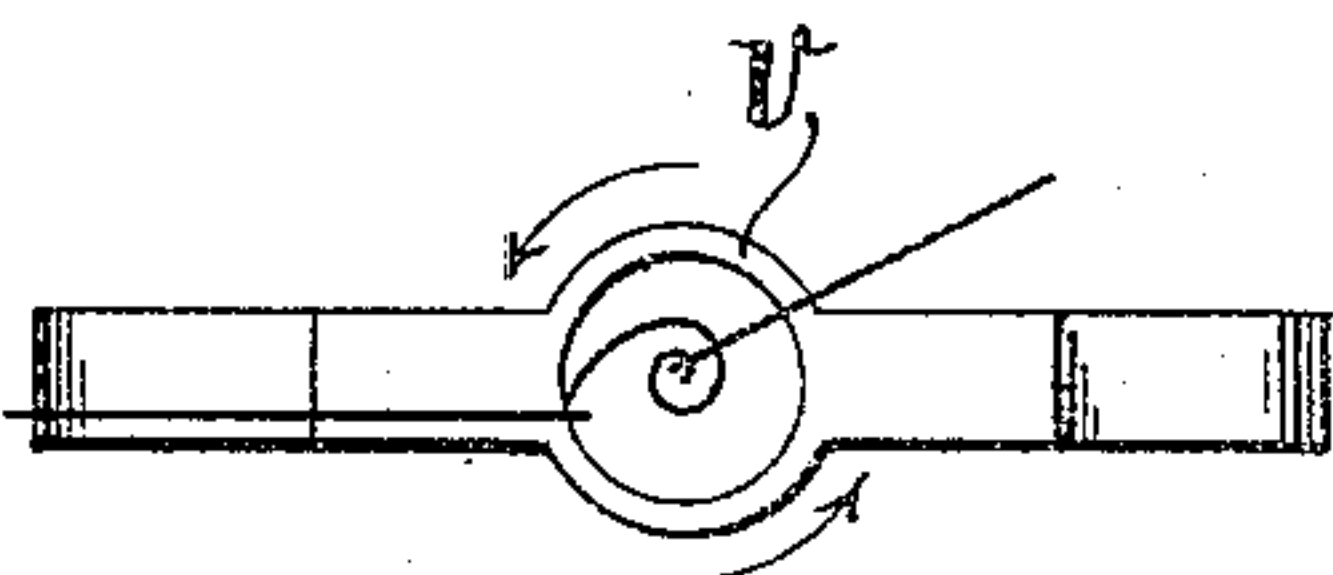
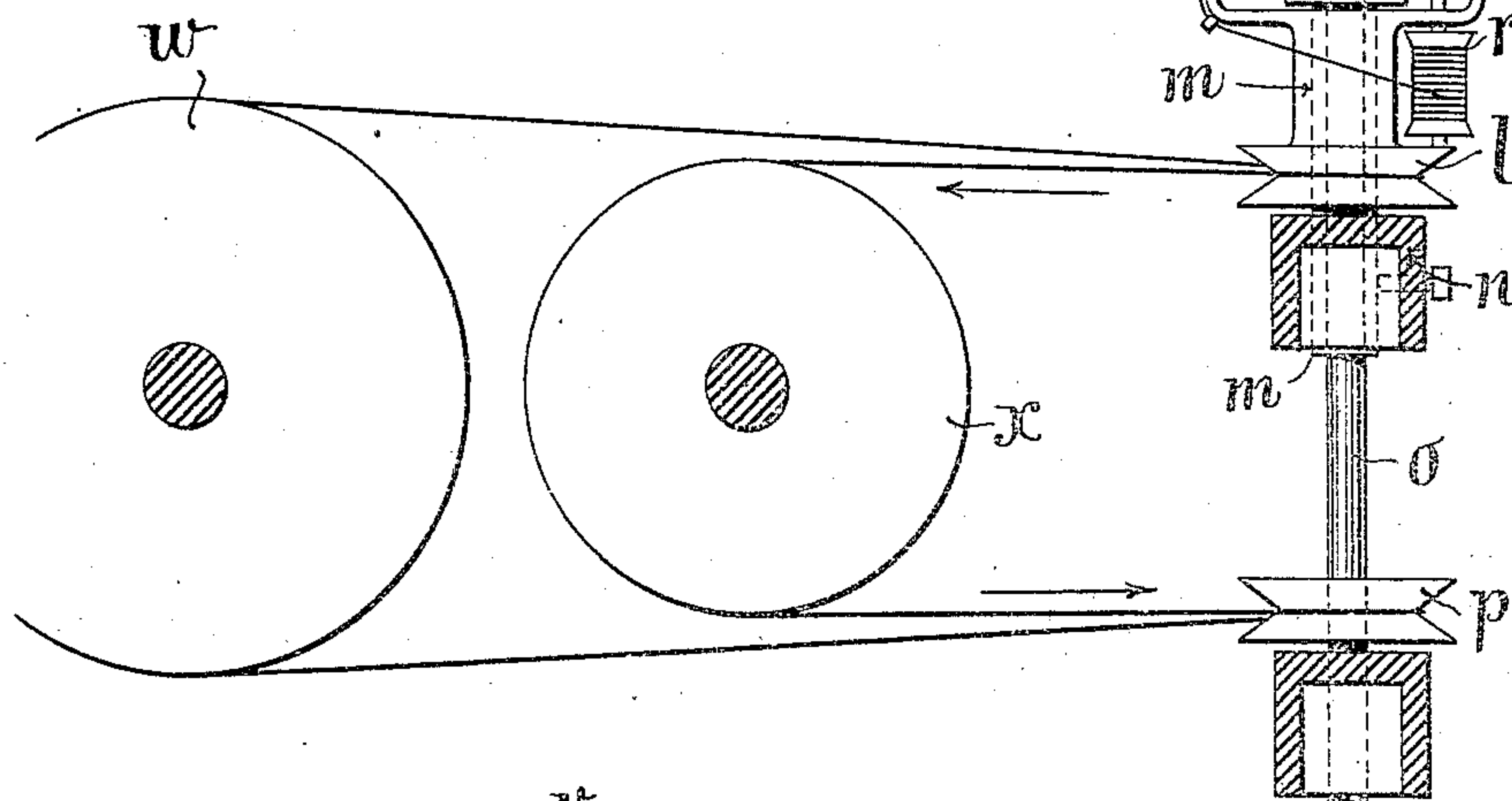
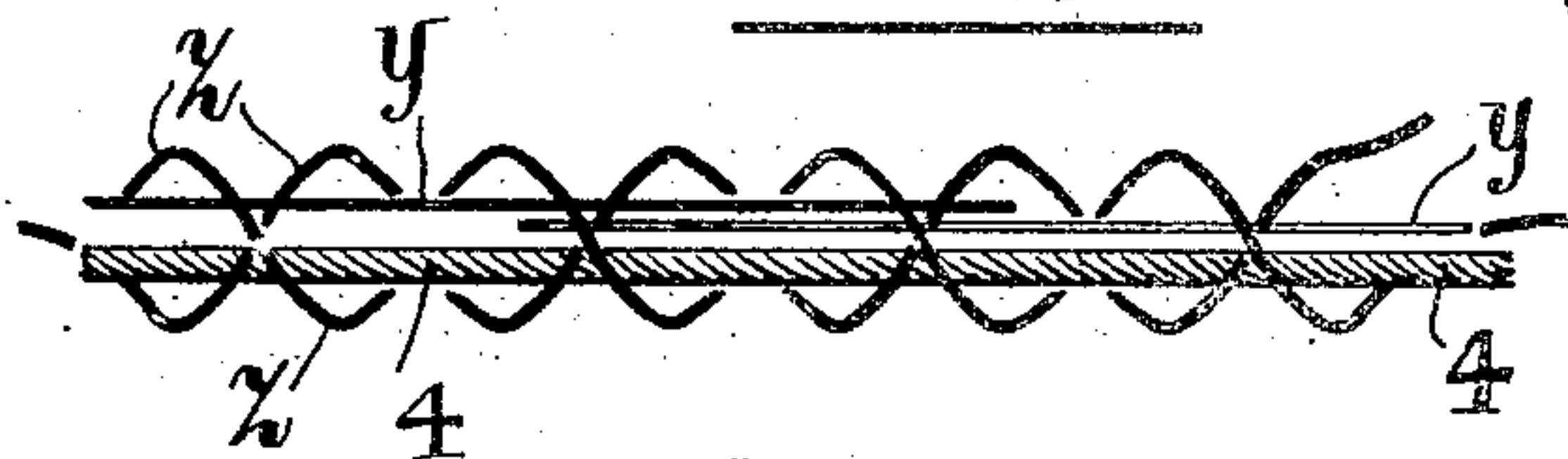


903,645.

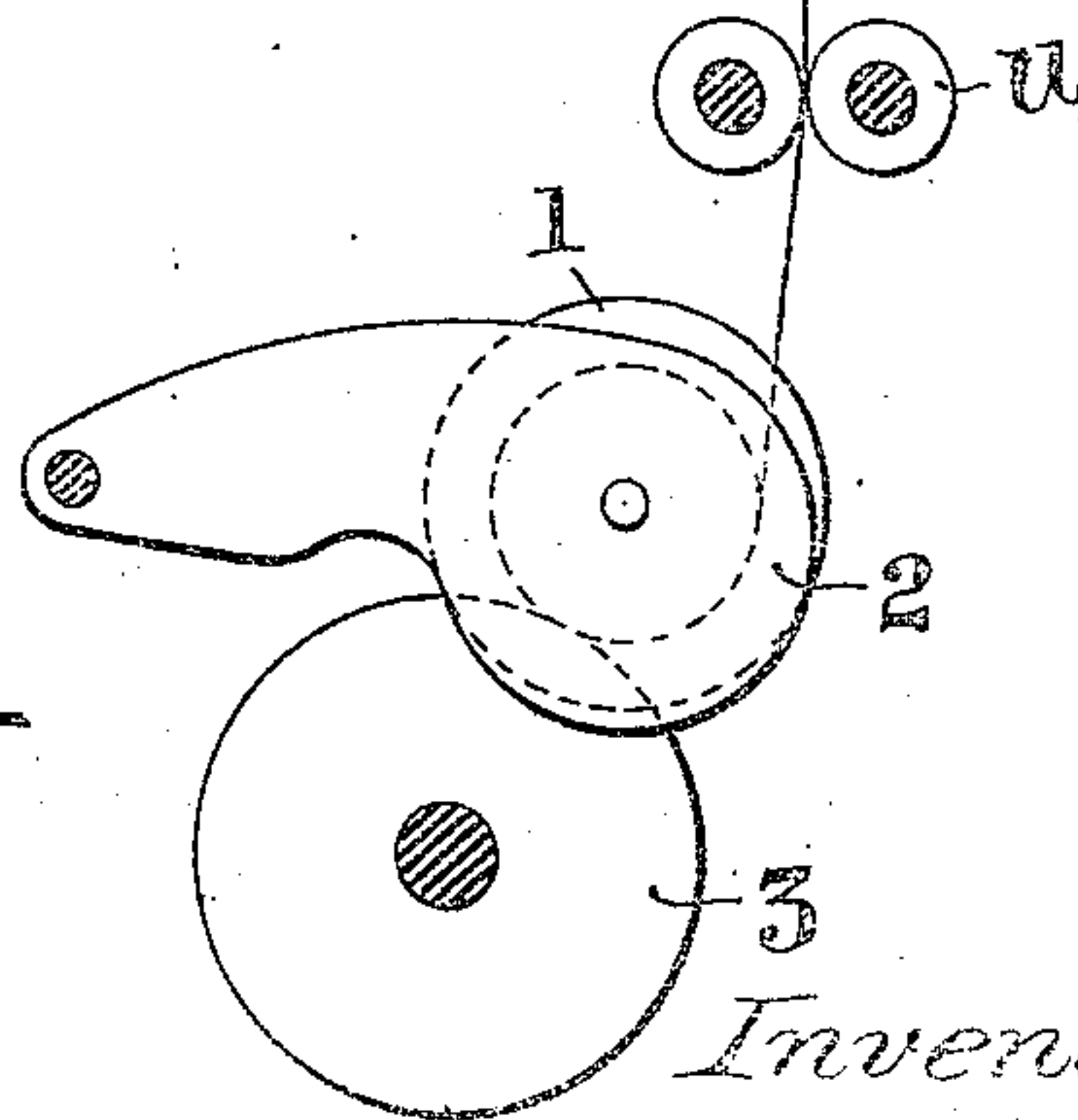
Fig. 1.



— FIG. 2. —



— Fig.3 —



Inventor:  
Albert Webb  
by attorneys  
Burrish & Howard



# UNITED STATES PATENT OFFICE.

ALBERT WEBB, OF WORCESTER, ENGLAND.

## MANUFACTURE OF THREAD FROM HAIR.

No. 903,645.

Specification of Letters Patent.

Patented Nov. 10, 1908.

Application filed January 15, 1906. Serial No. 296,059.

*To all whom it may concern:*

Be it known that I, ALBERT WEBB, horse-hair-carpet manufacturer, a subject of the King of Great Britain, and resident of Copenhagen street, Worcester, England, have invented new and useful Improvements Relating to the Manufacture of Thread from Hair, of which the following is a specification.

10 The present invention has for its object the manufacture of a continuous thread from stiff or tail horse-hair which thread may be used in weaving horse-hair cloth, tailor's linings and the like. Hitherto in the pro-  
15 duction of these materials hairs only of the longest and most expensive character have been employed and these have been inserted in the work by hand one by one as the weaving progressed. The fabric to be produced  
20 has also been limited in width by the length of the hairs procurable.

Spinning stiff horse-hairs together to form a yarn has been attempted, but owing to the nature of such hairs they do not lend them-  
25 selves to spinning and the resulting yarn is therefore unsatisfactory.

According to my present invention I make a horse hair thread without spinning it in the following manner. Hairs are picked or  
30 selected from a bunch and spliced together into a continuous thread by wrapping or binding them around with a cotton or other fine yarn. Preferably two wrapping or bind-  
35 ing yarns are employed wound in opposite directions and a reinforcing or core thread is also by preference employed. In fine threads where the hairs are used singly with but little overlap this is always so in order that the continuity of the thread may not  
40 fail should the selector occasionally omit to present a hair. In preparing a thread according to this method it is by no means necessary to employ the longest and most expensive hairs; on the contrary hairs of  
45 short lengths which may be varied without regard to the width of the fabric may be employed all being joined together into a continuous length by binding and splicing the overlapping ends. The yarn may be  
50 made stiffer or more pliable as the overlap is increased or diminished.

I do not propose to confine myself to any particular construction of apparatus but in

the accompanying drawing I have shown apparatus capable of producing a continuous  
55 horse-hair thread according to my invention.

Figure 1 is a side elevation, Fig. 2 is a detail in plan, and Fig. 3 is an exaggerated diagram of the thread itself.

In Fig. 1 *a* is a table capable of being  
60 traversed longitudinally about six inches upon rollers *b*. Upon this table are placed boxes *c* containing hair, the ends of which are turned downwards and project about two inches from the box. *d* is a double lever  
65 actuated to work up and down on a center *e* by a cam *f* fixed on a shaft *g*. At the end of the upper arm of the lever *d* is a selecting device *h* made to open its selecting finger *h'* when required by the pressure of a lever *i*  
70 operated by a cam *g'* on the shaft *g*. When not pressed by the lever *i* the point of the selecting finger is held against a bearing surface *d'* on the end of the lower arm of the lever *d* by means of a spring *h<sup>2</sup>*. The  
75 point of the selecting finger may be grooved or otherwise fitted to facilitate the selection of one or more hairs in the act of its closing upon the bearing surface *d'*.

After selecting a hair, which is seized  
80 about an inch from its end, the selector descends with the lever *d* until the hair is inserted between the nip rolls *j*, one of which is covered with india-rubber or some similar substance capable of adjusting itself to the  
85 variations in the size and number of hairs presented to it. The rollers are held together by a suitable spring or weighted lever, in the present instance, a weighted bell crank lever *j'*. As soon as the nip rolls *j*  
90 have seized the hair the lever *i* presses the selector and releases the hair and the lever *d* rises with the selector open to repeat its operation of selection as frequently as may be required to produce a yarn of the desired  
95 size. In Fig. 1 the selector is shown as having risen to its full height and closed upon a hair, the previously selected hair being shown as nearly passed through the nip rolls.

Close below the rolls is the flier *k* driven  
100 by the whirl *l* running on a bush *m* held fast by a set-screw in the framing *n*. Through the center of the bush *m* passes the spindle *o* driven in the opposite direction by the whirl *p* and at the top of the spindle *o* is the flier  
105 *q* rotating inside the flier *k*. There is a hole



throughout the axis of the spindle *o* about one-eighth of an inch diameter. Attached to the flier *k* by a movable pin is a bobbin of worsted, cotton or other material *r* and a similar bobbin *s* is similarly attached to the flier *q*. Fastened to the top of the flier *k* is a ring *v* shown in plan in Fig. 2 having a spirally coiled wire attached to one side. Through this ring is passed the thread from bobbin *r* and also the continuous thread from a bobbin *t* which runs on a stationary pin attached to the frame. Below the center of this ring is a hole about one-eighth inch diameter in the center of flier *q*. The thread from bobbin *s* is passed through this hole with the horse-hair, the thread from bobbin *r* and the continuous thread from the ring above. The whole are passed down the axial hole in the spindle *o* and through the rolls *u* which are driven at a little faster circumferential speed than the nip rolls *j*. From the rolls *u* the threads pass to the winding bobbin 1 running in the holder 2 and operated by friction on the drum 3. As soon as a hair emerges from the nip rolls *j* it encounters the ring *v* rapidly rotating in the direction indicated by arrows in the Fig. 2. The spiral wire instantly centers the hair and lays it alongside the core thread from bobbin *t*. Immediately below the ring the hair and core thread 4 are engaged by the thread from the bobbin *r* which is thus wrapped round them spirally as closely as may be desired. The yarn thus formed passes on through the hole in the flier *q* where it is engaged by the thread from bobbin *s* rotating in the opposite direction thus inclosing the hair and core thread in two reversely wound spirals.

The whirls *l* and *p* are driven by an endless band taking its motion from a pulley *w*. This band passes round the whirl *l* then back to a loose pulley *x* from which it runs to the whirl *p* upon the same side as it left the whirl *l* above and passing round this returns to the driving pulley *w* thus reversing the action of the two whirls.

Arrangements of any suitable kind (not shown in the drawing) are provided for stopping each spindle separately and for altering the speed of the selector, nip, or take down rolls and consequently the number of twists per inch of the wrapping threads. The core thread and one of the wrapping threads may be dispensed with if desired.

The diagram Fig. 3 shows clearly the composition of the thread. *y* are the horse hairs, *z* the wrapping threads and 4 the core thread which is here shown disproportionately coarse.

The whole on issuing from the machine constitutes a compound continuous yarn which can be used in weaving in an ordinary loom and at an ordinary speed. The fabric produced is preferable to ordinary hair

cloth used for tailor's linings, as the slipping of the warp threads on the hair which is a common defect is obviated.

Weavers of horse-hair cloth will readily appreciate the advantage of being able to weave in a continuous thread of hair, instead of being obliged to insert every hair separately as is now done, and to employ hair of almost any length instead of only the longest and most expensive.

What I claim and desire to secure by Letters Patent of the United States is:—

1. Apparatus for making a continuous thread of horse hairs comprising a source of horse hair supply in which the hairs are arranged in a bunch or group, a flier, a bobbin carried by the flier for feeding the thread for wrapping and splicing the hairs and means for feeding the hairs from the bunch or group to the flier comprising a selecting device arranged to select the hairs from the supply bunch or group, and intermediate means for receiving the hairs from the selecting device and presenting them to the flier, said selecting device comprising a bearing surface located on one side of the bunch or group of hairs and a selecting finger located on the opposite side of the bunch and means for advancing the selecting finger into the bunch or group toward the bearing surface to select a hair and for releasing the selecting finger from the hair.

2. Apparatus for making a continuous thread of horse hairs comprising a source of horse hair supply in which the hairs are bunched or grouped, a flier, a centering device carried by said flier, a bobbin carried by the flier for feeding the thread for wrapping and splicing the horse hairs and means for feeding the horse hairs from the bunch or group to the flier comprising a selecting device arranged to pick horse hairs from the bunch and an intermediate device for receiving the horse hairs from the selecting device and passing them on to the flier, said selecting device comprising a bearing surface located on one side of the bunch or group of hairs, a selecting finger located on the opposite side of the bunch or group of hairs and means for moving the selecting finger toward and releasing it from the bearing surface.

3. Apparatus for making a continuous thread of horse hairs comprising a source of horse hair supply in which the hairs are arranged in a bunch or group, a flier, a centering device carried by the flier, a bobbin carried by the flier for feeding the thread for wrapping and splicing the horse hairs and means for feeding the hairs from the bunch or group to the flier comprising a selecting device arranged to pick horse hairs from the bunch or group and nipping rolls intermediate of the selecting device and flier for receiving the hairs from the select-



ing device and passing them on to the flier,  
said selecting device comprising a bearing  
surface located on one side of the bunch or  
group of hairs, a selecting finger located on  
5 the opposite side of the bunch or group of  
hairs and means for moving the selecting  
finger toward and releasing it from the said  
bearing surface.

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

ALBERT WEBB.

Witnesses:

W. EDW. WILLIAMS,  
ARNOLD E. WEBB.