

(No Model.)

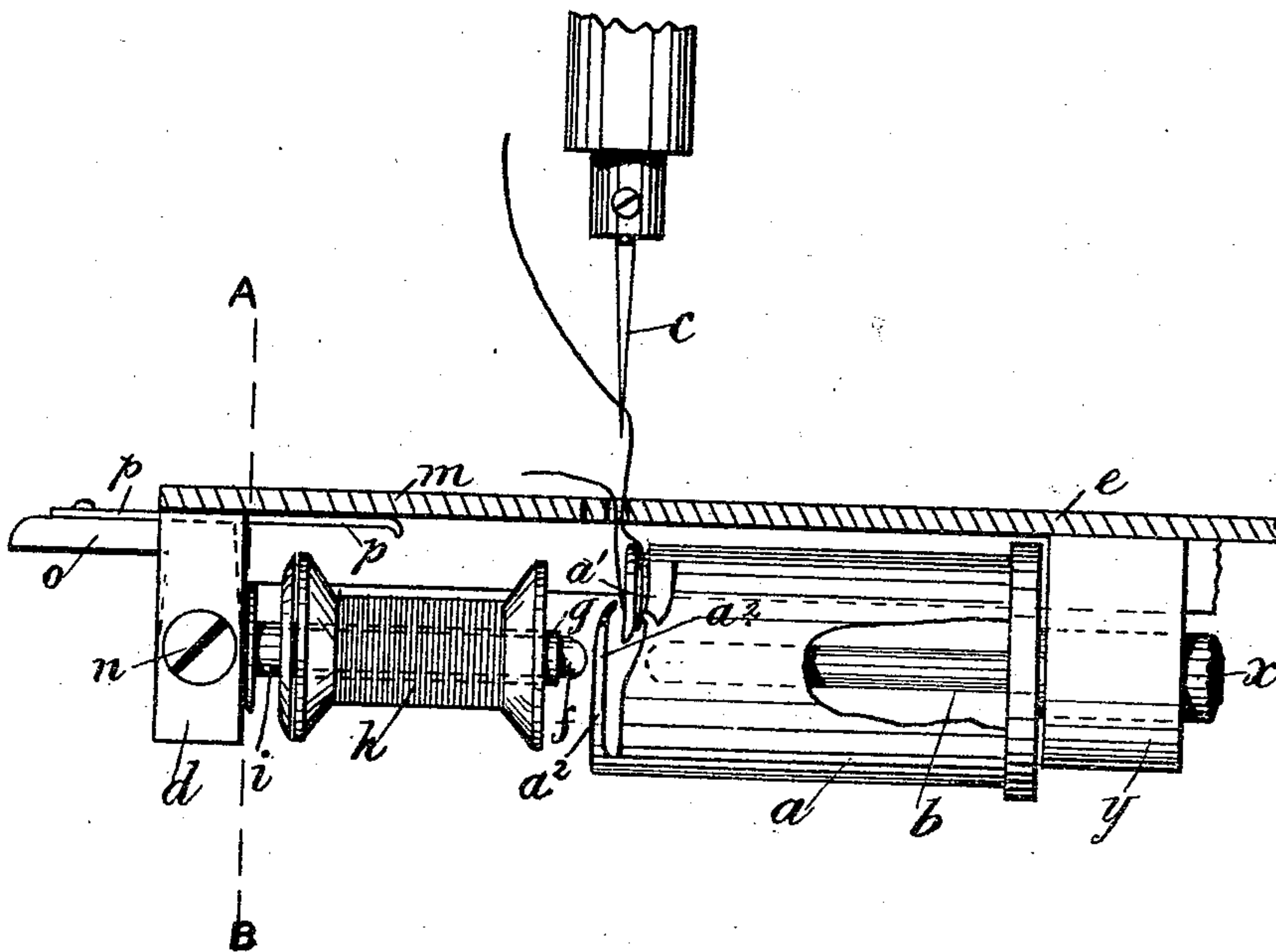
3 Sheets—Sheet 1.

D. RICHARDS.  
SEWING MACHINE.

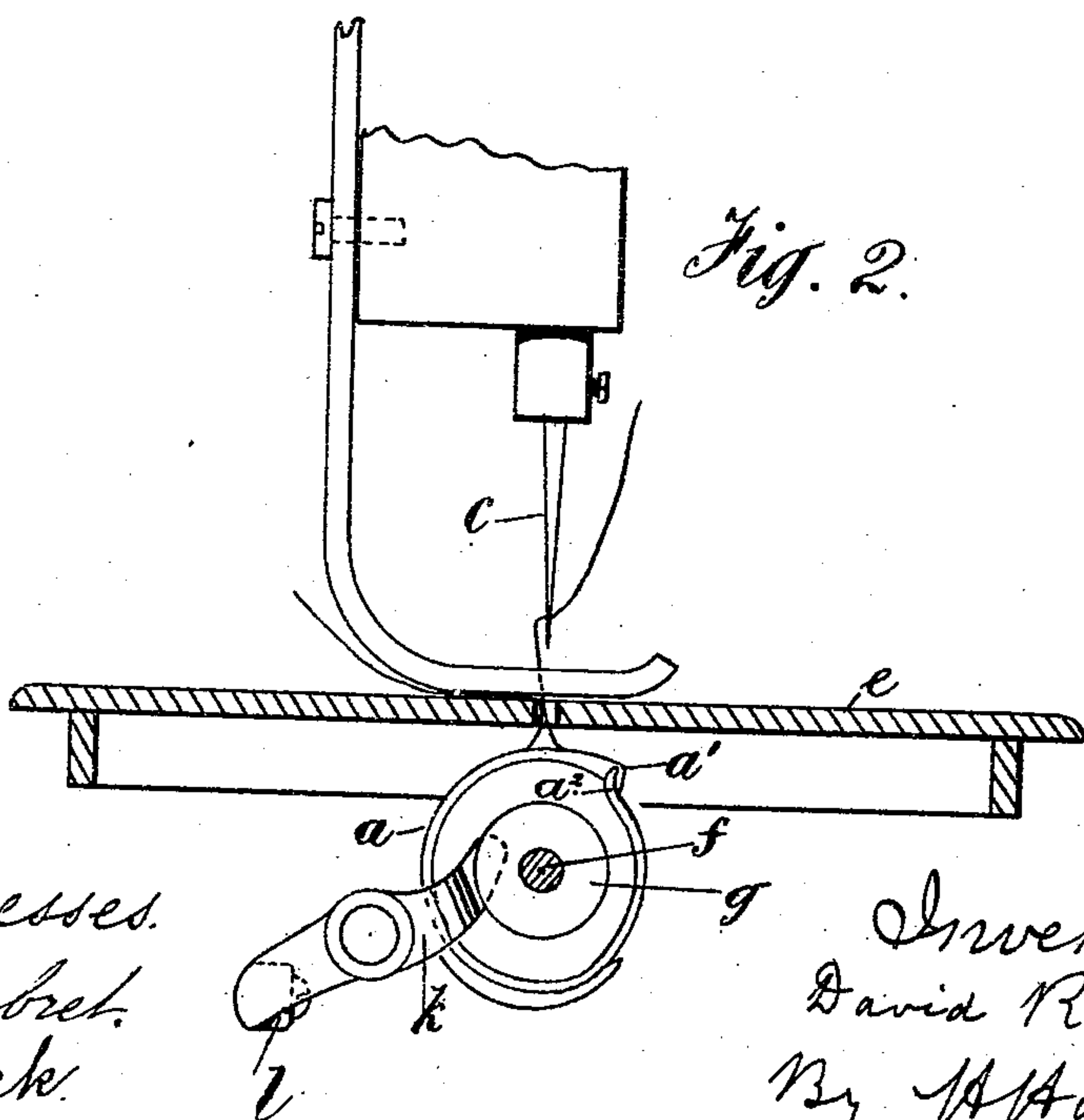
No. 543,507.

Patented July 30, 1895.

*Fig. 1.*



*Fig. 2.*



Witnesses.  
*J. C. Lebre.*  
*A. Block.*

Inventor.  
David Richards.  
By *H. A. de Vos.*  
Attorney.

(No Model.)

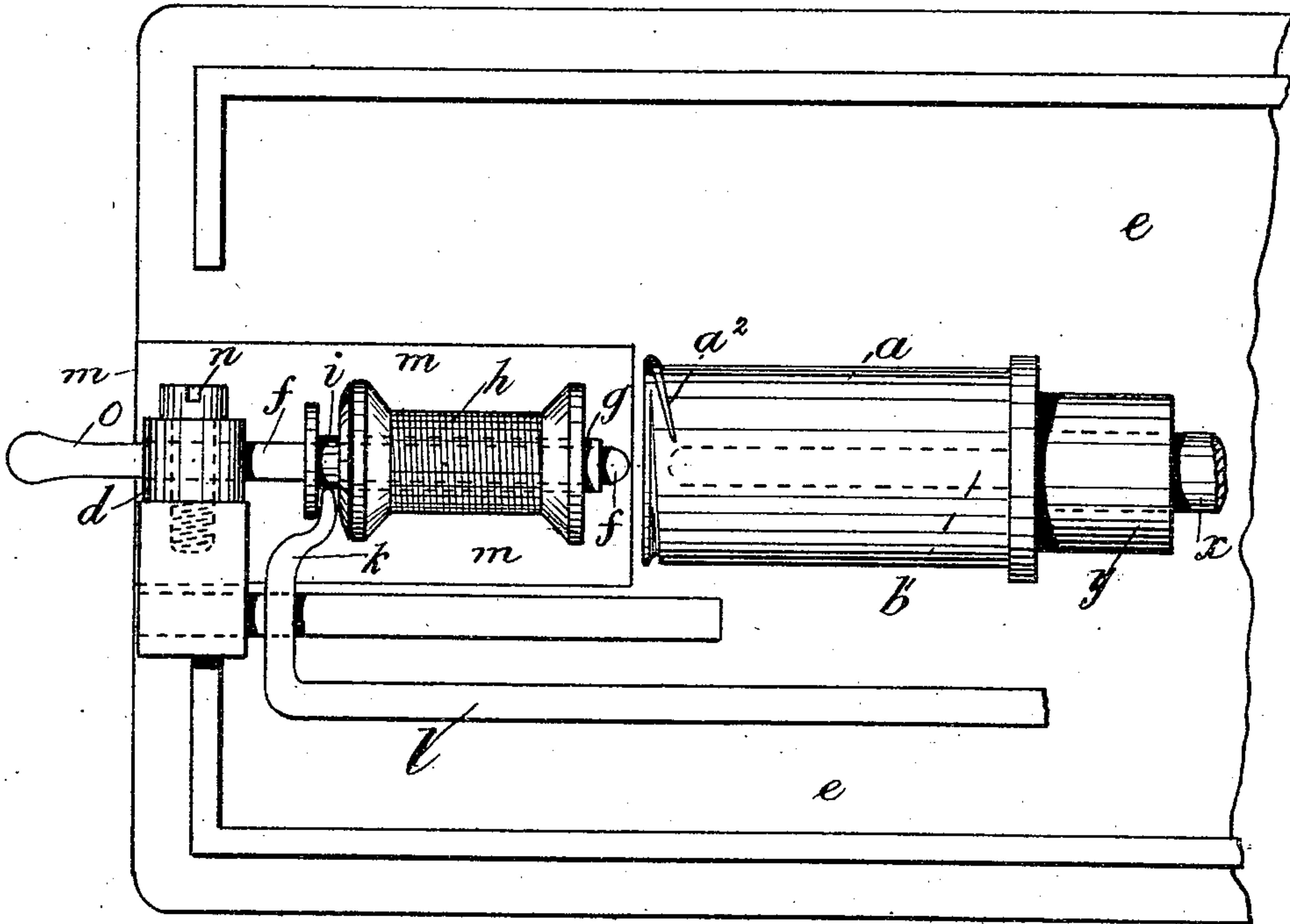
3 Sheets—Sheet 2.

D. RICHARDS.  
SEWING MACHINE.

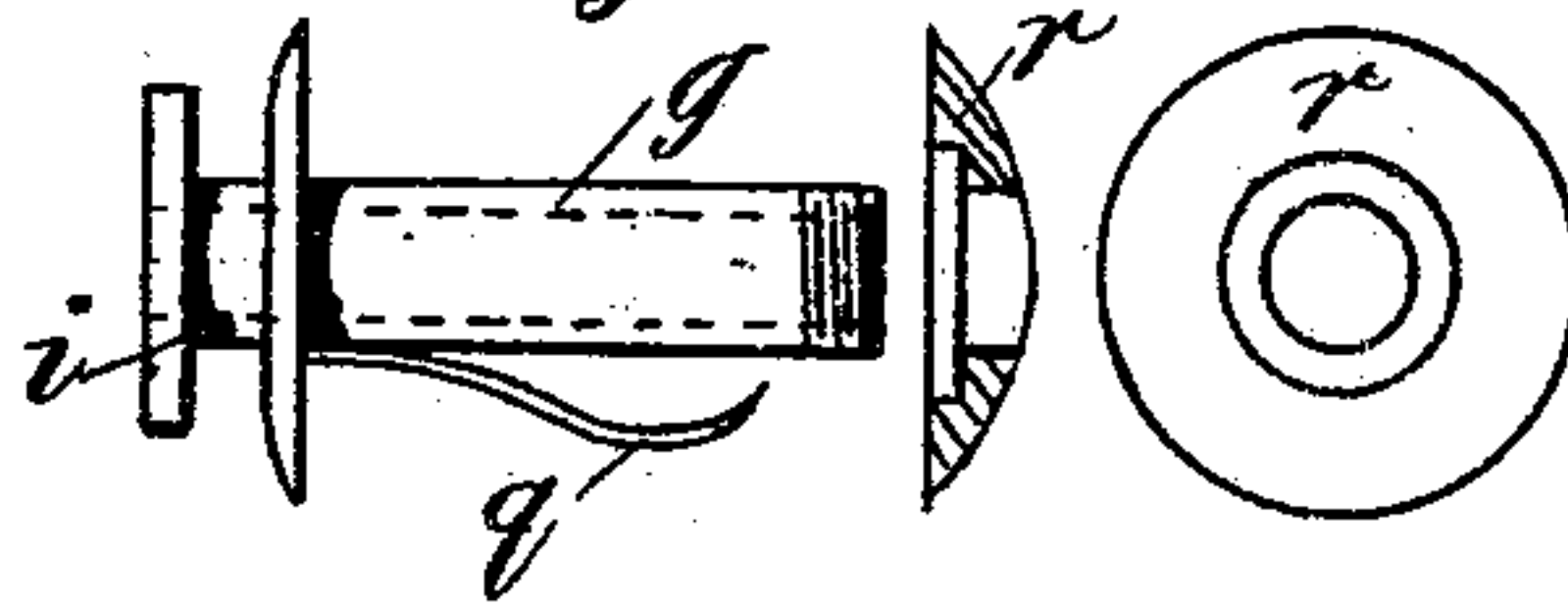
No. 543,507.

Patented July 30, 1895.

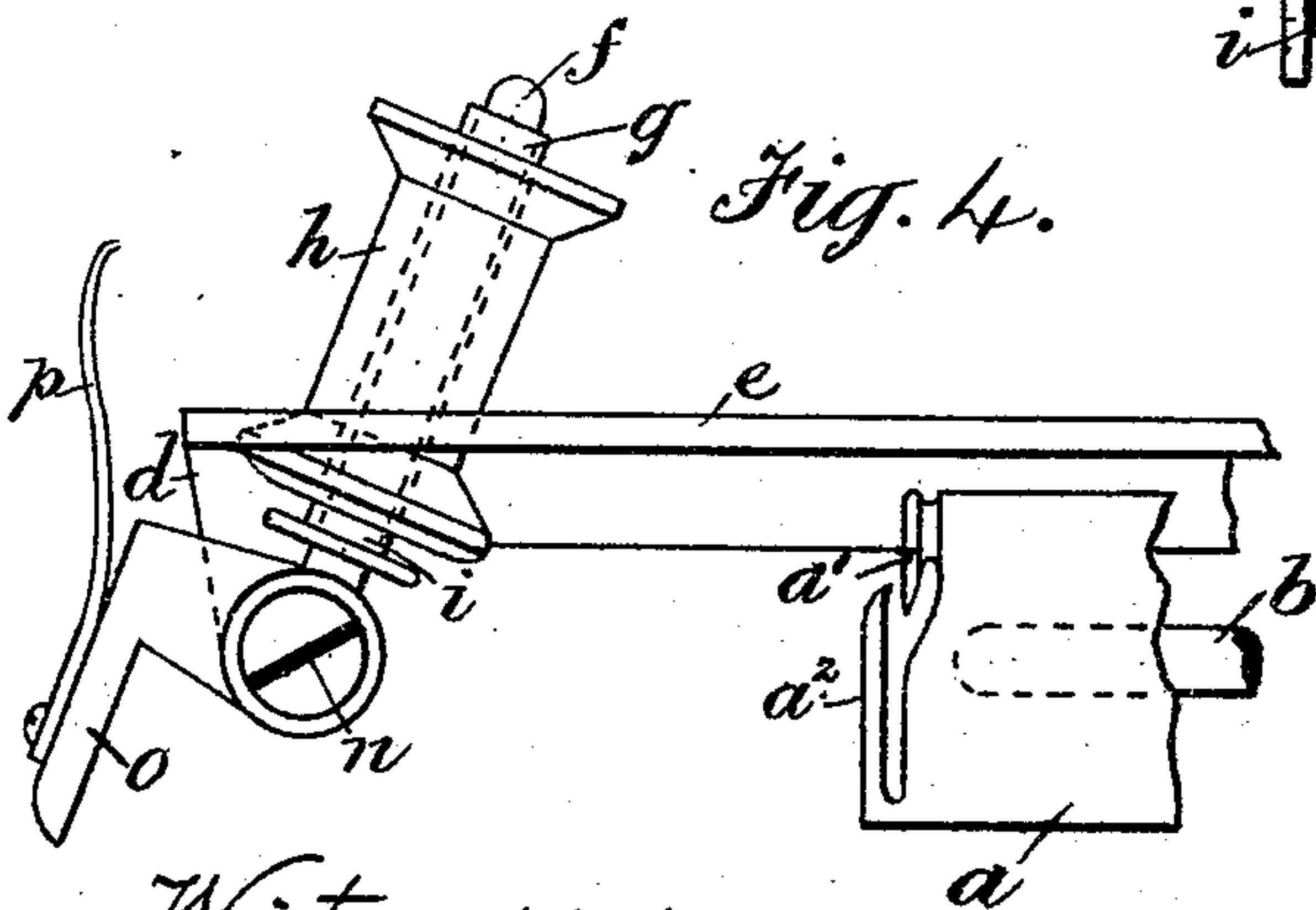
*Fig. 3.*



*Fig. 5.*



*Fig. 4.*



Witnesses.

*J. C. Hebert.*  
*O. Block.*

Inventor.

*David Richards,*  
*By W. A. de Vos.*  
Attorney.

(No Model.)

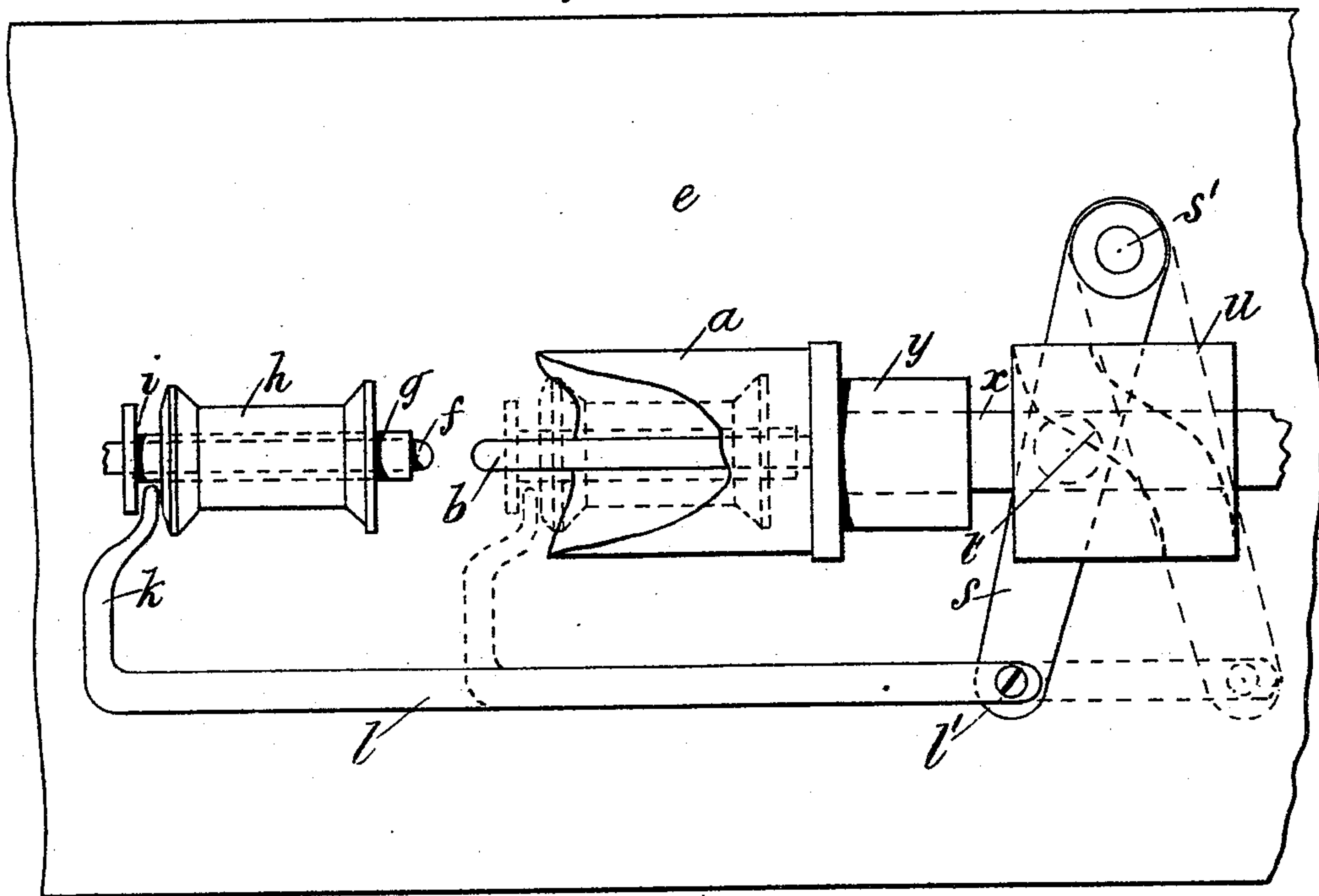
3 Sheets—Sheet 3.

D. RICHARDS.  
SEWING MACHINE.

No. 543,507.

Patented July 30, 1895.

Fig. 6.



Witnesses.  
*J. C. Lebert.*  
*O. Block.*

Inventor.  
David Richards.  
By *A. A. de Vos.*  
Attorney.



# UNITED STATES PATENT OFFICE.

DAVID RICHARDS, OF LONDON, ENGLAND.

## SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 543,507, dated July 30, 1895.

Application filed April 3, 1893. Renewed February 25, 1895. Serial No. 539,678. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID RICHARDS, engineer, a subject of the Queen of Great Britain, and a resident of London, in the county of London, England, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a full and true specification.

My invention relates to improvements in sewing-machines, and has for its object to afford a greater supply of thread to the spool or bobbin of the lock-stitch mechanism than can be wound upon the ordinary bobbin; and in accordance therewith means are provided whereby a second reel of cotton or thread is made use of for the supply of the underneath thread or cotton, and which second reel itself performs the functions of a shuttle, in so far as it carries the under or locking thread through the loop formed in the upper thread, or alternatively a bobbin, as hereinafter described, may be employed capable of holding a sufficiency of thread, the advantages to be derived from such a system being that the machine may run a much longer time without stopping for the purpose of replacing the empty spool or bobbin with a full one or of winding fresh cotton or thread upon the bobbin than has heretofore been possible with the ordinary shuttles of lock-stitch machines, upon the bobbins of which only a very few yards can be wound; and, again, by this invention a very high speed may be obtained without fear of breaking the top thread, as friction thereupon is reduced to a minimum.

Now, in accordance with this invention I have a novel and simple arrangement of bobbin and lock-stitch mechanism, whereby the advantages above enumerated are obtained, and whereby additional advantages—such as economy, less liability of accident, as well as a capability of working at a greatly-increased speed—are secured than are possible with that class of machines now known as “two-reel” sewing-machines.

In order that this my invention may be fully understood and readily carried into effect, I will now proceed to describe the same with particular reference to the accompanying drawings, in which similar letters of reference indicate like parts in all the figures.

Figure 1 shows in side elevation my im-

provements as applied to a sewing-machine. Fig. 2 is a front sectional elevation of the same through line A B, Fig. 1. Fig. 3 is an inverted plan. Fig. 4 is a detailed view showing the sliding plate removed and the front pin turned up for the removal of the reel. Fig. 5 is a detail view of the sliding sleeve or bush which carries the thread-reel; and Fig. 6 is an inverted plan view of my improvements, portion of the cylinder being broken away.

In carrying out this invention I have, beneath the bed-plate of the machine, a revolving cylinder *a*, formed at its front or needle-end with a suitably-shaped hook or looper *a'*. This cylinder *a* is carried upon the shaft *x* and revolves with same.

*y* is a bearing for the shaft *x*.

As the needle *c* descends, the hook or looper *a'* in revolving takes the thread from the needle and spreads same around the periphery of the cylinder *a* and thus forms a loop. A second hook or curved extension *a''* on front end of cylinder *a* acts as a guide for the under thread and prevents same being drawn into the hook *a'* and being carried around with the top thread.

Centrally (and longitudinally therewith) inside the cylinder *a* aforesaid I have a projecting pin or rod *b*. This pin or rod *b* extends from the back of the cylinder and terminates at or slightly within the front end of the cylinder. Supported in a suitable bearing *d*, formed at the front end of and underneath the bed-plate *e* of the machine, I have a second pin or rod *f*, which is in line with the pin or rod *b* and extends nearly thereto, a small space being left between the two ends to allow of the passage of the thread or loop after the lock-stitch is formed. These two pins or rods *b f* form the spool-race. Sliding upon the aforesaid pins *b f* or spool-race I have a sleeve or bush *g*, (shown separately in Fig. 5, and also seen in Figs. 1, 3, 4, and 6,) which carries a reel of cotton or thread *h*. This bush or “reel-carriage” *g* I form at one of its ends with a suitably-shaped head *i*, in the groove or against the shoulder of which takes the projecting finger *k* of its actuating arm or lever *l* worked by cam or cams or other suitable mechanism or gearing and from which the cotton-reel *h* receives a reciprocating mo-



tion upon the spool-race *b f*. Though not shown, suitable leaders and tensions may be applied for the under thread if desired. The actuating-arm *l* may be given an oscillating motion as well as a reciprocating motion in order that the projecting finger *k* may be kept well within the groove *i* on head of the reel-carriage, and backlash and consequent rattling thereby be prevented.

In Fig. 6, which is an inverted plan of my improvements as applied to a sewing-machine, will be plainly seen the action of the reel-carriage *g* upon the guide-pins or spool-race *b f*. A portion of the cylinder *a* is in this figure shown broken away for facility of illustration. The actuating-arm *l* is jointed at *l'* to the lever *s*, which is pivoted at *s'* to the underside of the bed-plate *e*. On the lever *s* there is a projecting stud or roller *l'*, (shown in dotted lines,) which travels in a cam-groove formed upon the periphery of the drum *u*, fixed upon and revolving with the shaft *x*. At the commencement of the stroke the reel *h*, upon carriage *g*, is at the front end of the machine, as shown in full lines in the drawings, the finger *k* of the actuating-arm *l* taking in the groove *i* of the head of the carriage *g*. Upon the descent of the needle the hook *a'* of the revolving cylinder *a* takes the thread from the needle and spreads it around the cylinder, and a loop is thus formed through which the cotton reel and carriage may pass. As the drum *u* revolves, the stud *l'* on lever *s* travels in the cam-groove upon the periphery of same and draws the lever *s*, which is pivoted at *s'*, as aforesaid, and with it the arm *l* and reel-carriage *g*, to the position shown in dotted lines, the cotton-reel and carriage passing through the loop of the upper thread and entering the cylinder *a*, as shown, the carriage *g* sliding off the guide-pin *f* onto the guide-pin *b*. A suitable take-up (not shown) provided on the head of the machine or in other convenient position draws the lock-stitch upward between the ends of the pins *b f*, and thus completes the stitch at every stroke of the needle. The reel and carriage then resume the position shown in full lines and are ready for the next descent of the needle, when the operation is repeated.

The cylinder *a*, with hook or looper *a'*, may have either, as above described and shown, a rotary motion, or an oscillating or reciprocating motion may be imparted to it, and when desired a suitable varying movement is applicable.

To take off the reel *h* when empty and replace with a full one a convenient method is to form the bed-plate *e* of the machine with a sliding portion *m* (see Figs. 1 and 3) over the front end of the spool-race and to pivot the front pin *f* of the spool-race in its bearing, as at *n*. When the sliding portion *m* of the plate is withdrawn the front pin *f* may be turned up and the reel or bobbin *h* can readily be removed and another one substituted. Fig. 4 shows the sliding portion *m* of the bed-plate *e* removed and the front pin *f* turned

up for removal of the reel *h*. The end of the pin *f* is let into the longitudinally-tilting block *o*, which latter, pivoted at *n*, upon being depressed, as shown, raises the pin *f* and reel *h* through the opening caused by the removal of the sliding plate *m* and allows the reel *h* to be taken off.

The tilting-block *o* is formed with a projection or heel which extends beyond the end of the bed-plate, so that it may be readily reached and manipulated. When this projection is depressed the inner end of the guide-pin *f* is swung longitudinally upward until it reaches a substantially-vertical position.

*p* is a spring fixed at top of the tilting-block *o*, which when in position is pressed upon by the sliding plate *m* and tends to keep the front guide-pin *f* of the spool-race true. (See also Fig. 1).

For convenience, where a reel at hand is too large to pass within the cylinder *a* the carriage *g* may be formed (see particularly Fig. 5) with a removable head *r* at its free end, such free end being screw-threaded for its reception. The cotton or thread may then be wound from the reel onto the carriage *g*, which will thus form a bobbin. Fixed to the sleeve or bush *g* I may have a spring *q*, as shown in Fig. 5, which when the sleeve or bush *g* is passed through the aperture in the cotton-reel will tend to hold same firmly in position.

These improvements are adapted for use or employment on either top or bottom feed machines and upon most of the machines now in use, and from the construction of the revolving cylinder *a* and its hook or looper *a'* it may be placed immediately under the bed-plate of the machine, thereby enabling a short needle to be employed—always a great advantage when working at high speed.

It will be observed from the foregoing that the shuttle now generally used is entirely dispensed with, the hook or looper on end of the cylinder spreading the thread and forming the loop and the cotton-reel being in its reciprocations passed through the loop when formed. Hence a great saving in expense is obtained and friction or tension upon the top thread is reduced, the only strain upon same being the weight of a portion of the under or locking thread, and not, as heretofore, having to bear partly the weight of the shuttle or the casing of the under reel, as is the case in the two-reel machines now in use.

Having now particularly described my invention, what I claim, and desire to be secured to me by Letters Patent of the United States, is—

1. In a sewing machine, the combination of the looping cylinder *a* carrying the guide pin *b*, of a guide pin *f*, the laterally pivoted and vertically tilting block *o*, swinging longitudinally of the spool race, by which the guide pin *f* is carried, said block when depressed being adapted to elevate the inner end of the guide pin *f* into a substantially vertical posi-



tion, and the sliding sleeve *g* adapted to slide upon said guide pins when they are in line with each other, substantially as described.

2. In a sewing machine, the combination of  
5 a looping cylinder *a* carrying the guide pin *b*,  
of the guide pin *f*, the laterally pivoted and  
vertically tilting block *o*, swinging longitudi-  
nally of the spool race, by which the guide  
pin *f* is carried, the heel or projection con-  
10 nected to said block and extending beyond the  
end of the bed plate, so that when said heel  
or projection is depressed the inner end of the  
guide pin *f* will be elevated into a substan-  
tially vertical position, and the sliding sleeve  
15 *g* adapted to slide upon said guide pins when  
they are in line with each other, substantially  
as described.

3. In a sewing machine, the combination of  
the bed plate having a section thereof remov-  
20 able, of the looping cylinder *a* carrying the  
guide pin *b*, the laterally pivoted and verti-  
cally tilting block *o* swinging longitudinally  
of the guide pin *b* and carrying the guide pin  
*f*, the spring *p*, secured to the upper surface  
25 of said block and adapted to bear against the

under side of the removable section of the  
bed plate when the guide pin *f* is in its lower  
position, and the sliding sleeve *g* adapted to  
slide upon said guide pins, substantially as  
described.

4. In a sewing machine, the looping cylin-  
der *a* carrying the guide pin *b*, the guide pin  
*f* pivotally mounted in line with said guide  
pin *b*, the sleeve *g* formed with the groove *i*  
and adapted to slide upon said guide pin, an  
35 actuating arm provided at one end with an  
angular finger *k* engaging the groove upon  
said sleeve, a lever *s* pivoted at one end to the  
bed plate and at its other end pivoted to said  
actuating arm, a stud *t* formed upon said le-  
40 ver *s* intermediate of its ends, a drum *u*, situ-  
ated on the power transmitting shaft, a cam  
groove formed upon the periphery of said  
drum and into which the said stud *t* projects  
so as to transmit reciprocating motion to the  
45 sleeve, substantially as described.

DAVID RICHARDS.

Witnesses:

A. C. ELI,

GEO. COXHEAD.