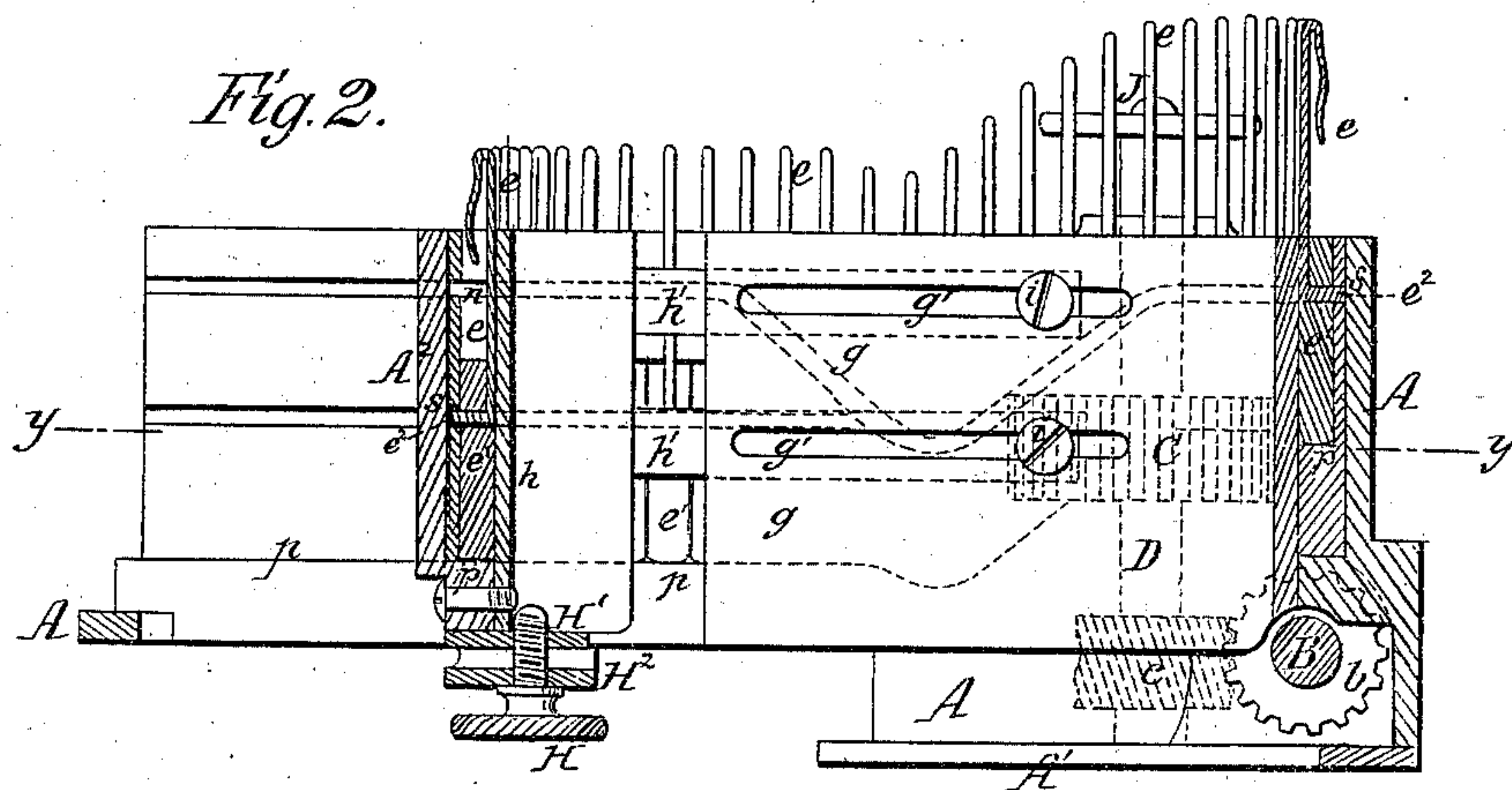
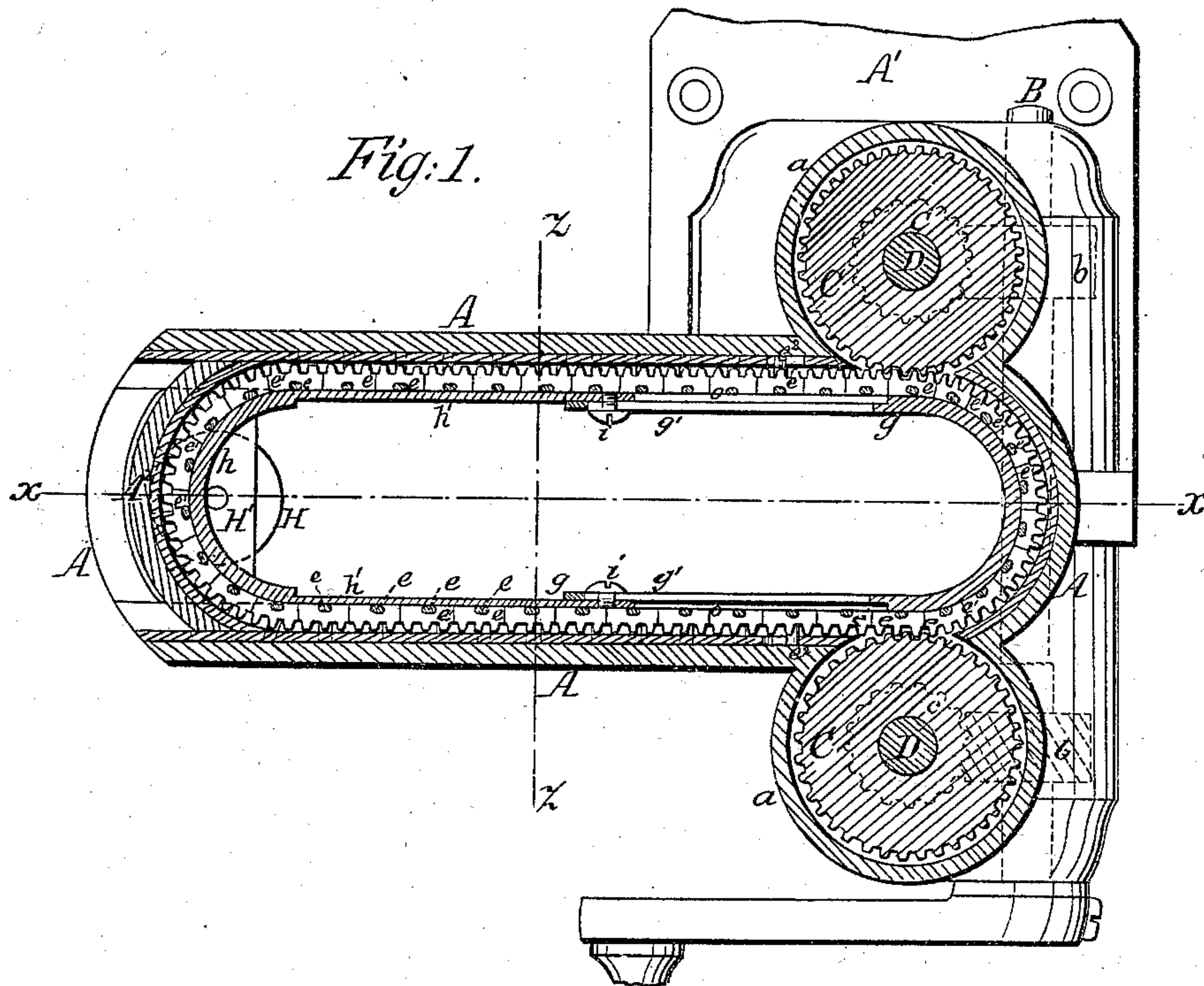


H. A. HOUSE.
KNITTING MACHINE.

No. 98,500.

Patented Jan. 4, 1870.



Witnesses.
R. T. Campbell
J. N. Campbell.

Inventor.
H. A. House
by
Mason Fenwick & Lawrence

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Fig. 3.

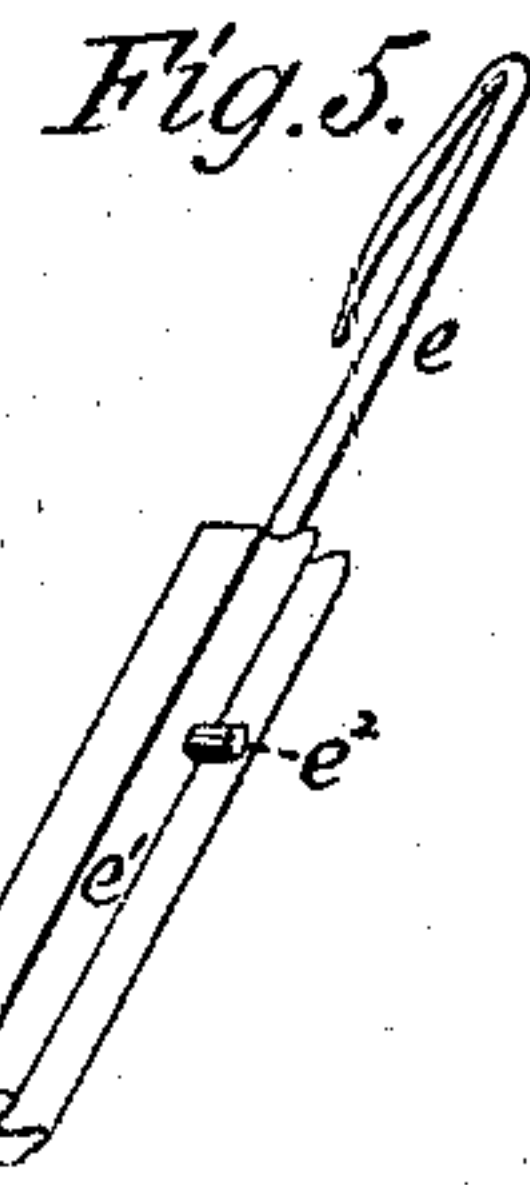
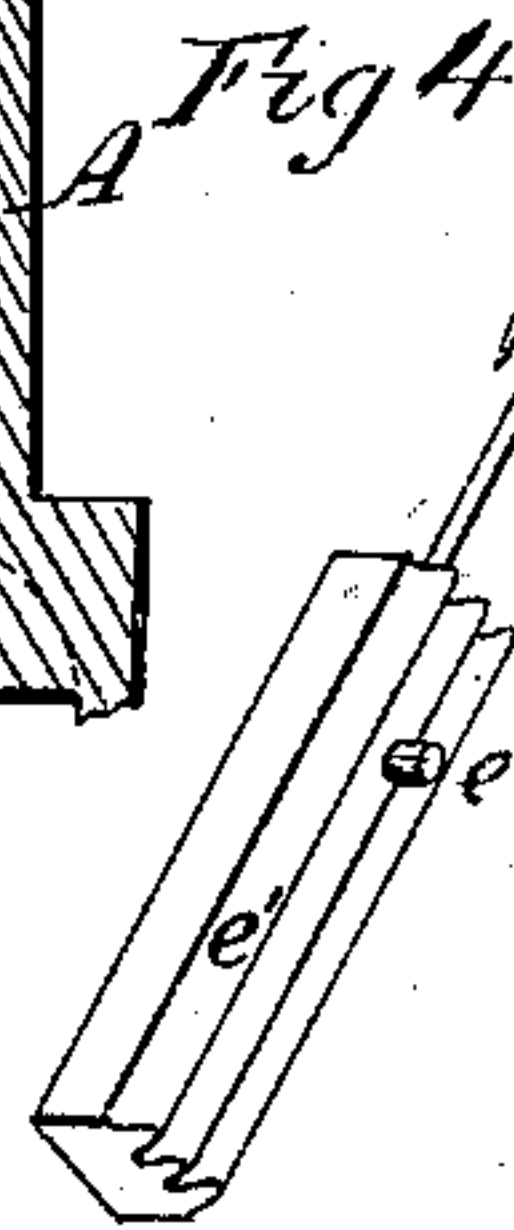
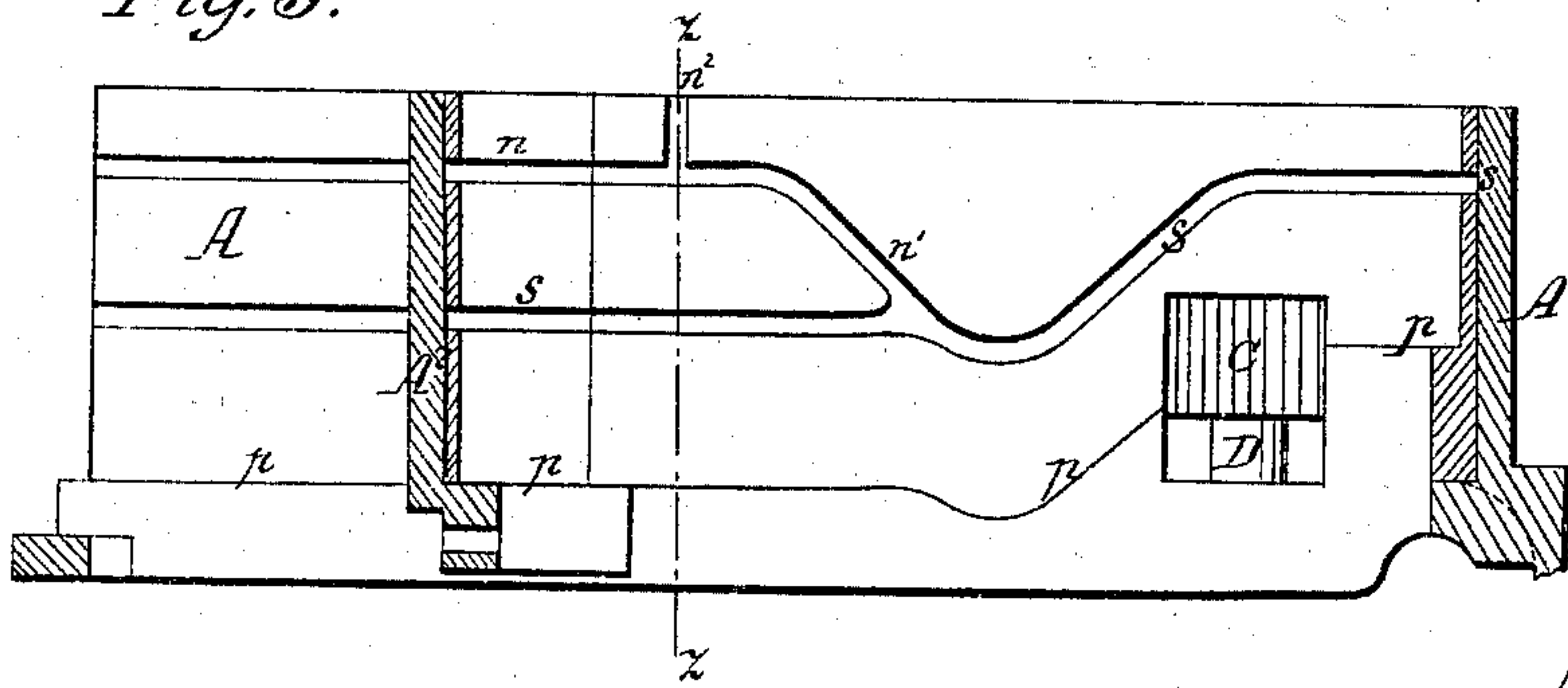
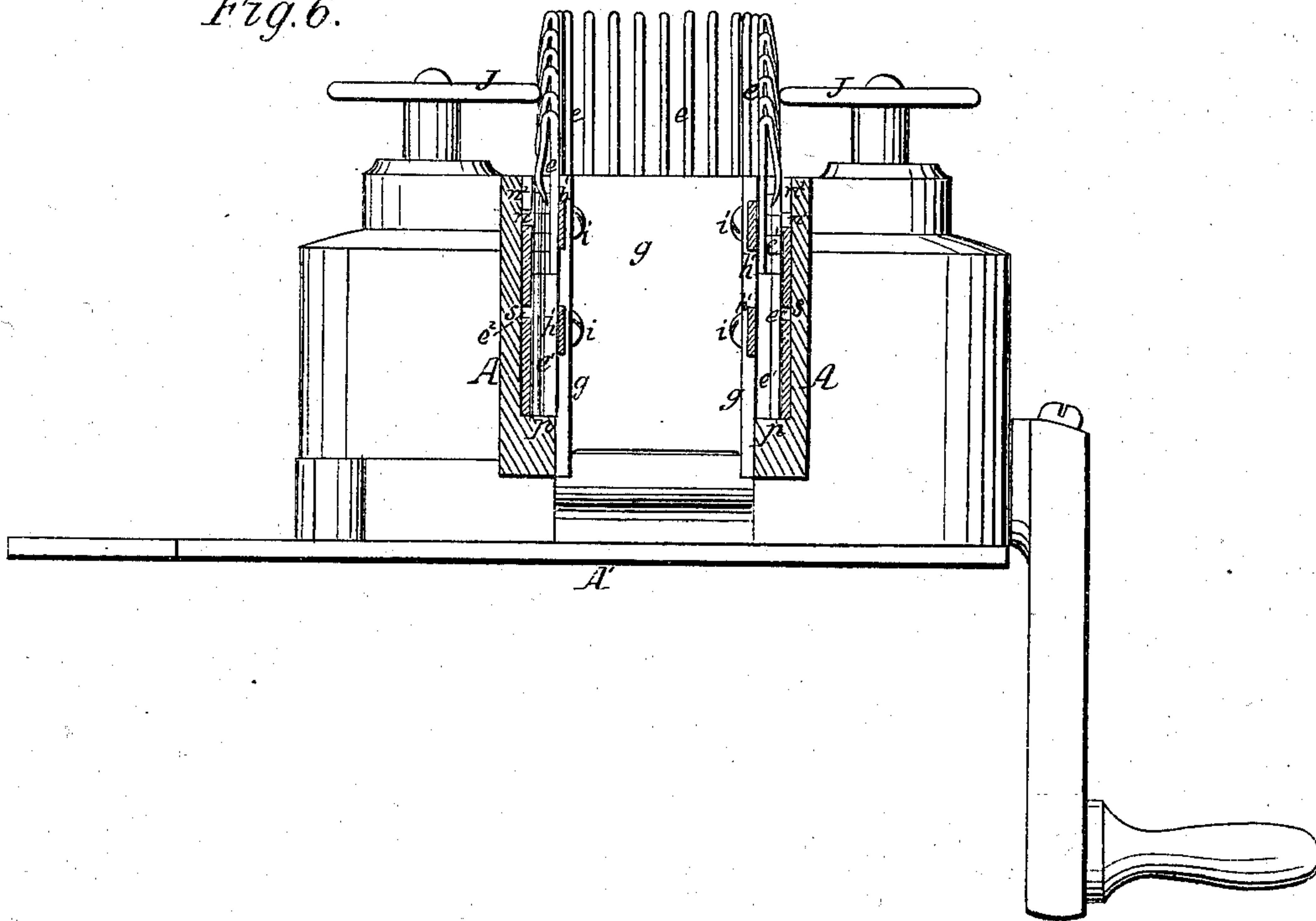


Fig. 6.



Witnesses.

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United States Patent Office.

HENRY A. HOUSE, OF BRIDGEPORT, CONNECTICUT.

Letters Patent No. 98,500, dated January 4, 1870.

IMPROVEMENT IN KNITTING-MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, HENRY A. HOUSE, of Bridgeport, in the county of Fairfield, and State of Connecticut, have invented certain new and useful Improvements in Knitting-Machinery; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, sheet 1, is a section through the machine, taken in the horizontal plane indicated by line *y* in fig. 2.

Figure 2, sheet 1, is a longitudinal section through the machine, taken in the vertical plane indicated by line *x x* in fig. 1.

Figure 3, sheet 1, is a longitudinal section of the frame, taken in the same plane as fig. 2, with the needles and inner guide-plates or walls removed.

Figures 4 and 5, sheet 1, are perspective views of needles and their toothed sections.

Figure 6, sheet 2, is an enlarged section, taken transversely through the machine, as indicated by line *z* in fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to certain novel improvements on that class of knitting-machinery which is adapted especially for knitting circular work, but which is applicable to the production of straight or single work, wherein the needles are arranged so as to travel around in the path of a flattened ellipse, and also rise and descend, for receiving the yarn and casting off the loops.

The nature of my invention consists in providing for increasing or diminishing the capacity of a knitting-machine, and affording guides and firm supports for the needles at all times, by the employment of an extensible frame, constructed as will be hereinafter explained.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

I have not represented in the accompanying drawings, devices for supplying yarn to the needles and casting off the loops, for the reason that well-known devices, adapted for these purposes, may be employed.

A represents the main portion of the frame of the machine, which portion consists of two parallel sides, terminating in semicircular ends, one of which ends is cut away so as to leave only a thin connecting portion, as shown in figs. 2 and 3.

A² represents the movable portion of the frame, which is of a semicircular form, and fitted snugly between the parallel sides of the portion A, so as to be supported upon ways, *p*, formed upon the inner side of this portion, near its lower edge.

By means of a binding-screw, H, and a transverse

bridge-plate, H², arranged beneath the base-plate H¹, of the section A², this section can be rigidly secured to the portion A, at any desired distance from the closed end thereof.

Within this extensible frame, plates *g h h'* are applied, so as to form a channel for receiving the toothed sections *e'* of the needles *e*, and guiding these needles while in operation.

The plate or inner wall *g* is secured to the portion A, near its lower edge, and occupies about one-half the length of this portion.

The plate or wall *h*, which is semicircular, is secured to the movable section A², at a point near its lower edge; and the narrow plates *h' h'* extend from the vertical edges of the plate or wall *h*, and are fitted into grooves made in the outer surfaces of the straight portions of the wall *g*, so as to be flush with the said surfaces, as shown in fig. 6.

These narrow plates *h' h'* are connected to the wall *g* by screws *i i*, which pass through long slots made through this wall, as shown in figs. 1 and 2, at *g'*.

It will be seen, that the channel which is formed within the frame-sections A A², is endless, and of an equal width at all points, and that this channel can be lengthened or shortened by adjusting the section A².

The base of this channel is formed by the off-sets or ways *p*, on the inner surface of the section A, which should be straight, or parallel to the upper edges of this section, along those surfaces upon which the section A² is required to slide; and at those points where the needles are required to take the yarn and cast off the loops, the ways *p* should be formed as shown in figs. 2 and 3, so as to elevate the needles as they successively pass around the closed end of the section A, and then allow them to descend or dip.

It will be seen, by reference to figs. 2 and 3, that the ways *p* are carried around upon the inner side of the section A², in an uninterrupted plane.

Above the ways or shoulders *p*, is a groove, *s*, which is made in the inner side of the section A, and continued around in the inner side of the adjustable section A², above the ways *p*.

This groove *s* should be parallel to the ways *p*, or equidistant from them at all points throughout its length.

At suitable points along the groove *s*, one or more switch-grooves, *n*¹, lead from it into a groove, *n*, from which one or more short vertical grooves, *n*², lead out to the upper edge of the section A, for allowing the insertion of the needles into their proper places, and a ready removal of one or more needles from the machine.

Each one of the needles *e* is secured to a quill or toothed-rack section, *e'*, which is adapted to fit snugly but loosely into the channel formed in the frame above

described, and which may be constructed with two or more teeth, according to the distance apart it is required to have the needles arranged in the frame.

Fig. 4 shows a needle, e , applied to a section, e^1 , having three teeth; and fig. 5 shows a needle applied to a section having but two teeth.

These sections e^1 collectively constitute an endless toothed rack, as shown in fig. 2, which rack is moved around in its channel by means of one or more toothed wheels C.

Each needle section e^1 has a short, round stud, e^2 , extending from its toothed side, which is received by the groove s , as shown in figs. 2 and 6, and affords a support for the needles and their sections in this groove, so that while the needles will all slide freely, they will be held down in their places, and be guided while in operation by the groove s .

The studs e^2 may be formed by bending the butts of the needles at right angles to their shank portions, and passing these bent ends through the sections e^1 , as shown in one instance in fig. 2; or the studs might be formed on the needle sections in casting them.

To introduce the needles into the channel formed in frame $A A^2$, the studs e^2 must be inserted into a vertical groove, n^2 , and made to follow the course of the grooves $n n^1$, and the same movements are required to remove the needles.

When the required number of needles have been inserted into their channel, as above stated, the section A^2 is pressed toward the closed end of section A, until all the quills or needle sections e^2 are in close contact with one another. The section A^2 is then secured fast by its binding screw H, and the machine is ready for operation.

The spurred wheels C C, which engage with the teeth of the needle sections e^1 , and move these sections around in their channel, are arranged near the closed end of frame section A, on opposite sides thereof, and are keyed on vertical shafts, D D, carrying spur-pinions $c c$.

The teeth of the spurs $c c$ are oblique, and engage

with corresponding teeth of spurs $b b$, made fast on a driving-shaft, B.

The gearing is enclosed within a chamber formed in the frame section A, as shown in the drawings.

On the upper ends of the shafts D D, circular plates J are keyed, which will serve as closers for the hooks of the needles, if hooked needles are used.

The grooves which are in the frame sections $A A^2$, for guiding the needles, may be formed in the inner surfaces of these sections, or they may be formed by a steel lining applied to said surfaces.

The plate A^1 , which is secured to the bottom of frame section A, beneath its chambered portion, will serve as a bearing for the lower ends of the shafts D D, and also as a means for securing the machine to a table or other established object.

I am aware that knitting-needles which were connected together by links have been applied to adjustable rollers or drums, applicable to chains of needles of different lengths; but I am not aware that an extensible frame, adapted for the working of disconnected needles, has ever been known or used prior to my invention.

Having described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. An extensible frame or needle-support, composed of sections $A A^2$, having interior guides applied to them, and adapted for receiving, supporting, and guiding knitting-needles which are disconnected from each other, substantially as described.

2. The plates or bars h^1 , in combination with the sliding frame section A^2 , and inner walls $g h$, for connecting these walls and forming a continuation of the needle-guide channel between them, substantially as described.

HENRY A. HOUSE.

Witnesses:

DAVID B. LOCKWOOD,
DOMINICK CONLIN.