

No. 665,674.

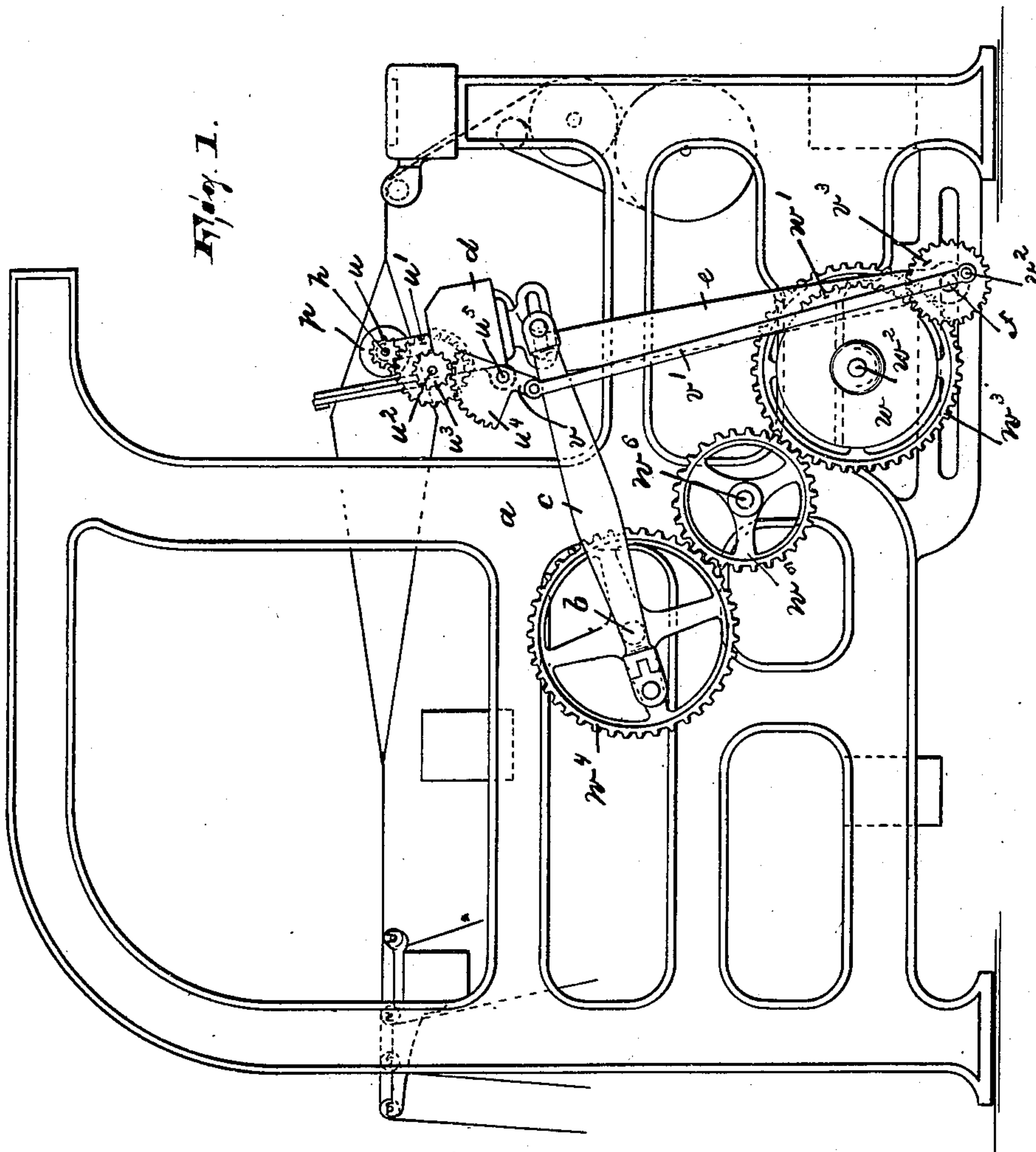
Patented Jan. 8, 1901.

A. GARTNER.
LOOM.

(Application filed Apr. 23, 1900.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

INVENTOR:

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ATTORNEYS.

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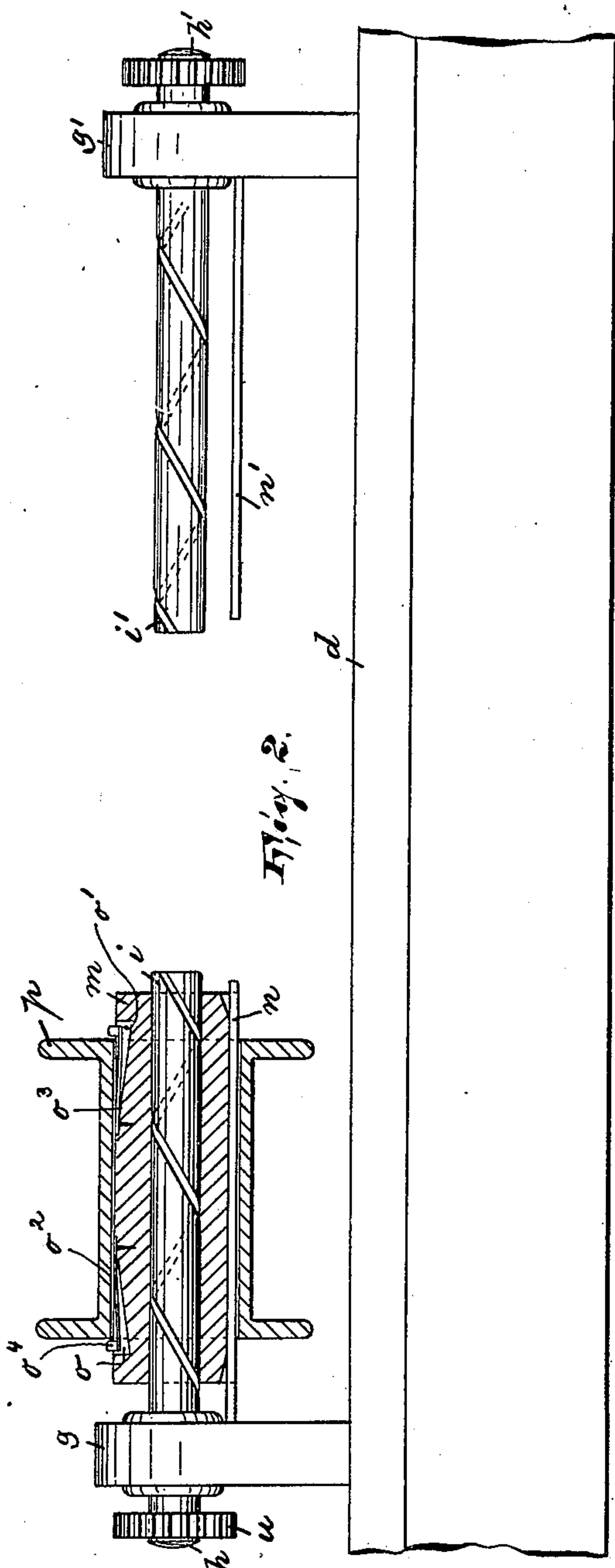


Fig. 2.

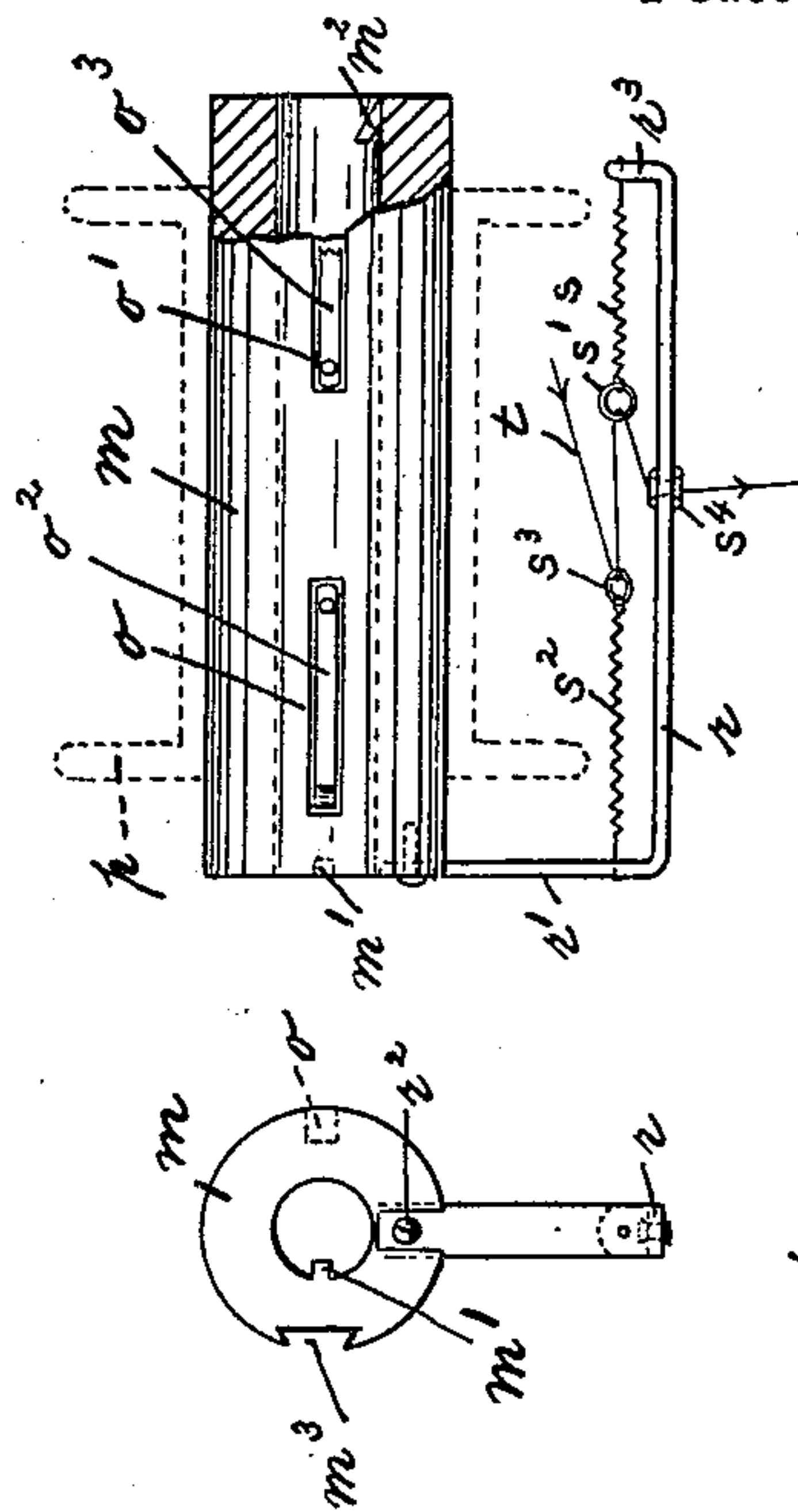


Fig. 3.

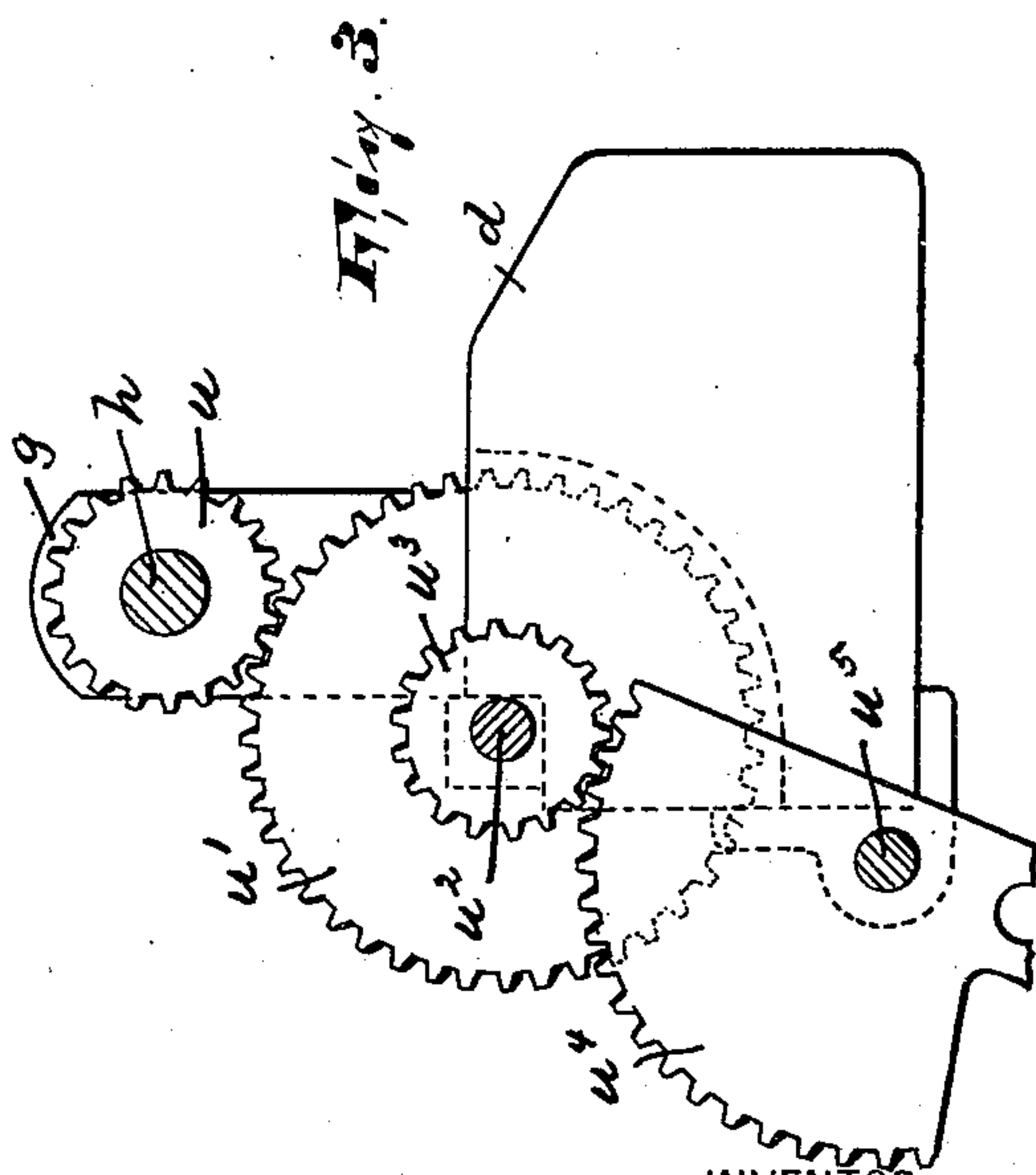


Fig. 4.

WITNESSES:

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UNITED STATES PATENT OFFICE.

ALFRED GARTNER, OF PATERSON, NEW JERSEY.

LOOM.

SPECIFICATION forming part of Letters Patent No. 665,674, dated January 8, 1901.

Application filed April 23, 1900. Serial No. 13,879. (No model.)

To all whom it may concern:

Be it known that I, ALFRED GARTNER, a citizen of the United States, residing at 579 Broadway, in the city of Paterson, county of Passaic, and State of New Jersey, have invented certain new and useful Improvements in Looms; 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 improvements in looms for weaving silk, cotton, or other fabrics, being especially applicable to ribbon or other narrow-ware looms, and it relates particularly to that portion of the loom by means of which the weft or filler is carried through the shed formed by the warp-threads. Heretofore the weft-thread-retaining means, together with the weft-thread, were moved through the shed either by means of suitably constructed shuttles or by means of needles. Looms embodying these constructions are well known as "shuttle-looms" and "needle-looms," respectively. Shuttle-looms—and especial reference being made to ribbon-shuttle looms—contain many objectionable features. Besides requiring an increased power for operating the shuttles by means of intermediate rack-bars and pinions the shuttles are of such construction that only a limited and specified amount of weft-thread or filling material can be carried by the shuttles, and accordingly the loom has to be frequently stopped for the purpose of removing the empty quills or bobbins and replacing them by full ones. This frequent stopping of the loom causes delay and loss of time and besides is injurious to the mechanism of the loom, as will be manifest to those familiar with the art. The second class of looms above mentioned—needle-looms—although overcoming the one objectionable feature of frequently stopping the loom for the purpose of replacing empty quills or bobbins, does not in every respect answer the requirements of a perfect loom. First of all, through the peculiar construction the weft laid between the warp is doubled, and besides in most cases the edges

of the fabric woven are imperfect—that is to say, the loops formed by doubling the weft-thread are merely held in position by means of the crossing warps, and thus the withdrawing of the weft and the pulling apart of the finished fabric can easily be accomplished. Furthermore, the construction of a needle-loom is too delicate and requires constant repair, which undoubtedly is one of the main objectionable features. Another class of looms may be mentioned—i. e., that in which the thread-carriers of the looms are engaged by propelling screws or worms in portions of said carriers which are remote from the thread-receiving portions thereof. The objectionable features of this class of looms are apparent and are to a certain extent the same as those mentioned in connection with the ordinary shuttle-loom. In addition to those objections are added the imperfect action of the carriers and the cost of construction and of running, which, all in all, have rendered such looms impracticable for the trade, and accordingly the market for the same is very limited.

The object of the present invention is to overcome the various objectionable features of the three classes of looms above mentioned and to provide a loom simple and durable in construction, perfect in action, especially in so far as the carriers are concerned, efficient in operation, not liable to get out of order, easily operated, and permitting the use of bobbins, quills, or spools of almost any shape, size, or construction, whereby the necessity of stopping the loom for changing empty quills or bobbins is reduced to the minimum.

The invention consists in the improved loom, in the weft-thread carrier, in means for propelling said carrier, adapted to engage the same in the thread-receiving portion thereof, whereby the thread or filling surrounds the propelling means, and in the combination and arrangement of the various parts, substantially as will be hereinafter more fully described and finally embodied in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the several views, Figure 1 is a side elevation of a loom provided with my improvements, only those parts of the loom being shown which are nec-

essary to fully illustrate the nature of the said invention. Fig. 2 is an enlarged front elevation of a portion of the batten and of the weft-thread carrier and its operating and propelling means with certain portions shown in section; Fig. 3, an enlarged detail end elevation of the weft-thread carrier operating or propelling means; Fig. 4, a detail view of the weft-thread carrier detached and also showing one form of tension device capable of being used in connection with my improvements, and Fig. 5 an end elevation of Fig. 4.

In said drawings, *a* represents the loom-frame, and *b* the main driving-shaft, transmitting motion through crank and pitman *c* to the batten *d*, the latter being supported by lay-swords *e*, fulcrumed on the shaft *f*, having bearings in the frame *a*, all of the usual and well-known construction.

On the batten *d* and at specified suitable intervals are secured brackets *g* and *g'*, forming bearings for the shafts *h* and *h'*, arranged in alinement with each other and having secured thereon screws or worms *i* and *i'*, respectively. It may be well to remark that the grooves in the screws or worms *i* and *i'* correspond in pitch or incline—that is to say, the pitch of the screw or worm *i'* forms a continuation of the pitch of the screw *i*, for a purpose hereinafter stated. On one of the screws (in the drawings on the screw *i*) is loosely arranged a sleeve or carrier *m*, provided at its ends with inwardly-extending lugs or projections *m'* and *m''*, adapted to engage the grooves of the screws or worms *i* and *i'*. Said sleeve or carrier is provided in its lower portion with a longitudinally-extending groove or recess *m³*, preferably inwardly beveled, (see Fig. 5,) slidably arranged on the guide plate or bar *n* or *n'*, which latter are secured to their respective brackets *g* and *g'* in any desired manner. Said guide plate or bar prevents the rotation of the sleeve or carrier while the latter is being reciprocated, as will be manifest. The sleeve or carrier *m* is also provided at suitable places with recesses *o* and *o'*, in which are secured flat springs *o²* and *o³*, carrying at their free ends upwardly-extending lugs or projections *o⁴*, adapted to retain upon the sleeve or carrier a spool or bobbin *p*. It will be noticed that by means of the peculiar construction of said retaining means the spool or bobbin can be readily removed from and placed upon the sleeve or carrier and when so disposed will be prevented from lateral motion, at the same time being allowed to freely revolve on the latter.

Any suitable tension device can be arranged on the sleeve or carrier, and in Figs. 4 and 5 is illustrated one form of tension device which can be quickly attached to or detached from the said carrier. Said tension device consists of an L-shaped bar or rod *r*, having its shorter arm *r'* removably secured by means of a screw *r²* in a recess or groove arranged in one end of the carrier *m*. The free end *r³* of the longer arm of said bar or rod *r* is bent inwardly at

right angles, and to it is secured one end of a spiral spring *s*, the other end of which carries an eyelet *s'*. A similar spring *s²*, with an eyelet *s³*, is secured to the shorter arm *r'*, substantially in alinement with the spiral spring *s*. The weft-thread *t* passes through one of said eyelets to and through the other and then through an eyelet *s⁴*, arranged approximately in the central portion of the bar or arm *r*. On each of the shafts *h* and *h'* is securely mounted a pinion *u*, meshing with a gear *u'*, secured on a shaft *u²*, which latter is parallel with the main driving-shaft and is supported by and extends longitudinally of the batten *d*. On one or both ends of said shaft *u²* is mounted a pinion *u³*, meshing with the toothed segment *u⁴*, revolvably arranged on a stub-shaft *u⁵*, having its bearings in brackets secured to and projecting from the batten *d*. The segment *u⁴* is provided with a radially-arranged arm *v*, pivotally connected, by means of a rod *v'*, to a pin *v²*, which latter is eccentrically arranged on the pinion *v³*, revolvably mounted on the shaft *f*. Said pinion *v³* receives an intermittent motion from the disk *w*, which for this purpose is provided on its outer periphery with a toothed section *w'*. The disk *w* is mounted on a shaft *w²*, which also carries a gear-wheel *w³*, receiving its motion from the gear-wheel *w⁴* on the main driving-shaft *b* by means of an intermediate pinion *w⁵*, revolvably mounted on a stub-shaft *w⁶*, which latter has its bearings in the frame *a*, all as clearly shown in Fig. 1 of the drawings.

It should be remarked that the various motion-transmitting gears must be of such size and construction that when the main driving-shaft makes one complete revolution the shafts *h* and *h'* are rotated sufficiently to propel the carrier *m* from its rest position on the screw *i* to its rest position on the screw *i'*, or vice versa, thereupon permitting the shafts *h* and *h'* to cease to rotate long enough for the changing of the sheds, as will be manifest.

I do not think it necessary to describe in detail the operation of weaving in connection with my improvements, as said operation is precisely the same as that of an ordinary shuttle-loom, the weft-carrier being propelled from one side of the shed, through the shed, to the other side, when it stops to allow the sheds to be changed, said weft-carrier being thereafter returned to its former position.

I have described my improvements in connection with the loom illustrated in the drawings—that is to say, in connection with a narrow-ware loom—only one section having been shown; but it will be manifest that the same principles can be applied to broadcloth-loom, and, in fact, to looms for weaving any kind of fabrics. I may also state that the mechanism for oscillating or rotating the shafts *h* and *h'* could be changed, and likewise the bobbin-retaining means and the carrier-guiding means could be altered, without deviating from the spirit of my invention.

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

1. A weft-thread carrier, and means adapted to penetrate the thread-receiving portion of said carrier and to operatively engage the same to reciprocate said carrier, one of the elements being revoluble.

2. A weft-thread carrier having an internally-threaded aperture in its thread-receiving portion, and a propelling device adapted to penetrate the aperture of the carrier and to operatively engage the threading thereof.

3. A weft-thread carrier, and a propelling screw or worm for the said carrier adapted to penetrate and to operatively engage the thread-receiving portion of said carrier, one of said elements being revoluble.

4. A suitably-guided weft-thread carrier and a revolving screw or worm adapted to penetrate the thread-receiving portion of said carrier and to operatively engage the same to propel said carrier.

5. A weft-thread carrier adapted to be reciprocated by rotary means penetrating the thread-receiving portion of said carrier.

6. A weft-thread carrier provided in its thread-receiving portion with an opening, said opening being adapted to receive rotary means for reciprocating said carrier.

7. A weft-thread carrier provided in its thread-receiving portion with an opening and with a projection extending into said opening, said opening being adapted to receive means for reciprocating said carrier, and said means being adapted to engage said projection.

8. A weft-thread carrier provided in its thread-receiving portion with a threaded aperture, said aperture being adapted to receive means for reciprocating said carrier and said means being adapted to engage the threading thereof.

9. A weft-thread carrier, propelling means operatively engaging the same, said carrier having an opening in its thread-receiving portion and said means being adapted to penetrate the same, one of the elements being revoluble, and means for guiding said carrier.

10. A suitably-guided weft-thread carrier, in combination with means penetrating the thread-receiving portion of said carrier and operatively engaging the same and adapted to reciprocate said carrier.

11. A weft-thread carrier provided in its thread-receiving portion with an opening, means adapted to penetrate said opening and to operatively engage the said weft-thread carrier, and means for guiding said weft-thread carrier.

12. A weft-thread carrier provided in its thread-receiving portion with an opening and with a projection extending into said opening, a propelling screw or worm penetrating said opening and in engagement with said projection, and means for guiding said weft-thread carrier.

13. A weft-thread carrier provided in its thread-receiving portion with an opening, means penetrating said opening and operatively engaging said carrier to reciprocate the latter, means for guiding said carrier, and bobbin-retaining means on said carrier.

14. In a loom, the combination with the reciprocating batten and with the main driving-shaft, of a thread-carrier on the batten, means adapted to penetrate the thread-receiving portion of said carrier and to operatively engage the same to reciprocate said carrier, and connecting means between the main driving-shaft and the thread-carrier-reciprocating means to operate the latter, substantially as and for the purposes described.

15. In a loom, the combination with the reciprocating batten and with the main driving-shaft, of a weft-thread carrier on the batten, a propelling screw or worm for said carrier adapted to penetrate and to operatively engage the thread-receiving portion of said carrier, and connecting means between the main driving-shaft and the propelling screw or worm to operate the latter, substantially as described.

16. In a loom, the combination with the reciprocating batten and with the main driving-shaft, of a suitably-guided weft-thread carrier on the batten, a revolving screw or worm adapted to penetrate the thread-receiving portion of said carrier and to operatively engage the same to propel said carrier, and means operated from the main driving-shaft for revolving said screw or worm, substantially as described.

17. In a loom, the combination with the reciprocating batten and with the main driving-shaft, of a weft-thread carrier on said batten and provided in its thread-receiving portion with an opening and with a projection extending into said opening, a propelling screw or worm penetrating said opening and engaging said projection, means for guiding said weft-thread carrier, and means operated from the main driving-shaft for revolving said propelling screw or worm, substantially as described.

18. In a loom, the combination with the batten and with a revolving shaft, of a weft-thread carrier on the batten, propelling means adapted to penetrate the thread-receiving portion of said carrier and to operatively engage the same to reciprocate said carrier, and intermittently-actuating power-transmitting mechanism operatively connecting said shaft and the propelling means, substantially as described.

19. In a loom, the combination with the reciprocating batten and with a shaft, means for intermittently rotating said shaft, a weft-thread carrier on the batten, a propelling screw or worm for said carrier adapted to penetrate and to operatively engage the thread-receiving portion of said carrier, and means for transmitting the motion from the shaft to the propelling screw or worm, substantially as and for the purposes described.

20. In a loom, the combination with the re-
ciprocating batten and with the main driving-
shaft, of a suitably-guided weft-thread carrier
on the batten, a propelling screw or worm for
5 said carrier adapted to penetrate and to oper-
atively engage the thread-receiving portion
thereof, a pinion at or near the end of said
propelling screw or worm, and means operated
from the main driving-shaft to intermittently

rotate said pinion, substantially as and for the
purposes described.

In testimony that I claim the foregoing I
have hereunto set my hand this 21st day of
April, 1900.

ALFRED GARTNER.

Witnesses:

MARGARET BRITTON,
ROBERT J. POLLETT.