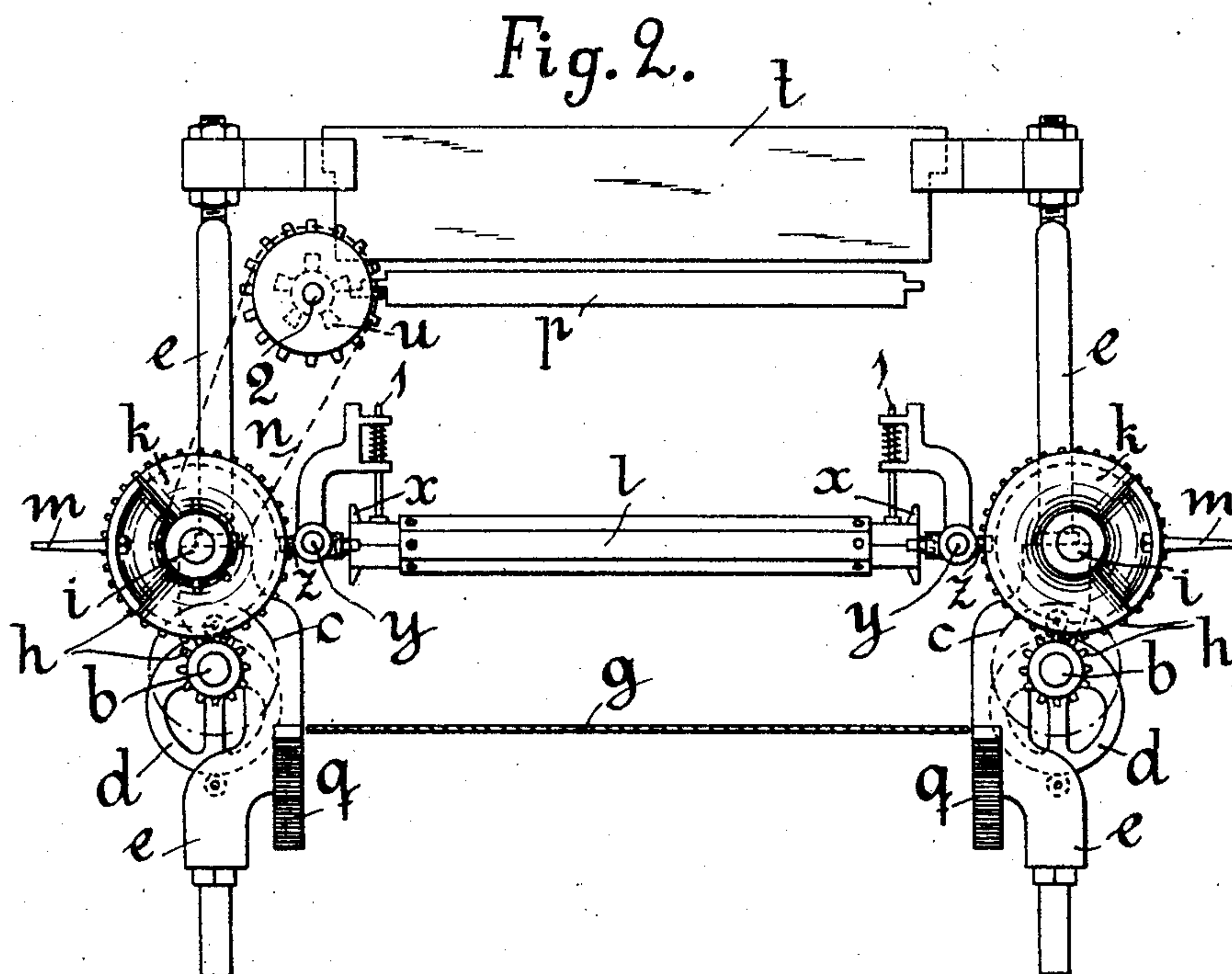
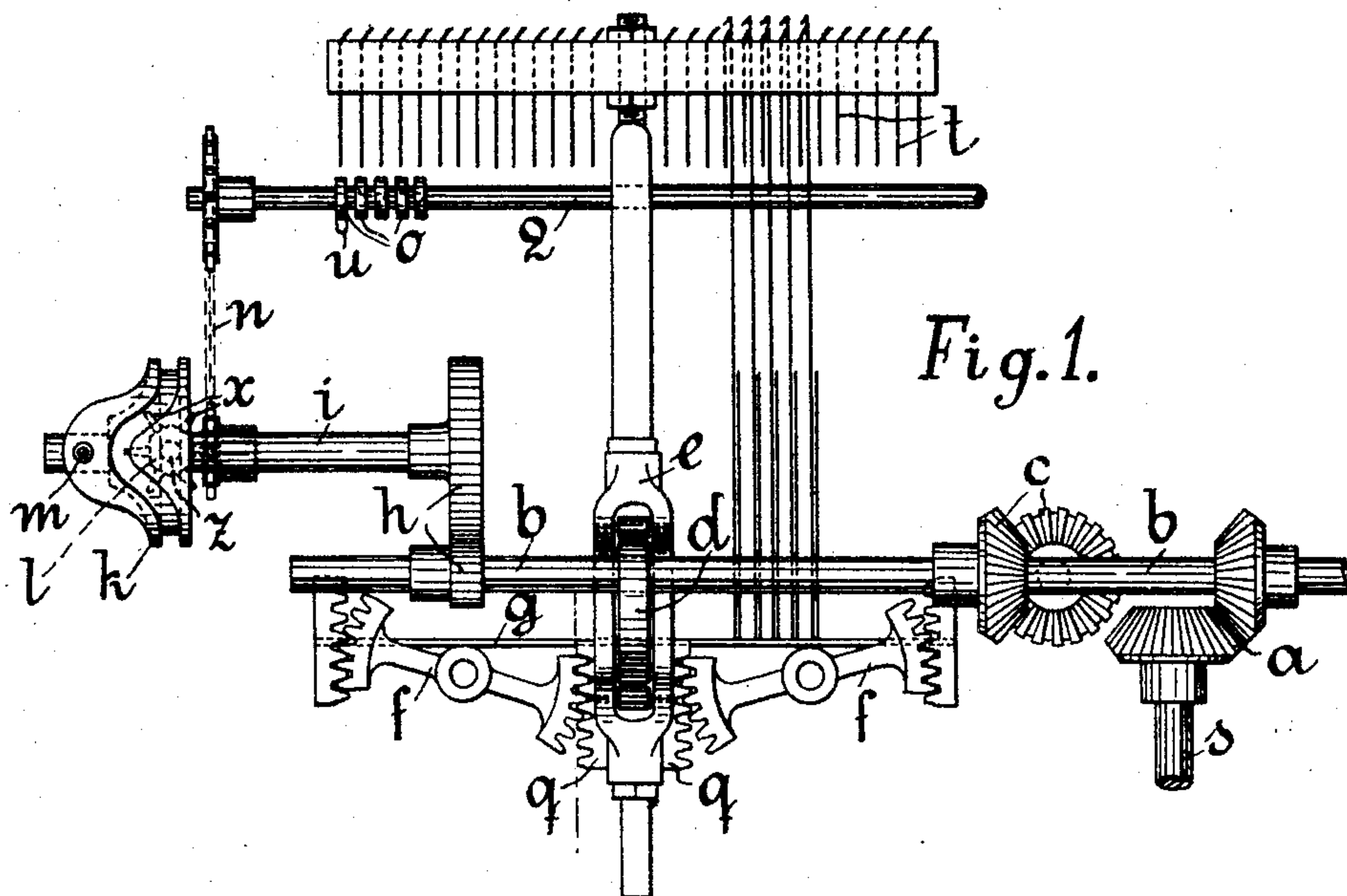


F. A. STERNER.
DAMASK JACQUARD LOOM.
APPLICATION FILED FEB. 27, 1903.

3 SHEETS—SHEET 1.

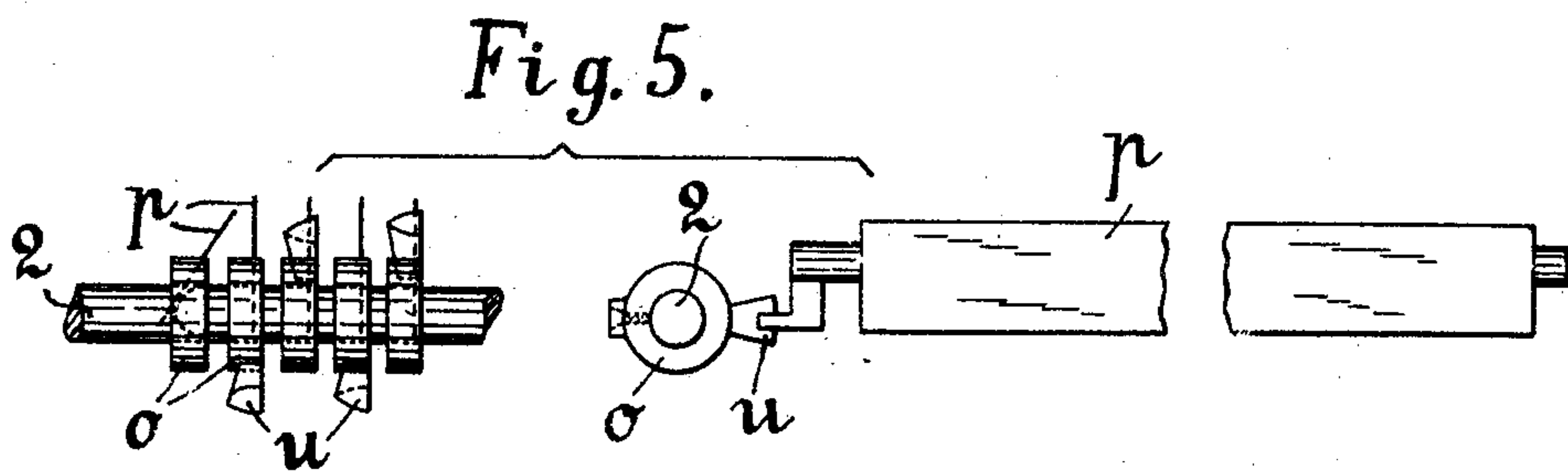
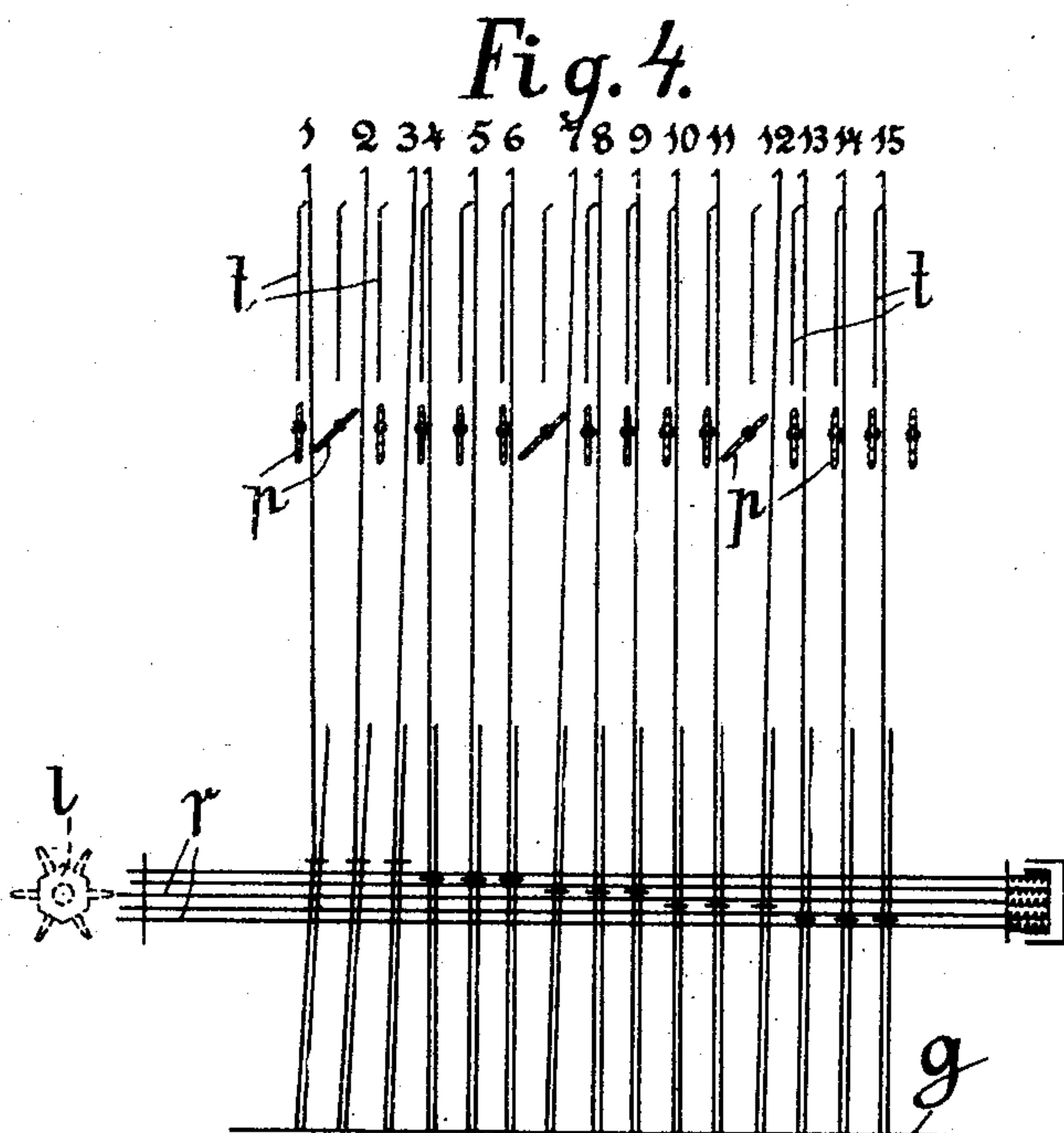
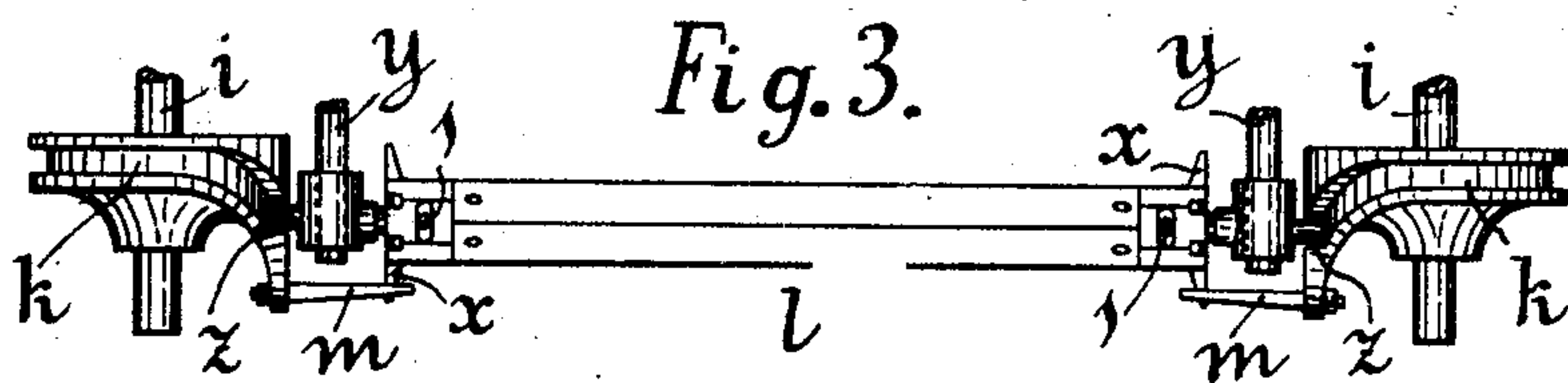


Witnesses:
E. S. Noble
O. Carlberg

Inventor,
Fritz Augustinus Sterner
by J. Singer Atty.

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3 SHEETS—SHEET 2.



Witnesses:

W. S. Noble
Carlberg

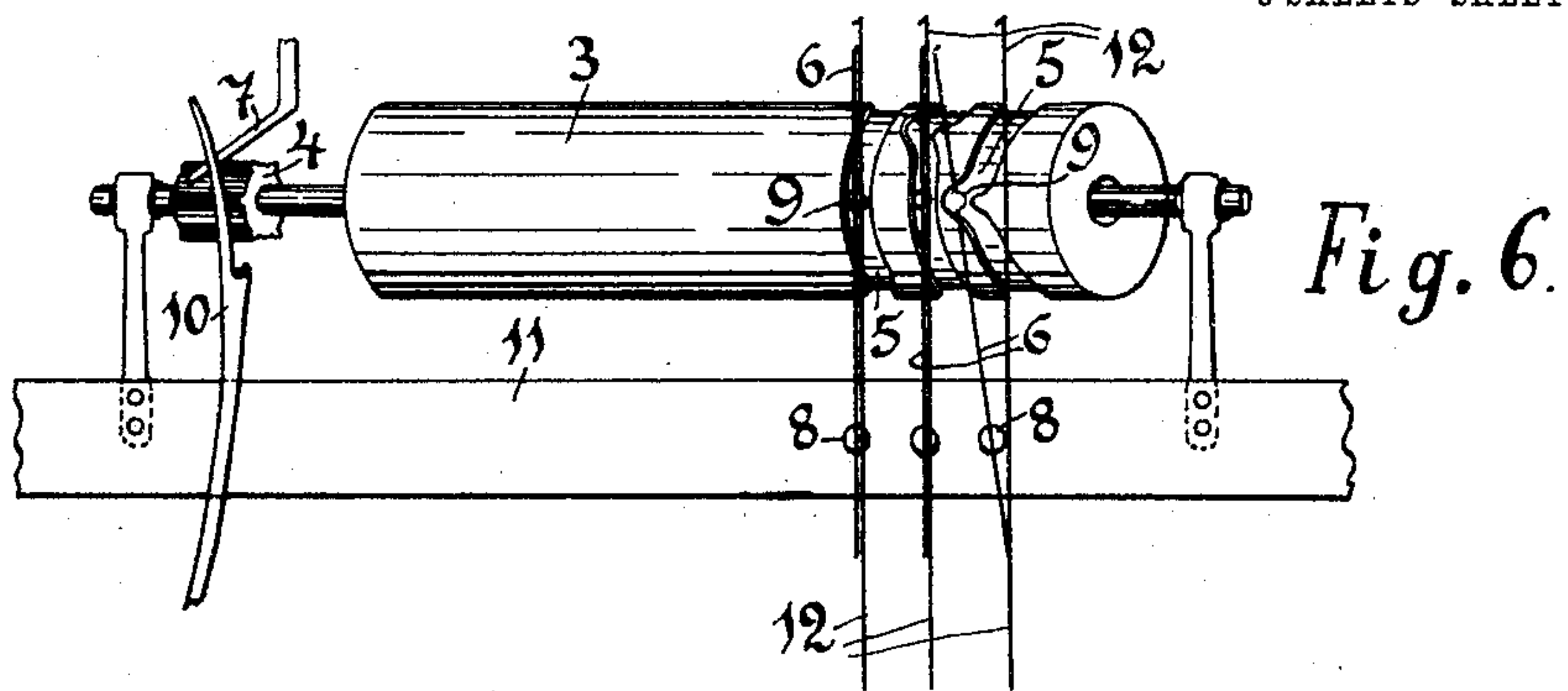
Inventor,
Fritz Augustinus Sterner
by J. Singer
Att'y.

No. 786,389.

PATENTED APR. 4, 1905.

F. A. STERNER.
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3 SHEETS—SHEET 3.



Witnesses:

G. S. Noble
O. Carlberg

Inventor,
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Atty.

UNITED STATES PATENT OFFICE.

FRITZ AUGUSTINUS STERNER, OF ÅBO, RUSSIA.

DAMASK JACQUARD LOOM.

SPECIFICATION forming part of Letters Patent No. 786,389, dated April 4, 1905.

Application filed February 27, 1903. Serial No. 145,313.

To all whom it may concern:

Be it known that I, FRITZ AUGUSTINUS STERNER, master weaver, a subject of the King of Sweden and Norway, and a resident of Åbo, Finland, Russia, have invented certain new and useful Improvements in Damask Jacquard Looms; and I do 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.

As above stated, this invention relates to a mechanical damask Jacquard loom in which the same saving of pattern-cards, pattern-drawings, and work which is won by the execution of ordinary damask-weaving by hand can be effected without the employment of so-called "forward healds" or other extra means of assistance. Besides this the production of an almost unlimited number of large patterns is rendered possible.

This invention is principally intended to effect the binding in a jacquard-pattern in such manner that the number of rows of lifting-wires is made dividable with the number of bindings in the binding and that this binding is accomplished by means of entire rows of lifting-wires in the order as indicated by the binding being compelled to remain downward and other entire rows of lifting-wires in the same order being compelled to rise, independent of which special wires have been receded or not.

In a form of the machine—namely, the one shown in Figures 1 to 5—the ordinary needles and the ordinary pattern-card prisms, as well as binding-disks, are present. Fig. 1 shows an end view of the first-mentioned form, Fig. 2 a front view, and Fig. 3 shows the device for turning the pattern-card prism. Fig. 4 shows the arrangement of the wires or hooks, the needles, and so-called "binding-disks;" and Fig. 5 shows the arrangement for maneuvering the binding-disks. Fig. 6 shows a preferred form of the apparatus in which the binding is effected by means of a cam-cylinder in place of the binding-disks.

The machine consists of a frame at the opposite ends of which the horizontal shafts *b*

are fitted, to which shafts are imparted simultaneous motion by means of a shaft and conical cog-wheel *c*, mounted onto the side of the frame. The machine can be fitted to any loom and is set in motion by means of the shafts *b*, which by means of a shaft *s* and cog-gear *a* are placed in communication with one of the shafts of the loom. On the shafts *b* are mounted eccentrics *d*, which move in grooves fitted in vertical-moving raisers or lifting-blades *e*, with whose upper ends the lifting-plates *T* are firmly fixed. On both sides of the raisers racks *g* are fitted, and in these one of the ends of the double-armed levers *f* engages, which levers are provided with cog-segments. The other ends engage racks arranged at the board *g* under the lifting-wires, which by this means is lowered when the lifting-plates *T*, with the lifting-blades *e*, are raised, and vice versa.

The card-prism *l* is horizontally and pivotally mounted on bars *y*, fitted to the frame, and on its bearings taps *z* are fitted, which enter the grooves of grooved or worm wheel *k*, fitted on shafts *i*, which worm-wheel in its rotation sets the card-prism in motion to and from the needles *r* and by means of taps *m*, attached to the said worm-wheel, which taps come into contact with taps *x*, fitted on the prism, turn the prism when it occupies a position farthest from the needles. The prism is kept in position by means of spring-actuated taps *1*, which engage with their plane ends one of the sides of the prism, thus keeping it steady, but yet, by reason of spring-pressure when the taps *m* are acted upon, allow its being turned round. The shafts *i* are connected with the shafts *b* by means of cog-gear *h* and are set in motion by them.

The binding in the pattern is effected by horizontal binding-blades *p*, which are fitted at the ends of the machine. The bearing-taps of the blades *p* are fitted close to the upper edges of the latter, by means of which the blades hang vertically when they are not acted upon. One of the taps of each of these blades is constructed in the form of a crank, by means of which the blades can be turned by projections *u* on rollers *o*, fitted on a shaft

2, which by means of chain-gearing *n* is connected with the shafts *i*. The needles and wires are arranged in the ordinary way.

In order to clearly explain the functions of the machine, an example of its method of working is here shown adjusted for a certion product. The cog-wheels in the gear *h* are so adjusted that worm-wheels *k* make one revolution in the same time as the shafts *p* make as many revolutions as threads desired in a so-called "web unit," (in this instance three.) After the third revolution the card-prism, which in the meantime has been pressed against the needles, is carried by the worm-wheel *k* away from the needles and is turned simultaneously by the taps *m*, so that a new card is turned toward the needles. (See Figs. 3 and 4.) Every needle is connected with as many wires as threads desired in a so-called "web-unit," (in this case three.) Suppose that five-binding satin is to be manufactured—*i. e.*, similar binding shall be effected at every fifth weft—then it must be so arranged that the shaft 2 makes one revolution while the shafts *b* make as many revolutions as indicated by the number of bindings, (in this instance five,) whereby the rows of lifting-wires, as numbered in Fig. 4, are acted upon by the binding-disks, of which one is arranged between each row of lifting-wires in the following order: At the first weft the first, sixth, eleventh, and so on, binding-disks are turned and convey thereby every fifth row of lifting-wires back onto the lifting-blades, if so-called "light satin" is to be manufactured—*i. e.*, first, sixth, eleventh, and so on, and every fifth row from these—*i. e.*, second, seventh, twelfth, &c.; but if heavy satin is to be manufactured the disks turn the first, sixth, and eleventh, &c., rows from the lifting-blades, and the second, seventh, and twelfth, &c., rows toward the lifting-blades. At the second weft in the first instance the third, eighth, thirteenth, &c., rows of lifting wires or hooks forward, and the fourth, ninth, fourteenth, &c., back, but in the latter case vice versa. At the third weft the fifth, tenth, fifteenth, &c., rows of lifting-wires are carried forward, and so on. The wires are conveyed,

as known, downward by their own individual weight and rest with their lower ends against the board under the lifting-wires *g*, resting with their upper ends against the lifting-blades *t*, providing they are not moved from the blades by the needles. In accordance with Fig. 6 there are no binding-disks, but the binding is here effected by the assistance of a prism 3, provided with grooves 5 on its periphery, and in these grooves entering taps 9, which are fitted on the lifting-blades 6 and convey these latter to and from the binding wires or hooks 12, so that certain ones of these may be acted upon by the blades as they (the blades) ascend. 11 is the lifting-plate, which also supports the cylinder 3. This so-called "binding-cylinder" is now given a rotary movement by a pawl or hook 10, (which is fitted in the frame of the machine and at the downward movement of the lifting-plate 11 and the cylinder 3 acts upon a cog-wheel 4, connected with the cylinder,) whereby every tooth on the cog-wheel, respectively every projection at the side of the grooves 5 in the periphery of the cylinder corresponds to a new weft-stroke. In order to prevent the cylinder turning of itself, a spring 7 may rest against the cog-wheel 4.

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

In a damask Jacquard loom, provided with as many hooks or wires to every needle as it is desired to have threads to a warp unit, the combination of rotatable lifting-blades 6, between said hooks, said blades being provided with taps 9, a cylinder or other rotating element 3 provided with grooves 5 with which said taps engage in order to cause the lifting-blades to engage the hooks and to operate them in a given order, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FRITZ AUGUSTINUS STERNER.

Witnesses:

ARTUR WILEN,
W. FAGERLUND.