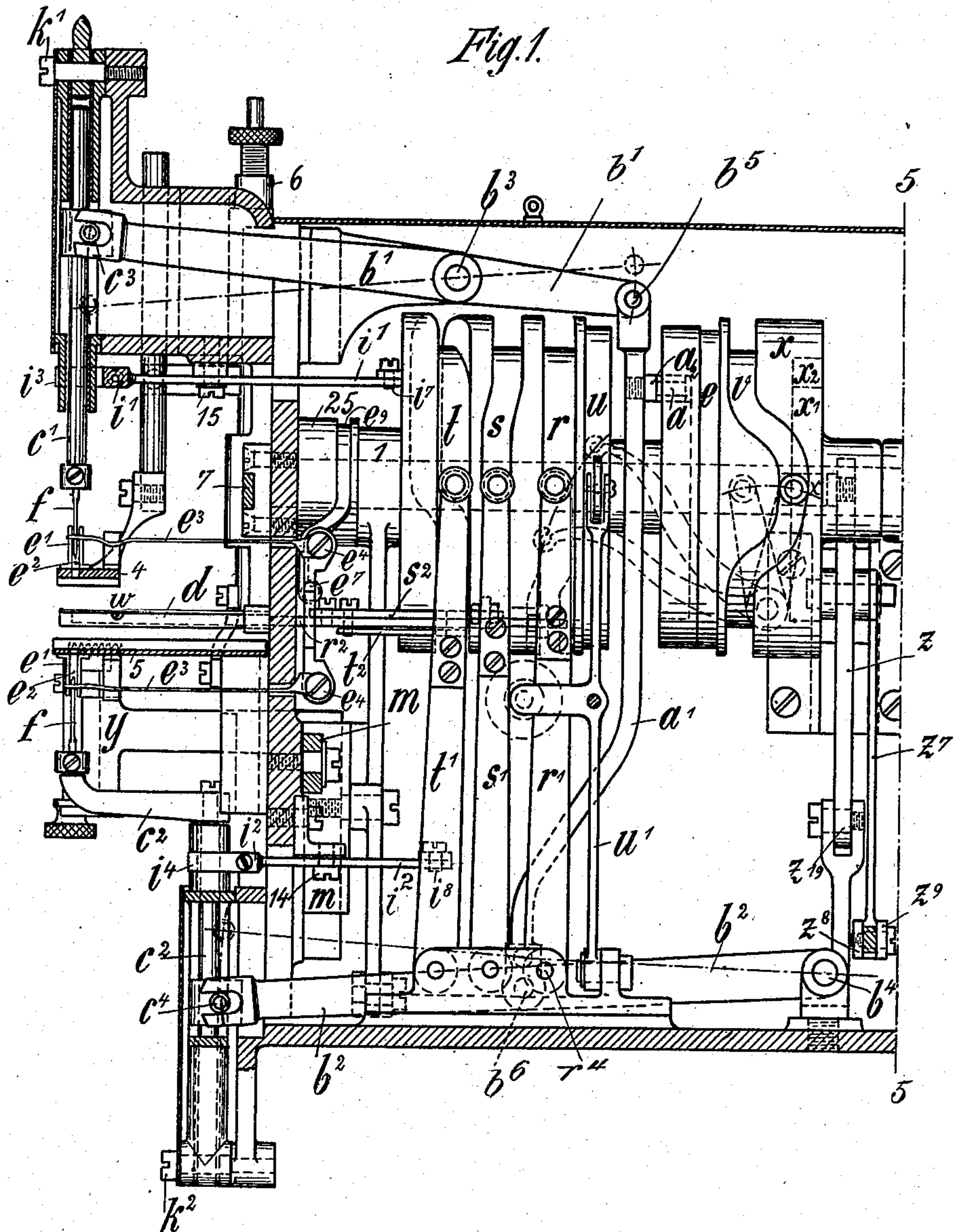


G. FISCHER.
SEWING MACHINE FOR SEWING STRAW PLAIT.
APPLICATION FILED JAN. 17, 1907.

899,392.

Patented Sept. 22, 1908.
10 SHEETS—SHEET 1.



Witnesses:
Arthur C. Guinpe
H. R. Schulz.

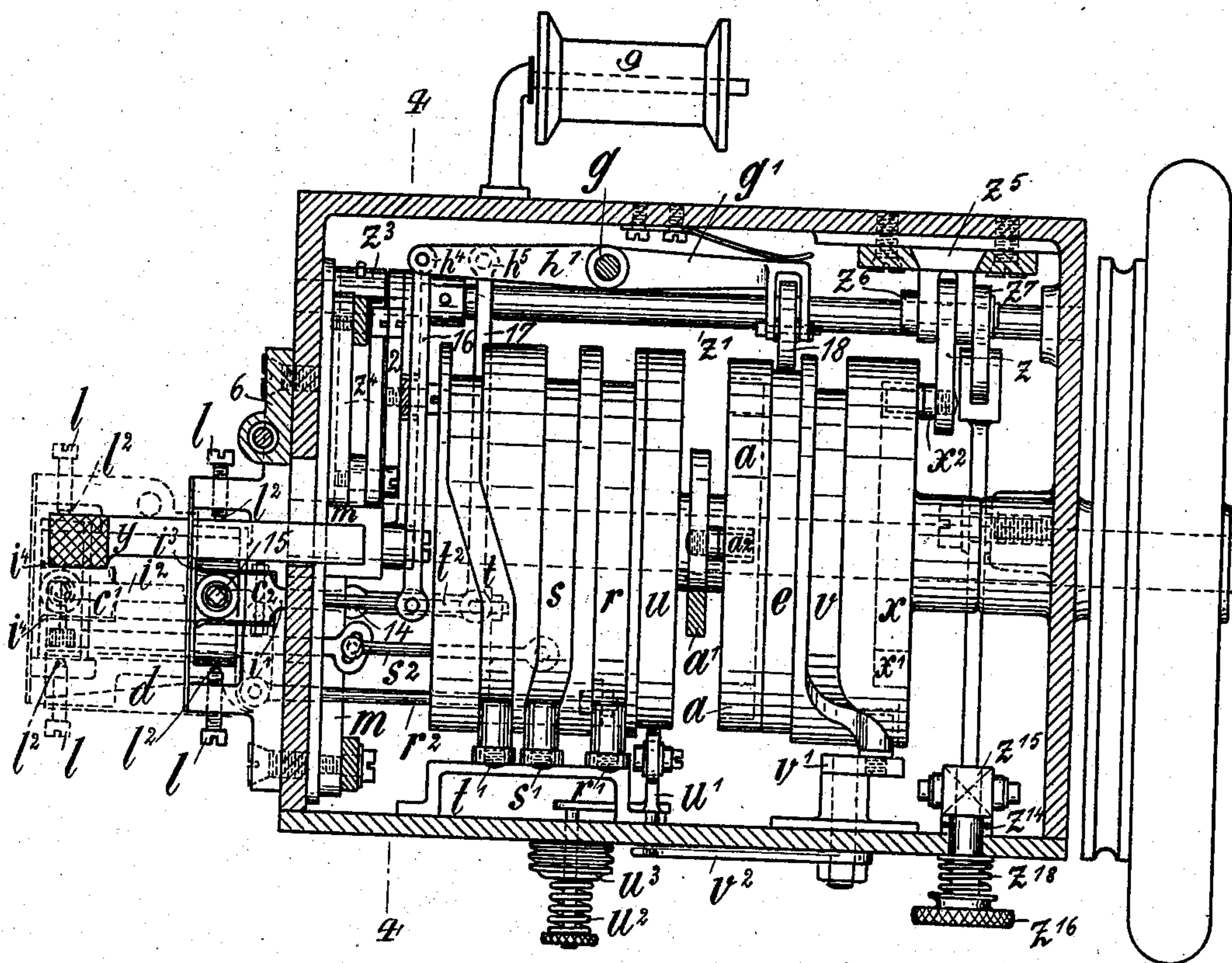
Inventor:
Guillaume Fischer
by *August Briesch* Atty.

G. FISCHER.
SEWING MACHINE FOR SEWING STRAW PLAIT.
APPLICATION FILED JAN. 17, 1907.

899,392.

Patented Sept. 22, 1908.
10 SHEETS—SHEET 2.

Fig. 2.



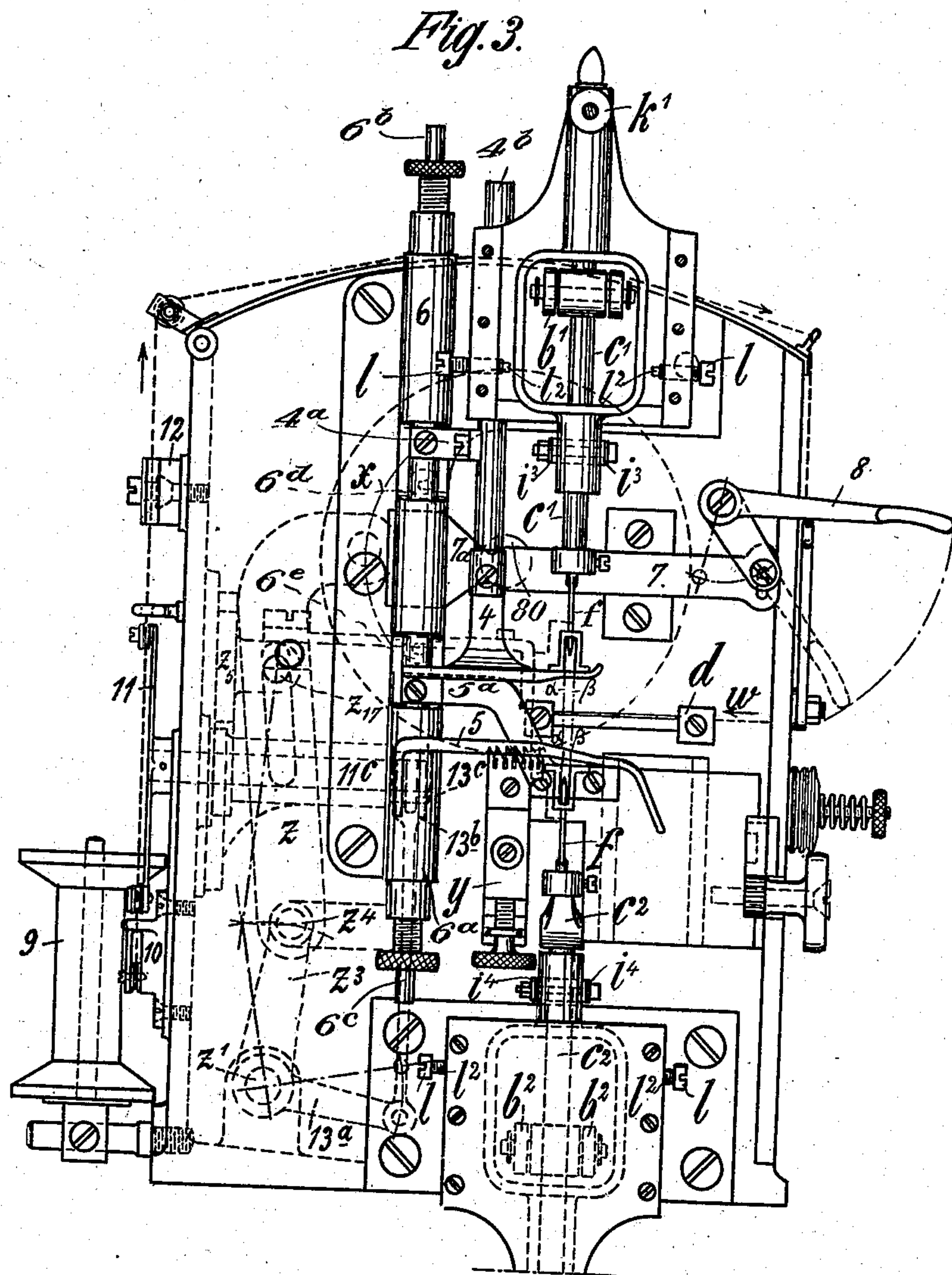
Witnesses:
Arthur E. Jumper
H. R. Schutz.

Inventor:
Guillaume Fischer
by Frank Briesew Atty.

G. FISCHER.
SEWING MACHINE FOR SEWING STRAW PLAIT.
APPLICATION FILED JAN. 17, 1907.

899,392.

Patented Sept. 22, 1908.
10 SHEETS—SHEET 3.



Witnesses
Arthur E. Ziempe
H. R. Schulz

Inventor
Guillaume Fischer
by Frank B. Brierley Atty.

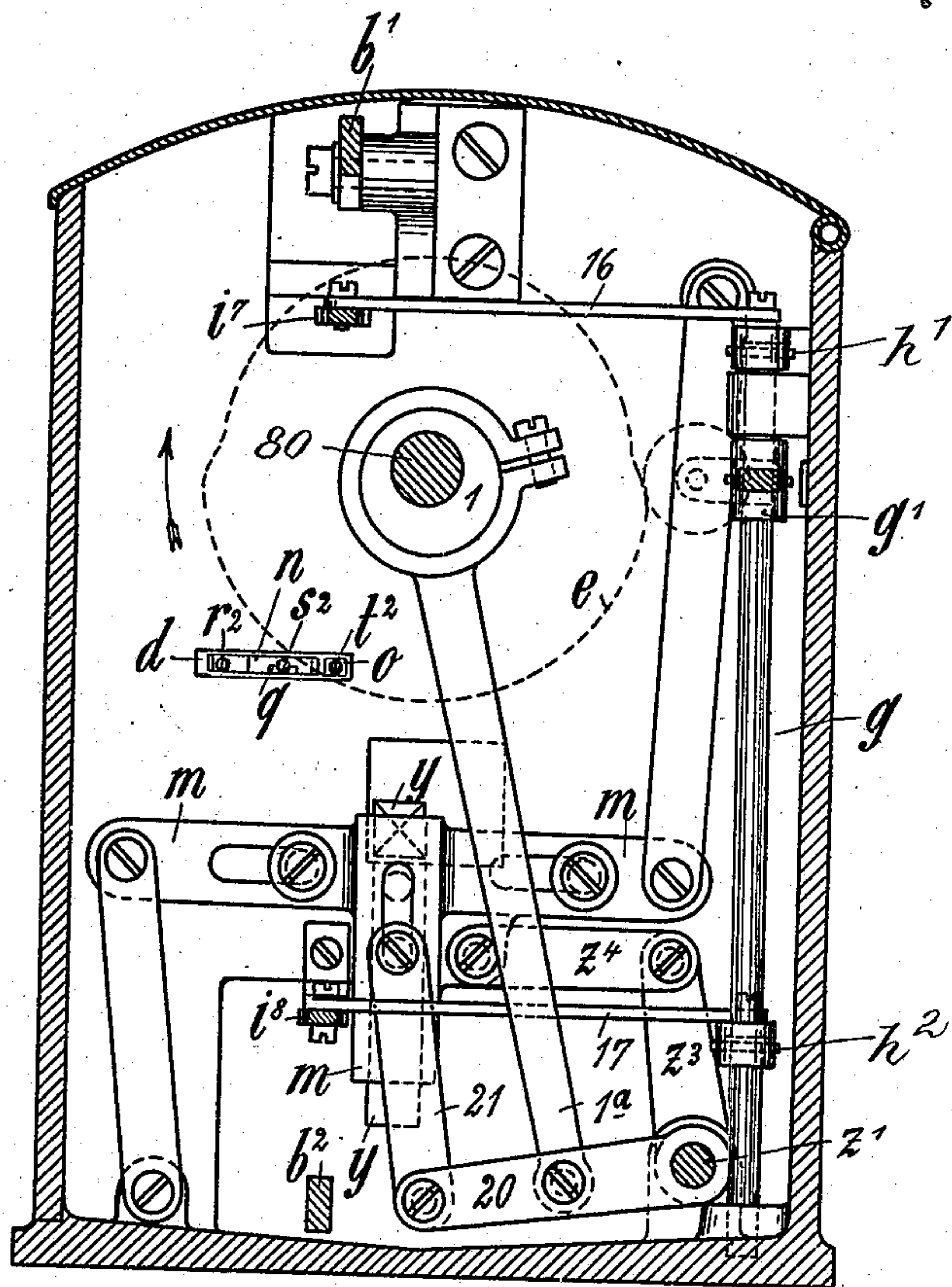
G. FISCHER.
SEWING MACHINE FOR SEWING STRAW PLAIT.
APPLICATION FILED JAN. 17, 1907.

899,392.

Patented Sept. 22, 1908.

10 SHEETS—SHEET 4.

Fig. 4.



Witnesses:
Arthur E. Zumpfer
H. R. Schulz.

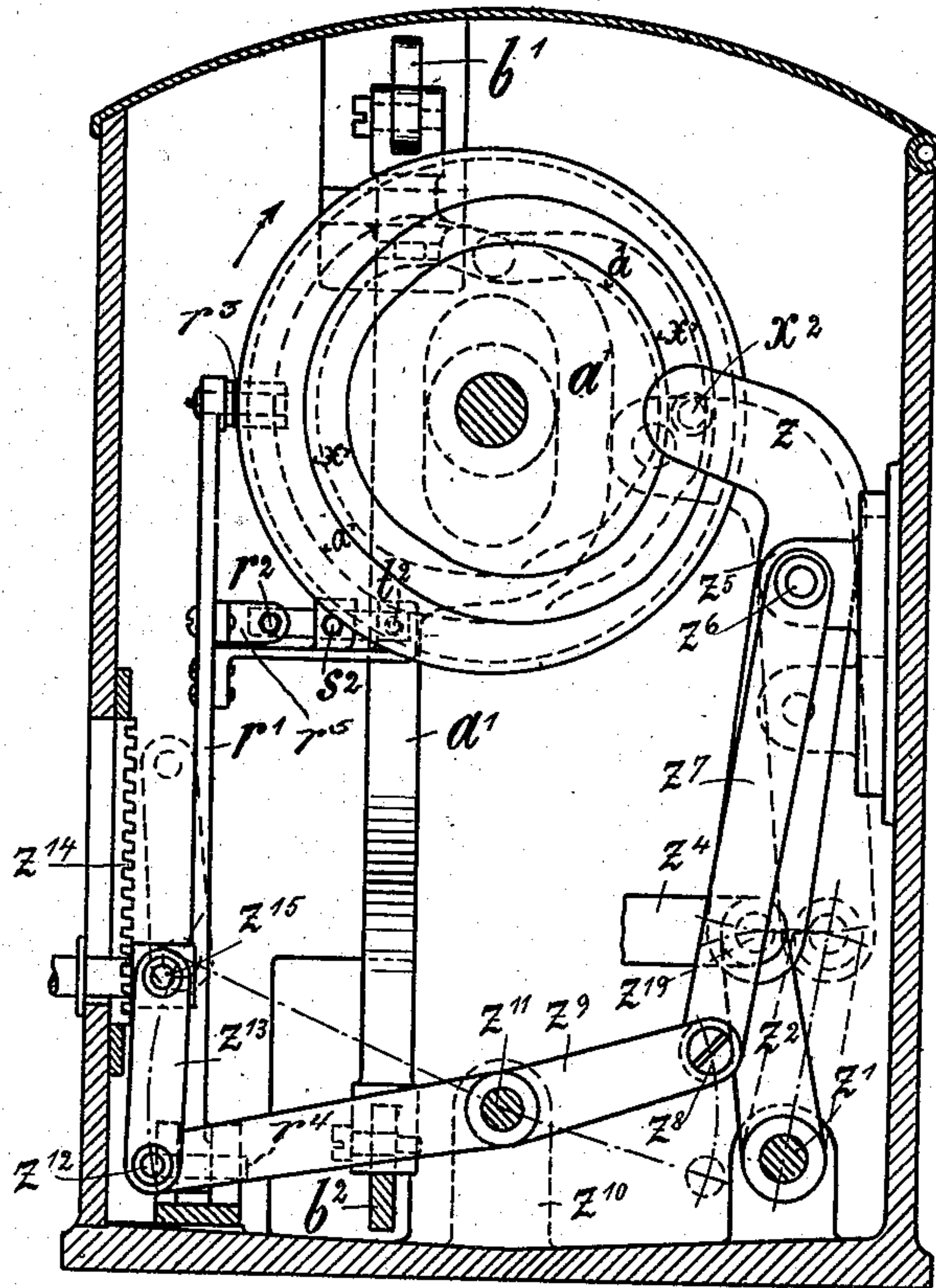
Inventor
Guillaume Fischer
by Haukorsiered Atty.

G. FISCHER.
SEWING MACHINE FOR SEWING STRAW PLAIT.
APPLICATION FILED JAN. 17, 1907.

899,392.

Patented Sept. 22, 1908.
10 SHEETS—SHEET 5.

Fig. 5.



Witnesses:
Arthur E. Zumppe
H. R. Schrey

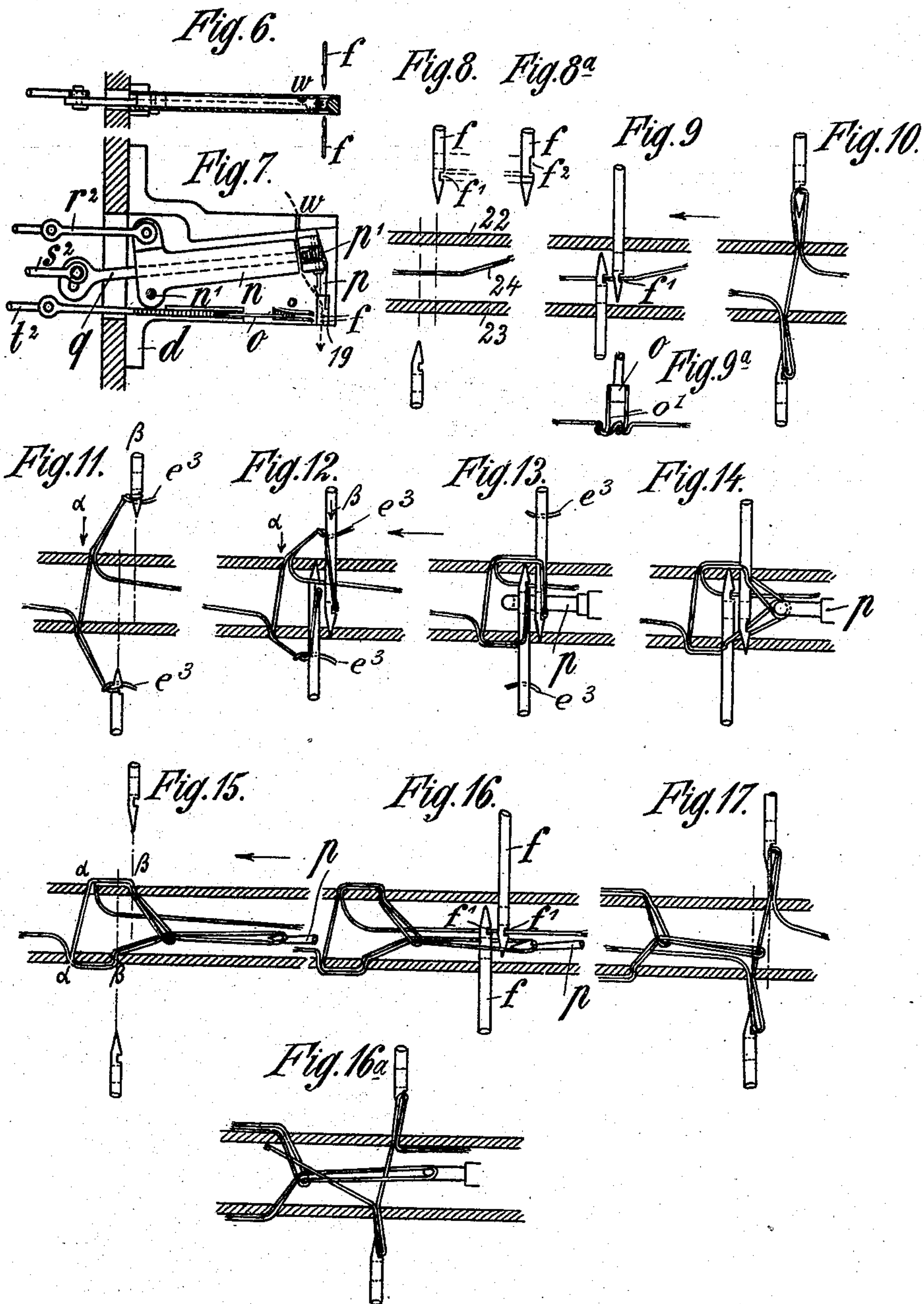
Inventor:
Guillaume Fischer
by Frankfort Bieder *Att'y.*

G. FISCHER.
SEWING MACHINE FOR SEWING STRAW PLAIT.
APPLICATION FILED JAN. 17, 1907.

899,392.

Patented Sept. 22, 1908.

10 SHEETS—SHEET 6.



Witnesses:
Arthur C. Zumppe.
H. R. Schulz.

Inventor
Guillaume Fischer
by Danko Briesen Att'y.

899,392.

G. FISCHER.
SEWING MACHINE FOR SEWING STRAW PLAIT.
APPLICATION FILED JAN. 17, 1907.

Patented Sept. 22, 1908.
10 SHEETS—SHEET 7.

Fig. 20.

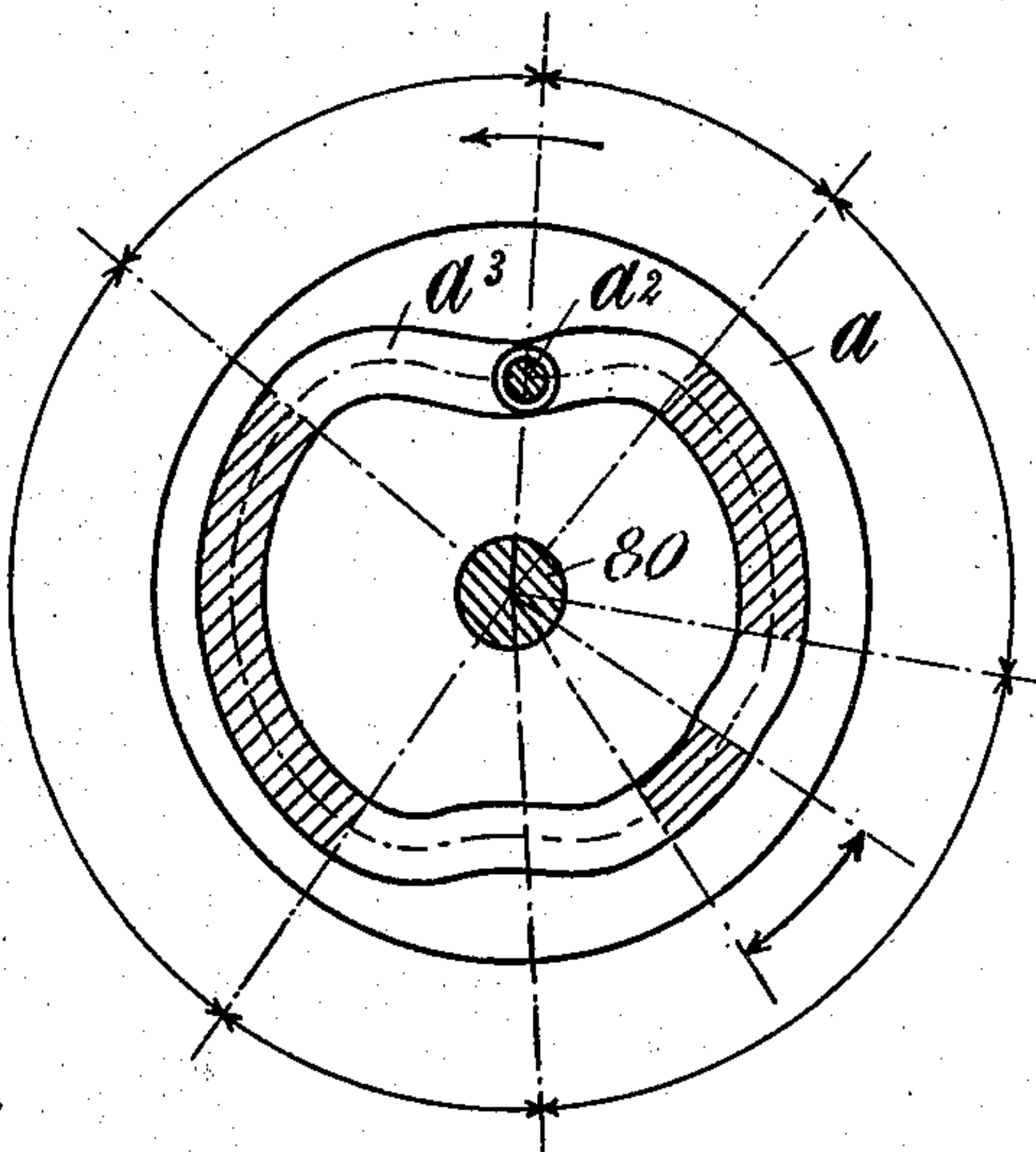
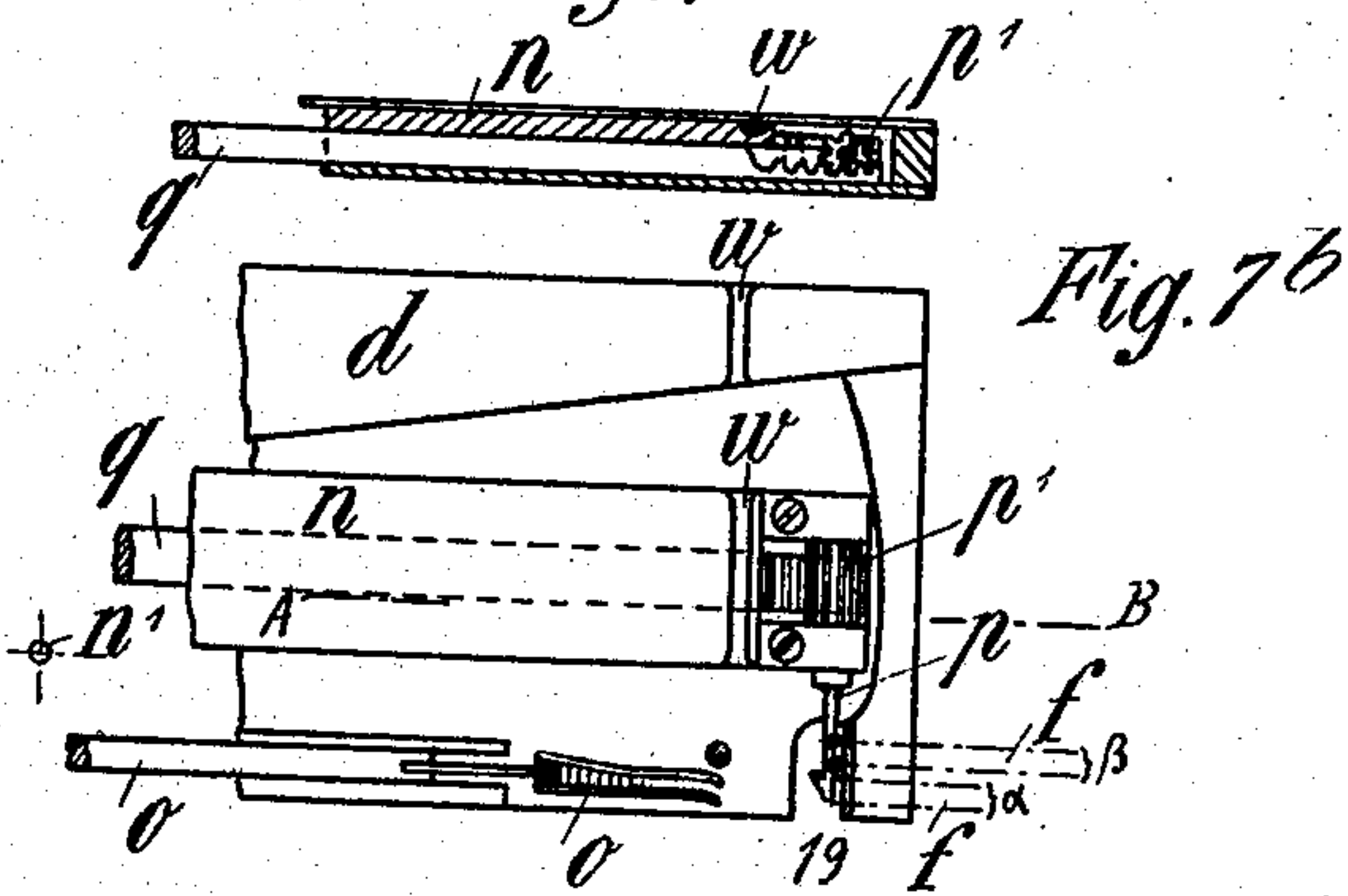


Fig. 7a



Witnesses:
Arthur E. Junge
H. R. Schulz.

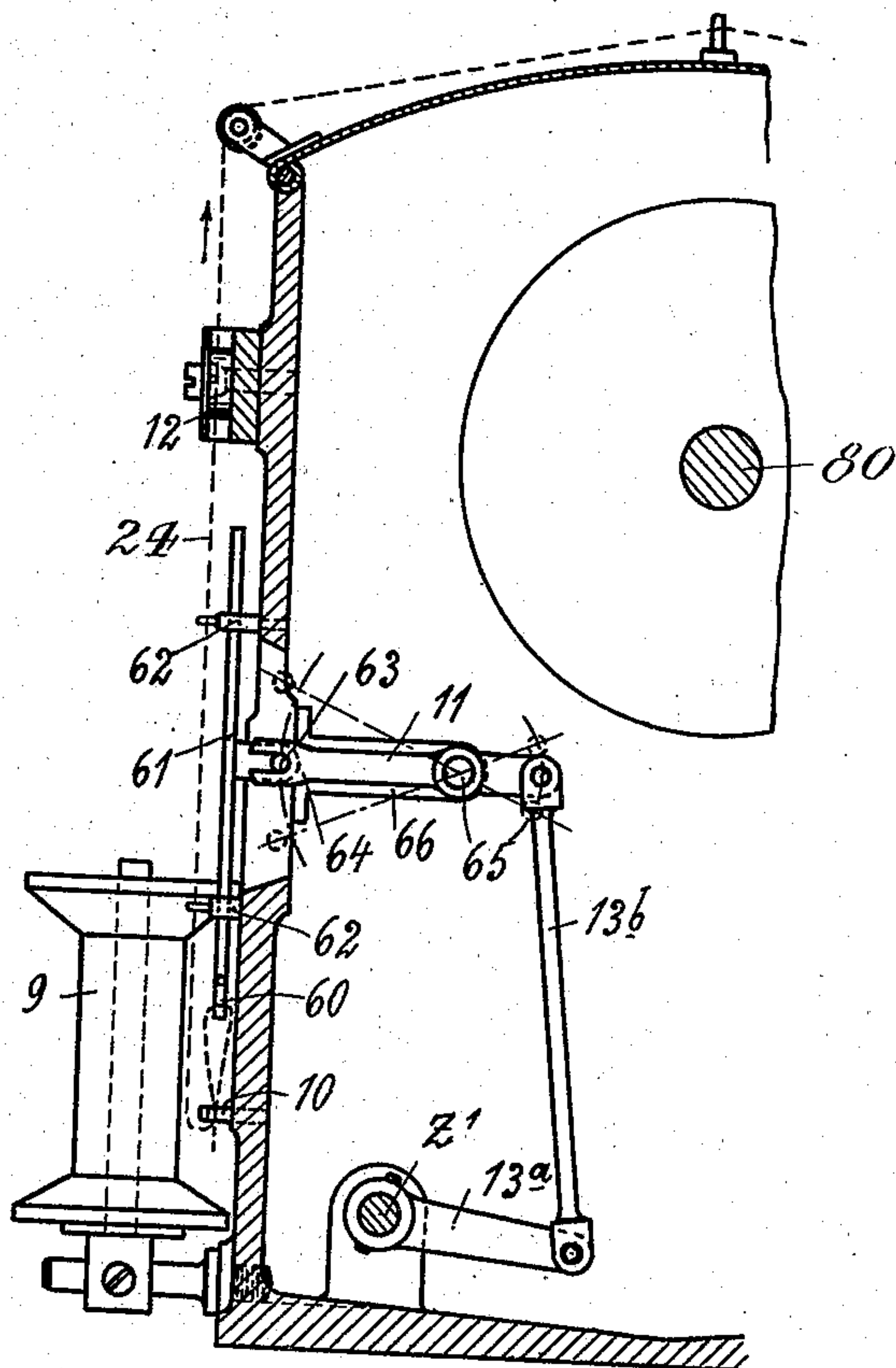
Inventor.
Guillaume Fischer
by Danko Briesen Atty.

G. FISCHER.
SEWING MACHINE FOR SEWING STRAW PLAIT.
APPLICATION FILED JAN. 17, 1907.

899,392.

Patented Sept. 22, 1908.
10 SHEETS—SHEET 8.

Fig. 18.



Witnesses:
Arthur E. Zumppe
H. R. Schurz.

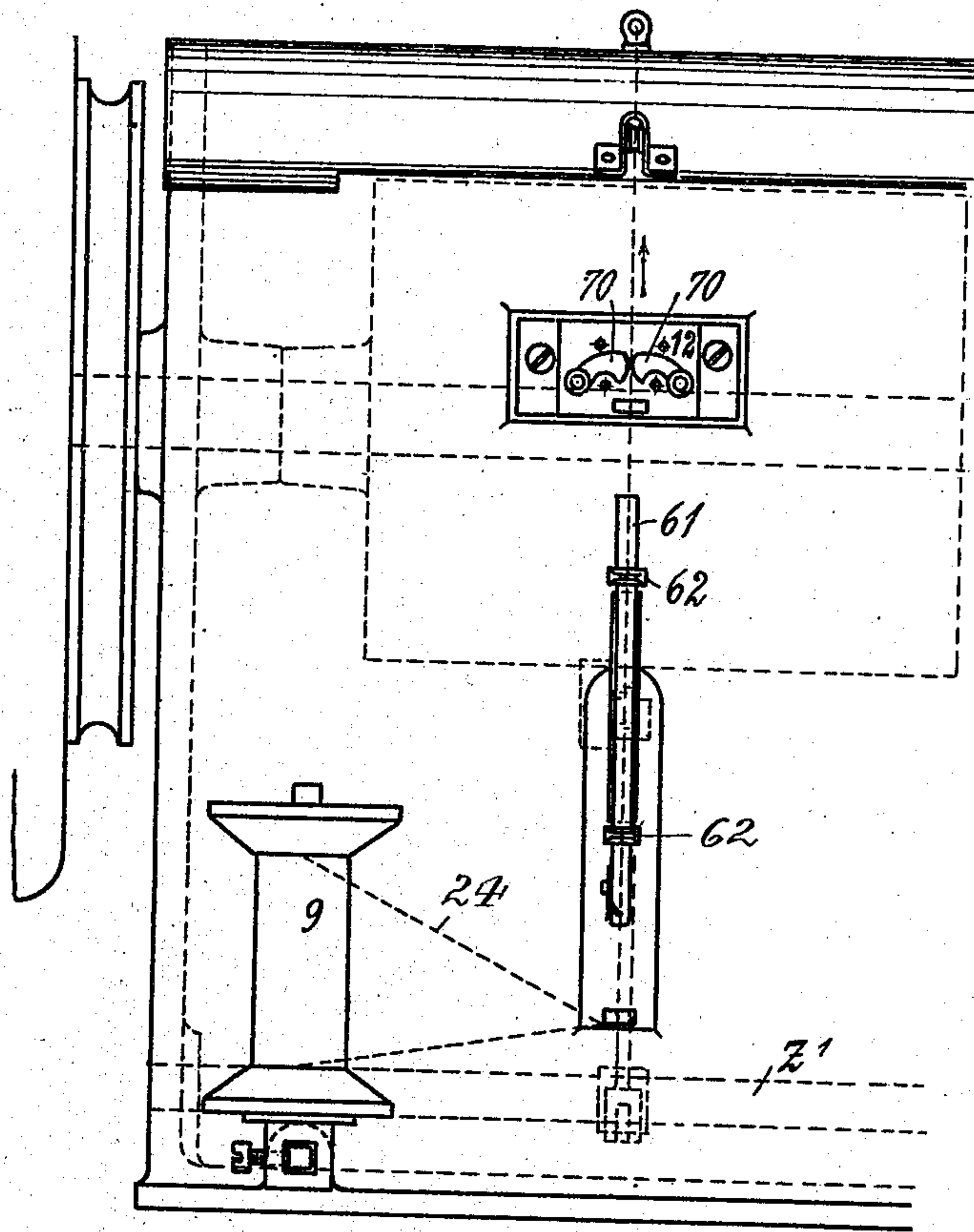
Inventor.
Guillaume Fischer
by *Amos B. Biers* Atty.

G. FISCHER.
SEWING MACHINE FOR SEWING STRAW PLAIT.
APPLICATION FILED JAN. 17, 1907.

899,392.

Patented Sept. 22, 1908.
10 SHEETS—SHEET 9.

Fig. 19.



Witnesses:
Arthur E. Jumper
H. R. Schuch

Inventor.
Guillaume Fischer
by Frank B. Briesed Mfg.

G. FISCHER.
SEWING MACHINE FOR SEWING STRAW PLAIT.
APPLICATION FILED JAN. 17, 1907.

899,392.

Patented Sept. 22, 1908.
10 SHEETS—SHEET 10.

Fig. 21.

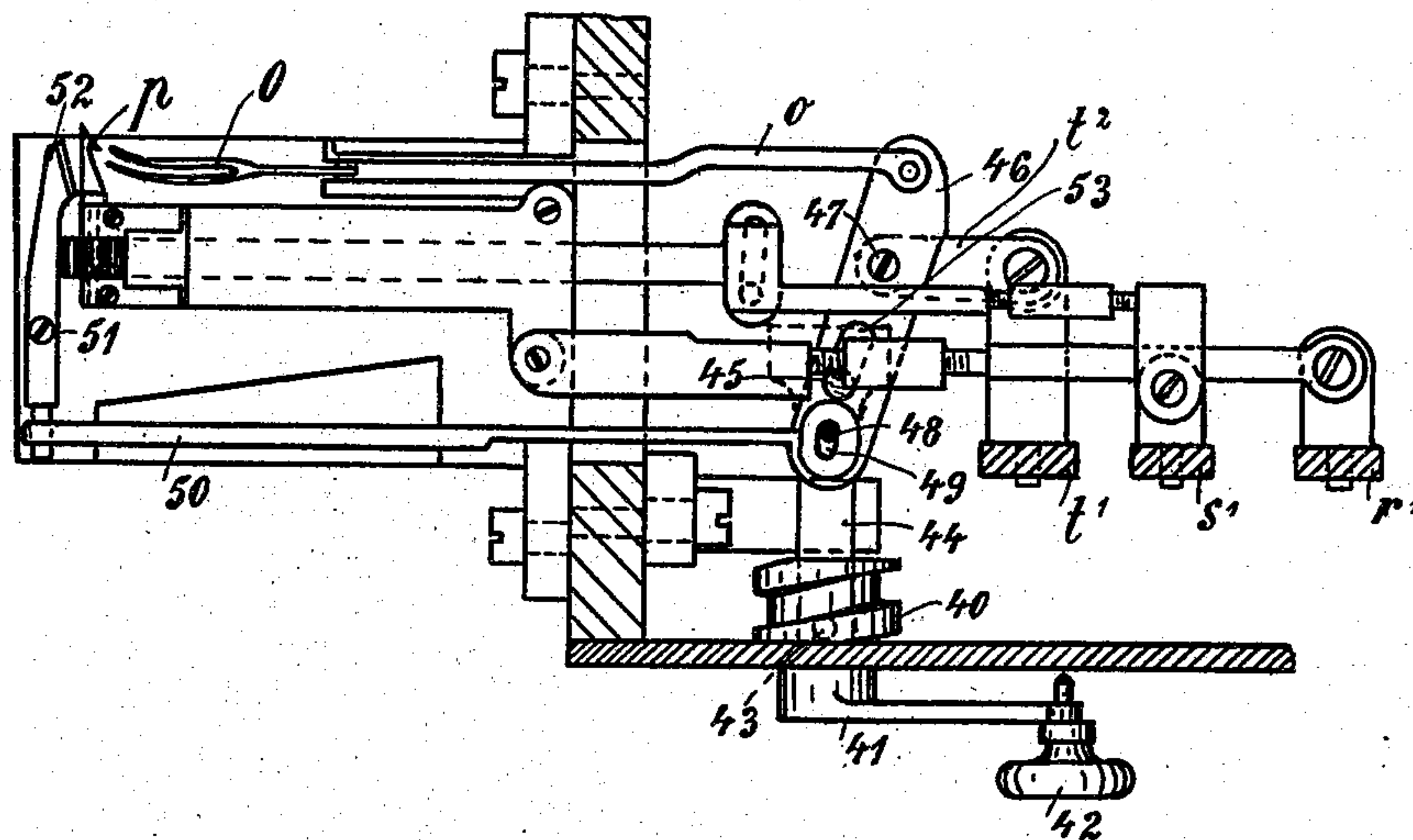
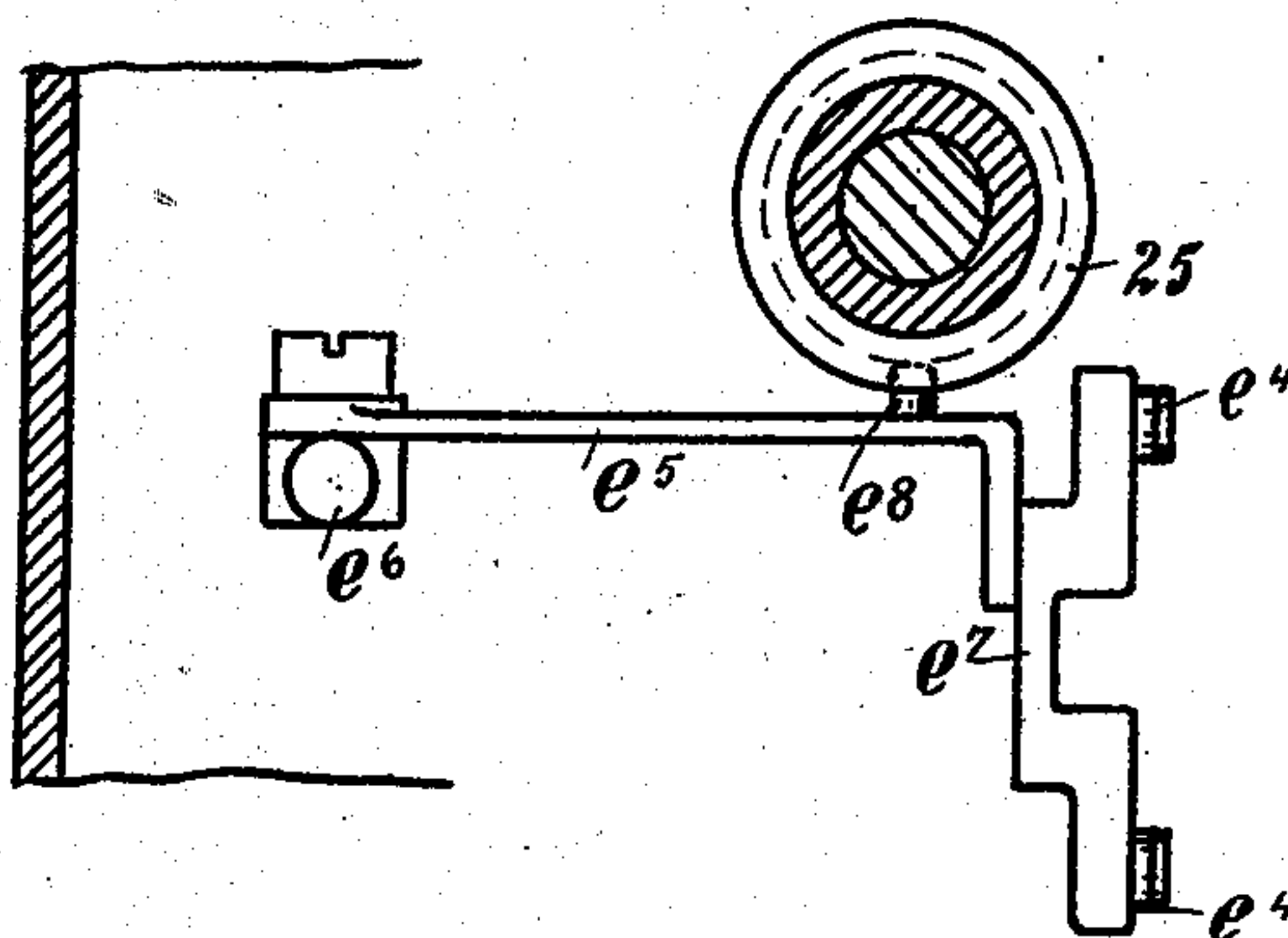


Fig. 22.



Witnesses:
H. R. Schulz.
August Miner.

Inventor:
Guillaume Fischer
by Drankovskien Att'y.

UNITED STATES PATENT OFFICE.

GUILLAUME FISCHER, OF GENEVA, SWITZERLAND.

SEWING-MACHINE FOR SEWING STRAW PLAIT.

No. 899,392.

Specification of Letters Patent.

Patented Sept. 22, 1908.

Application filed January 17, 1907. Serial No. 352,669.

To all whom it may concern:

Be it known that I, GUILLAUME FISCHER, a citizen of Switzerland, residing at Geneva, Switzerland, have invented a new and Improved Sewing-Machine for Sewing Straw Plait, of which the following is a specification.

This invention relates to a sewing machine, more particularly designed for sewing straw plait for straw hats, and for similar purposes, the machine forming a chain stitch, the loops of which are concealed between the straw plaits.

With the machines hitherto used, the concealed loops of the stitch have been formed by the simultaneous operation of four needles. By the construction which is the subject of the present invention, the same result is obtained by the use of two needles only. One of these needles is placed above the work-plate, while the other needle is mounted below the same, both needles being adapted to reciprocate longitudinally.

In the accompanying drawings: Figure 1 is a vertical longitudinal section through a sewing machine embodying my invention; Fig. 2 a plan, partly in section, thereof; Fig. 3 a left hand end view of the machine; Fig. 4 a vertical section on line 4—4, Fig. 2; Fig. 5 a vertical section on line 5—5, Fig. 1; Fig. 6 a detail section of the needles and cooperating parts; Fig. 7 a plan, partly in section, of Fig. 6; Fig. 7^a is a detail of part of Fig. 6; Fig. 7^b a detail of part of Fig. 7; Fig. 8 illustrates diagrammatically the position of the needles before beginning a stitch; Fig. 8^a is a side view of the upper needle shown in Fig. 8; Figs. 9—17 show the successive positions of the needles and cooperating parts; Fig. 18 is a detail of the thread delivering mechanism; Fig. 19 an end view of Fig. 18; Fig. 20 a diagrammatic view of the cam for reciprocating the needles; Fig. 21 a detail plan, partly in section, of the thread striker and cooperating parts; Fig. 22 a plan of the thread locking device.

The machine is provided with a pair of needles *f*, which are adapted to be reciprocated vertically in four phases of movement, which may be designated as follows: 1. The short inward stroke. 2. The short outward stroke. 3. The long inward stroke. 4. The long outward stroke.

Between the short inward stroke and the short outward stroke, there is a pause in the movement of the needles, during which the

thread striker is operated. The short outward stroke is also interrupted when the loop puller releases the loop held by it and tensions the thread. Similarly between the long inward stroke and the long outward stroke, there is a longer pause, during which the thread looper operates.

Needle holders *c'*, *c*², to which needles *f*, *f*, are secured, are provided with pins *c*³, *c*⁴, engaged by the forked ends of levers *b'*, *b*², respectively. Of these, lever *b'*, is fulcrumed at *b*³, while lever *b*², is fulcrumed at *b*⁴. To lever *b'*, is pivoted back of fulcrum *b*³, as at *b*⁵, the upper end of a bent link *a'*, the lower end of which is pivoted at *b*⁶, to lever *b*², in front of its pivot. Link *a'*, is provided with a cam roller *a*², engaging a groove *a*³, of a cam-body *a*, mounted on main shaft 80. By the means described, a vertically reciprocating movement is imparted to link *a'*, which, in turn, will swing the forward ends of levers *b'*, *b*², in opposite directions, so as to reciprocate the needle holders together with the needles in opposite directions.

In the diagrammatic view of cam *a*, shown in Fig. 20, the hatched parts of groove *a*³, designate the periods during which no vertical movement of the needles *f*, takes place.

In addition to the means described for vertically reciprocating needles *f*, means are provided for imparting a horizontal movement thereto. This movement is equal to about 2½ mm. corresponding to the length of the visible portion of the stitch as hereinafter more fully described. The two end positions of the needles are designated in the drawings with α and β (Figs. 3, 7^b, 11 and 12).

Needle holders *c'*, *c*², are fulcrumed on screws *k'*, *k*², tapped into the machine frame and are engaged by spring arms *i*³, *i*⁴, respectively. Spring arms *i*³, are secured to the free end of a lever *i'*, fulcrumed at 15, while arms *i*⁴, are secured to the free end of a lever *i*², fulcrumed at 14. Levers *i'*, *i*², receive horizontally oscillating movement from a cam *e*, forming part of cam-body *a*. Cam *e*, is engaged by a cam roller 18 rotatably mounted in an arm *g'*, of a rock-shaft *g*. The latter is provided with an upper arm *h'*, to which is pivoted at *h*⁴, one end of a link 16, the other end of which is pivoted at *i*⁷, to lever *i'*. Shaft *g*, is furthermore provided with a lower arm *h*², to which is pivoted at *h*⁵, one end of a link 17, the other end of which is pivoted at *i*⁸, to lever *i*².

It will be seen that upon the rotation of main shaft 80, shaft g , will receive a rocking motion, which is transmitted to levers i^1, i^2 , to correspondingly oscillate needle holders c^1, c^2 , on their pivots k^1, k^2 , respectively. The amplitude of oscillation of needle holders c^1, c^2 , may be regulated by set screws 1, tapped into the frame of the machine. As spring arms i^3 , and i^4 , form a yielding connection between the levers and the needle holders, the play of the latter may be adjusted while the stroke of the levers remains unaltered.

The needles f , are provided with notches f^1 , and with shallow recesses f^2 , (Fig. 8), into which the loop puller hook can enter.

In order to provide a constant guide for the needles, there are arranged two vertical tubes e^1 , fixed to work table 5 and presser-foot 4, respectively. These tubes have longitudinal slots e^2 , within which locking-pieces e^3 , are adapted to reciprocate in a vertical direction. The locking-pieces e^3 , are secured to horizontal screws e^4 , to which a horizontally reciprocating movement is imparted by means of a cam 25 keyed to main shaft 80, of the machine. A lever e^5 , (Fig. 22), pivoted at e^6 , carries a pin e^8 , engaging groove e^9 , of cam 25. The free end of lever e^5 , is provided with a U-shaped member e^7 , into which screws e^4 , are tapped. The locking-pieces e^3 , coöperating with the needle guide, prevent the thread from being taken along by the work in the direction of its travel. Furthermore, tubes e^1 , serve as guides for the needles which prevent the same from bending under the influence of the lateral strain produced by the threads. The locking-pieces e^3 , hold the thread in the notches f^1 , of the needles during the formation of the stitch, (Figs. 11, 12 and 13).

Within a recess of a center table d , (Figs. 6 and 7), is arranged an elbow lever n , pivoted at n^1 , and carrying the loop puller p , (Figs. 7, 7^a, 7^b). To the outer end of the latter is fulcrumed a small cog wheel p^1 , which meshes into a rack integral with a rod q , arranged below said wheel. Rod q , receives reciprocatory motion in a manner hereinafter described and consequently the loop puller p , is caused to rotate in one or the other direction, so that the hook of the same assumes either a vertical or a horizontal position. The arrangement is such that the loop puller completes a quarter revolution for each stroke of rod q . Lever n , is oscillated on its pivot n^1 , by means of a cam r , mounted on shaft 80 and engaged by the roller r^3 , of a cam-lever r^1 , pivoted to the machine frame at r^4 , (Figs. 1 and 5). Lever r^1 , is provided with a laterally extending arm r^5 , to which one end of a link r^2 , is connected, the other end of which is pivoted to lever n , at r^6 , (Figs. 1, 2, 5 and 21). Rod q , is actuated from cam s , through lever s^1 ,

and link s^2 , (Figs. 1 and 2). The thread 24 coming from the reel 9, passes through a small opening w , (Fig. 7), in the center table d , between the upper cover and the loop puller, and passes out through an opening 19 of table d , so as to be presented to the needles in horizontal alinement with their notches f^1 .

In order to insure a positive engagement of the thread with the notches f^1, f^2 , a thread striker o , is slidably mounted in center table d . This thread striker is provided at one end with a fork o^1 , (Fig. 9^a), by means of which the thread is forced into the notches of the needles.

The thread striker performs a rectilinear reciprocating motion which is transmitted to it from a cam t , by lever t^1 , and link t^2 , in manner hereinafter described, (Figs. 1 and 2).

Fig. 21 shows a regulating device for the thread striker. It comprises a roller 40, provided with a helical groove and adapted to be turned by an arm 41 having a knob 42. A pin 43 engages the groove of roller 40, said pin being secured to a plate 44. The latter is provided with a pin 45 engaged by the slot 53 of a two-arm lever 46, to which link t^2 , is fulcrumed at 47. Lever 46 is also connected at one end to the thread striker o , while its other end is connected to the slotted eye 49 of a rod 50, which oscillates the needle lever 52 pivoted at 51, and presses the needle against the loop puller.

By setting the arm 41, a displacement of plate 44 and consequently of the fulcrum of lever 46, will be effected, so that the arm of lever 46, which engages link t^2 , will be lengthened or shortened. In this way the amplitude of movement of rod 50, and of the swinging curve of needle lever 52 can be regulated according to the thickness of the needles.

The cams u and v , (Figs. 1 and 2), are designed for regulating the tension of the thread 24 coming from the reel 9. A lever u^1 , (Figs. 1 and 2), is operated by cam u , which lever periodically counter-acts the pressure exerted by spring u^2 , against rollers u^3 , that engage thread 24. The latter is subsequently tensioned by the lever v^2 , which is operated from cam v , by lever v^1 , after the material has been fed forward.

The forward movement of the material is effected by the feeder y , which performs a horizontal and also a vertical movement. The horizontal movement is effected by cam x , (Figs. 1 and 5), the groove x^1 , of which is engaged by a roller x^2 , carried by a lever z . Lever z , is provided with a longitudinal slot z^1 , which engages a pin z^6 , that forms the fulcrum of lever z . Pin z^6 , is carried by a slide z^5 , (Figs. 3 and 5), vertically displaceable in a corresponding guide way of the machine frame. To the lower end of lever z , is pivoted at z^1 , a lever z^2 , fast on rock-shaft z^1 . The latter is provided with an arm z^3 , pivot-

ally engaged by a link z^4 , which is in turn connected to the feed holder m .

The vertical movement of the feeder y , is effected by an eccentric l , keyed to the main shaft 80, (Fig. 4), and operably connected by eccentric rods l^a , to a lever 20, loosely mounted on shaft z' . Lever 20 is, by link 21, connected to feed holder m , the parts being so set that during the dead center positions of the eccentric, the horizontal movement of the feeder is effected.

The means for vertically reciprocating work-table 5 and presser foot 4, are as follows: In a pair of alined spring housings 6, 6^a, are guided the plungers 6^b, 6^c, the springs within the housings, (not shown), tending to move the plungers towards each other. At their inner ends plungers 6^b, 6^c, are provided with rollers 6^d, 6^e, engaging the widened end 7^a, of a slide 7, operatively connected to a lever 8. Plunger 6^b, is by arm 4^a, connected to a rod 4^b, carrying presser foot 4, while plunger 6^c, is by arm 5^a, connected to work-table 5. If lever 8, is raised, (Fig. 3), rollers 6^d, 6^e, will engage the widened section 7^a, of slide 7, so as to raise foot 4 and lower table 5. If lever 8, is depressed, (dotted lines Fig. 3), rollers 6^d, 6^e, will engage the reduced end of section 7^a, so as to permit the presser foot and work-table to be moved towards each other.

The successive positions of the needles and their operating parts, in the production of the stitches, are illustrated in Figs. 8—17. Fig. 8, shows the thread 24 between the two straw braids 22 and 23 to be sewed together. The needles assume the position α (Fig. 3), and have not yet entered the material. On passing through the straw plait, the needles perform the short inward stroke, (Fig. 9), and bring their notches f' , opposite to the thread. The thread striker o , is now driven forward by the cam t , and places the thread into the notches f' , of the needles, (Fig. 9^a), whereupon the needles perform the short outward stroke, (Fig. 10), carrying the thread with them and forming a loop, the thread striker being simultaneously retracted. At the same time the two locking-pieces e^3 , are pushed forward to press the thread into the notches f' , of the needles, (Fig. 11). The locking-pieces e^3 , are now taken along by the needles towards the work, thus holding the thread in the notches f' , (Fig. 12). After the short outward stroke has been completed, (Fig. 10), the thread is tensioned by cams u , and v . Simultaneously the horizontal displacement of the needles is effected, the needles passing from the position α which they have occupied during the period described, into the position β which is distanced about $2\frac{1}{2}$ mm. away from the first position, (Fig. 11). The long inward stroke now begins, (Fig. 12). The locking-pieces e^3 , after being moved towards the work, as described,

are suddenly withdrawn, thereby disengaging the thread, (Fig. 13), which has been previously held by them in the notches f' . The needles again pass through the material, this time, however, deeper than before, so that their recesses f^2 , become horizontally alined, (Fig. 13). The loop puller p , with its hook set vertically, now enters the recess f^2 , formed in each needle, seizes both stretched thread-sections and draws the thread back for a few millimeters to form the loops shown in Fig. 14, whereupon the long outward stroke of the needles takes place, (Fig. 15).

After the needles have left the work they are swung back into the original position α , (Fig. 15). Immediately thereafter the loop puller performs a quarter revolution so that its hook assumes a horizontal position, it being laid parallel with the work engaging faces of the center table, (Fig. 15). In consequence of this movement of the loop puller, the upper loop is released from the hook of the same, while the lower loop is held fast. As, however, the lower loop has been drawn through the upper loop, the latter is also retained by the lower loop. After the completion of the long outward stroke, there occurs a short pause during which the feeder advances the material for the length of one stitch.

During the forward movement of the material the loop held back by the loop puller is elongated corresponding to the length of one stitch. The needles now effect the short inward stroke, (Fig. 16), thereby passing through the loop held open by the loop puller. The needles seize the threads supplied to them by the thread striker and again recede from the material, thus performing the short outward stroke. During the short rest after the short outward stroke, the loop puller effects a slight forward movement so as to release the loop. The loop puller at the same time effects a quarter revolution so that its hook is again returned into a vertical plane. The needles are now returned to the original position and the operations are repeated in the manner described.

With machines of the above character, a greater quantity of un-wound thread is required, per stitch, than with the usual sewing machines. Consequently, special attention must be paid to the correct supplying and unwinding of the thread. With the unwinding device, (Figs. 18 and 19), the driving means of which are represented in Figs. 2, 3 and 5, a uniform unwinding of the thread corresponding to the forward movement of the material and to the length of the stitch desired, is obtained.

The thread wound upon reel 9, (Figs. 18 and 19), passes through a first eyelet 10, fixed to the casing of the machine and is conducted through a second eyelet 60 of a vertically reciprocating rod 61, the thread then

passing back through eyelet 10, to a thread clamp 12, whence it is conducted above the casing to the center table. The rod 61, is guided by two supports 62 arranged outside of the casing. Attached to rod 61 is a pin 63 which is engaged by a fork 64 of a rocking lever 11 pivoted at 65 to a bracket 66 of the machine frame. Lever 11 is oscillated from shaft z' , by an arm 13^a, secured to said shaft and connecting rod 13^b, so that the reciprocating movement thus imparted to rod 61, unwinds the thread from reel 9. As it is necessary to change the length of the unwound thread corresponding to the length of the stitch desired, the means for driving lever 11 and shaft z' , respectively, are constructed in such a manner that an alteration of the amplitude of the movement of the rocking lever 11 can be obtained. For this purpose there is pivoted to pin z^6 , of slide z^5 , hereinabove referred to, one end of a link z^7 , the other end of which is pivoted at z^8 , to one arm of a two-arm lever z^9 , fulcrumed at z^{11} , to a post z^{10} . The other arm of said lever is pivoted at z^{12} , to link z^{13} connected to a toothed head z^{15} . The latter is held in engagement with a fixed rack z^{14} , by means of a spring z^{18} , (Fig. 2). The head z^{15} , can be raised and lowered by correspondingly raising and lowering knob z^{16} , by hand, after the knob has been pushed inwards to disengage the teeth of head z^{15} , from rack z^{14} . In this way a displacement of the slide z^5 , and of the oscillating center of the lever z , is effected. After the proper position of slide z^5 , has been ascertained, knob 16 is released, so that spring z^{18} , will bring head z^{15} , into engagement with rack z^{14} , to lock the head in position. The displacement of slide z^5 , causes the ratio of motion transmitted from cam x , to shaft z' , to be changed, the amplitude of movement of the lower end of the lever z , being reduced in proportion to the lowering of support z^5 .

In Fig. 5, the lowermost position of lever z , and the parts connected thereto are indicated by dotted lines. By the aforedescribed means an exact regulation of the thread unwinding device is possible, so that an unwound thread of exact predetermined length is obtained.

Thread clamp 12, consists of two automatically acting pivoted blocks 70 which are raised by the thread running in the direction of the arrow, so that the blocks allow the thread to pass freely between them, but when the thread puller acts in the opposite direction owing to the action of the rod 61, said blocks descend by their own weight and hold the thread fast, thus preventing the unwound thread from being drawn back.

I claim:

1. In a straw plait sewing machine, the combination of a center table with a thread striker, a loop puller having a hook, a material feeder, and two needles, needle-operat-

ing mechanism constructed to vertically reciprocate said needles, the needles being arranged at opposite sides of the center table and provided with notches (f') for receiving the thread, and with shallow recesses (f^2) arranged between the notches (f') and the shank portions of said needles through which the hook of the loop puller can pass, and means for driving said thread striker, loop puller and material feeder, for the purpose of forming chain stitches with concealed loops of the thread between both the bands or plaits of the material.

2. In a straw plait sewing machine, the combination of a center table with two needles, needle-operating mechanism constructed to vertically reciprocate said needles arranged at opposite sides of the center table, a thread striker, a loop puller, a material feeder, means for horizontally moving the needles, and means for driving the thread striker, material feeder and loop puller to form chain stitches of loops of the thread between both the bands of the material.

3. In a straw plait sewing machine, the combination of a center table with two needles arranged at opposite sides of the center table, a thread striker, a loop puller, a material feeder, means for horizontally moving the needles, means for vertically reciprocating the needles, two succeeding strokes of the needles being of different length, and means for driving the thread striker, material feeder and loop puller to form chain stitches with concealed loops of the thread between both the bands or plaits of the material.

4. In a straw plait sewing machine, the combination of a center table with two needles arranged at opposite sides of the center table, a thread striker, a loop puller, a material feeder, means for horizontally moving the needles, a cam (a) for vertically reciprocating the needles, arranged on the main shaft of the machine and provided with a groove (a^3), and means for driving the thread striker, material feeder and loop puller to form chain stitches with concealed loops of the thread between both the bands or plaits of the material.

5. In a straw plait sewing machine, the combination of a center table with two needles, needle-operating mechanism constructed to vertically reciprocate said needles, the needles being arranged at opposite sides of the center table, a thread striker, a loop puller, a material feeder, two needle carriers (c' , c^2) pivotally secured to the machine frame, means for oscillating said needle carriers, means for regulating the amplitude of such oscillating movement, and means for driving the thread striker, the material feeder and loop puller for the purpose of forming chain stitches with concealed loops of the thread between both the bands or plaits of the material.

6. In a straw plait sewing machine, the combination of a center table with two needles, needle-operating mechanism constructed to vertically reciprocate said needles, the needles being arranged at opposite sides of the center table, a thread striker, a material feeder, a loop puller, two needle carriers (c' , c^2) a cam (a) arranged on the main shaft of the machine and provided with a groove (a^3), a rod (a') engaging the groove (a^3), rocking levers (b' , b^2) connected to the needle carriers (c' , c^2) respectively, means for reciprocating said needle carriers, and means for driving the thread striker, the material feeder and loop puller for the purpose of forming chain stitches with concealed loops of the thread between both the bands or plaits of the material.

7. In a straw plait sewing machine, the combination of a center table with two needles, needle-operating mechanism constructed to vertically reciprocate said needles, the needles being arranged at opposite sides of the center table, a thread striker, a loop puller, a material feeder, two needle carriers (c' , c^2) pivotally secured to the machine frame, two forks (i' , i^2) flexibly connected to said carriers, a cam (e) situated on the main shaft of the machine and effecting the oscillation of the needle carriers, a rocking lever (g') engaging in a groove of said cam (e), rods (h' , h^2) connecting said lever to said forks (i' , i^2) provided respectively with flexible ends (i^3 , i^4), means for horizontally oscillating said forks (i' , i^2) respectively, and means for driving said thread striker, material feeder and loop puller for the purpose of forming chain stitches with concealed loops of the thread between both plaits of the material.

8. In a straw plait sewing machine, the combination of a center table with two needles, needle-operating mechanism constructed to vertically reciprocate said needles, the needles being arranged at opposite sides of the center table, a thread striker, a loop puller, a material feeder, two needle carriers pivotally secured to the machine frame, means for oscillating said needle carriers, means for regulating the amplitude of such oscillation, two forks (i' , i^2) flexibly connected to said carriers, a cam (e) effecting the oscillating movement of the needle carriers, a rocking lever (g') engaging in a groove of said cam (e), rods (h' , h^2) connecting said lever to said forks (i' , i^2) respectively, a cam (a) on the main shaft and provided with a groove (a^3), a rod (a') engaging said groove (a^3), rocking levers (b' , b^2) connected to the needle carriers (c' , c^2) respectively, and means for driving said thread striker, material feeder and loop puller for the purpose of forming chain stitches with concealed loops of the thread between both the plaits of the material.

9. In a straw plait sewing machine, the combination of a center table with two needles, needle-operating mechanism constructed to vertically reciprocate said needles, the needles being arranged at opposite sides of the center table, a thread striker, a loop puller, a material feeder, means for rocking and partially rotating the loop puller, and means for driving said material feeder and thread striker for the purpose of forming chain stitches with concealed loops of the thread between both the plaits of the material.

10. In a straw plait sewing machine, the combination of a center table with two needles, needle-operating mechanism constructed to vertically reciprocate said needles, the needles being arranged at opposite sides of the center table, a thread striker, a loop puller, a material feeder, means for rocking and partially rotating the loop puller, means for reciprocating the thread striker, and means for driving said material feeder for the purpose of forming chain stitches with concealed loops of the thread between both the plaits of the material.

11. In a straw plait sewing machine, the combination of a center table with two needles, needle-operating mechanism constructed to vertically reciprocate said needles, the needles being arranged at opposite sides of the center table, a thread striker, a material feeder, a loop puller having a hook, a grooved cam (r) on the main shaft for rocking the loop puller, a loop puller holder pivotally secured to the center table of the machine, and rods and levers transmitting the motion of the cam (r) to the loop puller holder, a grooved cam (s) on the main shaft effecting the partial rotation of the loop puller, a rack (q) engaging a cog wheel (p') formed at the inner end of the loop puller, so that the loop puller hook can be turned out of a vertical plane to a horizontal plane, means for transmitting the motion of the cam (s) to the rack (q), and means for driving said thread striker and material feeder for the purpose of forming chain stitches with concealed loops of the thread between both the plaits of the material.

12. In a straw plait sewing machine, the combination of a center table with two needles, needle-operating mechanism constructed to vertically reciprocate said needles, the needles being provided with notches and shallow recesses and arranged at opposite sides of the center table, a thread striker, a loop puller, a material feeder, needle guides consisting of slotted tubes (e') for guiding the needles so that the notches and shallow recesses of them are always held in the same position, and means for driving said thread striker, material feeder and loop puller for the purpose of forming chain stitches with concealed loops of the thread between both the plaits of the material.

13. In a straw plait sewing machine, the combination of a center table with two needles, needle-operating mechanism constructed to vertically reciprocate said needles, the needles being provided with notches and arranged at opposite sides of the center table, a thread striker, a loop puller, a material feeder, needle guides (e') combined with two locking pieces (e^3) for holding the thread in the notches of the needles during the forming of the stitch, and means for driving said loop puller, material feeder and thread striker for the purpose of forming chain stitches with concealed loops of the thread between both the plaits of the material.

14. In a straw plait sewing machine, the combination of a center table with two needles, needle-operating mechanism constructed to vertically reciprocate said needles, the needles being arranged at opposite sides of the center table and provided with notches, a thread striker, a loop puller, a material feeder, needle guides consisting of slotted tubes (e'), two locking pieces (e^3) adapted to reciprocate within the slots (e^2) of the tubes (e') and attached to pivoted bars (e^4), means for reciprocating said bars, and means for driving said loop puller, material feeder and thread striker for the purpose of forming chain stitches with concealed loops of the thread between both the plaits of the material.

15. In a straw plait sewing machine, the combination of a center table with two needles, needle-operating mechanism constructed to vertically reciprocate said needles, the needles being arranged at opposite sides of the center table and provided with notches, a thread striker, a loop puller, a material feeder, needle guides consisting of slotted tubes (e'), two locking pieces adapted to reciprocate within the slots of the tubes (e') and attached to pivoted bars (e^4), a grooved cam (25) on the main shaft for reciprocating the said bars, means for transmitting the motion of the said cam to the bars (e^4), and means for driving said loop puller, material feeder and thread striker for the purpose of forming chain stitches with concealed loops of the thread between both the plaits of the material.

16. In a straw plait sewing machine, the combination of a center table with two needles arranged at opposite sides of the center table and provided with notches (f') and shallow recesses (f^2), a loop puller having a hook, a thread striker, a material feeder, needle guides consisting of slotted tubes (e'), locking pieces (e^3) to hold the thread in the notches of the needles, means consisting of screws (1, 1) acting as regulating device for horizontally moving the needles, means for vertically reciprocating the needles, means for reciprocating the thread striker, means

for rocking the loop puller, means for partially rotating the loop puller so as to turn its hook from a vertical plane to a horizontal plane, means for moving the material feeder to advance the material through the length of a stitch, and means for reciprocating and pushing forward and backward the locking pieces (e^3) in the slots of needle guiding tubes (e').

17. In a straw plait sewing machine, the combination of a center table with two needles, needle-operating mechanism constructed to vertically reciprocate said needles, the needles being arranged at opposite sides of the center table, a thread striker, a loop puller, a material feeder, means for moving the thread striker, means for regulating the movement of the thread striker comprising means for displacing the fulcrum of a two armed lever (46) actuating the thread striker and a needle lever (52), and means for driving said loop puller and material feeder for the purpose of forming chain stitches with concealed loops of the thread between both the plaits of the material.

18. In a straw plait sewing machine, the combination of a center table with two needles arranged at opposite sides of the center table, a thread striker, a loop puller, a material feeder, an unwinding device including a lever (11) for drawing the thread from a reel (9), means for imparting a rocking motion to the lever (11), means for altering the amplitude of the rocking movement of the lever (11) comprising means for displacing the fulcrum of a lever (z) driven from a cam (x) on the main shaft and transmitting the rocking movement by means of connecting members to the rocking lever (11), and means for driving said thread striker, loop puller and material feeder for the purpose of forming chain stitches with concealed loops of the thread between both the plaits of the material.

19. In a straw plait sewing machine, the combination of a center table with two needles, needle-operating mechanism constructed to vertically reciprocate said needles, the needles being arranged at opposite sides of the center table, a thread striker, a loop puller, a material feeder, a device for unwinding a length of thread equal, at least, to the length necessary for a stitch, and a thread clamp consisting of two pivoted blocks (70), between which the thread is led, and adapted to fall down by their own weight, thus holding the thread fast and preventing it from being drawn back.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

GUILLAUME FISCHER.

Witnesses:

L. H. MUNIER,
PAUL SECRETARY.