

No. 875,611.

PATENTED DEC. 31, 1907.

W. N. PARKES.  
FEEDING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED MAR. 30, 1903.

3 SHEETS—SHEET 1.

Fig. 1.

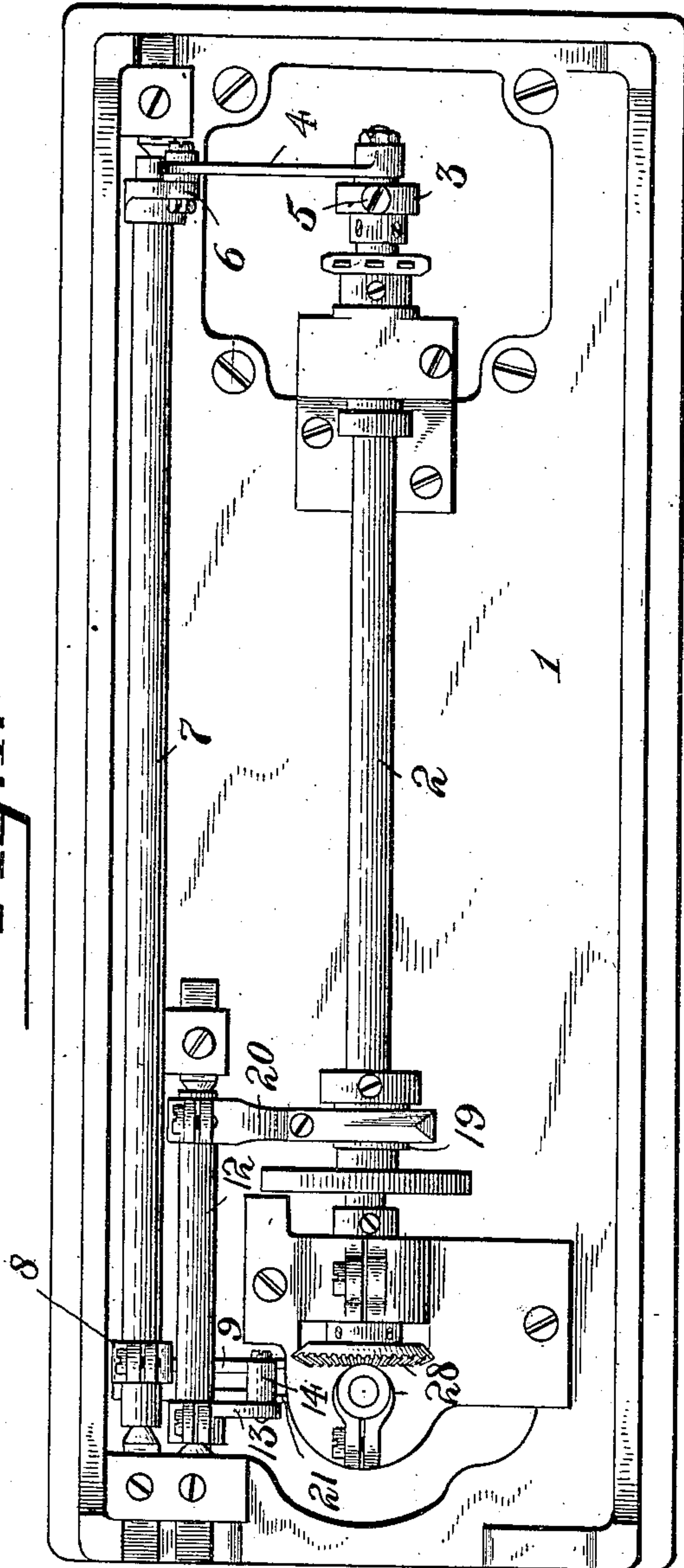


Fig. 2.

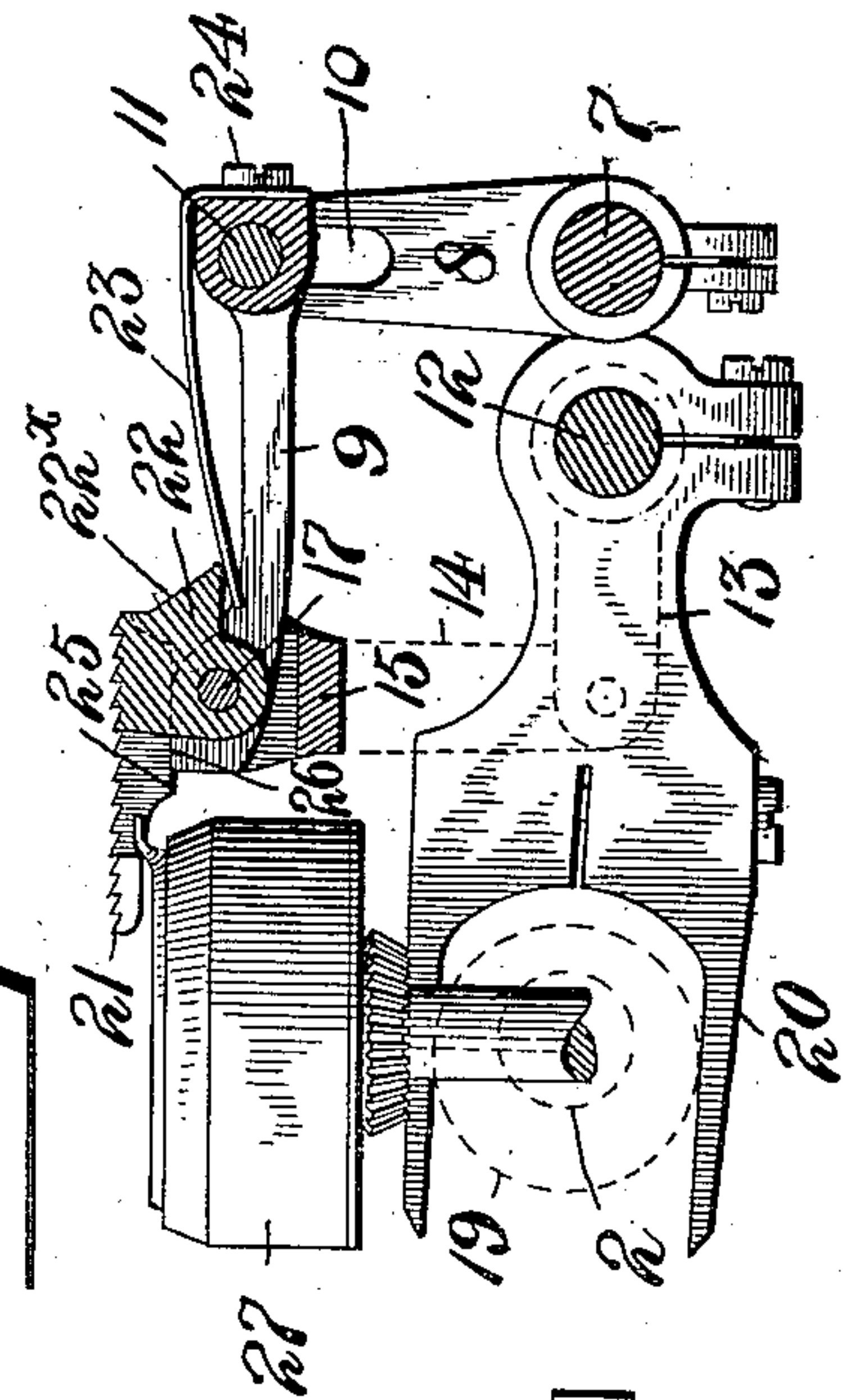
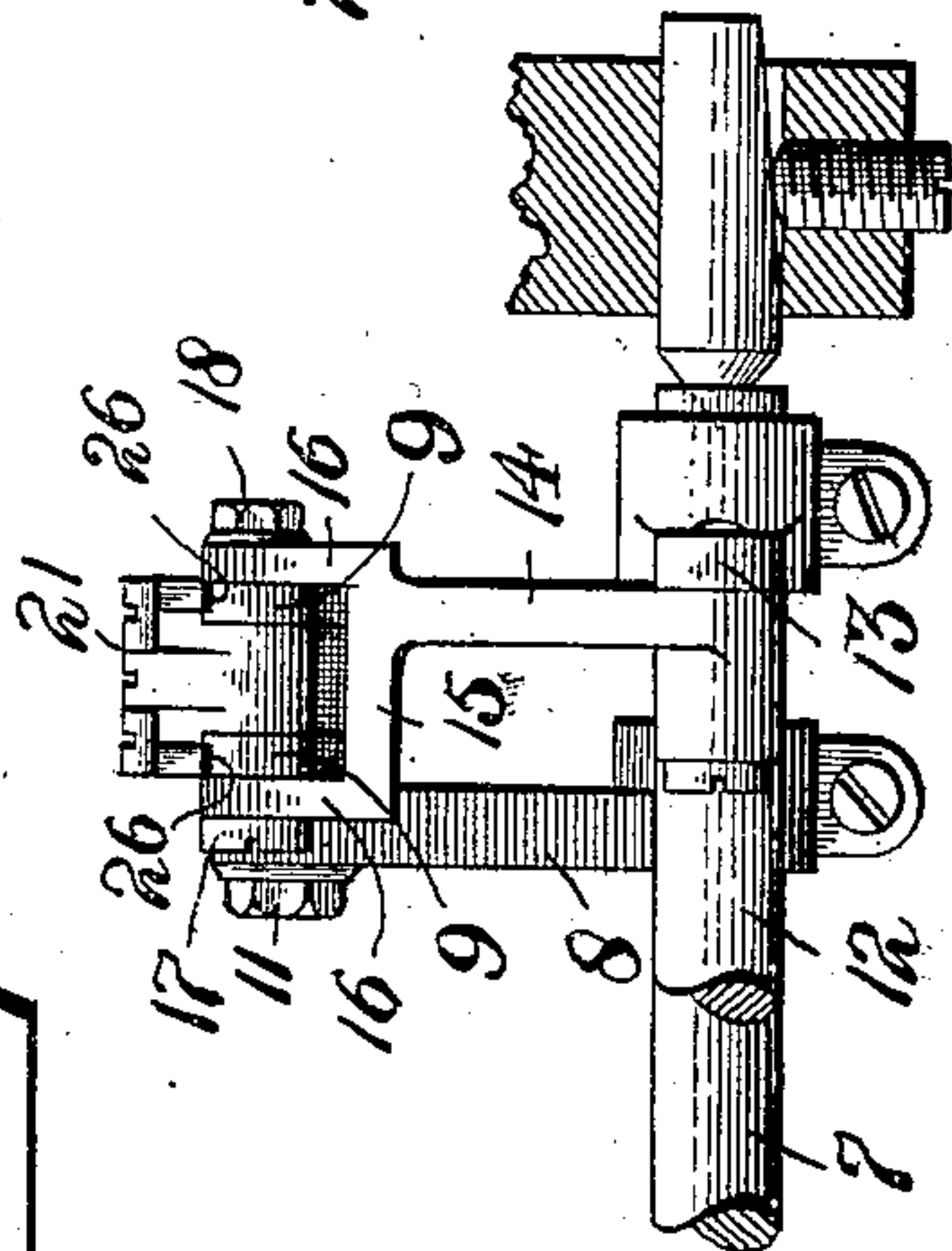


Fig. 3.



WITNESSES:

J. B. McGirr.  
W. B. Hoar.

INVENTOR:

William N. Parkes.

BY

Chas. M. C. Chapman  
ATTORNEY.

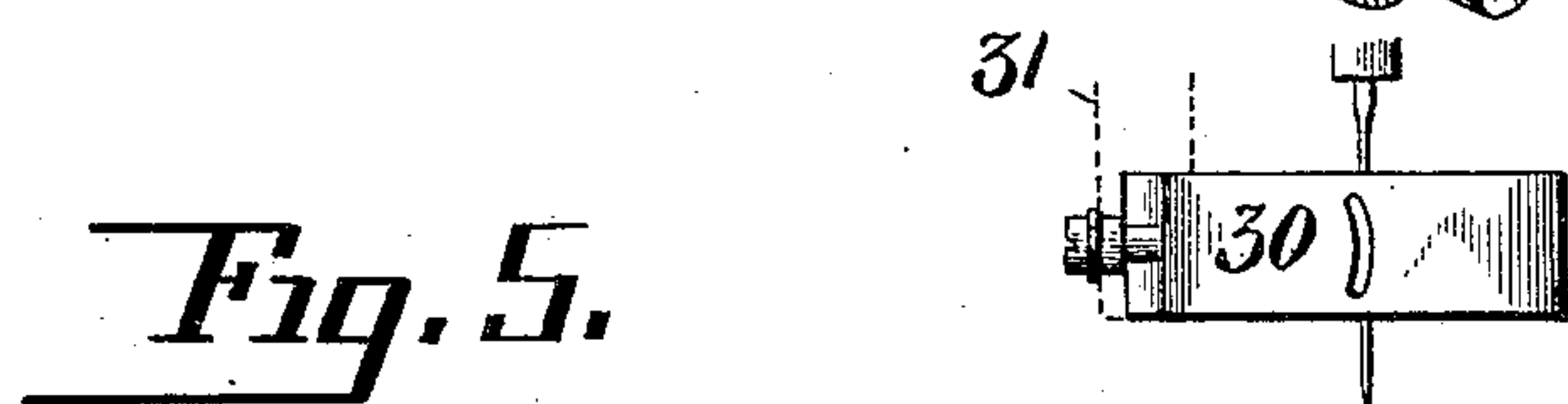
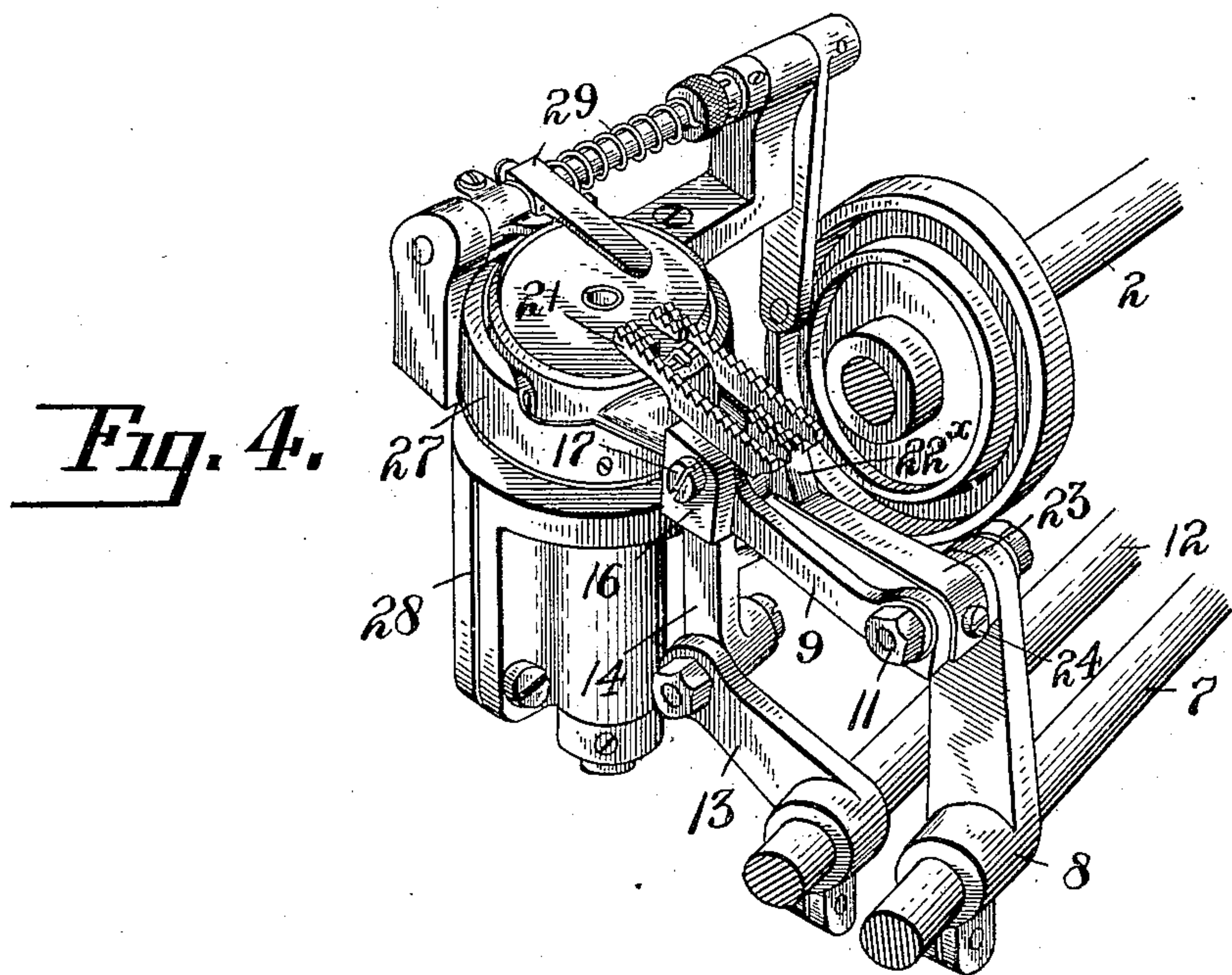
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3 SHEETS—SHEET 2.



WITNESSES:

*J. B. McGirr.*  
*W. B. Hoare.*

INVENTOR:

*William N. Parkes.*

BY

*Chas. M. C. Chapman.*  
ATTORNEY.



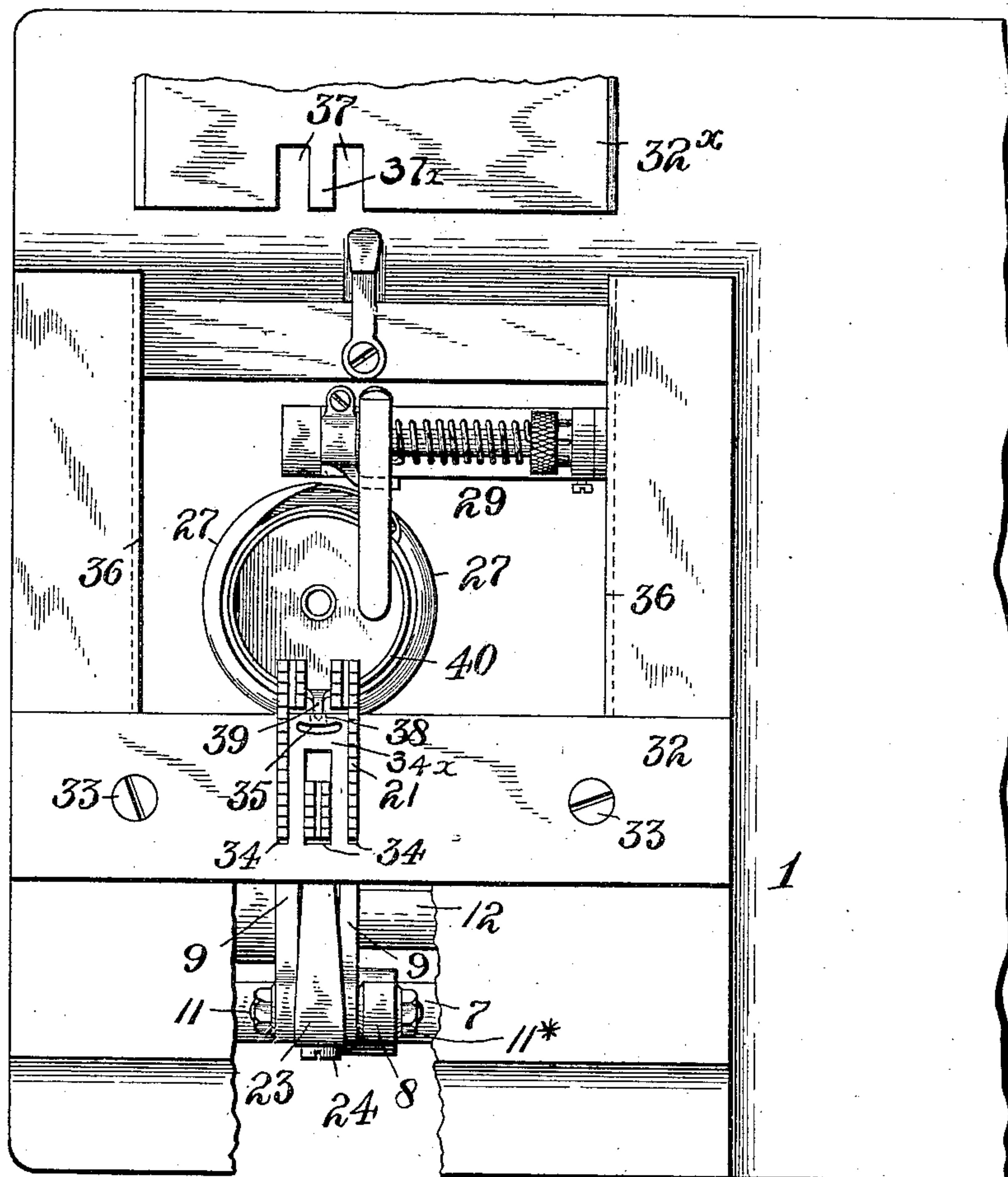
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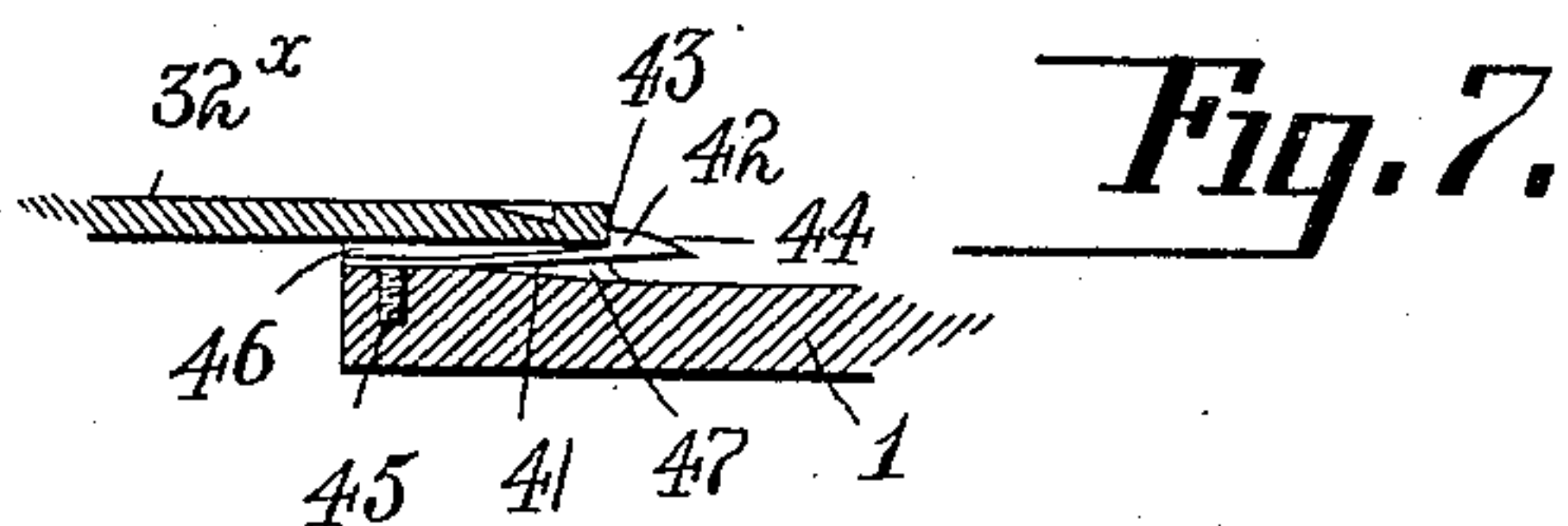
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3 SHEETS—SHEET 3.



*Fig. 6.*



*Fig. 7.*

WITNESSES:

*J. B. McGirr.*  
*W. B. Hoare.*

INVENTOR:

*William N. Parkes*  
BY  
*Chas. M. C. Chapman*  
ATTORNEY.



# UNITED STATES PATENT OFFICE.

WILLIAM N. PARKES, OF BROOKLYN, NEW YORK.

## FEEDING MECHANISM FOR SEWING-MACHINES.

No. 875,611.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed March 30, 1903. Serial No. 150,182.

*To all whom it may concern:*

Be it known that I, WILLIAM N. PARKES, a citizen of the United States, residing in Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Feeding Mechanism for Sewing-Machines, of which the following is a description.

This invention relates to sewing machines, and particularly to the feeding-mechanism thereof.

An object of this invention is to provide a feed-mechanism, the feeding-dog of which may be easily manipulated so as to move the same out of the way of the looper, or lower stitch-forming mechanism, whereby the latter, and particularly the bobbin or mass of thread, may be removed from the machine with facility.

Another object of this invention is to so dispose the looper and feed-mechanism relatively that an extraordinarily large bobbin or cop of thread may be employed and be easily and conveniently removable from the machine.

Another object of the invention is to so dispose the looper relatively to the feed-mechanism and the needle that the direction of trend, or the path, of the thread away from the needle will be substantially in the direction of the feed, and directly in line with the passage of the thread through the eye of the needle, thus avoiding twisting the loop of thread, friction of the thread in the eye of the needle, and resulting in making a better and more uniform stitch. And another object of this invention is to actuate the feeding-mechanism directly from the lower shaft of the machine and provide a compact arrangement of the parts therefor.

With these and other objects in view, as will hereinafter appear, the invention consists in the parts, features and combinations hereinafter described and claimed.

In the drawings: Figure 1 is a bottom plan view of the cloth-plate of a sewing machine, illustrating the disposition of the feed-actuating mechanism; Fig. 2 is a side elevation of a portion of the feed-mechanism, showing the relation of the latter with the looper, and also showing a section of the feed-dog and its supporting means; Fig. 3 is a rear elevation of the parts of the feed-mechanism shown in Fig. 2, the looper and the feed actuating yoke being omitted; Fig. 4 is a perspective view of the feeding and looper-mechanism, looking

at the same from the front end of the machine and from slightly above the same; Fig. 5 is an end elevation of the parts shown in Fig. 4, the feed-dog being shown swung back, the bobbin lifted from the looper and the bobbin-controller elevated, and the presser-foot turned up out of the way. Fig. 6 is a plan view of the bed-plate, a section being removed to show a portion of the feeding-mechanism, and the slide-plate being withdrawn to show the looper mechanism; Fig. 7 is a sectional detail view of the throat plate slide.

The looper mechanism herein shown is substantially the same as that shown, described and claimed in my Patent No. 730,692, issued June 9, 1903.

1, indicates the cloth-plate; 2, the lower shaft of the machine, which is shorter than usual relatively to the length of the cloth-plate, and which may be driven in any suitable manner, and the rear end of which beyond its bearing, is provided with a disk 3, having the usual diametrical slot in which is adjustable one end of the link 4, by means of the screw 5. The other end of the link 4, is pivotally connected to the crank-arm 6, on the rock-shaft 7, suitably journaled in hangers of the cloth-plate. To the forward end of shaft 7 is secured by means of a clamping screw 8\* an arm 8 that extends vertically from said shaft, as best seen in Fig. 5. In a slot 10 formed vertically in the upper end of said arm is adjustably secured, by means of a clamping nut 11\*, (see Fig. 6) a bolt 11 on which is suitably pivoted and retained one end of a feed bar 9. A short rock-shaft 12, suitably journaled in hangers on the cloth-plate is provided with a horizontal arm 13 which is secured to said shaft by means of a clamping screw 13\*, as seen in Fig. 5. The arm 13 is supporting at its end the link 14, extending vertically and provided at its upper end with the fork 15, to the prongs 16, of which the forward end of the feed-bar 9, is pivoted by means of the bolt 17, free to turn in its bearings, and suitably held by the nut 18. The rock-shaft 12, is actuated by means of the eccentric 19, on the shaft 2, which is embraced by the fork 20, suitably connected to said rock-shaft 12. The feed-dog 21, is supported by and pivoted upon the bolt 17, within the fork 15, of the link 14, and between the ends of the feed-bar 9. The feed-dog is provided with an extension 22, having its under side flat and on which bears



the flat spring 23, fastened in any suitable manner, at its rear end, to the feed-bar 9, by means of the screw 24. The extension 22, is also provided with the inclined portion 22<sup>x</sup>, on which bears the spring 23, when the dog 21, is turned up, or back, as shown in Fig. 5.

The under side of the feed-dog is provided with the flat portions 25,—see Fig. 5,—which normally rest upon the flat portions 26,—see Figs. 2 and 3,—of the feed-bar, said dog being normally held in the position of Fig. 2, by means of the spring 23. It is to be noted that by supporting the spring 23, upon the feed-bar 9, there is no relative movement between the spring and feed-dog during the operation of the machine, and the said dog is held firmly and properly in place without creating any friction between the pivotal bolt 17, and the supports or journals for the latter, such lack of friction being because the spring, feed-bar, feed-dog and pivot-bolt 17, move together as a unit and said bolt turns freely in its bearings 16, the said parts being thus "self contained." It will be further noted that the pressure of the feed-dog upon the work is firm, and that the action of the feed-dog is positive; also that, when it is desired, the feed-dog may be turned back out of the way of the looper mechanism, as hereinafter described. Locating the bolt 11 adjustably in the slot 10, serves as a means for adjusting vertically the end of the feed bar 9 that is pivoted on said bolt, and clamping the arm 13 on the shaft 12 serves as a means for adjusting vertically the other end of said feed bar. Clamping the arm 8 on the shaft 7, serves as a means for adjusting horizontally the position of the feed bar and through it the working position horizontally of the feed dog. It is thus seen that means are provided for adjusting the position of the feed dog horizontally and vertically. These adjustments will be readily understood by referring to Figs. 4 and 5. To so adjust the feed is advantageous for various reasons. For example when the work is soft and thick, or when heavy seams are to be crossed the feed dog should work more above the needle plate than when thin fine work is being done, or when the work is all flat and firm. The horizontal adjustment of the working position of the feed dog serves as a means for locating the working position of the dog horizontally relatively to the opening in the needle plate in which it operates. These adjustments permit of the feed dog being adjusted to the most favorable position for the kind of work it is desired to do on the machine, but of course they are not essential, and when a machine is to be used continuously on substantially the same kind of work they would not be used.

27, is the looper, located, as shown in Figs. 2, 4, 5 and 6, directly below the feed-dog, close to and in rear of the working position

of the needle and substantially in the direction of feed. This is the preferred disposition of the looper mechanism; but, it will be obvious that said mechanism may be disposed in various positions relatively to the direction of feed and still be within the scope and principle of my invention. As shown, the feed-dog extends considerably over the looper or bobbin-case. The disposition of the parts just described aids, as will be obvious, in a reduction of the size of the needle-loop which passes around the bobbin-case, or mass of lower thread.

It may be observed that, in most machines, it is desirable to have the feed-dog extend on various sides of the working position of the needle, and this extension of the feed about the needle prevents, or interferes with, the ready removal of the bobbin, bobbin-case, or looper and especially when the looper is disposed in a horizontal plane. The result is that the bobbin has to be located sufficiently distant from the needle to permit of its being removed; or the size of the feed has to be limited in extent. Again, when the looper is located directly back of the needle, it can be readily seen that the bobbin can be brought close to the working position of the needle, both of which are advantageous; but, the feed-dog cannot be extended back of the working position of the needle to an extent sufficient to produce the proper feed without interfering with the removal of the looper mechanism; this also applies when the looper is at the side of the direction of feed or in various other positions. These advantages and disadvantages will emphasize the importance of the structure of my invention. The other parts of the looper-mechanism are indicated by 28, and, as the same form no part of my present invention, they are not further described.

Reference character 29 indicates generally a bobbin controller mechanism which is illustrated, described, and claimed in my copending application, Serial No. 154,457, filed April 27, 1903. This mechanism is not herein claimed, and is not a part of my present invention, therefore it is not thought necessary to describe it.

Having disposed the looper mechanism and feeding-mechanism, as above described, it becomes important to so construct the cloth-plate that ready access may be had to the looper mechanism so the parts thereof may be easily reached for any purpose and removed with facility. A practical and convenient structure for the purpose is shown in Fig. 6, wherein the throat-plate of the machine includes the elongated plate 32, which is fastened to the cloth-plate by screws 33, and has, in one side, the feed-slots 34, some of which are open-ended and form the tongue 34<sup>x</sup>, and the needle aperture 35. The cloth-plate is provided with ways 36,



in rear of the plate 32, in which slides the section 32<sup>x</sup>, of the throat-plate, and which is provided with the open-ended slots 37, to receive the portions of the feed-dog which overlap the looper mechanism and between which slots 37, is formed the tongue 37<sup>x</sup>. The plate 32, is provided with a depression or groove 38, which coöperates with the finger 39, on the bobbin-case 40, and holds the latter from turning with the looper. The throat-plate thus constructed provides the opening in the cloth-plate through which the bobbin, or looper mechanism, can be conveniently removed; and the slots in the respective parts, coupled with the tongues thereof, form the feed-slots through which the several parts of the feed-dog operate. The cloth-plate, below the slide 32<sup>x</sup>, is provided with a spring-catch for holding said slide closed, or in operative position, and for preventing any movement thereof when in place. Said catch consists of a spring-plate 41, having on its outer end an enlargement 42, provided with a vertical wall 43, and an inclined portion 42, forming an engaging head to hold the slide, and a finger-rest for depressing the catch. The catch is fixed in place by screw 45, and held from lateral movement by the walls 46, of the groove, or depression, 47, in the cloth-plate, in which grove the plate 41, rests; and the groove 47, is of sufficient depth to allow vertical movement of the catch for depressing the same when it is desired to remove the slide.

The described disposition of the driving mechanism for the feed, and particularly the location of the feed-actuating and adjusting devices on the rear end of the lower shaft of the machine, provide a compact and convenient structure and eliminate many of the parts which become necessary when the feed is actuated from the upper shaft of the machine.

To emphasize the importance of the structure and relative disposition of parts of my invention, I will set forth some of their advantages and functions.

The disposition of the looper-mechanism, shown in the several figures, enables a very large bobbin, or cop of thread, to be employed, thus increasing the capacity of the machine; and such enlargement of the bobbin, or cop—approximating a size two-and-one-half times larger than those used in the ordinary machines; does not increase the size of the loop of the needle thread which encircles the same. Moreover, as previously suggested, the described disposition of the looper-mechanism enables the loop of the needle-thread to be cast about the bobbin, or cop, in a direction substantially that of the path of the feed and substantially in line with the path of the thread through the eye of the needle. This prevents friction between the thread and the needle and decreases the size of the loop nec-

essary to encircle the mass of under thread. It may be observed that the most natural way, and the best way, is to lead the thread through the eye of the needle substantially in the direction of the feed of the work as it avoids friction and produces a better and more even stitch. It may also be noted that by being able to locate the looper so near the needle, as indicated by the construction of my invention, the scope of zig-zag machines may be greatly enlarged, as the swing of the needle in the arc of a circle can be made to substantially coincide with the circumference of the looper.

The disposition of the looper, and the enlargement of the same, naturally cause the feed-dog to extend considerably over the looper, as it is desirable to have the feed operate upon the work back of the working position of the needle. Hence, the construction herein described, whereby the dog may be moved back, becomes important. When it is desired to remove the bobbin, or mass of thread, from the machine the dog may be turned back as shown in Fig. 5, and the presser-foot 30, after being elevated, may be turned up out of the way, as also shown in said figure, said foot being pivoted to its bar 31, for the purpose. However, the turning of the foot is not essential, it being only necessary to have sufficient lift to enable the hobbin to be removed. Thus, by this arrangement of the elements of the feeding and looper mechanisms, it will be apparent that an unusually long feed-dog and large bobbin can be used, and that the looper can be disposed very close to the path of reciprocation of the needle. These are important essentials, as it is desirable to have an extensive feed surface and have it operate all round the needle; also to have the looper operate as close to the path of the needle as possible to reduce the size of the needle-thread loop; and also to increase the size of the bobbin and thus to enlarge the scope and extent of operation of the machine as well as its producing capacity.

The operation of the feeding-mechanism and the other portions of my invention above described, will be obvious without being further detailed, it being of course assumed that the rock-shaft 7, through its connections to the feed-bar, gives the longitudinal or feeding movement, while the rock-shaft 12, through its connections to the feed-bar, gives the necessary rise and fall.

It is observed that while the feed dog is adapted to be moved about its pivot in a vertical plane in the direction of the movement of the dog, or the plane in which said dog operates to move the work, it is obvious that it may be arranged so as to be moved in other directions, but this direction is preferable when the looper is located just back of the feed dog. In my machine, as is of course



understood, the feed dog moves upwardly into engagement with the work, which latter is held down by a presser foot that is carried by a spring depressed presser bar in a usual manner. It is therefore to be understood that the usual downward pressure of the presser foot, the upward movement of the feed dog, and the tension of the spring 23 all tend to keep the dog in its normal position. The overhang of the dog beyond its pivot also tends to keep it in its normal position, and I find in practice that this dog is held securely enough in its normal position for any speed that a sewing machine can be run, with the dog spring 23 sufficiently light for the dog to be readily turned on its pivot when the pressure of the ordinary presser foot is removed from the same.

It is also noted that applicant does not wish to be limited to the specific form of his invention as herein illustrated and described, as it is clear that changes may be made in the same without departing from the spirit of said invention.

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

1. A sewing machine comprising a looper mechanism; and a feeding mechanism, operating below the bed-plate of the machine, and a portion of which normally extends over the looper mechanism; and means whereby the said portion may be moved from its normal position to permit free removal of parts of the looper mechanism.

2. A sewing machine having a looper mechanism and a feeding mechanism, a portion of the feeding mechanism being arranged to normally overlap the looper mechanism; and means whereby said portion of the feeding mechanism may be moved back from the looper mechanism so as not to overlap the latter, whereby the parts of the looper-mechanism may be conveniently removed from the machine.

3. In combination, a feeding mechanism comprising a feed-dog carrying bar; a looper mechanism arranged substantially in rear of the feeding mechanism, and a portion of the feed-dog extending over the looper mechanism; and means whereby said feed-dog may be moved relatively to its bar so as not to obstruct the removal of the bobbin or cop from the looper.

4. A sewing machine having in combination a looper mechanism and a feeding mechanism, both located and operating below the cloth-plate, the feeding mechanism comprising a bar having a dog movable relatively thereto, said dog overlapping the looper mechanism; and means whereby said dog may be moved back from the looper mechanism.

5. A sewing machine having a feeding mechanism comprising a horizontally disposed feed-dog carrying bar arranged below

the cloth-plate, the feed-dog being pivotally supported on said bar; and means for holding said dog in operative position, said means permitting the dog to be turned vertically relatively to said bar into, and maintained in, an inoperative position said means, at the same time, maintaining its normal cooperative relation with said dog.

6. In a sewing machine, a feeding mechanism comprising a horizontally disposed feed-dog carrying bar arranged below the cloth-plate; means for holding said dog in operative position, said means permitting the dog to be moved vertically relatively to said bar into, and maintained in, an inoperative position, said means, at the same time, maintaining its normal cooperative relation with said dog.

7. A sewing machine having a feeding mechanism comprising a horizontally disposed feed-dog carrying bar arranged below the cloth-plate, said dog being provided with an extension; a yielding means carried by said bar and normally engaging said extension for holding said dog in operative position, said means permitting the dog to be moved vertically relatively to said bar into, and maintained in, an inoperative position, said means, at the same time, maintaining its normal cooperative relation with said dog.

8. A sewing machine having a feeding mechanism comprising a feed-dog carrying bar arranged below the cloth-plate, the feed-dog being pivotally carried by the bar, and means carried by said bar for holding said dog in operative position, said means permitting the dog to be moved vertically relatively to said bar into, and maintained in, an inoperative position, said means, at the same time, maintaining its normal cooperative relation with said dog.

9. In combination, a stitch-forming mechanism comprising a needle and looper, and a feeding mechanism including a feed-bar and an independently movable feed-dog; the looper being disposed in a horizontal plane in rear of the feeding mechanism, below the feed-dog of the latter and in rear of the working position of the needle.

10. A sewing machine having a throat-plate, the latter consisting of a plurality of parts, one of which is provided with means whereby it may be held rigidly in place on the machine transversely to the line of feed, and also provided with feed-slots which extend transversely thereof and are open at one side of said part; and another of which parts is provided with open-end slots cooperating with, and extending in continuity of, the slots of the other part, whereby feed-slots are formed divisible transversely between their ends and extending in the line of feed.

11. In combination, a stitch-forming mechanism; a feeding mechanism; and a sec-



tional throat-plate one section being fixed and the other movable; the feeding mechanism being located under one section of the throat-plate and the looper of the stitch-forming mechanism under the other section of said plate; actuating means whereby the feed-dog may operate through both sections; and means whereby said dog may be moved through the fixed section independently of said actuating means.

12. A feed mechanism comprising a part adapted to carry a feed dog, a feed dog pivoted on said part and disposed to engage the under side of the work, a spring carried by said part adapted to hold the dog in its normal position, means adapting said dog to be turned out of its normal position without removing it from its pivot, and means adapting said spring to hold said dog out of its normal position.

13. A feeding mechanism comprising a feed bar, a feed dog carried by said bar located below the work a spring carried by said bar adapted to hold said dog in its normal position on said bar, means adapting said dog to be moved to an inoperative position without removing it from the bar, and means adapting said spring to hold the dog in said inoperative position.

14. A sewing machine comprising a looper mechanism the looper of which revolves in a horizontal plane, a feeding mechanism the feed dog of which projects over said looper, means for adjusting the position of said feed dog vertically and horizontally, means adapting it to be removed from its position of extending over said looper, and means for holding it in said removed position.

15. In combination, a cloth-plate having

an opening therein; a throat-plate for covering said opening comprising a part extending longitudinally of the cloth-plate, and a movable coöperating part; means for securing the first said part rigidly to the cloth-plate; means for temporarily holding the movable part in place; and both said parts having open-end slots which coöperate end-to-end to form feed-slots extending transversely of the cloth-plate.

16. In combination, a cloth-plate having an opening therein; a throat-plate for closing said opening, consisting of a front part and a rear part; means for fixing the front part to the cloth-plate; means whereby said rear part may move transversely of the cloth-plate and bodily relatively to the front part; and means for holding the rear part in operative position on the cloth-plate and in coöperative relation to the front part.

17. In combination, a cloth-plate having an opening therein; a throat-plate having a part fixed in position over the front portion of said opening, a movable part closing the rest of said opening, and both said parts having coöperating slots formed in continuity of each other in the line of feed; a feeding mechanism having a relatively movable dog working through said slots; and a looper mechanism located beneath the movable part of the throat-plate and beneath said dog.

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

WILLIAM N. PARKES.

Witnesses:

CHAS. MCC. CHAPMAN,  
M. B. HOARE.