

O. SCHULER & R. GLASER.

REEDING MACHINE.

APPLICATION FILED OCT. 10, 1907.

907,898.

Patented Dec. 29, 1908.

3 SHEETS—SHEET 1.

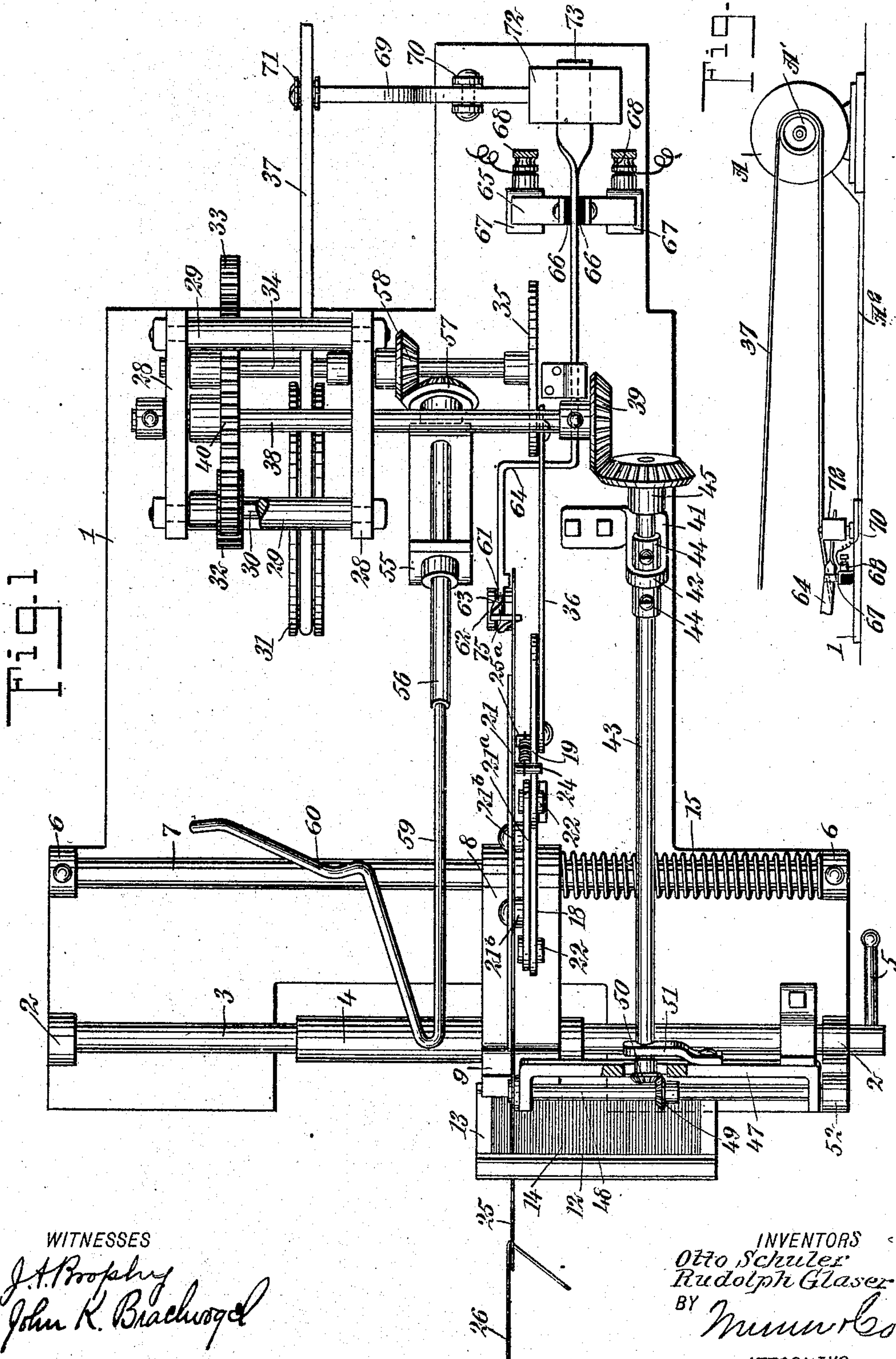


Fig. 1

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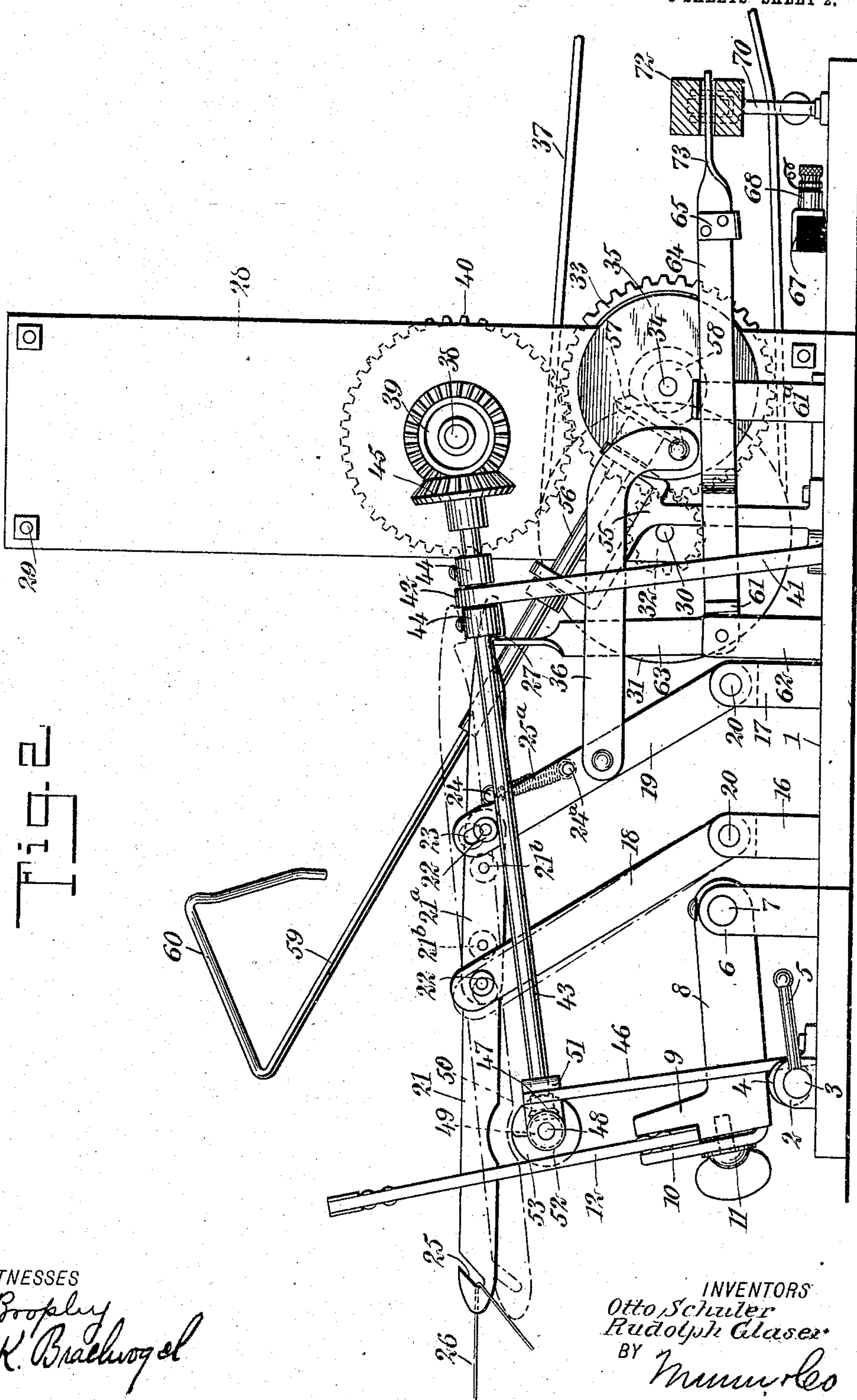


Fig. 2

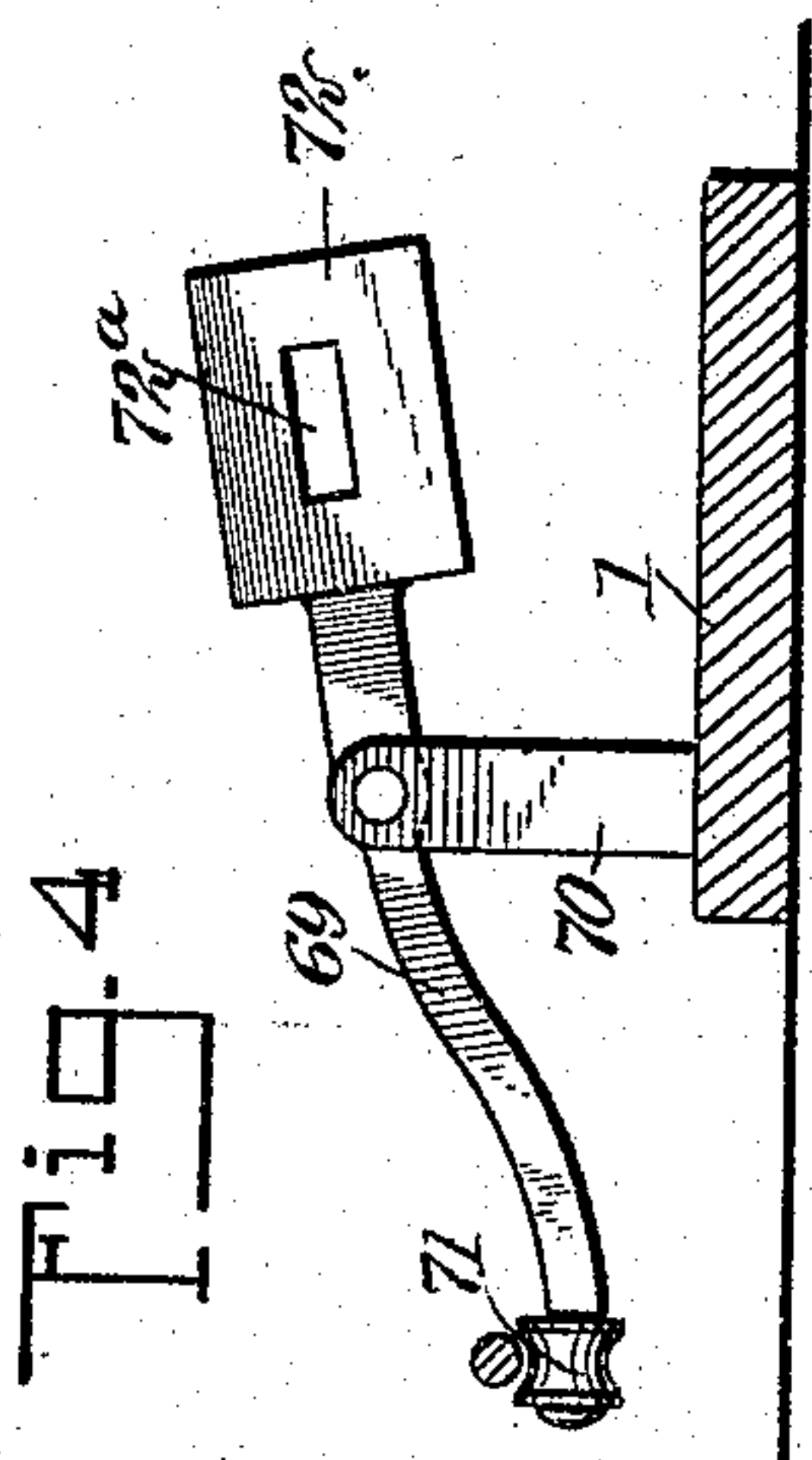
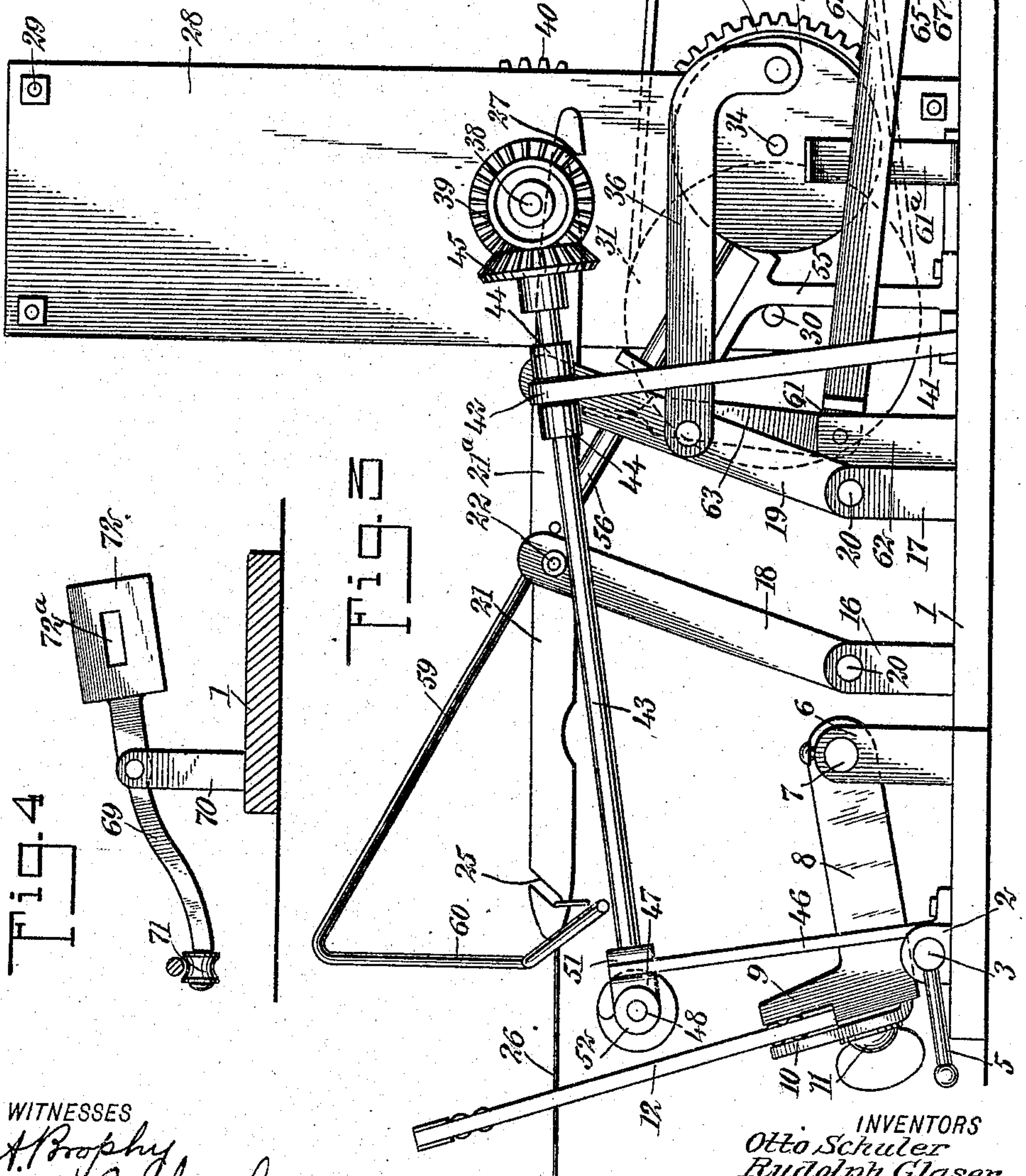
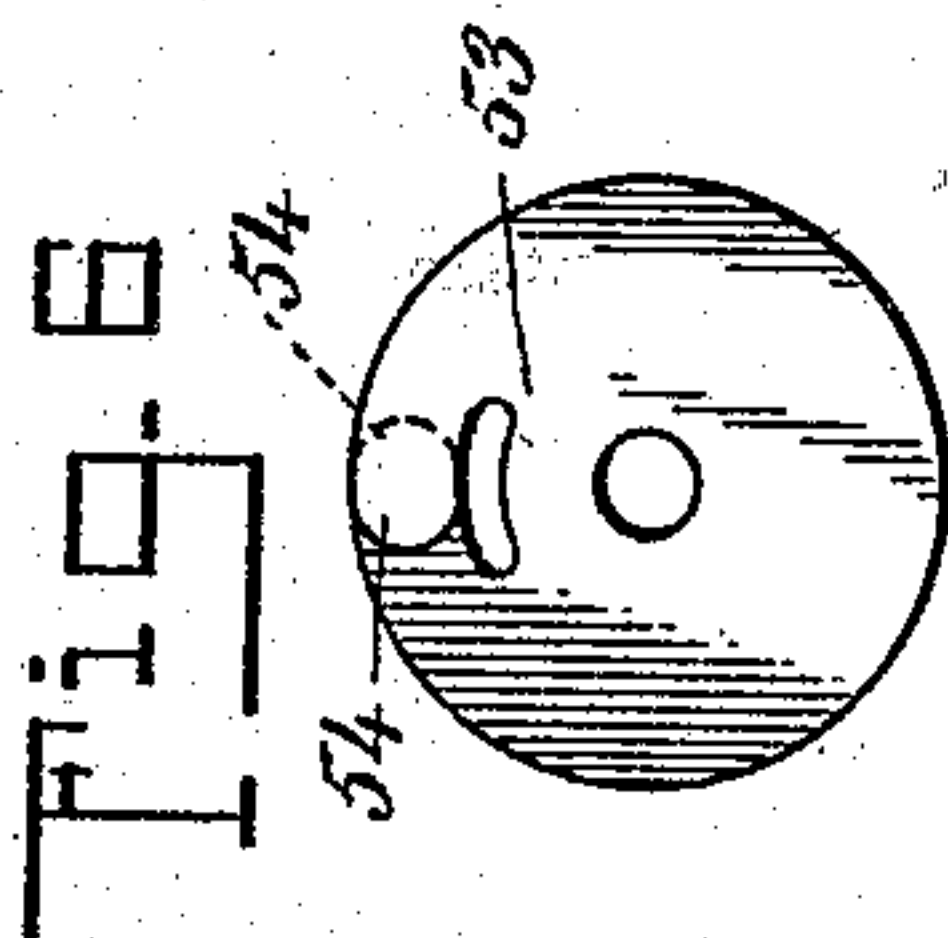
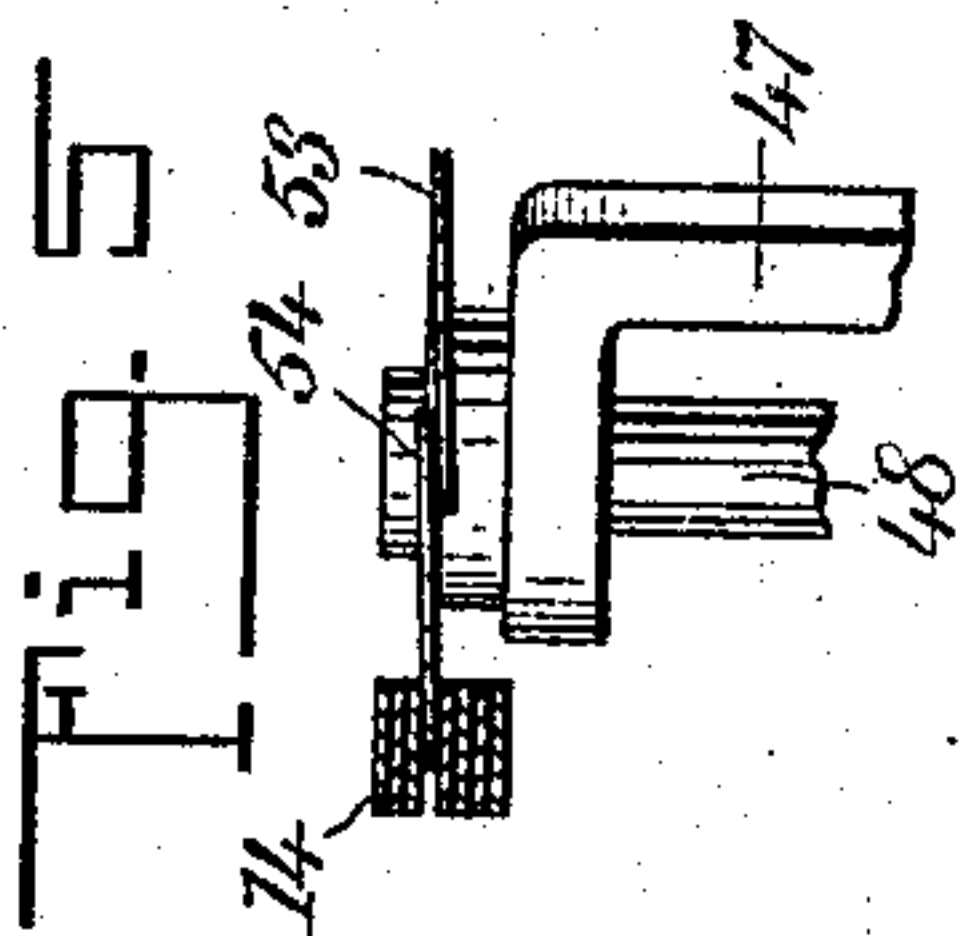
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UNITED STATES PATENT OFFICE.

OTTO SCHULER AND RUDOLPH GLASER, OF PATERSON, NEW JERSEY.

REEDING-MACHINE.

No. 907,898.

Specification of Letters Patent.

Patented Dec. 29, 1908.

Application filed October 10, 1907. Serial No. 396,765.

To all whom it may concern:

Be it known that we, OTTO SCHULER and RUDOLPH GLASER, both citizens of the United States, and residents of Paterson, in the county of Passaic and State of New Jersey, have invented a new and Improved Reeding-Machine, of which the following is a full, clear, and exact description.

This invention relates to reeding machines, and is particularly useful in warping or harnessing looms for weaving textile fabrics.

An object of the invention is to provide a simple and efficient reeding machine by means of which the warp threads used in textile looms can be easily and expeditiously inserted in the slits of reeds used in connection with these looms.

A further object of the invention is to provide a device of the class described which is automatic in its operation, which can be easily controlled by the weaver or operator of the loom, and by means of which warp threads can be rapidly inserted in the successive slits of the reed.

A still further object of the invention is to provide a reeding machine which automatically separates the wires or dents of a loom reed, inserts a thread knife between the separated wires or dents, maintains the knife in this position until the operator attaches a warp thread to the same, whereupon the knife with the thread is drawn through the reed and then removes the thread from the knife and inserts the latter through the next successive slit of the reed.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a plan view of our reeding machine; Fig. 2 is a side elevation of the device, showing certain of the parts in different positions in dotted outlines; Fig. 3 is a similar view showing certain of the parts in different positions; Fig. 4 is a side elevation of a detail of the controlling mechanism; Fig. 5 is a plan view of the part of the mechanism for separating the wires or dents of the reed, and showing a number of the wires or dents in cross-section; Fig. 6 is a side elevation of the wire or dent separating member and Fig.

7 is a side elevation of a part of the machine and shows an electric motor for driving the same.

Before proceeding to a more detailed explanation of our invention, it should be understood that reeding and harnessing in textile weaving are subsidiary processes in placing the warp in proper position on the loom; these processes consist in putting each warp thread through its proper slit in the reed and its corresponding eyelet in the harness. The method of reeding commonly in use at the present time consists in manually drawing the warp threads through the slits of the reed by means of a thread knife. The latter is manipulated by an assistant operator or weaver who inserts the knife by hand between the successive adjacent pairs of reed wires or dents and holds the knife in position until the weaver places a warp thread in a recess of the same, whereupon the assistant draws the knife through the reed and thus properly positions the thread. The assistant then frees the knife from the thread and inserts the instrument in the next slit. This operation is a tedious and expensive one, and it is one of the principal objects of our invention to provide a labor-saving device that performs the operation automatically. Our machine includes a thread knife which is automatically inserted successively in the slits of the reed, and is held in position there until the weaver has placed his thread in the recess or notch of the knife and has set the actuating mechanism in operation by manipulating the knife in a certain manner, the knife controlling the actuating mechanism for this purpose. The machine then withdraws the knife through the reed and a suitable member frees it from the thread. The knife is then advanced toward the reed and passes through the next successive slit of the latter, whereupon the operations are repeated. The wires or dents of the reed are successively separated by a suitable device coacting with the knife and the thread-removing member. We prefer to employ an electric motor as the actuating means for our machine, as will appear more clearly hereinafter.

Referring more particularly to the drawings, 1 represents a suitable base or support upon which the machine is mounted. Near the forward edge, the base 1 at the opposite sides has bearings 2 in which is revolvably arranged a transverse shaft 3 having an eccen-

tric or cam section 4. The shaft 2 has a handle 5 by means of which it can be manually operated. Brackets 6 are provided at the opposite sides of the base and carry a rigid transverse shaft 7 upon which is slidably mounted a reed carriage 8 by means of a suitable opening in the body of the same. The reed carriage extends over the cam section 4 of the shaft 3 and has an upwardly disposed part 9 constituting one of the jaws of a reed holder; the other jaw 10 of the holder is adjustably mounted upon the carriage by means of a thumb-screw 11. The reed 12, which can be of any preferred or common form and preferably comprises a frame 13 and wires or dents 14, is mounted upon the carriage 8 by means of the holder jaws and the thumb-screw. A helical spring 15 is arranged upon the shaft 7 between the carriage 8 and one of the brackets 9 and tends to slide the carriage longitudinally of the shaft 7.

At the side of the shaft 7 remote from the reed, the base 1 has two alined pivot brackets 16 and 17 which carry swinging links 18 and 19 respectively, pivoted upon the brackets by means of pins 20 or in any other suitable manner. The links 18 and 19 at the upper ends have an elongated bar 21^a which is pivotally secured to the links by means of pins or rivets 22 and which carries, by means of screws and spacing collars 21^b, a thread knife 21. The link 19 has a slot 23 at its upper end, through which the pin 22 passes and which permits a limited movement of the connecting bar and the knife longitudinally of the link. The knife 21 has a stud 24 to which is secured a helical spring 25^a; the opposite end of the latter is secured to a stud 24^a of the link 19, and the spring thus serves to hold the knife at the lowest limit of its movement longitudinally with respect to the link 19. At the forward end the knife has an inclined recess or notch 25, adapted to receive a warp thread 26, and serving to hold the thread while it is being drawn through the reed. The notch 25 is at the upper edge of the knife. Near the opposite end, though at the under edge, the knife has a notch 27, for a purpose which will appear hereinafter. Preferably upright frames 28 secured together by cross bolts 29, are mounted upon the base 1 and have revolubly arranged therebetween a shaft 30 carrying a rigid driving pulley 31 and a pinion 32; the latter is in mesh with a gear-wheel 33 mounted upon an adjacent shaft 34. The latter extends beyond the frames 28 and at the extremity has a rigid crank disk 35. A connecting rod 36 is pivotally mounted upon the crank disk and the link 19 and serves operatively to join these parts. Thus, as the shaft 34 is driven from the shaft 30 the knife is reciprocated by means of the links, the connecting rod and the crank disk. The driving pulley 31 is

connected by means of a belt 37 with a prime mover which consists of an electric motor A having a pulley A' in the form of the device illustrated in the accompanying drawings, and as shown most clearly in Fig. 7. A further shaft 38 is revolubly carried by the frame 28 and extends laterally therebeyond, having at the end a rigid bevel gear 39. The shaft 38 has a gear wheel 40 in mesh with the gear wheel 33, from which it is driven. A standard 41 is carried by the base 1 and is provided at its upper end with a bearing 42 in which is arranged a revoluble shaft 43. The latter has rigid collars 44 at each side of the bearing 42 and is held revolubly in position thereby. At one end, the shaft 43 has a bevel gear 45 in mesh with the similar gear 39. Near the shaft 3, the base 1 has an upright 46 which is provided with a laterally extended cross-member 47 rigidly, though removably, mounted thereupon. The cross-member has its ends laterally disposed and formed into bearings in which is revolubly carried a spindle 48, provided with a bevel-gear 49 in mesh with a bevel-gear 50 mounted at the end of the shaft 43. The latter extends through a suitable opening in a support 51, carried by the cross-member 47. At one end, the spindle projects beyond the extremity of the cross-member and has a head 52 which serves to limit its movement. At the other end, which is similarly extended beyond the cross-member, the spindle carries a rigid disk 53 which constitutes the reed wire or dent-separating member. The disk 53 is split near the rim and has the edges 54 of the split overlapping. Thus, the periphery or edge of the disk is spirally disposed, and when the disk is revolved the spiral edge has a screw-like action which successively separates the dents of the reed. The disk, in operation, has its edge inserted between two of the reed dents, and as it revolves one of the dents passes into the spiral slit, and thus the edge of the disk passes from one side of the dent to the other; consequently, successively engaging the slits between the adjacent dents of the reed.

A journal frame 55 is carried by the base 1 adjacent to the knife, and therein is pivotally mounted a shaft 56 at one end of which is a bevel-gear 57 in operative engagement with a similar gear 58 rigidly carried by the shaft 34. The shaft 56 has an extension 59, the end of which is laterally disposed to form an arm 60. The arm 60 when the shaft 56 is driven from the shaft 34 has a rotary movement and sweeps around the forward end of the knife to free the same from the thread. The shaft 56 is inclined so that the movement of the arm 60 as it engages the thread 26 is substantially parallel to the length of the slot 25, and thus the thread can be removed from the latter with-

out difficulty. The arrangement of the parts is such that the arm 60 swings around the point of the knife as the latter nears the end of its backward movement, and when the knife is traveling forward or through the reed in either direction the arm 60 is moving inoperatively with respect to the knife.

A bell crank lever 61 is pivoted by means of a bracket 62 upon the base 1. The upwardly extending arm 63 of the lever constitutes a stop and is arranged to be engaged by the notch 27 of the knife. The other arm 64 of the lever carries a contact 65 which is suitably insulated from the lever by means of blocks 66 of hard rubber or the like. The contact 65 serves to effect an electrical connection between terminals 67 provided with binding posts 68 by means of which the terminals can be included in the circuit of the driving motor. It will be understood that when the contact 65 connects the terminals, current can flow in the circuit to drive the motor; whereas, when the contact is raised the circuit is broken and the motor is inoperative. A lever 69 is pivoted upon a support 70 carried by the base 1 and has at one end an idler pulley 71 and at the opposite end a weight 72. The latter has a slot 72^a through which extends the end 73 of the bell crank lever arm 64. The end 75 of the arm 63 of the bell crank lever is twisted laterally in order to present a suitable engaging surface for the shoulder of the knife notch 27. A stop 61^a serves to limit the upward movement of the bell crank lever.

The operation of our invention is as follows: When the contact 65 effects electrical connection between the terminals 67, the motor is actuated and drives the pulley 31 by means of the belt 37. When the contact is in an operative position the bell crank lever arm 64 is lowered, consequently the weight 72 is also lowered and the lever 69 is so positioned that the idler pulley 71 presses upward against the lower run of the belt 37 and tightens the same so that the motor can drive the pulley 31. As the pulley revolves it actuates the shaft 34 through the connecting gears and this drives the knife forward through the reed. As the knife advances it engages the arm 63 of the bell crank lever and pulls the same forward, thereby raising the arm 64 and breaking the circuit. The motor is thus stopped and at the same time the idler pulley is disposed so that the belt is permitted to loosen and is rendered inoperative with respect to the pulley 31. This feature is of importance as the motor may continue to rotate for a short time owing to its acquired momentum and thus the stopping of the device would not be instantaneous; however, when the belt is loosened in this way the moving parts stop at once. The knife, which has been projecting through the reed remains in this position until the

weaver places the warp thread in position upon the knife and depresses the same. As soon as the knife is depressed it is pivotally swung about its connection with the link 18, the slot 23 of the link permitting this movement. This swinging movement of the knife releases the arm 63 of the bell crank lever and the weight of the arm 64 together with the weight 72 swings the bell crank lever into position with the contact closing the motor circuit. At the same time, the belt 37 is tightened and therefore, as soon as the motor begins to operate, the belt drives the reeding machine. The movement of the knife is then continued and it withdraws from the reed, carrying through the same the thread 26. Meanwhile, the arm 60 has been swinging toward the knife and as the latter withdraws from the reed the arm passes around the point of the knife and removes the thread. At the same time the separating member has inserted its edge between the succeeding pair of reed dents and as the knife again approaches the reed it is inserted in this succeeding slit. It will be understood that the knife and the separating member are necessarily arranged in the same plane. When the knife is again projected through the reed the bell crank lever has been operated and the motion of the machine ceases. The same operations are then repeated until a sufficient number of warp threads has been inserted in the reed.

The reed carriage 8 can be raised or lowered to permit the engagement or disengagement of the reed and the separating member by means of the revoluble shaft 3. As the latter is swung in one direction the cam section raises the carriage and brings the reed into engagement with the separating member. When this movement of the shaft is reversed the reed is withdrawn from the separating member. It will be understood that the spring 15 serves to advance the carriage as the successive reed slits are spread by the separating member.

Having thus described our invention we claim as new and desire to secure by Letters Patent:

1. A machine of the class described, comprising means for holding a reed, means for separating the dents of the reed, a thread knife arranged to be removably inserted between the dents of said reed, and actuating means controlled by said knife.

2. A machine of the class described, comprising means for holding a reed, means for successively separating the dents of the reed, a movable thread knife arranged to be reciprocated between the dents of said reed, actuating means, and controlling means for said actuating means and operable by said knife, whereby said actuating means are rendered inoperative when said knife is in a predetermined position.

3. A machine of the class described, comprising means for holding a reed, means for successively separating the dents of said reed, a reciprocating thread knife arranged to be inserted between the dents displaced by said separating means, actuating means for said knife and said separating means, and controlling means for said actuating means, said controlling means being operable by said knife.

4. A machine of the class described, comprising adjustable means for holding a reed, means for successively separating the dents of said reed, a reciprocable knife adapted to carry a thread through said reed, means for freeing the thread from said knife, actuating means, and controlling means for said actuating means and operable by said knife.

5. A machine of the class described, comprising means for holding a reed, means for successively separating the dents of said reed, a movable thread knife arranged to be reciprocated between the dents and serving to carry a thread through the reed, means for freeing the thread from said knife, common actuating means for said dent separating means, said thread knife, and said freeing means, and controlling means for said actuating means, and operable by said knife, whereby said actuating means are rendered inoperative when said knife is in a predetermined position.

6. A machine of the class described, comprising means for holding a reed, means for successively separating the dents of said reed, a reciprocable thread knife arranged to be inserted between the dents displaced by said separating means and serving to carry a thread through the reed, means for freeing the thread from said knife, common actuating means for said knife and said separating means, and controlling means for said actuating means, said controlling means being operable by said knife.

7. A machine of the class described, comprising adjustable means for holding a reed, means for successively separating the dents of said reed, a reciprocable knife adapted to carry a thread through said reed and arranged to be inserted between the dents displaced by said separating means, a swinging member for removing the thread from said knife, common actuating means for said separating means, said member and said knife, and controlling means for said actuating means and operable by said knife.

8. A machine of the class described, comprising adjustable means for holding a reed, a member for successively separating the dents of said reed, a reciprocable knife adapted to carry a thread through said reed and arranged to be inserted between the dents displaced by said member, a swinging mem-

ber for removing the thread from said knife, common actuating means for said separating member, said swinging member and said knife, and a controlling connection between said actuating means and said knife and operable by the latter.

9. In a machine of the class described, in combination, a removable reed, a member arranged successively to separate the dents of said reed and to limit the movement of said reed, a reciprocable knife adapted to carry a thread through said reed and arranged to pass between the dents displaced by said member, a movable arm for withdrawing the thread from said knife, actuating means, and a controlling connection between said actuating means and said knife and operable by the latter.

10. In a machine of the class described, in combination, a reed carriage, means for resiliently propelling said carriage, a reed removably mounted upon said carriage, a member arranged successively to separate the dents of said reed and to limit the movement thereof, a reciprocable knife adapted to be inserted between the dents of said reed and to carry a thread through the same, said knife passing between the dents displaced by said member, a movable arm for withdrawing the thread from said knife, common actuating means for said member, said knife and said arm, a controlling connection between said actuating means and said knife, said knife operating said controlling connection in such a manner that the actuating means are rendered inoperative at a predetermined position of the knife.

11. In a machine of the class described, in combination, a reed, means for holding said reed, a thread knife arranged to be reciprocated between the dents of said reed, and actuating means for said knife, said actuating means being rendered inoperative when said knife is in a predetermined position and being operable by said knife.

12. In a machine of the class described, in combination, a reed, a member arranged successively to separate the dents of said reed, a reciprocable knife adapted to be inserted between the dents of said reed and to carry a thread through the same, a movable arm for removing the thread from said knife, common actuating means for said member, said knife and said arm, and a lever controlling said actuating means and arranged to be engaged by said knife to render said actuating means inoperative when said knife reaches a predetermined position, said knife being pivotally mounted whereby a swinging movement of said knife releases said lever.

13. In a machine of the class described, in combination, a resiliently held reed, a member arranged successively to separate the dents of said reed and to limit the movement

thereof by engagement with said reed, a reciprocable knife adapted to be inserted between the dents of said reed and to carry a thread through the same, said knife and said member being substantially alined, a movable arm for removing the thread from said knife, common actuating means for said member, said knife and said arm, and a lever controlling said actuating means and arranged to be engaged by said knife to render said actuating means inoperative when said knife reaches a predetermined position.

14. In a machine of the class described, in combination, a resiliently held reed, a member arranged successively to separate the dents of said reed and to limit the movement thereof by engagement with said reed, a reciprocable knife adapted to be inserted between the dents of said reed and to carry a thread through the same, said knife and said member being substantially alined, a movable arm for removing the thread from said knife, common actuating means for said member, said knife and said arm, and a lever controlling said actuating means and arranged to be engaged by said knife to render said actuating means inoperative when said knife reaches a predetermined position, said knife being pivotally mounted whereby the depressing of one end of said knife releases said lever, said knife having resilient means for holding it in the normal position.

15. In a machine of the class described, in combination, a resiliently held reed carriage, a reed mounted upon said carriage, a member arranged successively to separate the dents of said reed and to limit the movement thereof by engagement with said reed, a reciprocable knife adapted to be inserted between the dents of said reed and to carry a thread through the same, a movable arm for removing the thread from said knife, a common driving shaft for said member, said knife and said arm, actuating means, a driving connection between said actuating means and said shaft, a lever controlling said actuating means and arranged to be engaged by said knife to render said actuating means inoperative when said knife reaches a predetermined position, and means operable by said lever for controlling said driving connection.

16. In a machine of the class described, in combination, a reed, a member arranged successively to separate the dents of said reed and to limit the movement thereof by engagement with said reed, a reciprocable knife adapted to be inserted between the dents of said reed and to carry a thread through the same, a movable arm for removing the thread from said knife, a motor for driving said member, said knife and said arm, and a lever arranged to be operated by engagement with said knife, and having means for stopping said motor.

17. In a machine of the class described, in combination, a resiliently held reed carriage, a reed mounted thereupon, a member arranged successively to separate the dents of said reed, a reciprocable knife adapted to carry a thread through said reed, a movable arm for removing the thread from said knife, a common driving shaft for said member, said knife and said arm, a driving motor, a flexible driving connection between said motor and said shaft, a lever arranged to be operated by engagement with said knife and having means for stopping said motor, and means controlled by said lever for tightening said flexible connection when said lever is in a position such that said motor is in operation.

18. In a machine of the class described, in combination, a reed, a reciprocable knife arranged to carry a thread through said reed, a driving shaft for said knife, a lever arranged to be operated by engagement with said knife, actuating means, a flexible connection between said actuating means and said shaft, said lever controlling the operation of said driving means, and a second lever engaged by said first lever and engaging said belt, whereby said belt is tightened when said first lever is in a position such that said actuating means are operative.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

OTTO SCHULER.
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Witnesses:

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