J. FALTUS.

SHUTTLE THREADING MECHANISM.

APPLICATION FILED JULY 1, 1909.

962,327.

Patented June 21, 1910.

3 SHEETS—SHEET 1.

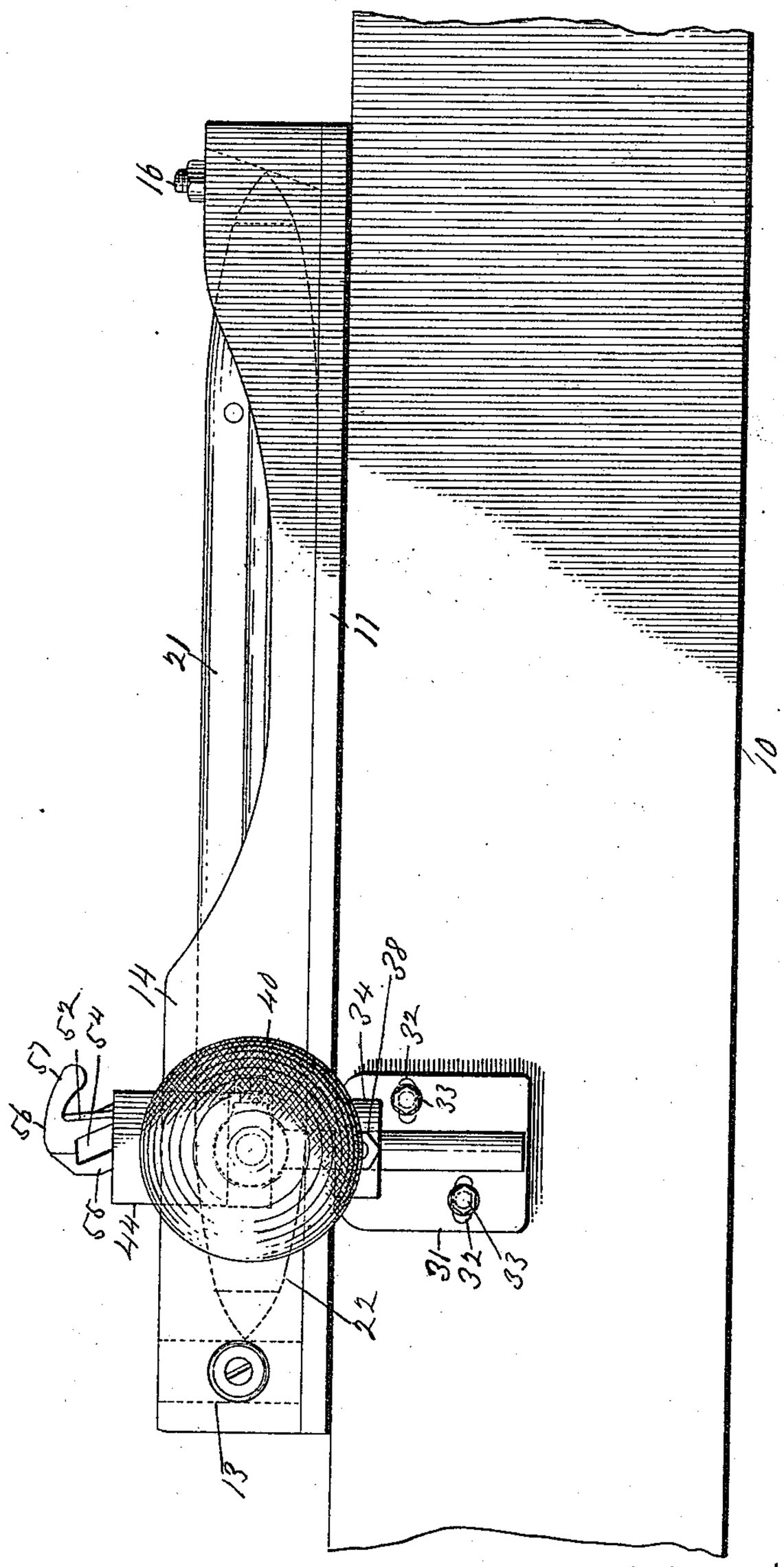

FIG. 1.

WITNESSES:

Frank G. Parker.

M. Hallenbeck.

INVENTOR:

Joseph Faltus.

By Terry & Williams

Atty's.

ANDREW B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

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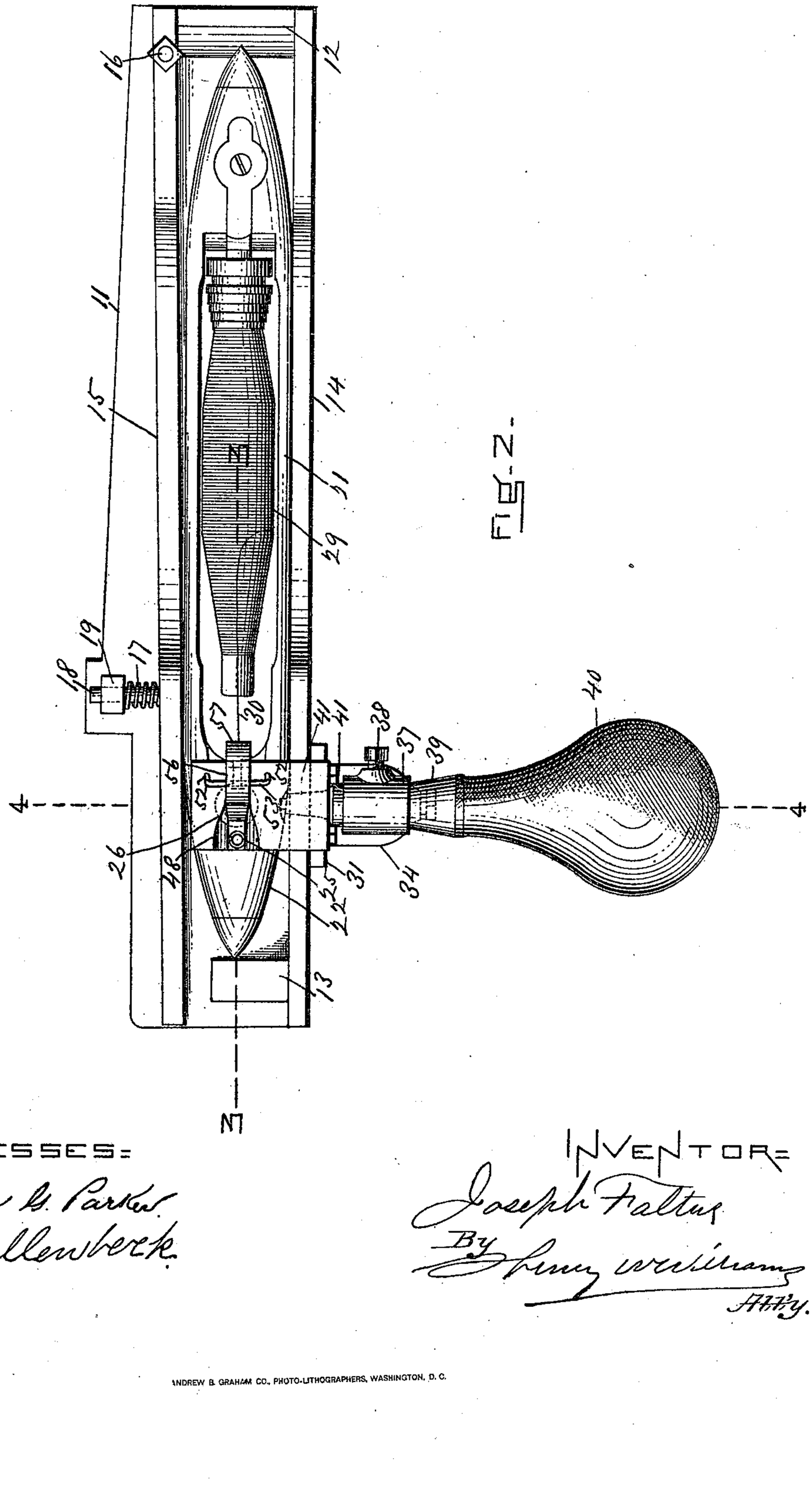

FIG. 2.

WITNESSES:

Frank B. Parker.

M. Hallenbeck.

INVENTOR:

Joseph Faltus.

By Pierce Williams

Atty.

J. FALTUS.

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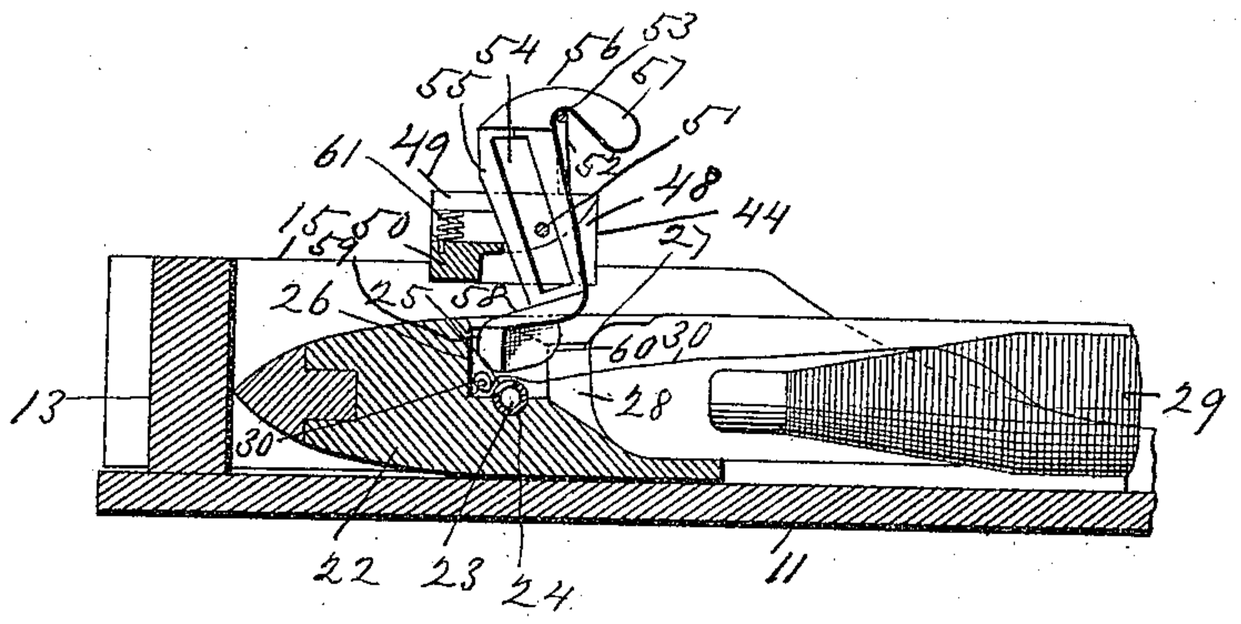

Fig. 3.

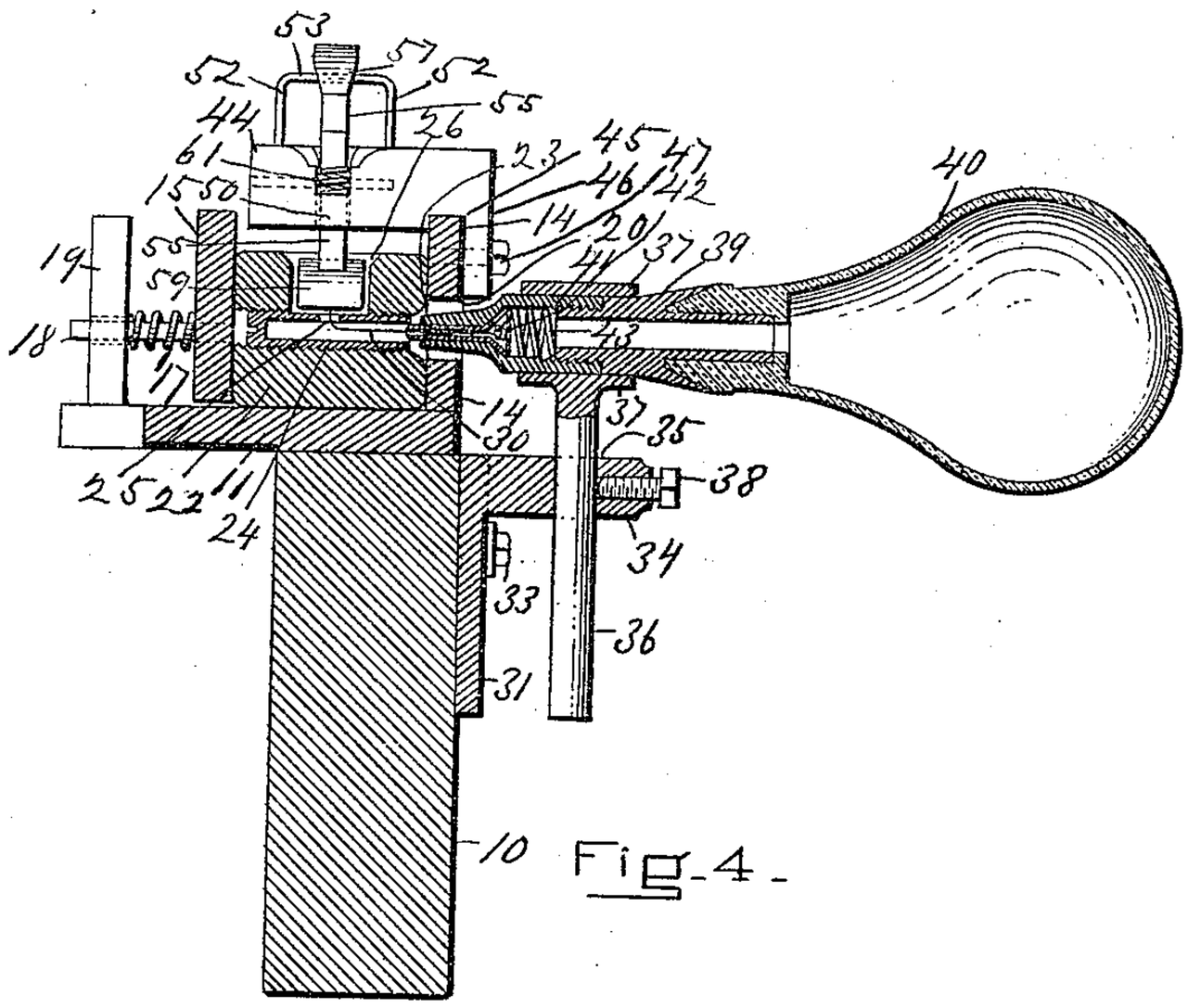

Fig. 4.

WITNESSES:

Frank G. Parker

W. Hallenbeck.

INVENTOR:

Joseph Faltus

By Penny & Williams

Atty.

UNITED STATES PATENT OFFICE.

JOSEPH FALTUS, OF FALL RIVER, MASSACHUSETTS.

SHUTTLE-THREADING MECHANISM.

962,327. Specification of Letters Patent. **Patented June 21, 1910.**

Application filed July 1, 1909. Serial No. 505,366.

To all whom it may concern:

Be it known that I, JOSEPH FALTUS, a subject of the Emperor of Austria-Hungary, residing in Fall River, in the county of Bristol and State of Massachusetts, have invented new and useful Improvements in Shuttle-Threading Mechanism, of which the following is a specification.

This invention relates to a new and useful improvement or device adapted particularly to be used in connection with the shuttle-rest supported by the arch of the loom. It is not essential, however, that the shuttle-rest should be applied to the arch of the loom, as it may be secured in any convenient position. A portion of the device is connected directly with the shuttle-rest, and a portion is applied directly to the arch next to the shuttle-rest, the two portions being enabled to work in connection with each other by means of an opening in the front side of the shuttle-rest.

The invention has for its principal object to do away with the unsanitary process of "sucking the shuttle", when the shuttle is to be threaded or re-threaded, without making any particular change in the construction of the shuttle itself. The invention, therefore, is not an improvement in shuttles, but an attachment to or mechanism connected with a shuttle-rest and the portion of the machine supported thereby.

The method commonly in use at the present time of threading the shuttle after the thread has become broken is to apply the lips to the shuttle-eye and suck or draw the thread through the eye from the socket of the shuttle. This method is productive of disease to such an extent that the death rate from tuberculosis and other germ diseases is much greater in towns and cities devoted largely to textile industry than other places of the same size. The evil is recognized to be such, that various improvements in shuttles have been devised whereby the operator can draw the thread by hand through slots and passages in the shuttle-head, and thus guide it to the eye. But this method occupies considerable time and involves alterations more or less expensive in the shuttle.

My present invention is intended to draw the thread after it has been broken through the shuttle-eye entirely by mechanical means. In practice there are always one or more shuttles supported by a shuttle-rest, which is usually secured to the arch of the loom. When my invention is in use, and the thread breaks, the shuttle containing the bobbin of thread is instantly removed and placed in the shuttle-rest, and a shuttle which has been suitably threaded is removed from the rest and placed in the shuttle-box. The threading of the shuttle by means of the mechanism embodied in this invention is done instantly, either by the operator who deposits the shuttle having a broken thread in the shuttle-rest, or by any operator whose duty may be to keep the shuttle-rest provided with one or more shuttles which are threaded and in condition to be applied to the shuttle-box of the loom.

The nature of the invention is fully described below, and illustrated in accompanying drawings, in which—

Figure 1 is a front elevation showing a shuttle in a shuttle-rest supported by the arch of the loom (a portion of which is illustrated), the said shuttle-rest and arch being provided with my invention. Fig. 2 is a plan view of the same. Fig. 3 is a section taken on line 3—3, Fig. 2. Fig. 4 is a section taken on line 4—4, Fig. 2. In all these figures the shuttle is in the shuttle-rest, and the different parts of my invention are in the same position. In Figs. 1, 2 and 3 the thread has not been pulled through the shuttle-eye, but is bunched up slightly in the socket of the shuttle-head ready to be drawn through the eye. In Fig. 4 it has been drawn through the eye.

Similar numerals of reference indicate corresponding parts.

Reference-numeral 10 represents a portion of the arch of the loom.

11 represents the floor, 12 an end wall, preferably on a slant, 13 a bunter or stop at the opposite end, 14 the rigid front wall, and 15 the rear wall hinged at 16 and held normally in by means of a spring 17 surrounding a horizontal rod 18 supported by an upright 19 secured to the floor.

The important elements in the shuttle-rest are the opening 20 in the front wall opposite the shuttle-eye when the shuttle is in position, and the yielding rear wall whereby the shuttle may be swung away from the nozzle (below described) when it is to be removed.

21 represents the front wall of an ordi-

nary shuttle, 22 being the shuttle-head and 23 the thread-eye. Preferably a metallic thimble 24 is provided in the shuttle-head and leads to the eye, said thimble being provided with a hole 25 which connects with the ordinary recess or socket 26 in the shuttle-head divided from the main portion of the interior of the shuttle by the ordinary wall 27 provided with the usual vertical passage 28. 29 represents the bobbin, the thread 30 of which is adapted to extend through the passage 28 into the socket or recess 26, and thence through the hole 25, thimble 24 and thread-eye 23 in the front wall 21—all of which is constructed substantially as usual.

31 represents a plate secured to the front wall of the arch in vertical line with the opening 20 of the shuttle-rest, said plate being rendered horizontally adjustable by means of ordinary slots 32 and bolts 33. Rigid or integral with the plate 31 is a horizontally extending bracket 34 vertically bored at 35 to receive a vertical rod or shank 36 whose upper end supports and is preferably integral with a tubular holder or socket 37. A set-screw 38 enables the socket to be raised and lowered and held rigidly at any desired height, the desired height being the same as that of the opening 20, and the socket therefore being held firmly and centrally exactly opposite said opening. Held by this socket is a metallic tubular shank 39, which is provided at its outer end with an ordinary rubber suction-bulb 40, and has screwed to its inner end a nozzle 41, which extends through the opening 20 in the front wall 14 of the shuttle-box and into the thread-eye 23 and to or into the outer end or mouth of the metallic tube or thimble 24. Within the larger portion of the nozzle is a wall or piece of wire gauze or perforated metal 42, which is held in place by means of a spiral spring 43 which lies between it and the end of the portion 39.

44 represents a block or holder which is supported by the shuttle-rest, preferably on the front wall 14, the block being grooved at 45 for the purpose, and said block is provided with an integral downward extension 46 whereby it is secured in a horizontal position by a bolt 47 or other suitable means to said front wall. This holder is provided with a slot 48 which extends vertically through the holder and at its upper portion horizontally through said holder at 49, the part 50 being integral with and connecting the two parts of the holder on the opposite sides of the slot. A wire or rod 51 extends horizontally across this slot, as illustrated particularly in Fig. 3. A frame or rod consisting of the upright portions 52 of a wire or rod and the horizontal portion 53 is secured to the block 44 on opposite sides of the slot. The wire or rod 51 extends through a large slot or opening 54, which extends for practically the entire length of the central portion 55 of a substantially Z-shaped trip-frame, said trip-frame comprising said central portion 55, and upper portion 56 which extends toward the center of the shuttle, and is formed with a downwardly dipping portion 57 whereby the trip-frame is enabled to rest on the horizontal portion 53 of the wire frame. The lower end of the portion 55 is integral with a plug or closure which extends downward and slightly toward the adjacent end of the shuttle, and is of a general shape to fit into the socket 26 of the shuttle. This part, however, does not fit closely in the shuttle, but consists of an approximately horizontal portion 58, a downwardly extending portion 59 and another downwardly extending portion 60, which is at right angles with the portion 59, said portion 60 extending into the vertical passage 28 and in connection with said passage operating to guide and steady the structure 55, 56, 57, 58 and 59 in its movements. The object of the part 58—59—60 of the Z-shaped trip-frame is to prevent a bunch of thread which lies in the socket from being forced upward or rising out of said socket, as will be hereinafter explained. Resting on the part 50 within the slot 48 is a vertically disposed spiral spring 61.

To re-thread a shuttle after the thread has been broken, draw a portion of the thread from the bobbin through the passage 28 into the recess or socket 26, and preferably bunch it up a trifle in the socket, insert the shuttle in the shuttle-rest from the right, and as it is being moved forward and is sliding down the inclined end wall 12 the head of the shuttle is moving under the block or holder 44, pushing up the trip-frame until the shuttle lies entirely on the bottom 22 of the rest. When it has reached that point the socket 26 is exactly under the portion 58—59—60 of the trip-frame which has been lifted by the nose and head of the shuttle, and drops into said socket over the little bunch of thread so that said thread cannot rise out of the socket. The lower portion of this trip-frame fills the socket above the thread. The bulb 40 is then compressed and instantly released and allowed to expand, and as it expands the thread is drawn by the suction thus produced through the eye 23 into the nozzle 41 which extends through the opening 20. As this opening is quite long the thread is then easily accessible, but it is unnecessary to touch it, as when the shuttle is removed from its position in the rest the end of the thread leaves the nozzle and hangs down from the eye of the shuttle. The portion 58 rests on the opposite walls of the passage 28, and when the bulb is compressed the thread cannot be blown out of the socket

26, as the upper portion of said socket is practically filled or covered by said portion 58. The function of the frame 52—53 is to support the portion 56—57 of the trip-frame, and the portion 57 is formed downward at the angle illustrated in order that the trip-frame shall not swing out of engagement with the portion 53 of the wire frame. The object of the wire 51 is to prevent the total disengagement of the trip-frame from the block, and the object of the spring 61 is to cushion the trip-frame as it is swung down when the shuttle is withdrawn from the rest.

It is evident that when the shuttle is being inserted in the shuttle-rest its head raises the trip-frame. When it is being inserted in the shuttle-rest the upper portion of the trip-frame is swung toward the advancing shuttle, and when the shuttle is being removed from the rest the upper portion of the trip-frame is swung away from the receding shuttle upon the spring 61. In both cases the size and length of the slot 54 allow the trip-frame to be freely swung in opposite directions without interfering with the movement of the shuttle, and also to be lifted from and to drop freely into the socket 26. In practice, however, there is always a loaded or full shuttle in a shuttle-rest on the arch of the loom, and often there are quite a number thus sustained by the arch. As soon as a thread breaks the shuttle is removed from the loom and placed in a shuttle-rest, and another shuttle all threaded and ready for use is removed from the shuttle-rest and applied to the shuttle-box on the loom. Either the operator who removes the shuttle with the broken thread and replaces it by a threaded shuttle attends to the re-threading of the shuttle removed from the loom, or some other operator re-threads said shuttle. But whoever re-threads the shuttle does it simply by placing it in position in the shuttle-rest, pulling a little of the thread into the socket 26, and compressing the bulb and allowing it to expand. It will be seen, therefore, that all that is needed to re-thread the shuttle after it has been placed in the shuttle-rest is to draw a little thread into the socket and compress the bulb once, or the end of the thread may be inserted in the socket before the shuttle is placed in the shuttle-rest, and then all that is needed to thread it is to compress the bulb and the subsequent expansion thereof draws the thread into the nozzle 41, but such thread is prevented from being drawn too far into said nozzle by the gauze partition 42. As the shuttle is being removed from the shuttle-rest the thread which is drawn into the nozzle hangs outside the shuttle in accessible position. It is practically true, therefore, that the threading or re-threading of the shuttle is accomplished in an instant upon its reception by the shuttle-rest. Thus all necessity for sucking the thread through the shuttle-eye or for making radical changes in the shuttle whereby the thread may be drawn by hand into the shuttle-eye are obviated, and the process of re-threading is instantaneously accomplished by mechanical means.

The portion of the Z-shaped trip-frame which constitutes a cover or closure for the socket 26 comprises, as above mentioned, the horizontal portion 58 and the vertical portions 59—60 at right angles to each other. The portion 60 operates to guide and center the cover or closure by sliding down into the vertical passage 28 which, as usual, connects the socket or recess 26 with the interior of the shuttle.

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

1. In a shuttle-threading mechanism, a shuttle-rest adapted to support a shuttle in a stationary position and provided with an opening opposite the thread-eye of the shuttle, mechanism comprising a suction bulb and a nozzle, means for supporting said mechanism with the nozzle extending through said opening to the shuttle-eye, a trip-frame supported by the shuttle-rest near said opening, and a cover or closure supported by the trip-frame over the socket in the head of the shuttle when the shuttle is in position in the rest whereby as the shuttle is moved into position the trip-frame is raised and as it reaches its stationary position the cover or closure is dropped over said socket, for the purpose of preventing the end of the thread in the socket from being blown out of said socket when the air-bulb is compressed previous to its being allowed to expand and draw the thread through the eye.

2. In a shuttle-threading mechanism, a shuttle-rest adapted to support a shuttle in a stationary position and provided with an opening opposite the thread-eye of the shuttle, mechanism comprising a suction bulb and a nozzle, means for supporting said mechanism with the nozzle extending through said opening to the shuttle-eye, a slotted frame sustained by the rest with its slot over the socket of the shuttle when the shuttle is in stationary position in the rest, a rod extending horizontally across said slot, a wire frame bridging the slot, and a trip-frame comprising a central longitudinally slotted portion through which said horizontal rod extends, a substantially horizontal upper portion adapted to rest on the wire which bridges the slot, and a lower portion shaped to form a cover or closure for the socket in the shuttle-head, whereby as the shuttle is moved into position the trip-frame slips over the nose and head of the shuttle until its lower portion drops over the socket in the shuttle and when the

shuttle is withdrawn from the rest the cover or closure slips out of the socket and is held suspended by the trip-frame.

3. In a shuttle-threading mechanism, a shuttle-rest adapted to support a shuttle in a stationary position and provided with an opening opposite the thread-eye of the shuttle, mechanism comprising a suction bulb and a nozzle, means for supporting said mechanism with the nozzle extending through said opening to the shuttle-eye, a slotted frame sustained by the rest with its slot over the socket of the shuttle when the shuttle is in stationary position in the rest, a rod extending horizontally across said slot, a wire frame bridging the slot, and a trip-frame comprising a central longitudinally slotted portion through which said horizontal rod extends, a substantially horizontal upper portion adapted to rest on the wire which bridges the slot, and a lower portion shaped to form a cover or closure for the socket in the shuttle-head, whereby as the shuttle is moved into position the trip-frame slips over the nose and head of the shuttle until its lower portion drops over the socket in the shuttle and when the shuttle is withdrawn from the rest the cover or closure slips out of the socket and is held suspended by the trip-frame, said cover or closure being provided with a guiding or centering rib adapted to extend into the passage between the socket of the shuttle and the interior thereof.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH FALTUS.

Witnesses:
HENRY W. WILLIAMS,
M. HALLENBECK.