

No. 858,695.

PATENTED JULY 2, 1907.

J. WOJCIECHOWSKI & R. PLUZANSKI.

WARP STOP MOTION FOR LOOMS.

APPLICATION FILED JUNE 21, 1905.

2 SHEETS—SHEET 1.

Fig. 1

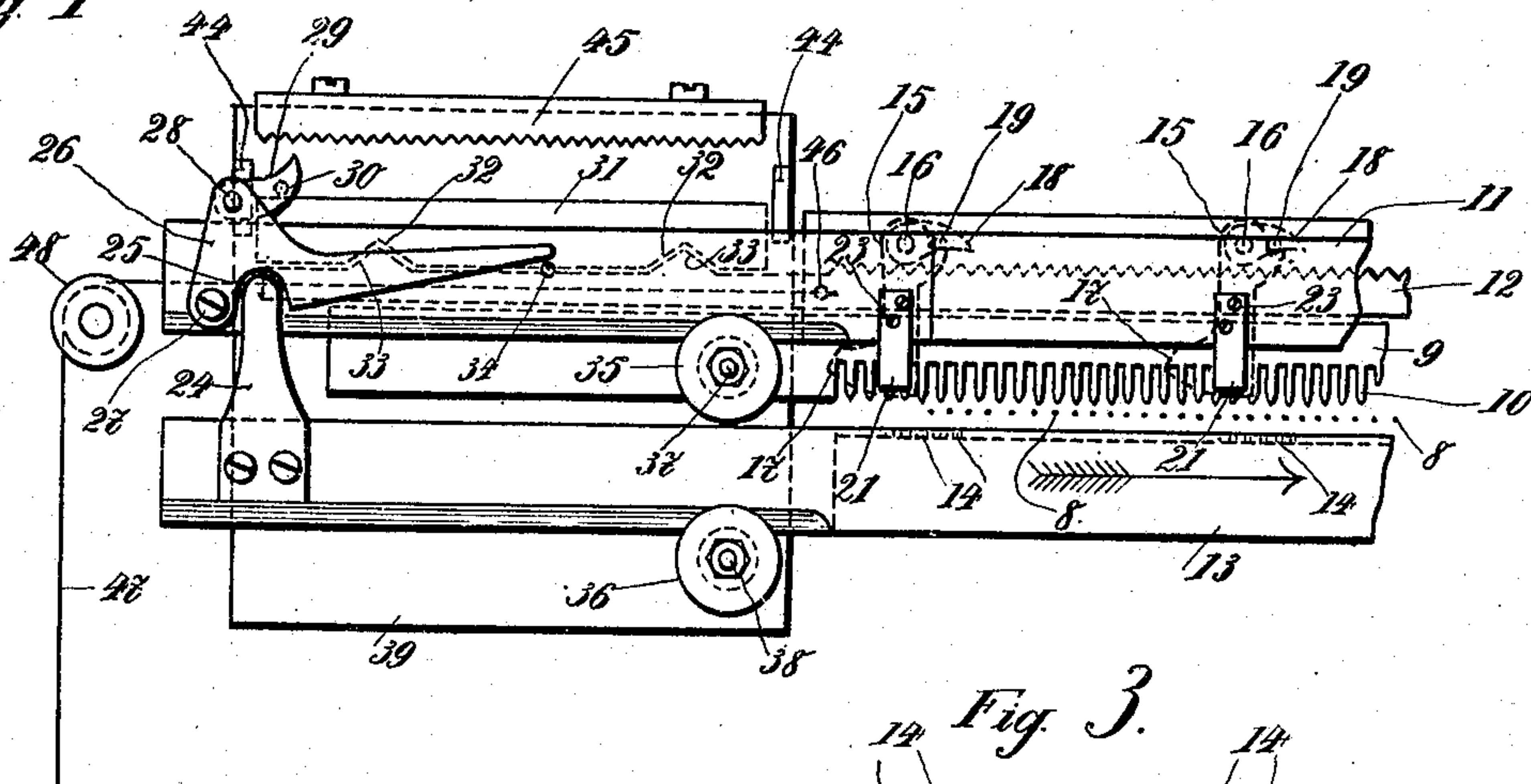


Fig. 3.

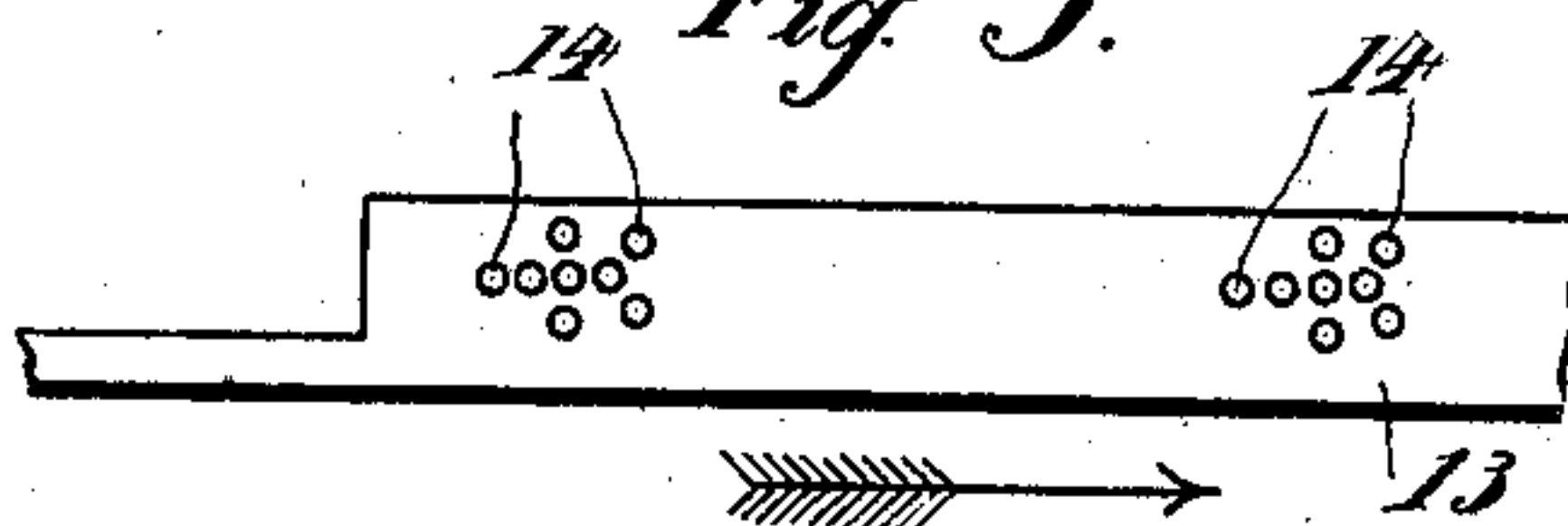
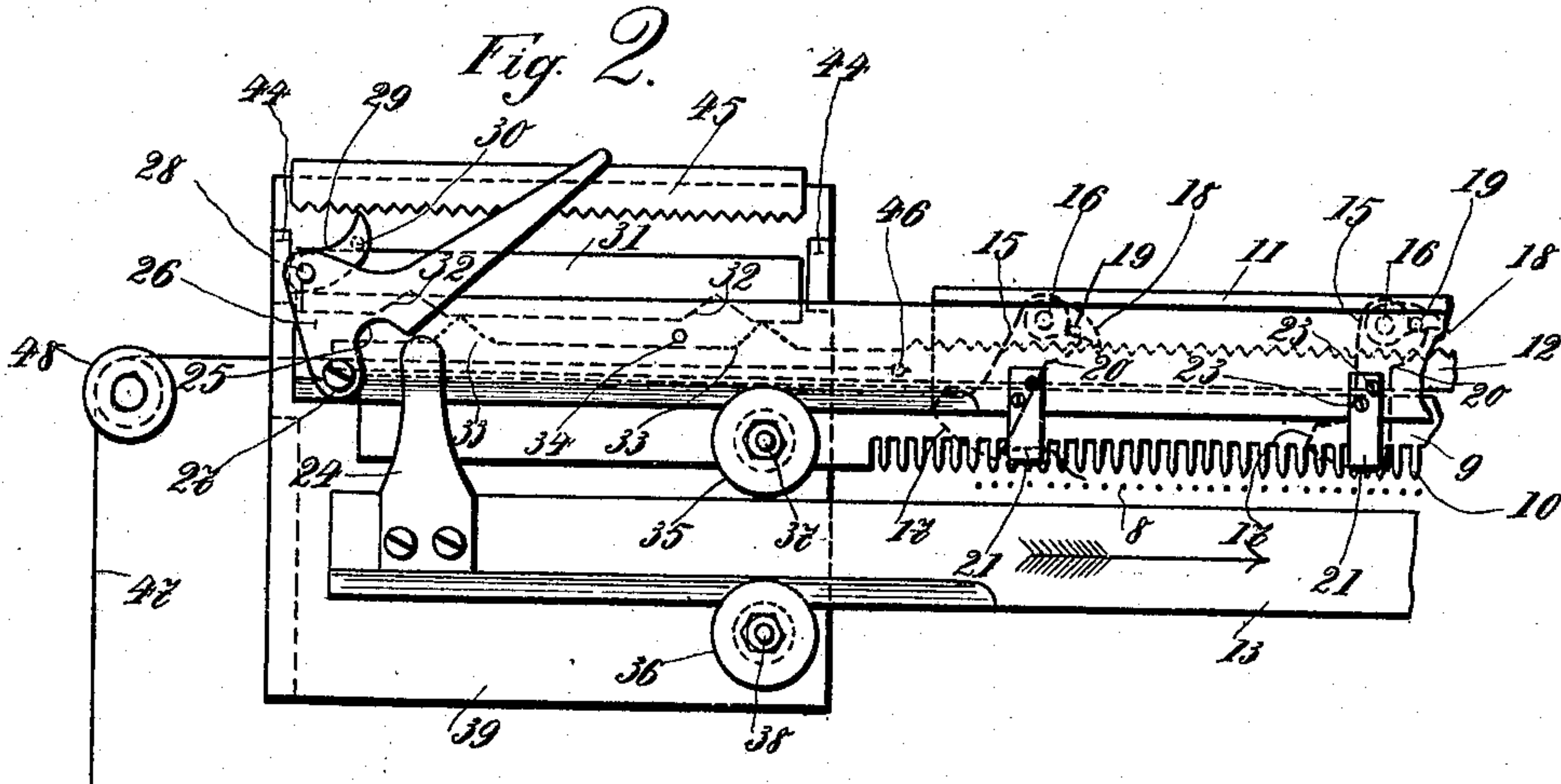


Fig. 2.



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Fig. 4.

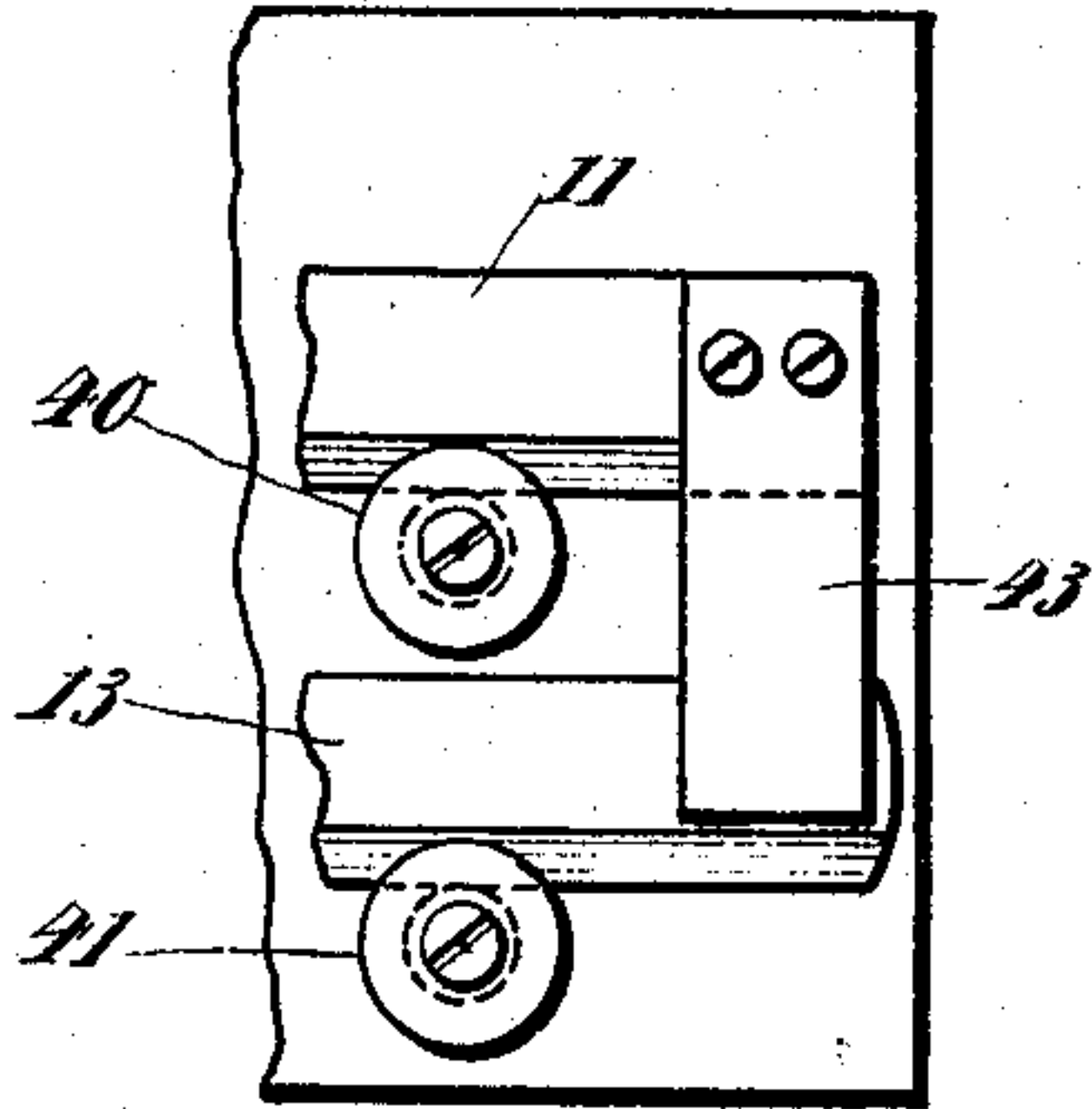


Fig. 5.

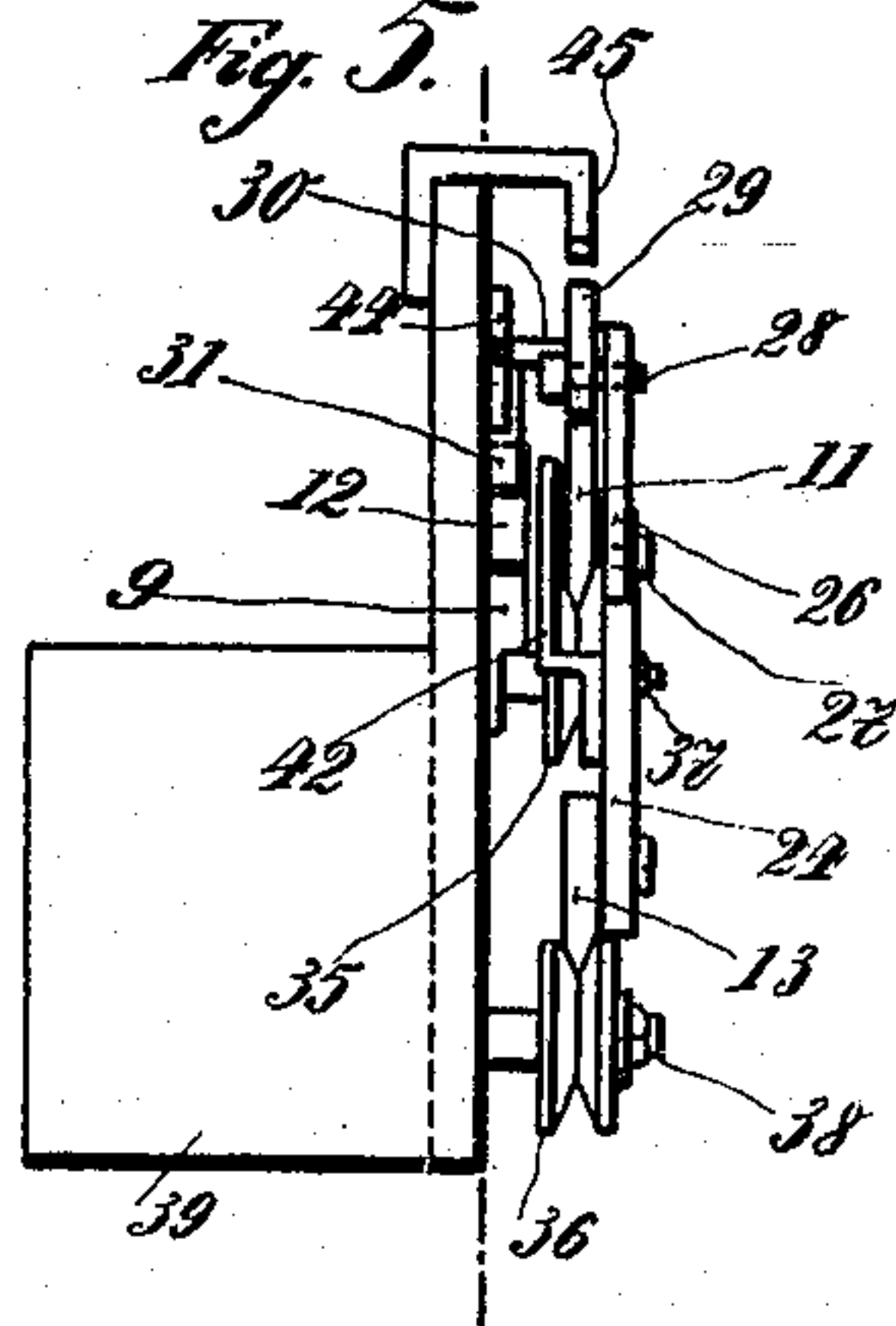


Fig. 6.

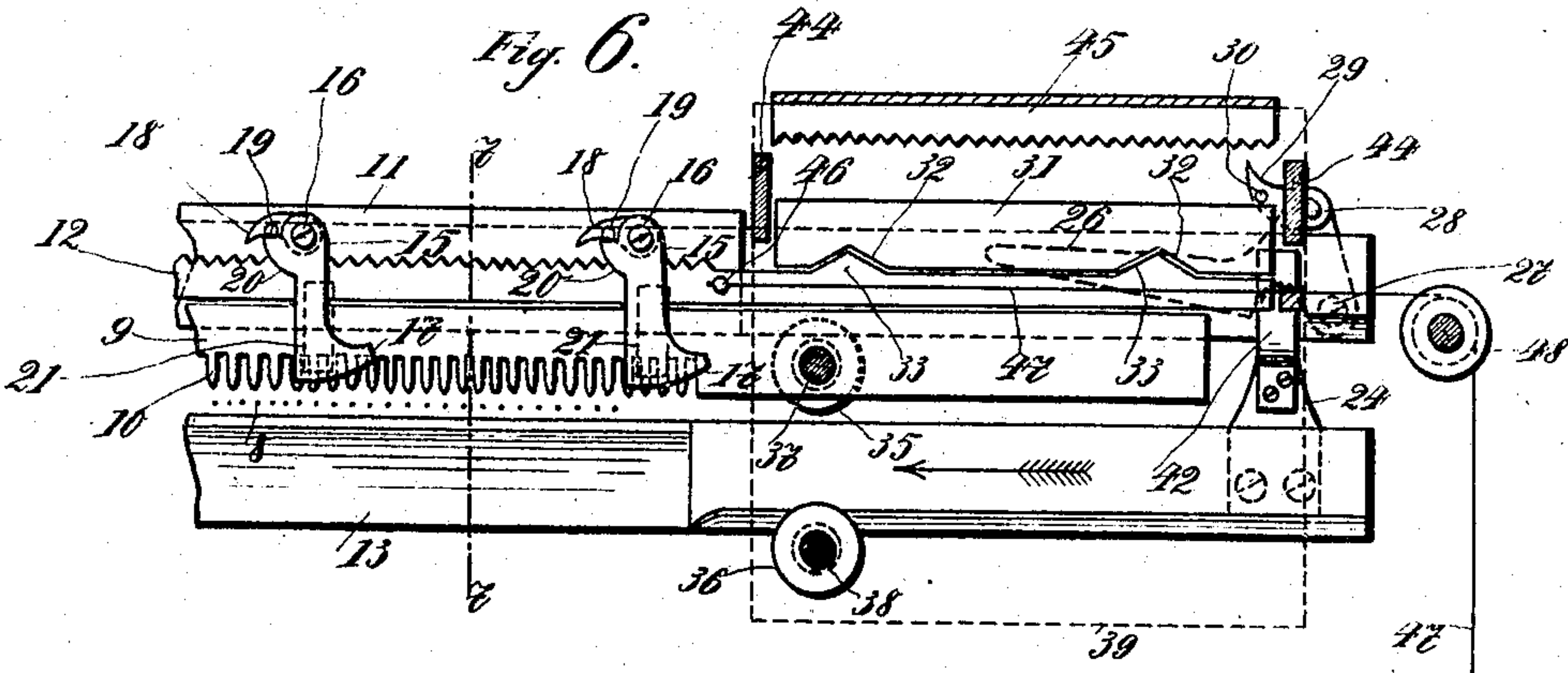
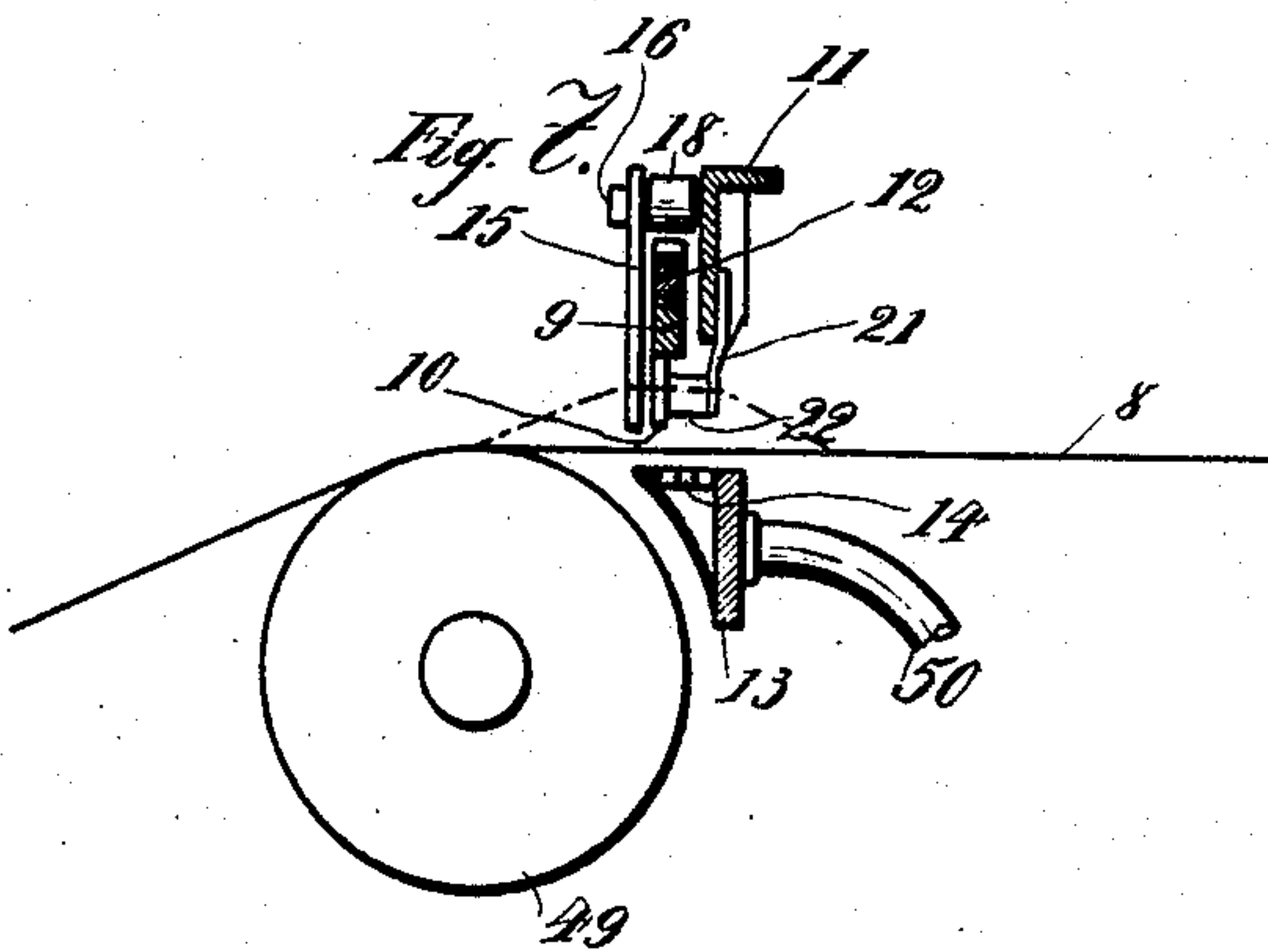


Fig. 7.



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# UNITED STATES PATENT OFFICE.

JAKOB WOJCIECHOWSKI, OF WARSAW, AND ROMAN PLUZANSKI, OF STOMPERKOW, RUSSIA.

## WARP STOP-MOTION FOR LOOMS.

No. 858,695.

Specification of Letters Patent.

Patented July 2, 1907.

Application filed June 21, 1905. Serial No. 266,362.

*To all whom it may concern:*

Be it known that we, JAKOB WOJCIECHOWSKI, residing at Warsaw, Russia, and ROMAN PLUZANSKI, residing at Stomperkow, Russia, subjects of the Emperor of Russia, have invented certain new and useful Improvements in Warp Stop-Motions for Looms; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a device for automatically stopping the loom as soon as one or more warp-threads is or are broken. The operation of the invention is based on the arrangement that equidistant from one another pendulums are pivotally suspended from a beam which pendulums move with said beam continuously to and fro transversely of and above the warps, and which on the breakage of a warp thread are caused to swing, the swing of the pendulums being produced by the threads when broken being blown into the spaces between the teeth of a stationary rake or comb the thread end being pressed on the forward side thereof by means of slip-springs, whereupon the pendulums at their lower ends meet the raised end of the warp thread and are moved out of their vertical position. The swing of the pendulum effects engagement of pawls connected therewith with the teeth of a transverse rack-bar arranged above said comb or rake, which rack-bar is hereby moved forward. The result of the forward movement of the rack-bar is to throw out of gear the beam to which the pendulums and pawls are secured and to operate a device for stopping the loom by means of a cord and a spring arrangement.

In the accompanying drawings which illustrate the invention Figure 1 is a front elevation, Fig. 2 is a similar view when a warp thread has been broken, Fig. 3 is a view of the air blast pipe, Fig. 4 shows a continuation of Fig. 1, Fig. 5 is a left hand end view of Fig. 1, Fig. 6 is a rear elevation of Fig. 1, Fig. 7 is a cross section on the line 7—7 of Fig. 6.

As shown transversely above the warp threads 8 (Fig. 1 and 7) is disposed the stationary rake 9 having very narrow pointed teeth 10. This rake 9 carries loosely mounted thereon a rack bar 12 which during the regular operation of the loom does not vary its position, but when subjected to a definite pressure, which takes place when a warp thread is broken, is moved longitudinally above the rake 9. Parallel to the rake 9 and likewise transversely above the warp is arranged the beam 11, and which is reciprocated continuously. Beneath the rake and the warp is an air pipe 13 which is provided on the top with orifices 14 (Fig. 3) and is so connected with the beam 11 that upon its longitudinal movement the beam 11 is simultaneously moved there-

with. The warp are as shown in Fig. 1 and 2, disposed between the beam 11 and the pipe 13. As shown in Fig. 3 the orifices 14 in the air pipe 13 are arranged in groups which are disposed equidistant from one another. Corresponding to the number of groups of orifices which afford an outlet for a current of compressed air there are suspended on the beam 11 pendulums 15 (Figs. 1, 2 and 6) mounted loosely on the spindles 16 (Fig. 6.) The pendulums 15 are provided beneath with hook-like ends 17 which lie above the openings 14. The hook-like end 17 in consequence of the weight of the pendulum 15 remains in vertical position. On the same spindles 16 as the pendulums are loosely mounted pawls 18 (Fig. 6 and 7) with pins 19 secured on their side faces which pins during the regular operation of the loom lie on the abutments 20 of the pendulums 15 but when said pendulums are caused to swing the abutting projections 20 are also turned away whereby the pawls 18 are allowed to drop and come into engagement with the rack 12.

Above the orifices 14 on the air pipe 13 (Fig. 7) the cross section of which is shown in the same figure, there is secured on the beam 11 the upper part of which is bent at right angles to the spring 21 which is screwed by means of screws 23 (Fig. 1 and 2) to the beam 11, and to which is secured a cork or another elastic support 22, which serves to press the broken end of the thread on the teeth 10 of the rake 9. The air pipe at its one end (in Fig. 1 and 2 the left hand end) is reduced to flatter formation similar to that of the end of the beam 11. On this end of the pipe 13 is set a finger 24 the upper end of which enters a notch 25 in a bent lever 26 which is pivotally mounted on the pin 27 secured to the beam 11. 29 is a pawl pivotally mounted at 28 on the lever 26, and carrying a lateral pin 30. 31 is a bar having notches 32 upon its under face in which enter corresponding ridges 33 on the end of the rack 12. During the regular operation of the loom the lever 26, as shown in Fig. 1, presses with its free end upon the pin 34 of the beam 11, and the finger 24 which enters in the notch 25 connects the air pipe 13 with the beam 11 so that this is reciprocated with the pipe.

In order to facilitate the movement of the beam 11 and the pipe 13 the ends thereof are beneath pointed in a form of a roof and mounted on turned rollers 35 36, which are fitted loosely on the shafts 37 and 38 which are fixed on the stationary parts 39 (Fig. 5), which serves to secure the entire construction of the frame of the loom. Besides the rollers 35 and 36 like rollers 40 and 41 are arranged on the opposite ends of the beam and the pipe. For the purpose of obtaining exactly uniform forward motion of the beam 11 and the pipe 13, that is, in order that the beam 11 and the pipe 13 on being moved are not shifted out of the vertical plane, the



flattened ends of same are connected both by the said finger 24 and also on one side by means of a clip 43 secured to the end of the beam (Fig. 4) which at its lower end engages the flat pipe of the part 13.

5 The bar 31 may be moved upwardly in lateral grooves formed by two guides 44 44 and so far until the pawl 29 moved therewith engages the teeth of the stationary frame 39 (Fig. 5). The rack 12 is on its lower face provided with a pin 46 (Fig. 6) with which is connected  
10 a cord or a wire 47, which loops around the pulley 48 and is connected with a suitable device for stopping the loom. Consequently as soon as on the breakage of a warp thread the rack 12 is moved, at the same time the cord or wire 47 sets in motion the apparatus for  
15 stopping the loom.

As is known in the art, the breakage of the warp threads always takes place in the neighborhood of the reed and therefore the device is arranged between the rear warp-beam and the adjoining shaft and therefore  
20 in the direct neighborhood of the drum 49 (Fig. 7). The pipe 50 is shown in Fig. 7, and the said pipe 50 serves to lead the air from a compressor or a reservoir filled with compressed air to the air pipe 13 which is of triangular section. The air is led from the compressor  
25 into the air pipe always in the same direction as indicated by arrows in Fig. 1 and 2, so that both the operation of the pendulums and the parts connected therewith always takes place on the movement of the beam 11 and pipe 13 in one direction. On motion of the  
30 beam and pipe in the opposite direction the air current is interrupted by a suitable leaf valve or the like.

The above mentioned device for stopping the loom in case of breakage of the warp threads operates as follows: As the pipe 13 and the beam 11 move together  
35 to and fro along a horizontal path which slightly exceeds the distance between the groups of openings 14 during the movement of the pipe 13 all the warp threads are successively subjected to the action of the air current which issues with a certain pressure from  
40 the orifices 14 (Fig. 3) the arrangement of the orifices 14, as shown in Fig. 3 being regular and insuring that the end of the thread will be blown out of the plane of the warps against the comb or rake and will be held there until the slip spring presses the end of the  
45 thread on the front side of the rake. When one of the warp threads breaks and the orifices 14 on the movement of the tube come under the broken thread the latter is immediately blown upwards into the space between the teeth 10 of the stationary comb 9 and held in  
50 this position by the sliding spring 21 (Fig. 5) provided with a support 22 of cork or like elastic material, which spring as secured to the beam 11 which moves above the warps when the pipe 13 connected with said beam is moved below the warps, the spring 21 with its sup-  
55 port 22 pressing with slight friction against the teeth of the comb or rake. As soon as the free end of a broken thread is blown upwardly into the teeth of the rake the spring 22 at once presses the end of the thread against the surface of the rake and tightens the thread  
60 so that the pendulum 15 arranged on the other side of the beam meets said thread and is thereby turned on its pivot out of vertical position, as shown in Fig. 2. The pawls 18 which rests with their pins 19 on the projections 20 of the pendulums 15, when said pendulum  
65 or pendulums swing, drop downwards so that they en-

gage the teeth of the slidable rack 12, which being now coupled with the beam 11 moves longitudinally therewith. A slight movement of the rake 12 operates on the cord or wire 47 secured thereto which is connected  
70 with the device for stopping the loom so that the operation of the loom is interrupted. The loom however is not suddenly brought to rest, but this takes place approximately within a period of time necessary for one rotation of the main shaft of the loom. Were  
75 not special device for stopping the beam 11 provided independent of the motion of the loom, the rack 12 engaged by the pawl 18 would be moved further than required which might injure the stop-motion device connected with said rack 12. In order therefore to be able to stop  
80 the beam independently of the motion of the loom, there is provided a device consisting of the combination of said finger 24 with the lever 26, which are arranged at one end of the air pipe and the beam. On the sliding  
85 movement of the rack 12 which moves about 15 millimeters, the ridges 33 on the rack leave the notches 32 of the beam, whereby the beam is raised and hereby lifts the pawl 29 resting thereon by means of the pin 30. Hereupon the said pawl engages the teeth of the stationary rack 45 disposed above the same. On the  
90 beam moving further and therewith moving the pivot of the lever 26 which also serves as a pawl the lever 26 is turned upwards and the finger 24 leaves the notch 25 of the bent lever 26. The finger 24 which is thus released moves further while the beam 11 now set out  
95 of operation interrupts its motion with the pendulums stopped by the broken threads, independently of the motion of the loom. The swing of the pendulum indicates the place where a thread is broken so that the  
100 weaver can easily ascertain the point and bind the ends together. After the broken thread has been put right the fly wheel of the loom is turned back whereupon the beam 11 and pipe 13 return to their original position where they are again coupled by means of a spring  
105 suitably secured and which was tensioned on the forward movement of the rack. It is clear that alterations can be made in the construction of the members constituting the device: for instance instead of the  
110 above mentioned rake or comb a bar ribbed on its lower side or covered with rough material such as plush, leather or the like might be used.

The device above described can be used for weaving material in suitable combinations and with the employment of different kinds of threads, even of the finest such as silk threads for weaving plush and the like.  
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What is claimed as new is:

1. In a warp stop motion for looms, the combination of a toothed member disposed transversely above the warp threads, a reciprocating beam, a source of supply for compressed air beneath said member, and means for reciprocating the latter and the beam in unison.  
120
2. In a warp stop motion for looms, the combination of a toothed member disposed transversely above the warp threads, a reciprocating beam, a source of supply for compressed air beneath said member, and means for reciprocating the latter and the beam in unison, and means co-  
125 operating with said toothed member to clamp the broken warp thread thereagainst.
3. In a warp stop motion for looms, the combination of a toothed member disposed transversely above the warp threads, and means for blowing a broken warp thread against said member.  
130
4. In a warp stop motion for looms, the combination of



a toothed member disposed transversely above the warp threads, and means for blowing a broken warp thread against said member, and a clamp for clamping the broken thread against said member.

5 5. In a warp stop motion for looms, the combination of a toothed member disposed transversely above the warp threads and means for blowing a broken warp thread against said member, and a clamp for clamping the broken thread against said member, a normally stationary rack, 10 a beam adapted to be continuously reciprocated, and means on said beam for engagement with said rack.

15 6. In a warp stop motion for looms, the combination of a toothed member disposed transversely above the warp threads, and means for blowing a broken warp thread against said member, and a clamp for clamping the broken thread against said member, a normally stationary rack, a beam adapted to be continuously reciprocated, and means on said beam for engagement with said rack, and means connecting said beam and air pipe for reciprocating them 20 together.

25 7. In a warp stop motion for looms, a continuously reciprocating beam, a stationary rake, a normally stationary reciprocating rack-bar loosely mounted thereon, an air pipe mounted to reciprocate with said beam and pendulums suspended from said beam for reciprocating said rack bar.

30 8. In a warp stop-motion for looms, a continuously reciprocating beam, a stationary rake, a normally stationary reciprocating rack-bar loosely mounted thereon, an air pipe mounted to reciprocate with said beam, and pendu-

lums suspended from said beam for reciprocating said rack-bar, and a clamp carried by said beam for clamping a broken thread against said rake.

9. In a warp stop-motion for looms, a continuously reciprocating beam, a stationary rake, a normally stationary 35 reciprocating rack-bar loosely mounted thereon, an air pipe mounted to reciprocate with said beam, and pendulums suspended from said beam for reciprocating said rack-bar, and a clamp carried by said beam for clamping a broken thread against said rake, a finger on the air pipe 40 and a pivoted bent lever on the beam and operatively connected with the rack bar.

10. In a warp stop-motion for looms, a continuously reciprocating beam, a stationary rake, a normally stationary reciprocating rack-bar loosely mounted thereon, an air 45 pipe mounted to reciprocate with said beam, and pendulums suspended from said beam for reciprocating said rack-bar, and a clamp carried by said beam for clamping a broken thread against said rake, a finger on the air pipe and a pivoted bent lever on the beam and operatively connected 50 with the rack-bar, a stationary rack, and means on said bent lever for engaging the same.

In testimony whereof, we affix our signatures, in presence of two witnesses.

JAKOB WOJCIECHOWSKI.  
ROMAN PLUZANSKI.

Witnesses:

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CYRYL SREDWICKI.