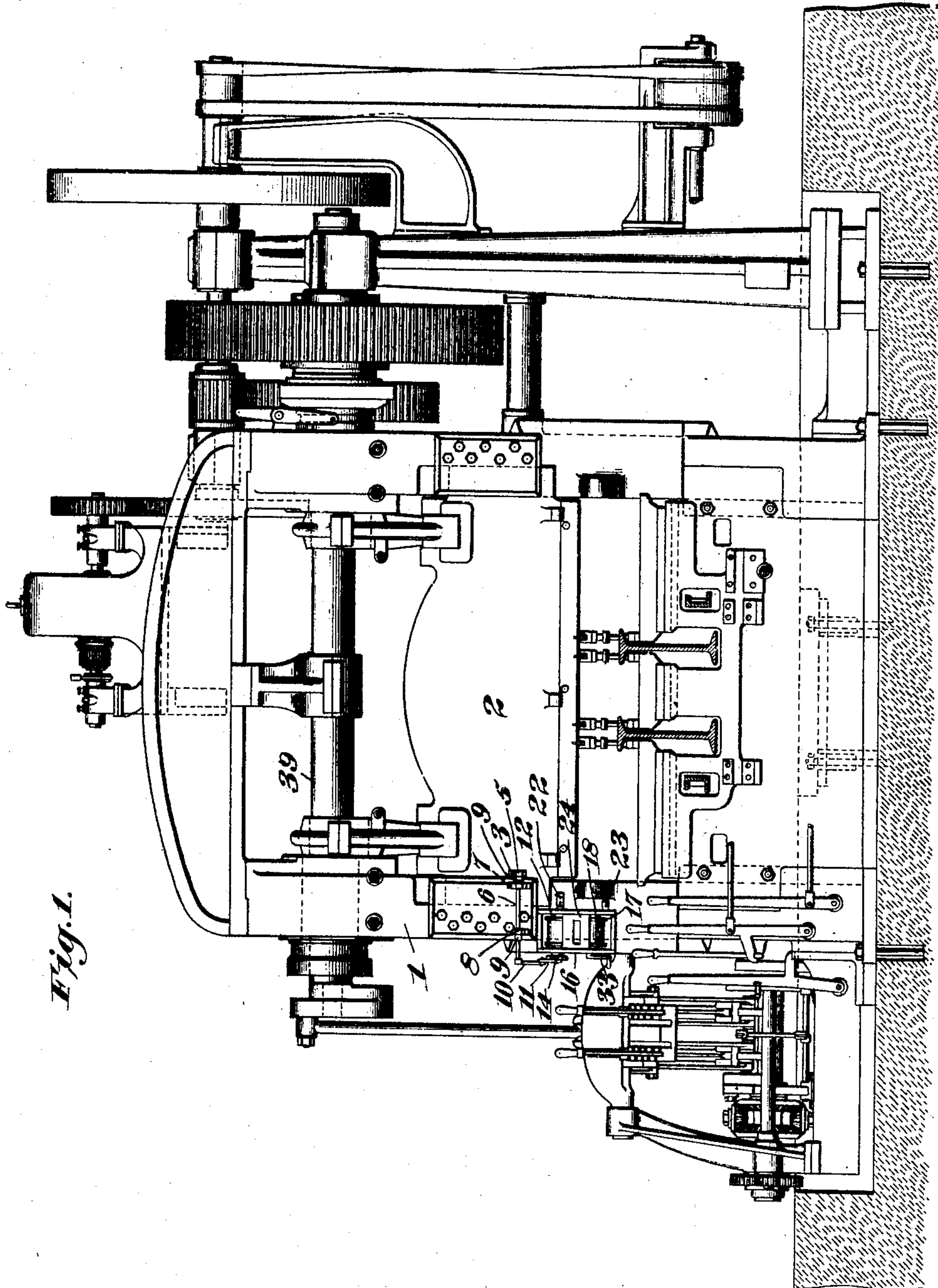


No. 793,993.

PATENTED JULY 4, 1905.

J. J. DAVIES.  
SPACING INDICATOR FOR PUNCHING MACHINES.  
APPLICATION FILED NOV. 14, 1904.

4 SHEETS—SHEET 1.



WITNESSES,

*Elmer Leavery*  
*Geo. Beatty*

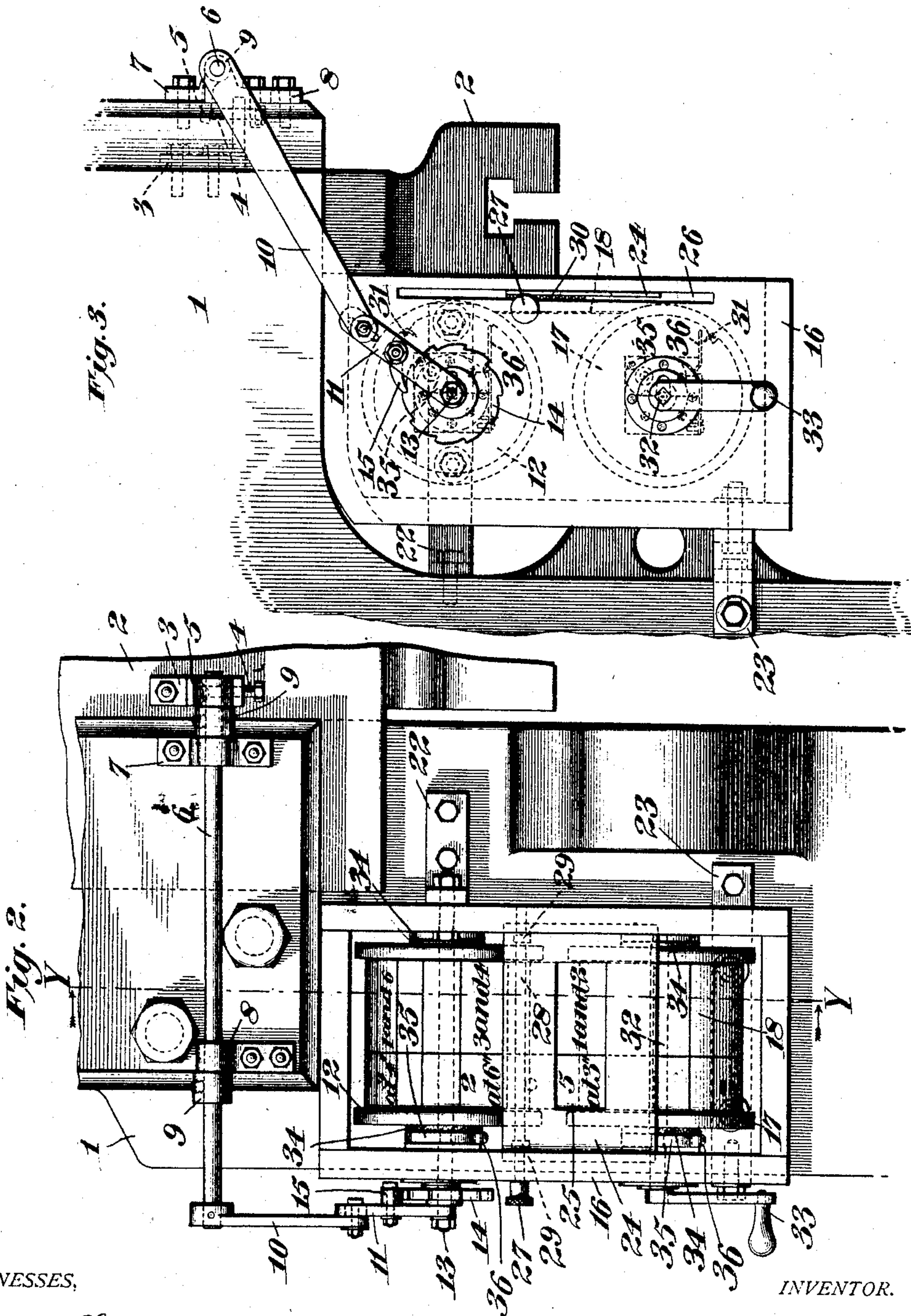
INVENTOR.

*John J. Davies.*  
by *Geo. E. Hackray*  
his *ATTORNEY.*

J. J. DAVIES.  
SPACING INDICATOR FOR PUNCHING MACHINES.

APPLICATION FILED NOV. 14, 1904.

4 SHEETS—SHEET 2.



WITNESSES,

*Elmer Seavey*  
*Geo. Beatty*

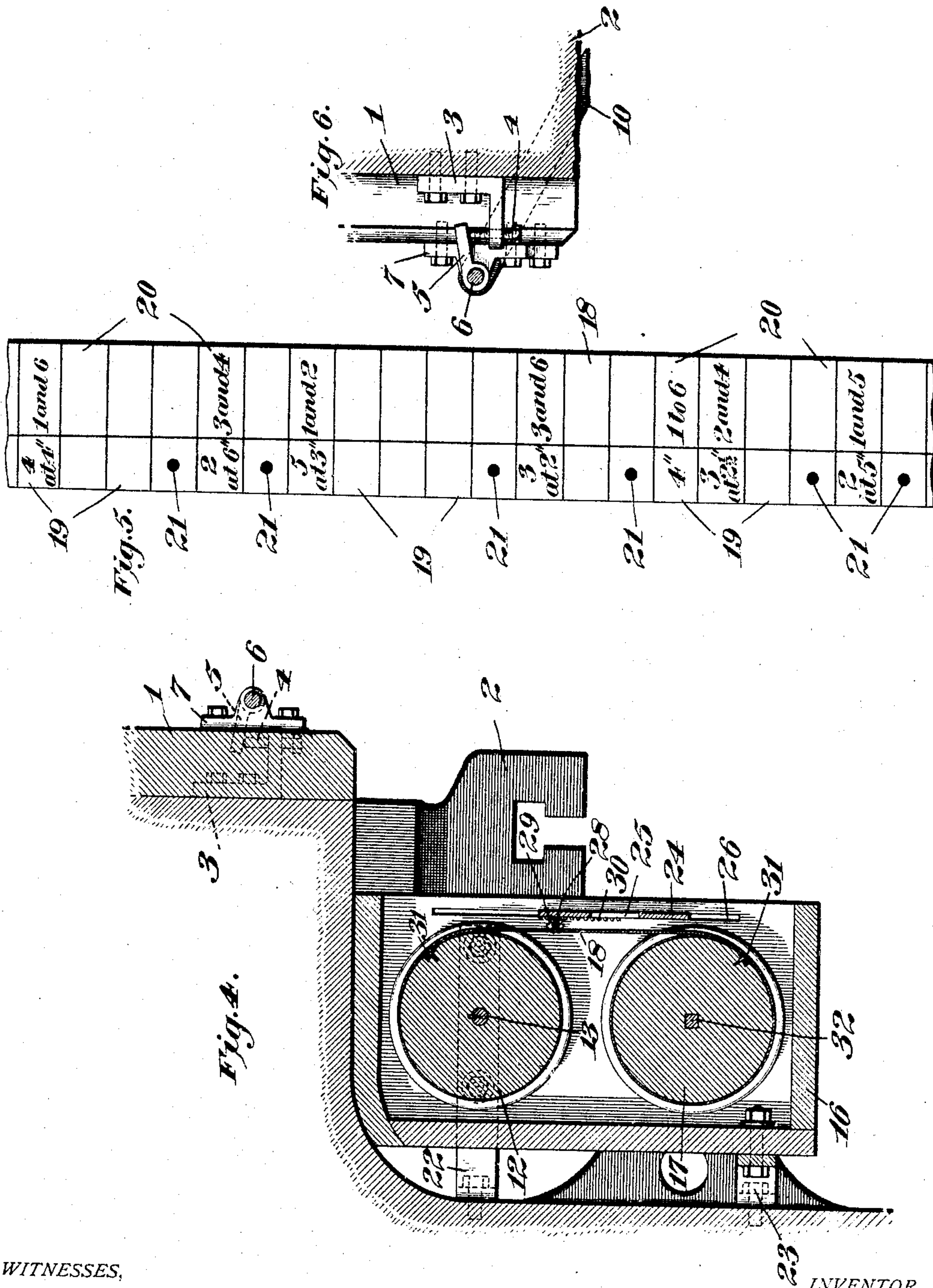
INVENTOR.

*John J. Davies*  
by *Geo. E. Hackray*  
his ATTORNEY.



J. J. DAVIES.  
SPACING INDICATOR FOR PUNCHING MACHINES.  
APPLICATION FILED NOV. 14, 1904.

4 SHEETS—SHEET 3.



WITNESSES,

*Elmer Seavery*  
*Geo. Beatty*

INVENTOR.

*John J. Davies.*  
*by Geo. E. Shackray*  
*his ATTORNEY.*

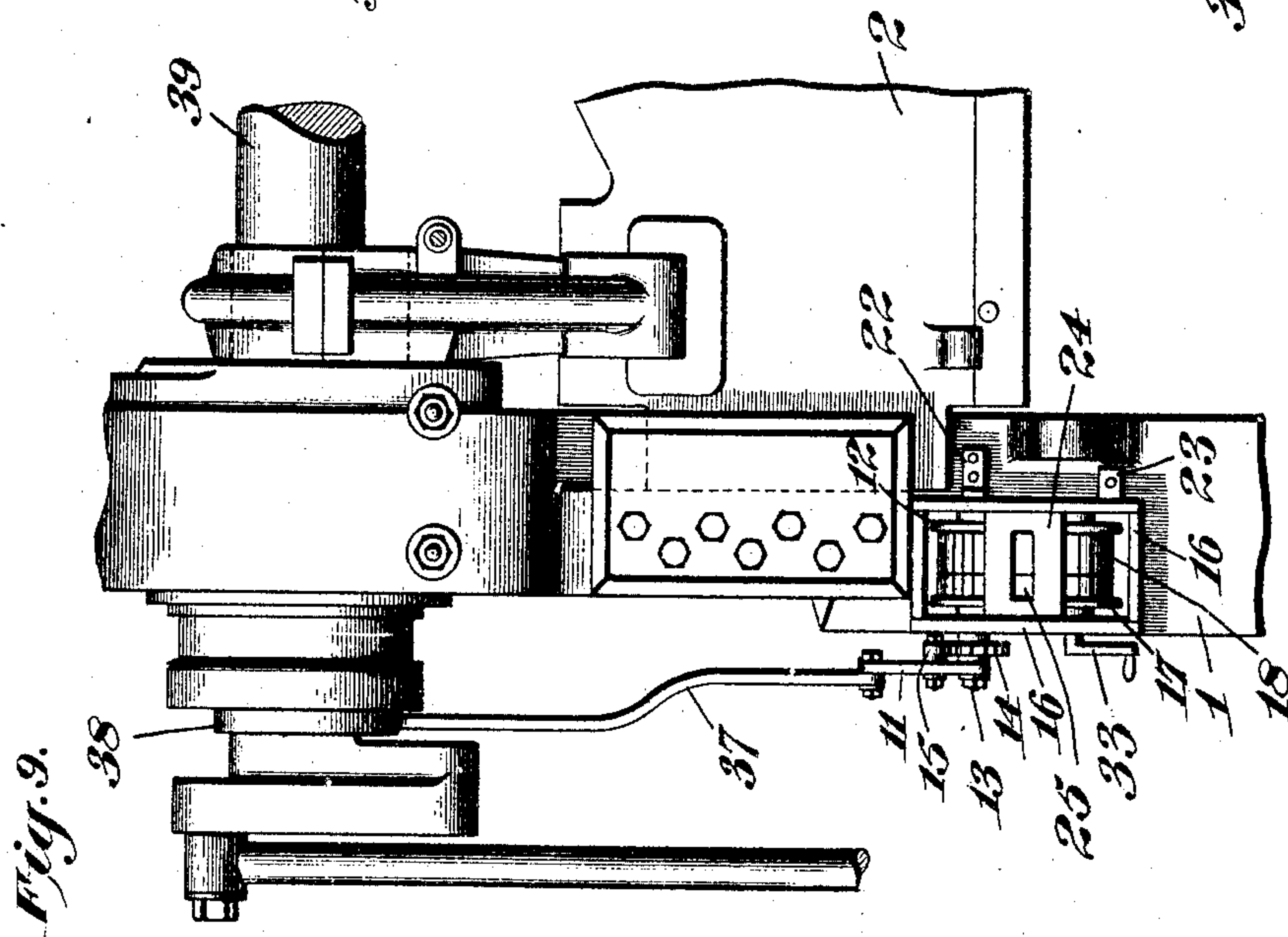
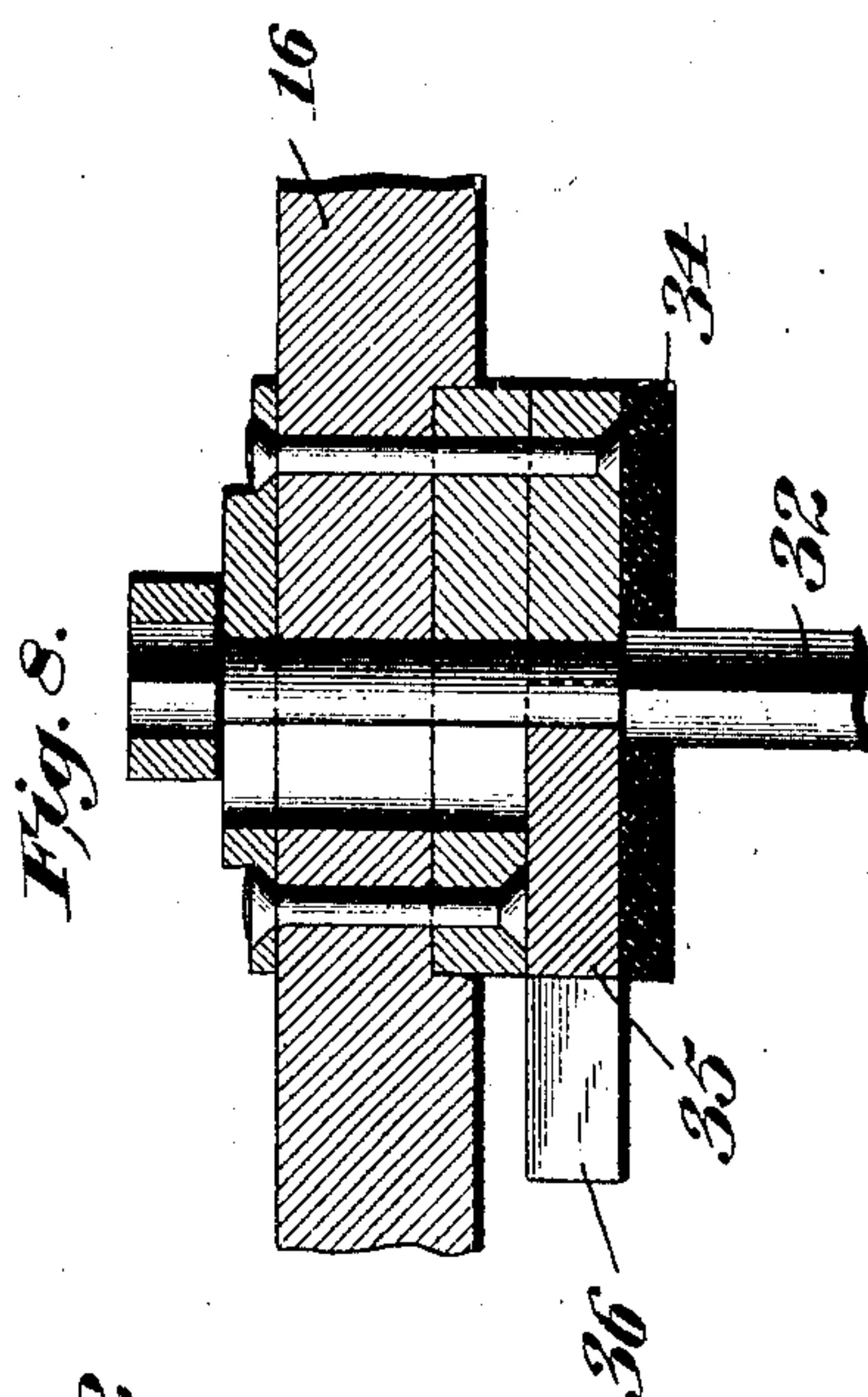
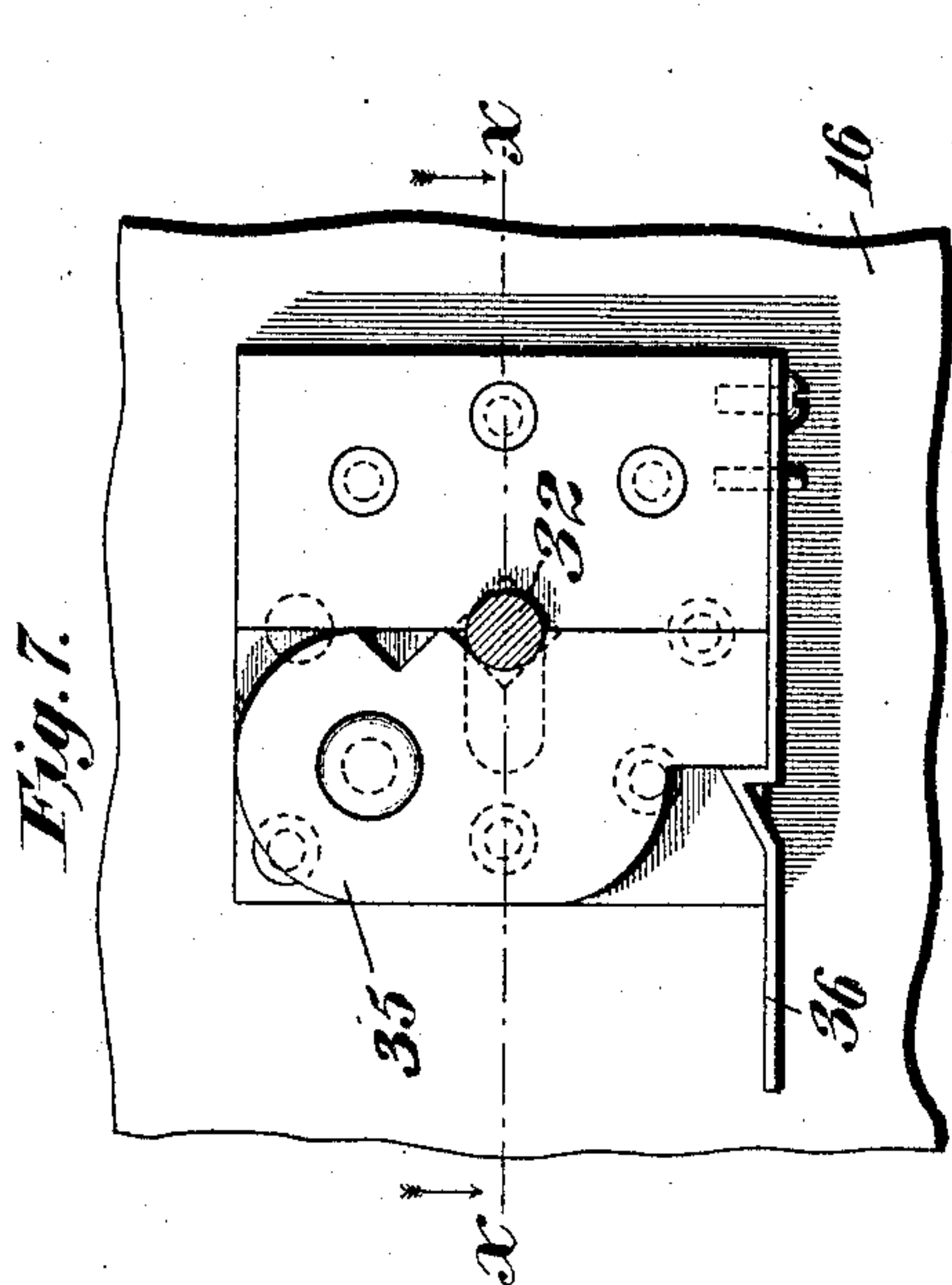
No. 793,993.

PATENTED JULY 4, 1905.

J. J. DAVIES.  
SPACING INDICATOR FOR PUNCHING MACHINES.

APPLICATION FILED NOV. 14, 1904.

4 SHEETS—SHEET 4.



WITNESSES,

*Elmer Leaver*  
*Geo. Beatty*

INVENTOR.

*John J. Davies.*  
by *Geo. E. Hackray*  
ATTORNEY.



# UNITED STATES PATENT OFFICE.

JOHN J. DAVIES, OF JOHNSTOWN, PENNSYLVANIA.

## SPACING-INDICATOR FOR PUNCHING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 793,993, dated July 4, 1905.

Application filed November 14, 1904. Serial No. 232,726.

*To all whom it may concern:*

Be it known that I, JOHN J. DAVIES, a citizen of the United States, residing in the city of Johnstown, in the county of Cambria and State of Pennsylvania, have invented certain new and useful Improvements in Spacing-Indicators for Punching-Machines; and I 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.

My invention consists of an apparatus, to be automatically operated by a punching-machine, which will accurately indicate to the operator the number of the punch to be used, also the number of spaces and the distances center to center of the holes to be punched, all in a convenient and simple manner, thereby facilitating the work.

Certain of the objects of my invention are to furnish the operator with all the information needed without any need on his part of referring to detail drawings and to expose the said information to his view at the exact time required and in such amount only as is needed for one complete operation of the punching-machine.

A further object of my invention is to reduce to a minimum the liability of errors and the number of men necessary for the successful operation of a multiple punch.

In general my invention consists of an indicating-ribbon, hereinafter more fully described, on which is written or printed in a simple manner the data necessary for the operator's use, said ribbon being wound around and connected to two drums, one end to each drum, said drums being secured to and supported on shafts, all so placed and operated that the ribbon automatically unwinds from one drum while it is being wound around the other, the latter of said drums being made to revolve by power transmitted from a suitable rotating shaft or from the reciprocating head of the punching-machine by means of a system of levers and shafts operating a pawl which engages a ratchet-wheel secured to the shaft of the latter drum.

The aforesaid drums and ribbon are arranged in a case or frame, in which an adjustable shutter is so set as to hide from the operator's view that part of the data on the ribbon which is not needed for use at the time and expose that part of it which he requires for the operation of the machine, said shutter being provided with an aperture or slot for this purpose.

Having thus given a general description of certain features of my invention, I will now in order to make the same more clear refer to the four sheets of drawings which form part of this specification, and in which like numbers refer to like parts.

Figure 1 is a front elevation of a multiple punching-machine fitted with my spacing-indicator, said punch being shown in considerable detail, so that the application of my invention may be clearly understood, although the punching-machine itself forms no part of my invention. Fig. 2 is an enlarged front elevation of my spacing-indicator, showing the shaft which transmits the actuating power from the reciprocating cross-head of the punching-machine to the operating-levers of my indicator and also other details of my apparatus. Fig. 3 is a side elevation of my apparatus, which clearly shows the lever arms, to one of which is connected a pawl, which engages a ratchet-wheel connected to the shaft of the upper drum. Fig. 4 is a vertical section of my apparatus, taken on the line Y Y of Fig. 2 and shows the attachment of the indicator-ribbon to the drums, also the rack and pinion operating the adjustable shutter by means of the milled knob shown in Fig. 2. Fig. 5 is a front view of a portion of a typical indicator-ribbon, forming part of my invention. Fig. 6 is a side elevation of a portion of my apparatus, showing a bracket secured to the reciprocating cross-head of the punching-machine, said bracket carrying an adjustable bolt which engages once during every complete movement of the cross-head a tappet-arm shown connected to one end of the transmission-shaft. Fig. 7 is an end elevation of one of the drum-shaft bearings. Fig. 8 is a cross-section taken on the line X X of Fig. 7. Fig. 9 shows an al-



ternative method of connecting my apparatus to a punching-machine.

Referring now to the various characters of reference on the drawings, 1 is the main frame of a multiple punching-machine having a reciprocating cross-head 2, to which is attached a bracket 3, carrying an adjustable bolt 4, mounted on its projecting leg. Said adjustable bolt 4 engages a tappet-arm 5, attached to the rock-shaft 6, once during each operative stroke of the cross-head 2, as shown in Fig. 3.

7 and 8 are bearings attached to the frame and support the shaft 6, which is held in position longitudinally by the collars 9.

10 represents a lever, one end of which is attached to the rock-shaft 6, while the other end is attached to the upper end of the lever 11, the lower end of lever 11 being connected to the shaft 13, which carries the ratchet-wheel 14 and the drum 12, as shown in Fig. 3.

15 is a pawl connected to lever 11 and engages the teeth on ratchet-wheel 14 at each operative stroke of the cross-head 2.

16 represents the case or frame connected to frame 1 of the punching-machine by brackets 22 and 23 and contains the drums 12 and 17, and it also carries their supporting-shafts, &c., as shown in Fig. 2.

18 represents the ribbon, which is spaced off into sections, as represented by 19 and 20 of Fig. 5. The number and spacing to be used by the operator is printed on the left of the dividing-line in sections 19, while the number of the punch or punches to be used is printed on the right of the dividing-line in sections 20.

21 is a solid circle (shown in Fig. 5) and indicates plainly to the operator the last hole which is to be punched of any series.

24 represents the adjustable shutter, which has an aperture 25 on its face and so arranged as to slide up and down in the grooves 26.

27 is a milled knob, (shown in Fig. 2,) which is attached to shaft 28, carrying the pinions 29, which engage the teeth on the racks 30, fastened on the inside of the shutter 24, all as shown in Fig. 4.

31 represents hooks, by means of which the ribbon 18 is secured to the drums 12 and 17.

32 is a shaft carrying the drum 17 and having a crank 33 attached to one end for rewinding ribbon 18 on the drum 17, as shown in Figs. 2 and 3.

34 represents felt washers placed on the shafts at each end of the drums 12 and 17, as shown in Figs. 2 and 8, to prevent said drums from moving too freely.

35 represents a locking-plate which forms part of a split bearing and is held in posi-

tion by the spring 36, as shown in Figs. 7 and 8.

37 is the connecting-rod used in an alternative method of attaching my indicating apparatus to the main operating-shaft of the punching-machine 1 by means of the eccentric 38.

In the operation of my apparatus the adjustable bolt 4, which is fastened to the reciprocating cross-head 2 by means of the bracket 3, comes in contact with the tappet-arm 5, secured to the shaft 6, once during each operative stroke of the punching-machine. The tappet-arm 5 is thereby thrown up and in turn by transmission through the shaft 6 throws the lever 10 upward, carrying with it lever 11, which is attached to shaft 13 of the drum 12. The pawl 15, attached to lever 11, then engages the ratchet-wheel 14, thereby causing said ratchet-wheel to revolve through a certain portion of an arc equal in distance to the width of one of the spaces 19 20 on the ribbon 18 and expose the figures inscribed on said ribbon through the aperture 25 in the adjustable shutter 24. The operator upon reading the figures exposed throws the spacing-lever of the punch into position such that the traveling carriage of the punching-machine moves the proper distance for the next space between holes, and he also sets from the same reading the punches which are needed in the next operative movement of the punching-machine. Where there are a number of equal spaces in succession, my apparatus will indicate the spaces accurately and show the operator when to make a change in the spacing or the punches.

The adjustable shutter 25 is fitted on its rear side with two racks 30, which engage the pinions 29, that are connected to the shaft 28, which has a milled knob 27 at one end. By turning this knob the shutter can be adjusted so as to allow for any inaccuracy in the initial placing of the ribbon 18 or for the inaccuracy consequent upon the accelerated movement of the ribbon due to the increased diameter of the roll as the ribbon is wound upon it.

The crank 33, secured to the end of shaft 32, is used to rewind the ribbon 18 on the drum 17 when said ribbon is to be used over again. By a system of split bearings (shown in Figs. 7 and 8) the drum 17 may be readily changed when a new ribbon due to a change in the character of work becomes necessary.

Although I have shown and described my invention in considerable detail, I do not limit myself to the exact and definite particulars of the construction, arrangement, or actuating mechanism shown or described. Furthermore, although I have shown my invention in connection with a multiple punch,



I reserve the right to apply my invention to any style of a punching-machine. I also wish to reserve the right to use any substitutions, modifications, or equivalents thereof such as are embraced within the scope of my invention and as pointed out in the claims.

Having thus given a general description of my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a punching-machine, of an indicating apparatus of the class described, comprising a ribbon or tape having characters or figures written or printed thereon, and mounted in position exposed to the view of the operator, means for moving and registering said ribbon or tape by and in harmony with the reciprocating movement of the said punching-machine, whereby the various sections of characters or figures are in turn exposed to the view of the operator in advance of the time when the punching indicated thereby is to be done, thus enabling the operator to arrange the spacing and set the punches in time for the next movement of the machine.

2. The combination with a punching-machine, of an indicating ribbon or tape on which characters or figures are inscribed, said tape being mounted in a holder provided with an aperture through which a portion of said figures are exposed to the view of the operator, and means for moving and registering said ribbon or tape by and in harmony with the operative movement of said punching-machine.

3. The combination with a punching-machine, of an indicating ribbon or tape on which characters or figures are inscribed, said tape being mounted in a holder provided with an adjustable shutter having an aperture through which a portion of said characters or figures are exposed to the view of the operator, and means for moving said ribbon or tape by and in harmony with the operative movement of said punching-machine.

4. The combination with a punching-machine, of an indicating ribbon or tape on which characters or figures are written or printed, said ribbon or tape being mounted upon a pair of winding and unwinding drums, said characters or figures on the portion of said ribbon or tape between the drums aforesaid being exposed to the view of the operator, means for moving and actuating said winding-drum by and in harmony with the reciprocating movement of said punching-machine, whereby the various sections of the characters or figures are successively exposed to the view of the operator.

5. The combination with a punching-machine, of a ribbon or tape on which characters or figures are inscribed, said ribbon or

tape being mounted upon a pair of winding and unwinding drums and provided with an adjustable shutter having an aperture through which a portion of said characters or figures are exposed to the view of the operator, and means connected with some moving portion of said punching-machine for actuating said winding-drum, thereby causing said indicating ribbon or tape to move and register in harmony with the operative movement of said punching-machine.

6. The combination in an indicating apparatus of the class described, of a ribbon or tape on which characters or figures are written or printed, said tape being mounted upon a pair of winding and unwinding drums, and means connected with one of said drums and with the reciprocating cross-head of a punching-machine for actuating said drums in harmony with the operative movements of said punching-machine.

7. The combination in an indicating apparatus of the class described, of a ribbon or tape on which characters or figures are written or printed, a pair of winding and unwinding drums on which said indicating ribbon or tape is wound, said drums being mounted on revoluble shafts, a ratchet-wheel secured to the shaft of the winding-drum, a pawl for actuating said ratchet, said pawl being operated by a system of levers and shafts operatively connected with the reciprocating head of a punching-machine at each stroke thereof, whereby said ribbon or tape is moved in harmony with the motion of said punching-machine.

8. The combination with a punching-machine, of an indicating apparatus comprising a ribbon or tape on which characters or figures are inscribed, a pair of winding and unwinding drums on which said ribbon or tape is wound, said drums being revolubly mounted in a holder provided with an adjustable shutter having an aperture through which a portion of said characters or figures are exposed to the view of the operator, shafts for said drums, a ratchet-wheel mounted on the shaft of the winding-drum, a pawl for actuating said ratchet-wheel, a system of levers and a rock-shaft connected with said pawl and in operative contact with an adjustable bolt secured to the reciprocating cross-head of a punching-machine, whereby said indicating ribbon or tape is moved by and in harmony with the motion of said punching-machine.

In testimony whereof I hereto affix my signature in the presence of two witnesses.

JOHN J. DAVIES.

Witnesses:

GEO. BEATTY,  
ELMER SEAVEY.

It is hereby certified that in Letters Patent No. 793,993, granted July 4, 1905, upon the application of John J. Davies, of Johnstown, Pennsylvania, for an improvement in "Spacing-Indicators for Punching Machines," errors appear requiring correction, as follows: In the printed specification, page 2, line 59, after the word "shafts" the numerals and word *13 and 32* should be inserted: in line 102, same page, the numerals "25" should read *24*, and in the drawings, figure 8, the numerals *33* should be affixed to indicate the crank secured to the end of shaft *32*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 4th day of July, A. D., 1905.

[SEAL.]

F. I. ALLEN,  
*Commissioner of Patents.*