

J. A. GROEBLI.
 PROTECTIVE DEVICE FOR JACQUARD CARD PUNCHING MACHINES.
 APPLICATION FILED JULY 3, 1908.

924,610.

Patented June 8, 1909.

5 SHEETS—SHEET 1.

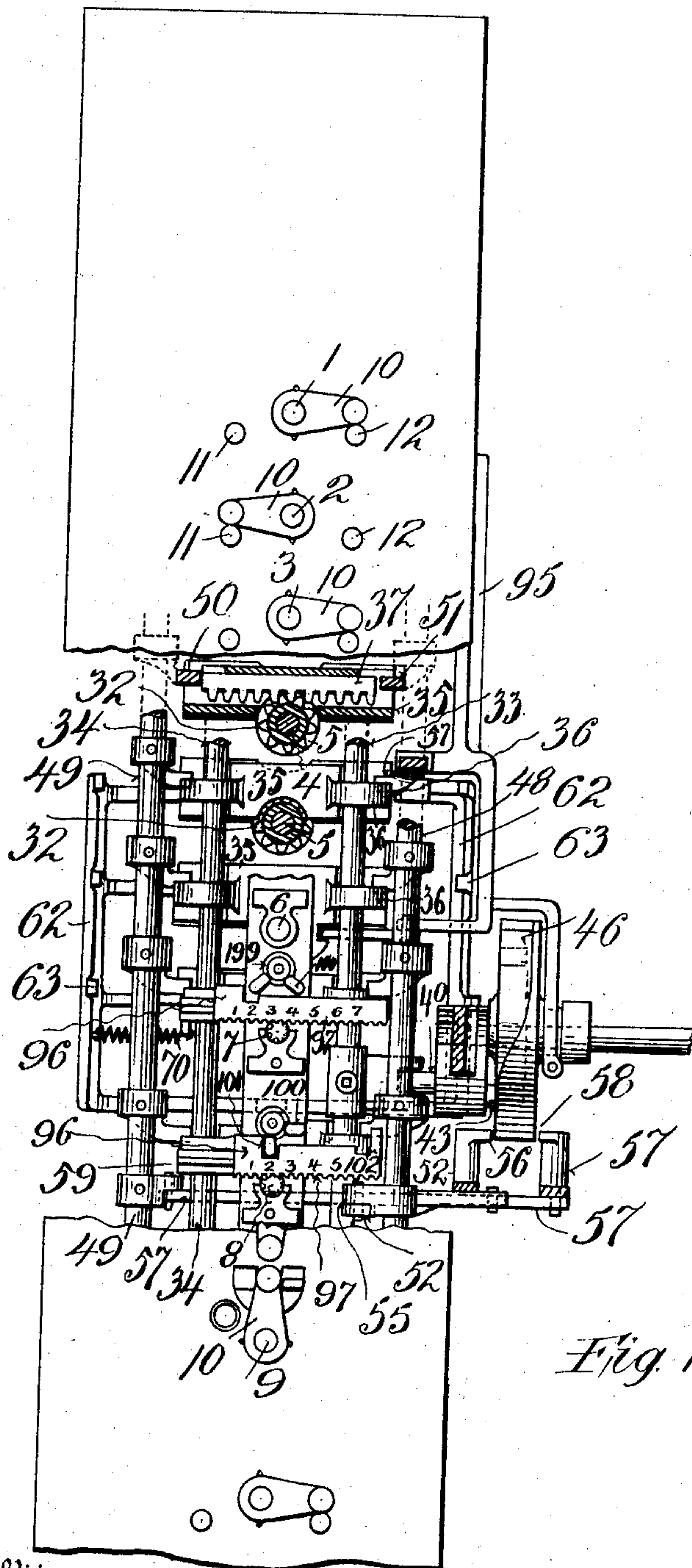


Fig. 1.

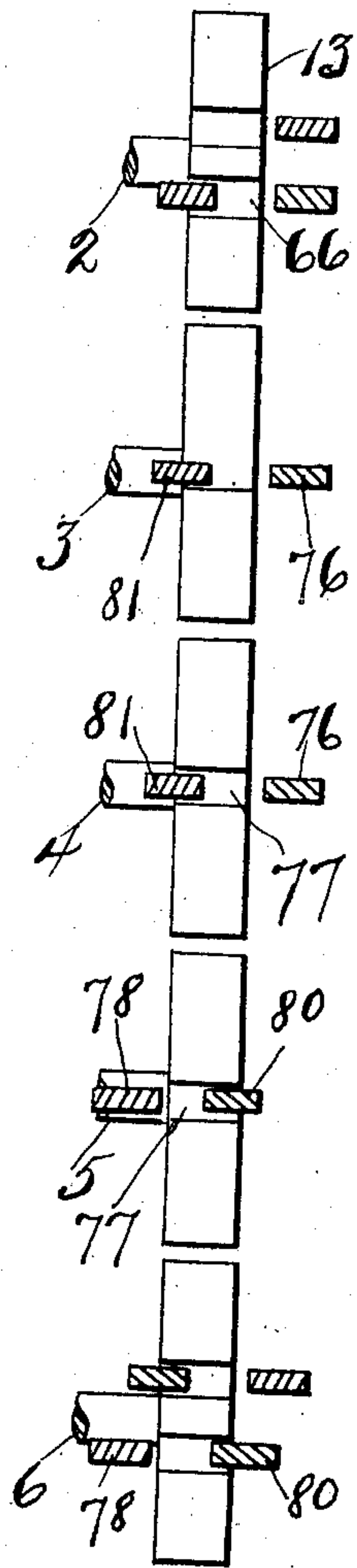


Fig. 14.

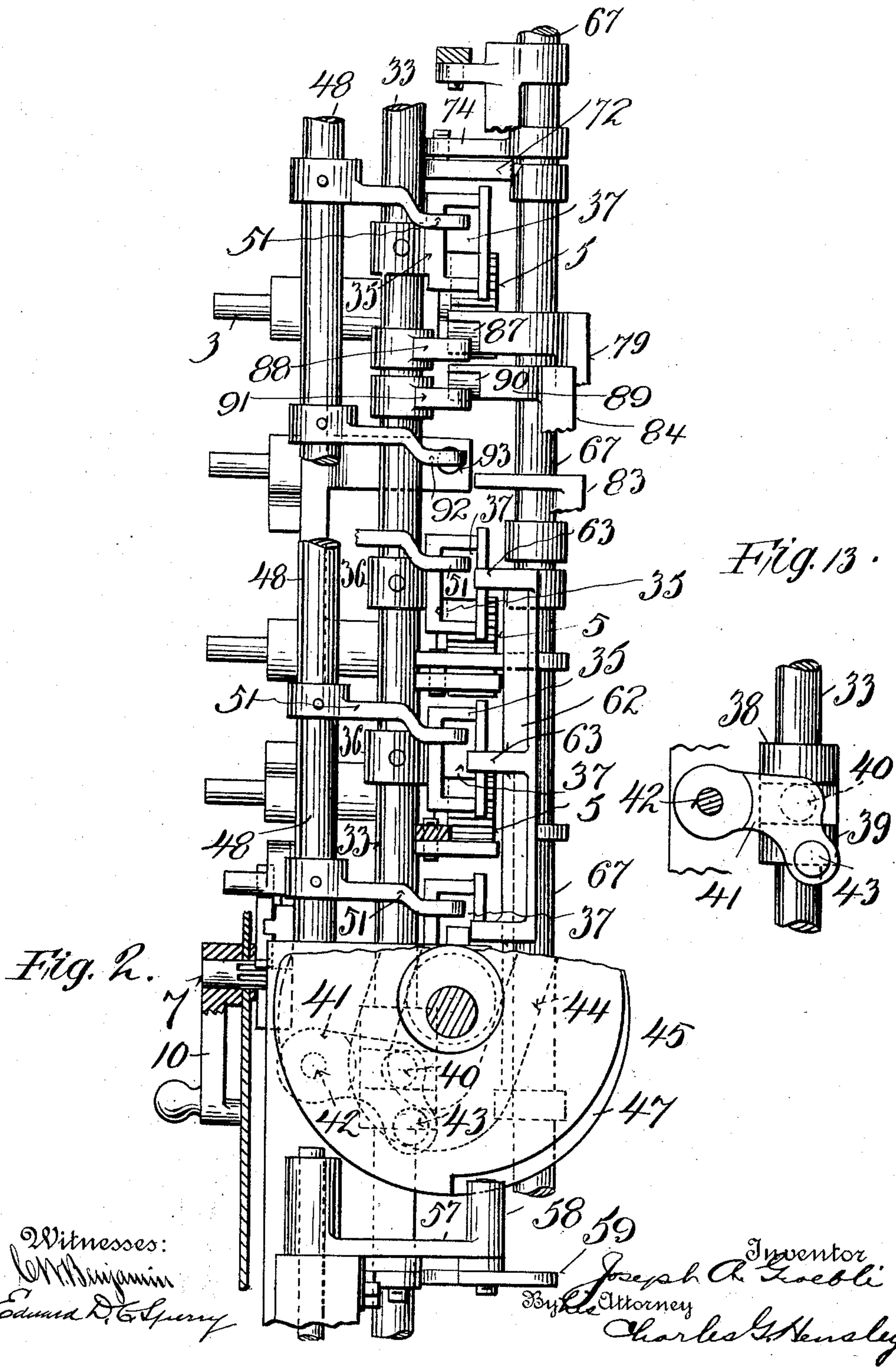
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 5 SHEETS—SHEET 2.



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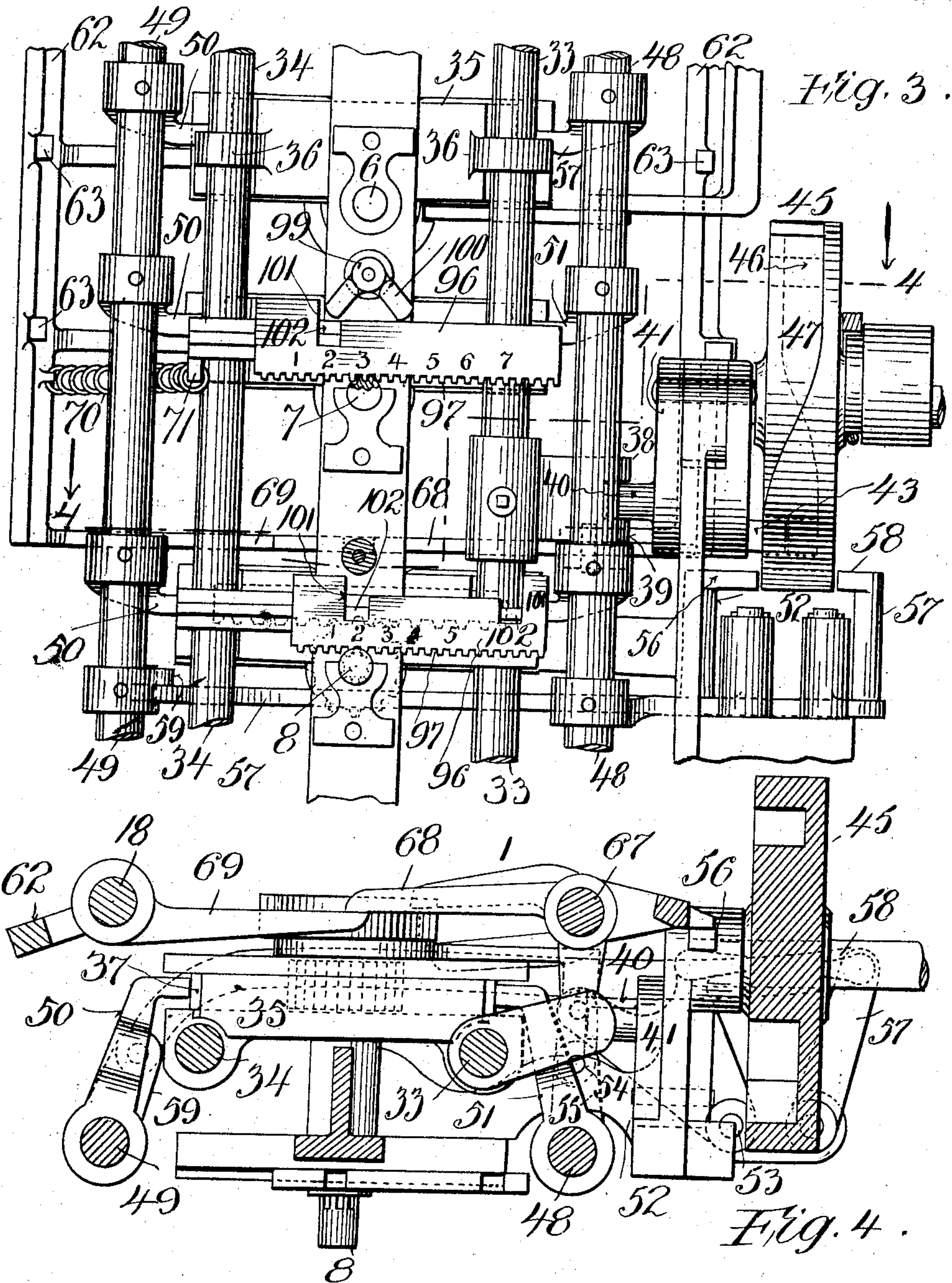
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5 SHEETS—SHEET 3.



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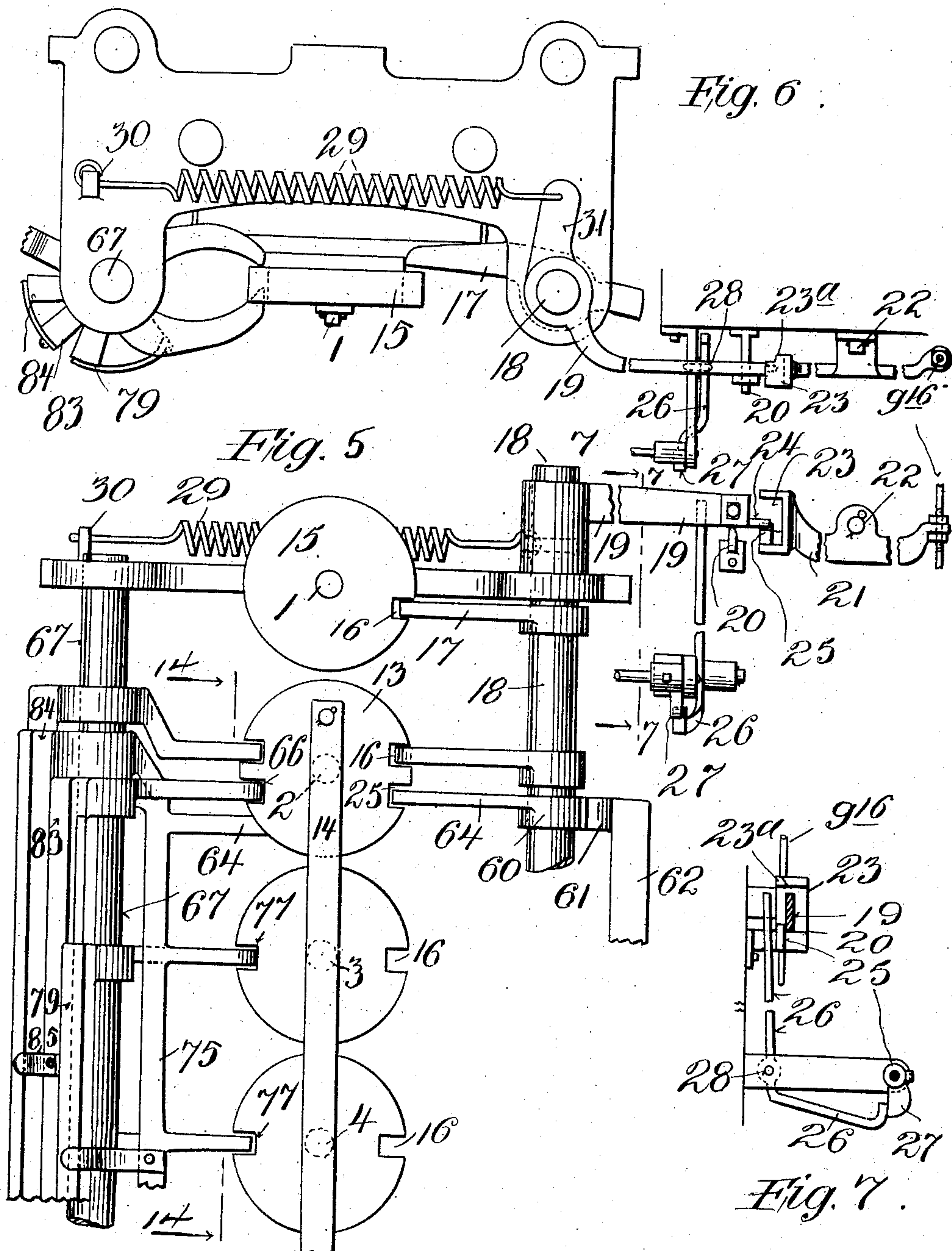
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5 SHEETS—SHEET 4.



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5 SHEETS—SHEET 5.

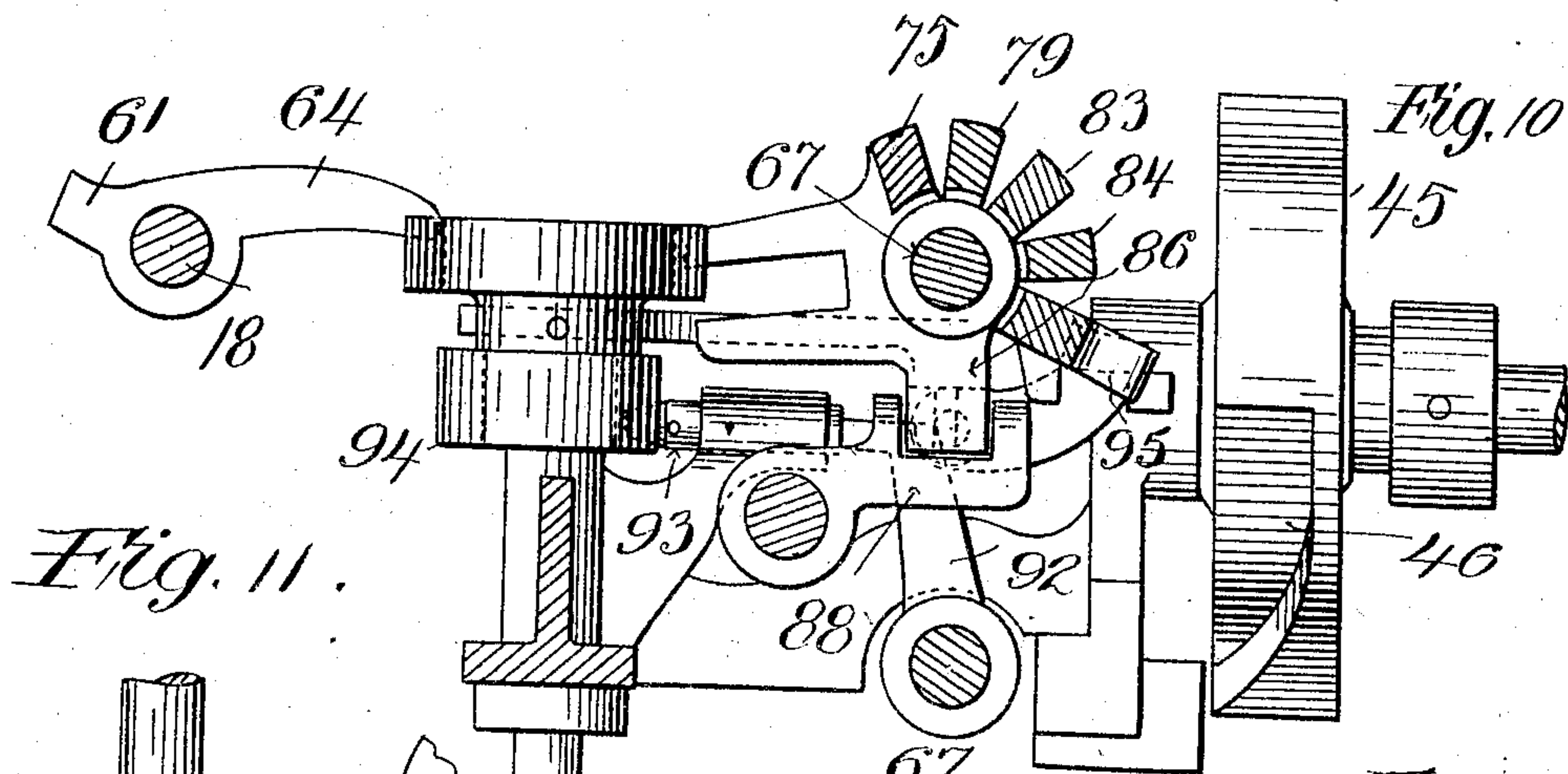
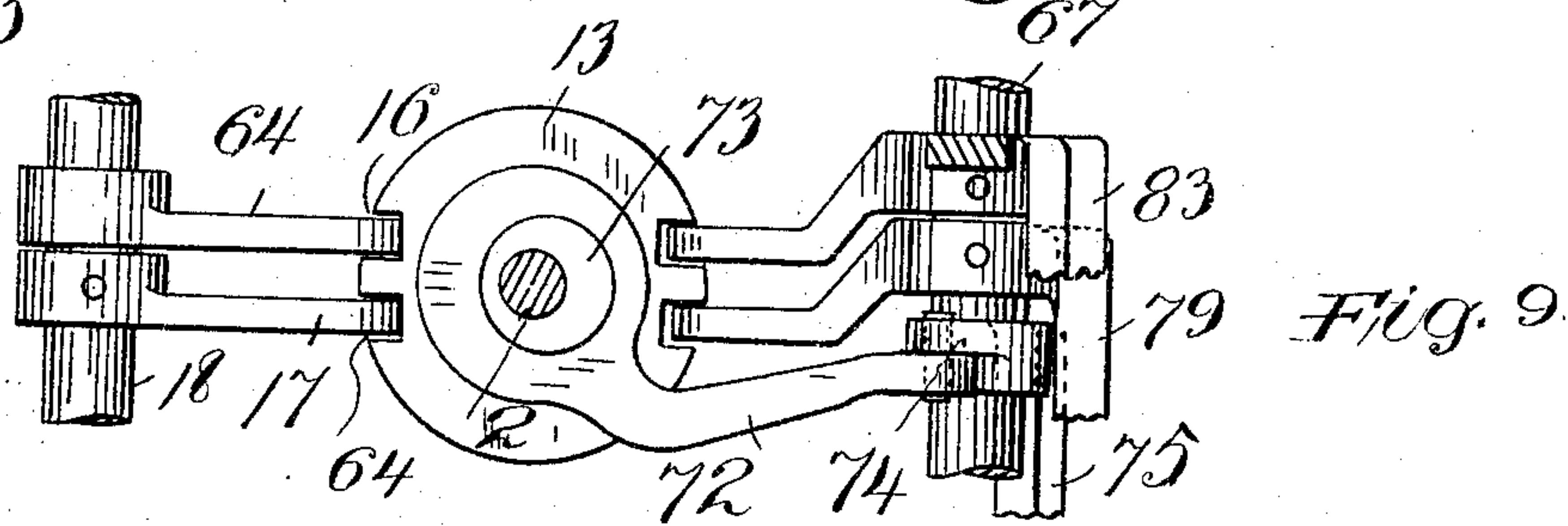
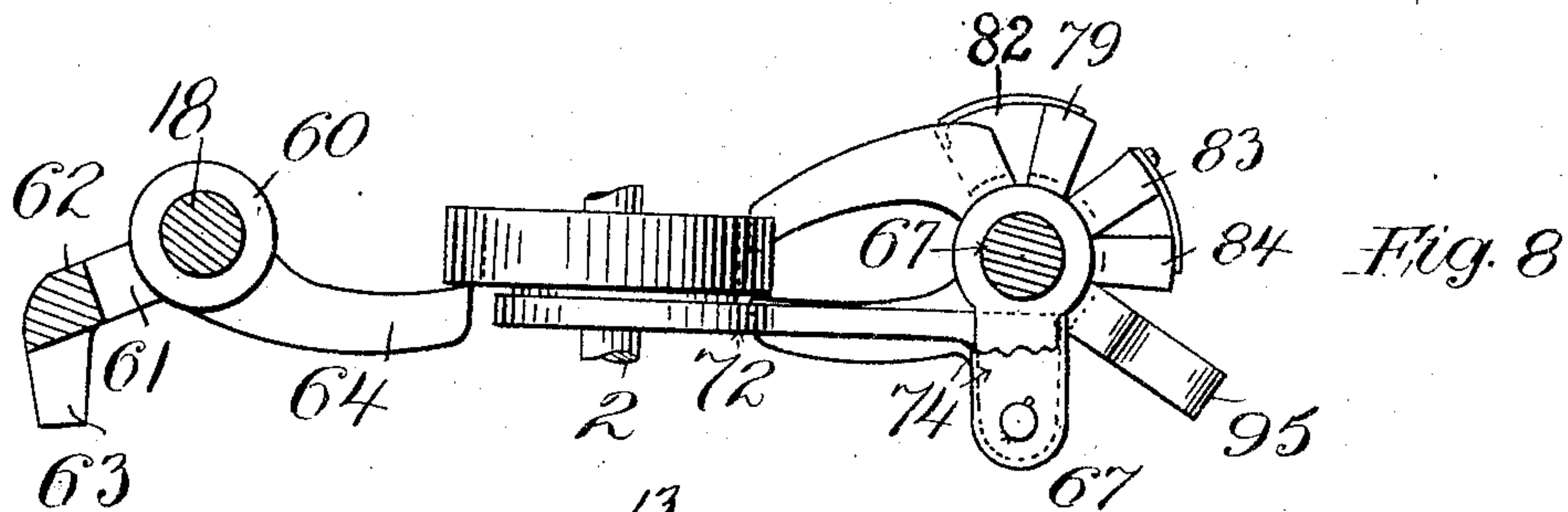
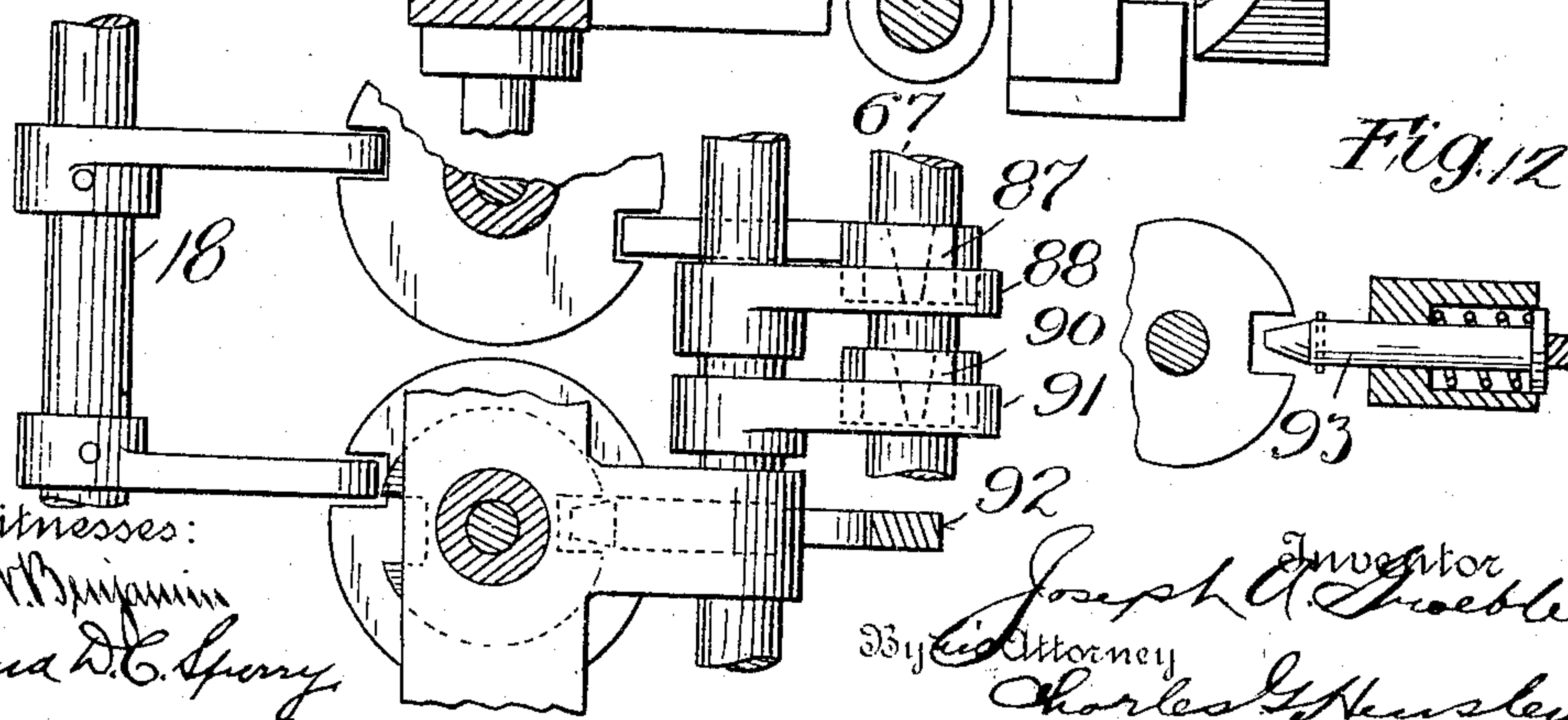


Fig. 11.



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UNITED STATES PATENT OFFICE.

JOSEPH A. GROEBLI, OF NEW YORK, N. Y.

PROTECTIVE DEVICE FOR JACQUARD-CARD-PUNCHING MACHINES.

No. 924,610.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed July 3, 1908. Serial No. 441,745.

To all whom it may concern:

Be it known that I, JOSEPH A. GROEBLI, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Protective Devices for Jacquard-Card-Punching Machines, of which the following is a specification.

My invention relates to protective devices for punching machines by which jacquard cards or pattern rolls are made.

In the making of pattern rolls of paper, for use in jacquards it is necessary to guard against placing on the roll perforations for putting into operation at the same time mechanisms operated by the jacquard, such as the elements of an embroidering machine, which would conflict either in the production of the desired design in the product, or by actual physical conflict between the parts of the machine. Heretofore it has been necessary for the operator to guard against such occurrences by mental calculation, but in my improved device this is taken care of by an automatic means which detects and prevents the machine from placing on the roll perforations which would conflict the mechanisms operated by the jacquard. This operation is effective both as to immediate changes and parts are effective for the same purpose where there is a lapse of time between the setting into and out of operation of a mechanism by the pattern roll.

Furthermore, part of my improved device consists of certain interlocking means whereby the various operating elements of the jacquard operated machine will be caused to be set into or out of operation with particular reference to the condition of the operating elements of the machine such as operating cams and in addition to the protection against conflict heretofore referred to.

My invention also provides for the locking of the various means such as the levers, by which the perforations in the roll are caused, so that there will be no alteration during the actual punching by the machine.

My present device is an improvement over certain portions of the machine shown in U. S. Patent No. 627256, dated June 20, 1899 and I have here illustrated only such parts of the entire machine as will be necessary to understand my invention, it being understood that the present device may be substituted for so much of the mechanism in the said patent as the present device displaces

and a complete machine thereby formed. However my present invention may be utilized in other forms of punching machines.

Some of the machines which I have invented and which may be referred to as mechanisms which may be operated by pattern rolls made on my improved punching machine, are shown in U. S. patents as follows, an examination of which will make the purposes of my present invention better understood—No. 902,817, No. 902,814, No. 902,819, No. 902,818, dated November 3, 1908, No. 556,143, dated March 10, 1896 and No. 618,458, dated January 31, 1899.

In the drawings forming a part of this application, Figure 1 is a front elevation of my invention with a part of the front plate broken away to show the mechanism behind it, Fig. 2 is a side elevation thereof, Fig. 3 is a front elevation of a part of the mechanism immediately behind the front plate and on an enlarged scale, Fig. 4 is a cross section taken on the line 4—4 of Fig. 3 looking in the direction of the arrow, Fig. 5 is a rear elevation of a portion of the mechanism, Fig. 6 is a plan view, Fig. 7 is a cross section taken on the line 7—7 of Fig. 5 looking in the direction of the arrows, Fig. 8 is a cross section showing one of the interlocking actions, Fig. 9 is a vertical section of another part of one of the interlocking actions, Fig. 10 is a horizontal section showing various parts, Fig. 11 is a vertical section showing an interlocking action, Fig. 12 is a section of a locking plunger or pin, Fig. 13 is an elevation of the connection by which the cam operates the reciprocating rods which carry the racks out of engagement with their various pinions, Fig. 14 is a section taken on the line 14—14 of Fig. 5.

In the making of a pattern roll for embroidering machines there are various punching pins which operate to form apertures in the pattern roll to perform what are the normal functions of the embroidering machine such as the positioning of the tambour frame for the different stitches. There are also other functions to be performed by the jacquard which I have called special functions in my various U. S. patents heretofore referred to and these special functions are also represented by perforations in the pattern roll. The perforations for the tambour frame positioning are taken care of by the machine as shown in my patent to which cross reference has been made herein and of

which this case is an improvement. There are a number of setting devices which are adapted to set punching elements in proper position for punching perforations in the roll to place the embroidering machine into or out of operation, that is, the needle operations and other setting devices for setting punching elements for placing the perforations on the roll to set into or out of operation the various special functions and in certain cases to adjust certain of the special function devices. Through an arrangement of locking devices connected with these various setting devices I prevent automatically the setting of punching elements of conflicting actions into operation. In some cases it is only necessary to prevent conflict while the punching is being done, while in other cases a perforation is placed on the roll to place a certain function into operation and leave it in action for a length of time, during which certain other conflicting functions must not be set into operation, and the conflicting function punching elements are locked until the first mentioned setting device has been reset and another perforation made to take the function represented by it out of action; when the conflicting mechanism which had been locked in the meantime, will be automatically released.

In the form of punching machine herein shown and which may be conveniently combined with the device shown in my prior patent referred to herein, there are a number of setting devices which operate a number of levers to position punching elements in the punching device for placing perforations on the pattern roll for different purposes. As here shown these setting devices consist of a number of shafts 1, 2, 3, 4, 5, 6, 7, 8, and 9, which may represent respectively; the starting or stopping of the machine; the connecting or disconnecting of the embroidering machine; the changing of the shuttle action for different stitches; the throwing of the scallop mechanism into or out of action; for throwing the bore mechanism into or out of action; for throwing the stufel mechanism into or out of action; for adjusting the bore mechanism to change the stroke thereof; to adjust the tension mechanism; and to adjust the take up mechanism. These various shafts are provided with operating handles which, in the present illustration so far as the first five shafts are concerned are adapted to be turned from the position on the left, as determined by the stops 11, a half turn to the right, as determined by the stops 12, to set the various devices into operation by forming perforations for such purpose in the pattern roll, while a turn of the levers to the left takes the mechanisms represented by them out of action. So that while any of the levers herein referred to are in their right position the mechanisms they repre-

sent are in action. These several shafts are provided with revolving elements which move therewith and are here shown as disks which revolve and operate the bars which set the punching elements for action through the mechanism shown in my prior patent. An example of one of the disks may be seen in Fig. 5, which is a rear elevation, wherein the disk is numbered 13 and the lever for setting the punching element operated by this disk is numbered 14. When shaft 2 is revolved a half turn the disk 13 throws bar 14 down to place a perforation on the roll and upon return the bar 14 is raised to place another perforation on the roll, to put the mechanism thereby represented respectively into and out of action. These disks differ somewhat according to the number of locking devices to be engaged with them. For instance, the upper one 15, is merely to start and stop the machine and need only be locked against accidental movement during the punching and therefore has a slot 16, in which a locking finger 17, engages to prevent the rotation of the shaft 1 during the punching of the perforation in the roll. The finger 17 is moved into or out of the slot on an oscillating shaft 18 at each punching operation as will appear. As it is desirable to lock all of the various setting devices, including the adjusting levers, during the punching regardless of any relationship which they may bear to each other this slot 16 and corresponding finger 17 is duplicated for each of the disks.

The operation of the shaft 18 is caused by the following mechanism. On the upper end of the shaft 18 there is a lever 19 which rocks the shaft and is supported upon a small bracket 20, which prevents its free end from dropping. The lever 21, which is fulcrumed at 22 to a support is rocked by the rod g^{16} which is the rod bearing the same designation in my prior patent and which is moved each time a punch is made by the machine. The lever 21 has a guiding pocket 23 on the end in which a pin 24 on the lever 19 is engaged by a small projection 25 in the pocket 23 and is released therefrom when the rod g^{16} is operated. There is a lever 26 operating at 28 which is rocked by a cam 27 on shaft h^{19} , which is the shaft similarly designated in my prior patent and at each revolution of the shaft the lever 26 is rocked and engages in its upper end with the lever 19 and moves the latter rearwardly until the pin 24 is held by the projection 25 of lever 21, as shown in Fig. 5, ready to be released whenever the latter is operated by the rod. The movement of the lever 19 to the position described is against the action of a spring 29 which has one end stationarily held at 30 while the other pulls on a short lever 31, which, through its connection to shaft 18 transmits its action to the lever 19. The upper part of the pocket is cut away at 23^a

on a slant and when the pin 24 moves in alinement therewith the lever 21 may be further operated.

Certain of the shafts may be turned by their cranks 10 to the right (see Fig. 1) to cause the perforations representing the different functions to be made, leaving other shafts at rest in their first or normal positions. If the machine is now ready for punching, the rod g^{16} is pulled by the operator which will raise the end of lever 21 and depress the other end until the projection 25 releases the pin 24 when the spring 29 acting on lever 31 will oscillate the shaft 18 and move the fingers 17 into the slots in the disks and prevent the various disks from rotating during the perforating of the roll so that no errors will be made by accidental dislocation during the punching. If the setting handles are not properly or fully positioned the fingers 17 will not be able to enter the slots and lever 19 will be held back so that the pin 24 can not travel to the cut away part 23* and the lever 21 can not be fully operated and the machine started. When the punching is completed, the cam 27 will rock the lever 26, which will carry the lever 19 rearward again and position it for the next operation and unlock the various disks, so far as this mechanism is concerned. The disks on the shafts which remained in their first position will be locked by the fingers 17 moving into the slots 16 while those on the shafts which were turned will be locked by the fingers 17 other slots on the other sides of the disks brought into alinement with the fingers 17 by the rotation of the shafts.

Certain of the shafts are provided with pinions 32, which move therewith and these pinions are adapted to move racks either to the right or to the left and the racks after each movement by the pinions are disengaged therefrom and returned to their first engaging position before the next successive operation of the pinion. These racks as will appear are for a double purpose. As certain of the parts of the present mechanism are a duplication similar numerals will be used for duplicate parts unless otherwise indicated. There are preferably two vertical rods 33, 34, which are movable vertically and are adapted to be reciprocated in unison to carry the racks out of engagement from their several pinions, to be free to be returned. These rods are connected by plates 35 which have collars 36 encircling the rods and the plates 35 act as guides for racks 37 which are adapted to move longitudinally on the guiding plates 35 by which they are reciprocated vertically and carried with the rods 33, 34. The rods 33, 34, being connected together may be operated by applying power to one of them. The rod 33, (see Figs. 2, 3 and 13) has two lateral projec-

tions 38, 39, which engage on opposite sides of a pin 40 and the latter is on a lever 41 which fulcrums at 42. On the end of lever 41 there is a pin or bowl 43 which travels in a groove 44 in the face of the cam 45. In this way the revolution of the cam reciprocates the two rods 33, 34, with their rack supports, carrying the racks therewith.

The racks after being raised out of engagement from the pinions are returned to their initial positions, whether they have been moved to the right or to the left, by the following mechanism. The cam 45 revolves a half revolution at each operation of the punching machine, representing a stitch, and it has two grooves 46 and 47 which are open from opposite sides of the cam and are disposed on opposite sides of the circumference of the cam and the grooves are adapted to rock and lock certain levers. There are two vertical shafts 48 and 49 from which extend a series of fingers 51 and 50, which are adapted to engage with various racks on the setting devices. As will be seen in Fig. 2, these fingers may engage the racks no matter what their position may be in their path of movement. There is an elbow lever 52 pivoted to a support and having a pin 56 which enters the cam groove 46 and is caused to rock thereby. On one end of the lever 52 is connected a short arm 55 on the shaft 48 by which the latter is rocked and locked. Another lever 57 fulcrumed to a support has a pin 58 which engages in the cam groove 47 by which it is locked and rocked similar to the lever 52 but alternately thereto, that is, while one is free the other is locked and vice versa. The end of the lever 57 is connected to an arm 59 on shaft 49 by which the latter is rocked and locked.

On the shaft 18 there is loosely mounted a frame consisting of collars 60 about the shaft from which projects a series of arms 61 connected by a longitudinal arm or bar 62 which is provided along its inner face with a number of projections 63 which are adapted to be engaged by the racks and the frame thereby rocked. There is also projecting from the frame a series of locking fingers 64 (see Fig. 8) which are adapted, when the frame is swung, to enter recesses 16 (see Fig. 9) in certain of the disks and lock them. There is another frame similar to the one just described, on the opposite side, the parts of which are similarly numbered and whose fingers are adapted to enter recesses 66 in certain of the disks. The frame on the right is loosely mounted on shaft 67. The frame on the right has an arm 68 (see Fig. 4) which engages a similar arm 69 on the opposite frame, whereby rocking of the right frame in one direction will also rock the left frame. A spring 70, is connected to the bar of the left frame and to an ear 71, to draw the frames toward each other and into the path of

the racks, and their locking fingers out of the disks. There is another locking element which is operated by certain of the shafts to lock certain other shafts so that their mechanisms can not be operated while the first mentioned shafts are positioned for throwing into action the devices represented by their punches. This may be seen in Figs. 8 and 9. One of the shafts is connected, such as the shaft 2 by a strap 72, which is positively operated by an eccentric 73 on the shaft, and is connected to an arm 74, connected on a collar which is loose on the shaft 67 and by such connection the rod 75 is oscillated. This latter rod is provided with locking fingers 76 which enter slots 77 in certain of the disks, say those on shafts 3 and 4, from the rear when the bar 75 is rocked by the strap being moved outwardly by the eccentric and having other fingers 78 which enter the slots 77 from the front in other disks, say on shafts 5 and 6, the fingers 76 and the fingers 78 being so positioned that they engage the disks alternately, that is to say, when the fingers 76 are in the disks the fingers 78 are out and vice versa. There is another rod 79 which is loosely journaled on shaft 67 by means of collars similar to the rod 75 and this rod also has alternately engaging fingers, but arranged somewhat differently from those of rod 75. It has two fingers 80 which enter from the rear into the slots 77 in disks on shafts 5 and 6 and other fingers 81 which enter other disks, say on shafts 3 and 4, the fingers 80 and 81 being arranged to act alternately the same as on the other rod. The rod 75 has a spring 82 which engages by friction with the rod 79 which it revolves with it and the rod 79 is adapted to be returned by the next operation of the cam after being positioned by the rod 75, whereby only a temporary locking by rod 79 will be effected, in one of its positions.

The rod 83 is substantially a duplication of rod 75, it being connected by a strap and eccentric connection with another of the shafts, say on shaft 3, the difference being that its locking fingers select different disks according to which ones would set mechanisms into action which would conflict with the functions caused by the operation of shaft 3. The rod 84 is also a duplication of the rod 79, it being oscillated by a spring 85 on rod 83 engaging therewith and the fingers on this rod select and lock such disks as are necessary.

After the rod 79 has been partly operated by the rod 75 it is returned again by positive means and against the friction of the spring as follows: There is an arm 86 (see Figs. 2 and 10) which extends forward and it has a V shaped end 87 which is engaged by the arms 88 on rod 33 when the latter rises and the contact of the arm 88 with the slanting part of the arm 86 rocks the rod 79 back to

its normal position, which will cause certain of the disks to be unlocked and others to be locked. This construction is duplicated as to the bar 84, the parts being numbered 89, 90 and 91 and the same action is caused thereby. On shaft 48 one of the locking fingers 92 (see Figs. 10 and 12) operate to force a spring pressed pin 93 into a disk 94 on shaft 3, so that the scallop mechanism can be changed only in certain positions of the machine. The rod 95 and its connected mechanism is not herein specifically claimed and a detailed description thereof is unnecessary.

In the case of shafts 7, 8, and 9 which are for causing punches to operate certain adjusting devices in the embroidering machine the shafts are adapted to be turned several successive half revolutions in a given direction and a number in the reverse direction. To indicate the position of the adjusting device on the embroidering machine as it is positioned by the punches I have provided indicating bars 96, which have racks 97 engaging pinions on the shafts 7, 8 and 9 and these bars are provided with indicating means such as numbers, only one of which on each shows through apertures in the front plate at a time. If the aperture shows the number 4 through it the shaft may be turned a half revolution to the left, when number 5 will show; when a punch is made and the shaft may be again turned in the same direction until the number 6 appears and so on. By turning the shaft to the right the numbers will be shown in the reverse order, and indicate at all times the adjustment on the embroidering machine. I have also provided an idle collar 99 on a pin above the racks 96, which have two downward fingers 100 which lie near or against the upper edges of the rack bars and when either of the shoulders 101 on the ends of the bars contact with either of the fingers, the latter will be forced into the recesses 102 and determine the extreme movement of the rack bar.

The operation of my device is as follows; By reference to some of the embroidering machine patents it will be seen that at each revolution of the jacquard shaft the operating cams move certain levers one way and return them on the next revolution and movable bowls are operated by various jacquard slides to connect the various bowls of the levers with the cams on their two positions to either connect or disconnect the different mechanisms and the operations of these bowls must therefore be timed in relation to the revolution of the cams. The cam on my present device operates a half revolution each time which corresponds with a revolution of the jacquard shaft of the embroidering machine and therefore punches for disconnecting and connecting the various levers on the embroidering machine must be set at

alternate movements of the cam herein. At each operation of the machine the operator pulls the rod g^{16} to cause the punching and this operates through the lever 21 to release the lever 19 when shaft 18 will be rocked by the spring 29, until the locking fingers on the shaft engage in the slots in the disks on the various shafts and lock them against accidental movement until the punch is made, no matter in which of their positions the shafts may be. At each operation of the cam 45 the rods 33 and 34 are raised and lowered. If one of the handles on one of the shafts which has a rack is turned a half revolution to the right the rack will be moved to the right and the bar on the disk will operate to set a punching element for action. If the machine is not in proper position for the setting into operation of the function, that is, if cam 45 is not properly positioned for the alternate stitch and the cam on the jacquard is not properly positioned for such action, then the shaft 48 will be locked, with the fingers 51 in the path of the racks, by the lever which engages in the cam 45. Such locking of the shaft 48 would prevent the turning of a setting shaft to the right until the cam 45 is revolved another half turn and the shaft 48 is unlocked, when the rack will move the fingers 51 in their path. If one or more of the setting shafts are in their right position and it is desired to return it to throw out the mechanism represented thereby, the shaft 49 and its fingers will have the same effect. That is, when the shaft is revolved to the left, if the shaft 49 is locked, the change can not be made until another half turn of the cam 45. If it is not locked then the fingers 51 will be moved by the rack. If the setting shafts so operated should be 6 or 7 its rack will engage the projections 63 on frame 62 and rock the latter, whose locking fingers will lock certain of the disks, until the return of the rack to its normal position. If the setting shafts were turned to the left it would engage one of the projections 63 on the left frame 62 and rock it and lock certain disks in the same way. In my device as I have used it the setting shafts which operate the right frame 62 and which operate the left frame do not entirely correspond. Each time the racks are operated either to the right or to the left the shafts 48 or 49 with their fingers prevents the setting of the punching mechanism at the wrong time, the shafts being alternately locked and unlocked by cam 45 as described.

When the setting shafts have been set and their racks moved one way or the other they are raised out of engagement with the pinions and returned and again engaged with the pinions to be moved in the reverse direction the next time the setting shaft is operated. If a setting shaft has been moved to the right the cam groove 46 on the next movement of

the cam will move the lever 52 and through it the shaft 48 will be rocked and its fingers move the rack or racks back to the former position, which is possible when the racks are disengaged by the upward movement of rods 33, 34. The same action will take place on the left side through the action of shaft 49 and its operating lever, the action of the shafts 48 and 49 alternating. Whenever the shaft 48 is operated, one of its fingers 92 will throw the pin 93 in, to lock one of the shafts making it possible for that shaft to be set only when the cam is in one of its positions. If the shaft 2 is moved to the right to connect the embroidering machine by forming a perforation for that purpose, it is desirable to prevent certain other functions from being started until the next successive stitch or operation of the cam, while others are to be locked out of action until the embroidering machine is disconnected, which will be until shaft 2 is returned again. When shaft 2 is turned to the right the strap operated by the eccentric thereon will move the rod 75 and by doing so it will take some of its locking fingers out of some of the disks and enter others in other disks which condition will remain until the return of shaft 2. When the rod 75 is moved, the spring thereon will cause the rod 79 to move therewith and this will, so far as this bar is concerned, unlock certain disks and lock others, but this change is only temporary. The next time that the rods 33, 34 raise the arm 88 will engage the V shaped end of the arm 86 on the bar or rod 79 and rock it back to its first position, where it will remain until again operated by the rod 75. When the shaft 2 is returned the rod 75 will be returned and the first condition restored. The bars 83 and 84 operate similar to the bars 75 and 79, except that they operate from a different setting shaft and effect a different set of disks.

From the foregoing it will be seen that the setting of the various punching elements is timed in relation to the stitch; that perforations for conflicting function devices can not be set into operation at the same time and that all the setting elements are locked during the actual punching; and that as to some of the functions there are certain parts in common. Furthermore, by the present combination a number of interlocking devices may be embodied in a single compact device and operate independently.

While I have shown and described in detail one embodiment of my invention I do not wish to be limited thereto as other forms may embody the spirit of my invention and come within the scope of my claims.

Having described my invention what I claim is:

1. In a punching machine, means for setting a punching element, means for causing the operation of the punching device and

means operated by said operating means adapted to lock said setting means during the punching operation and automatic means for unlocking said locking means after the

5 punching operation.

2. In a punching machine, means for setting a punching element, means for causing the operation of the punching device, means operated by a spring adapted to lock said

10 setting means and means operated by said operating means adapted to release said locking means.

3. In a punching machine, means for setting a punching element, means for causing

15 the operation of the punching device, rocking means having locking fingers for locking said setting device, said locking device being adapted to be released by said operating means, a spring adapted to move said locking

20 means into locking engagement and a positively operated lever adapted to operate to unlock said locking means and reengage it with said operating means.

4. In a punching machine, means adapted

25 to be placed in a plurality of positions and to thereby set into operative position a punching element and another means for positioning a punching element and means operated by said first setting element adapted to lock

30 said second element when placed in one of its positions and to unlock the same when placed in another of its positions.

5. In a punching machine, a plurality of setting means for positioning punching ele-

35 ments and a plurality of means operated by said setting means adapted to cause interlocking of the several setting means.

6. In a punching machine, a plurality of means adapted to set punching elements,

40 means operated by a setting means adapted to lock another setting means and another means adapted to unlock the said locking means.

7. In a punching machine, a plurality of

45 means adapted to set punching elements, means operated by a setting means adapted to lock another setting means and automatic means adapted to unlock the said locking means.

8. In a punching machine, a plurality of

50 means adapted to set punching means for action, means operated by a setting means adapted to lock another setting means and automatic means adapted to unlock said

55 locking means after the punching element set by said first setting means has formed its perforation.

9. In a punching machine, means for setting punching elements containing a revolu-

60 ble element having a slot and means having a finger adapted to engage in said slot and adapted to be operated by a setting device.

10. In a punching machine, a plurality of

65 means for setting punching elements and means whereby the operation of a setting

means will lock another setting means and means whereby the alteration of said setting means will lock another setting means.

11. In a punching machine, a plurality of means for setting punching elements and

70 means operated by a setting device having alternately engaging elements adapted to alternately lock other of said setting means.

12. In a punching machine, means for setting a punching element and means which

75 will prevent a change in the setting means after the operation of the punching element until another operation of the punching machine has intervened.

13. In a punching machine, means for setting a punching element and automatic

80 means which will prevent a change in the setting means after the operation of the punching element and until another operation of the punching machine has intervened.

14. In a punching machine, a plurality of means for setting punching elements, a plu-

85 rality of locking means adapted to be operated by a setting means and other means adapted to operate one of said locking means

90 after the operation of the punching machine has taken place, subsequent to the operation of said last locking means, by the setting means.

15. In a punching machine, a plurality of

95 means for setting punching elements, a locking means operated by a setting means, another locking means operated by said first locking means and other means adapted to change said second locking means after an

100 operation of the punching machine has taken place.

16. In a punching machine, means for setting a punching element and means whereby

105 said setting means may be changed only upon alternate operations of the punching machine.

17. In a punching machine, means for setting a punching element and a plurality of

110 alternately locked means for preventing the alteration of said setting means except upon alternate operations of the punching machine.

18. In a punching machine, means for setting a punching element, a reciprocating

115 element operated thereby either to the right or left and means for alternately preventing the right and left movements of said reciprocating element.

19. In a punching machine, means for

120 setting a punching element, a reciprocating element operated thereby either to the right or left and a plurality of rocking members having engaging fingers adapted to be alter-

125 nately locked in the right and left path of said reciprocating member.

20. In a punching machine, means for setting a punching element, a reciprocating

130 element operated thereby in reverse directions, means for alternately opposing the

reciprocating element in reverse directions and adapted to return the reciprocating element to its initial position.

21. In a punching machine, means for setting a punching element, a reciprocating element operated thereby, means for disengaging the reciprocating element therefrom and means for returning the reciprocating element for reengagement with the setting means.

22. In a punching machine, means for setting a punching element, a reciprocating element operated thereby, means for disengaging the reciprocating element and means which alternately oppose the reciprocating element and which will return the reciprocating element after disengagement from the setting means.

23. In a punching machine, means for setting a punching element, having a pinion, a reciprocating rack adapted to be moved by said pinion, means for disengaging the rack from said pinion, means for returning said rack for reengagement with the pinion and a locking device operated by said rack.

24. In a punching machine, a plurality of means for setting a punching element, a pinion operated by a setting element, a rack adapted to be reciprocated by said pinion, means for disengaging the rack from the pinion and means for returning the rack for reengagement with the pinion and means operated by the rack and adapted to lock a punch setting means.

25. In a punching machine, means having successive movements in a given direction

and adapted to position a punching element in its several positions and a means whereby said punch setting element will be locked after its several movements until an operation of the punching machine has intervened before the next operation of the setting element.

26. In a punching machine, means adapted to have successive movements in a given direction and adapted to position a punching element in its several movements and means for determining the extreme action of the said positioning means.

27. In a punching machine, means for positioning a punching element, means for operating the punching machine, means for locking the positioning element during the punching and means whereby said punching device operating means will be prevented from operating the punching machine until the said locking means has engaged the positioning means.

28. In a punching machine, means adapted to have a plurality of positions and to position a punching element, means for causing the operation of the punching device and means whereby the failure of said locking means to lock the positioning means will prevent the operation of the operating means.

Signed this 30th day of June, 1908.

JOSEPH A. GROEBLI.

Witnesses:

ADOLPH LEIBUNDGUT,
ALBERT PRESSER.