

H. DEGENER.
 TYPE SETTING AND LINE CASTING MACHINE.
 APPLICATION FILED MAY 23, 1908.

924,326.

Patented June 8, 1909

2 SHEETS—SHEET 1.

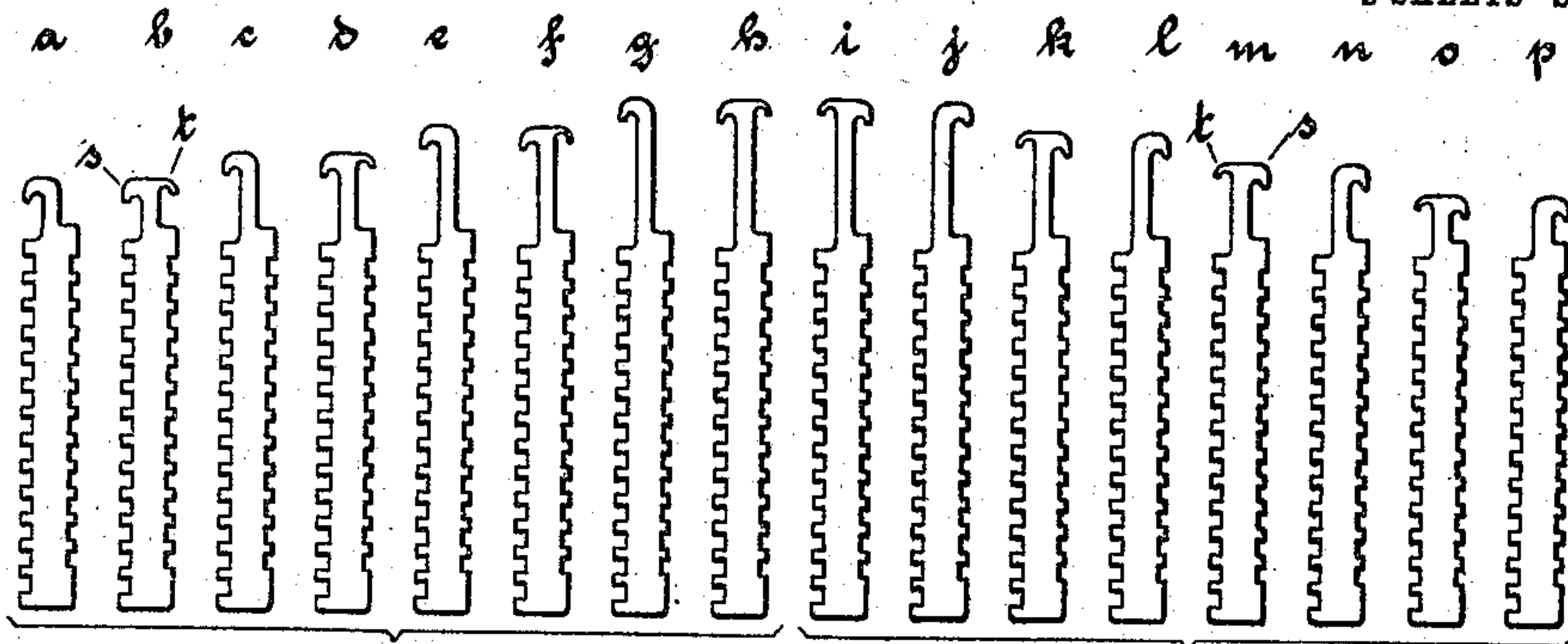


Fig. 1.

Fig. 2.

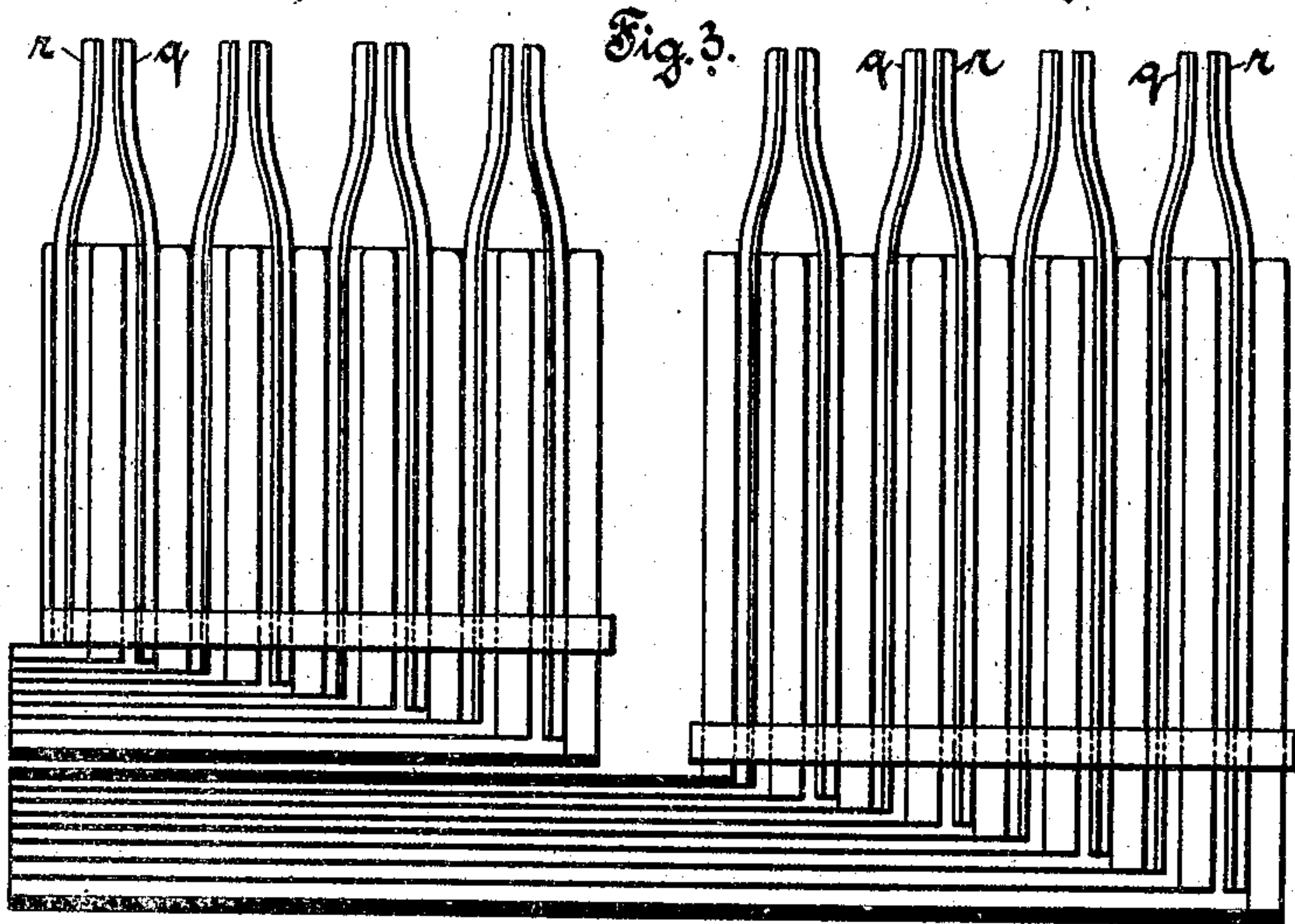


Fig. 3.

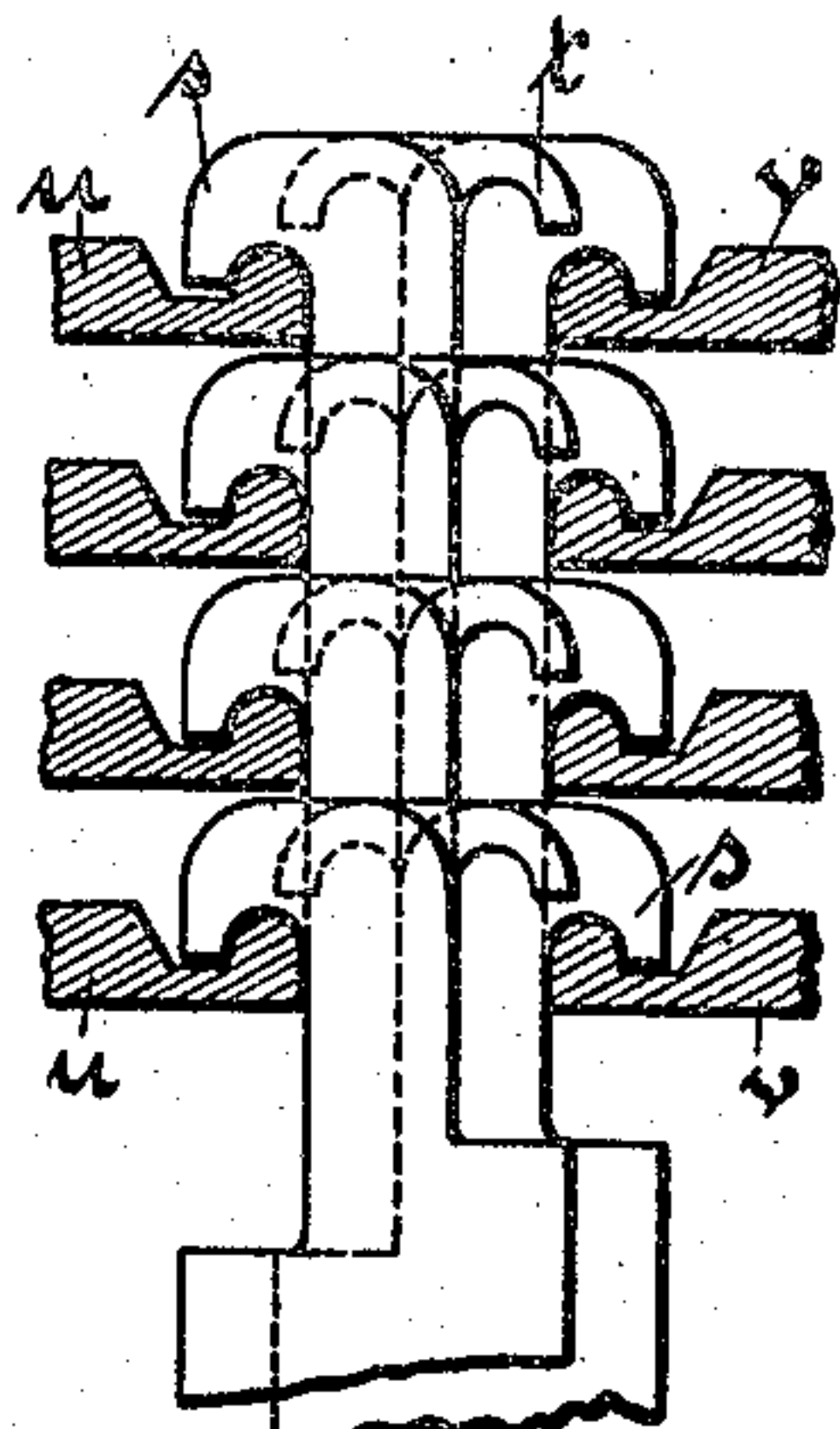


Fig. 5.

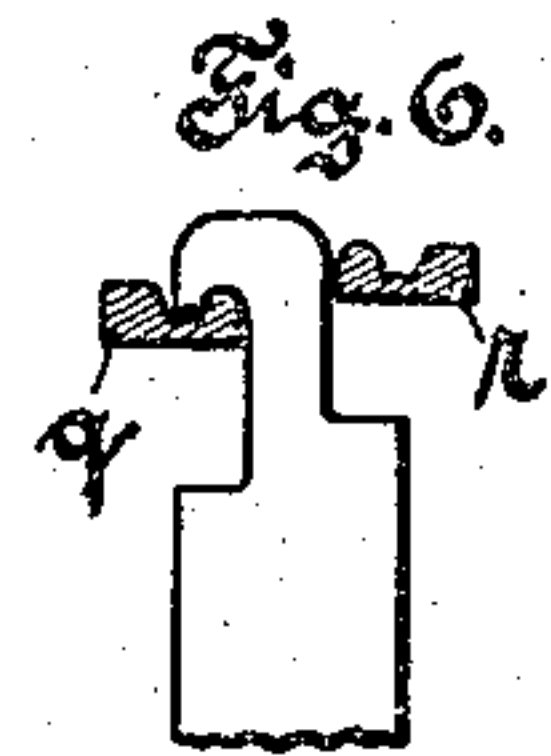


Fig. 6.

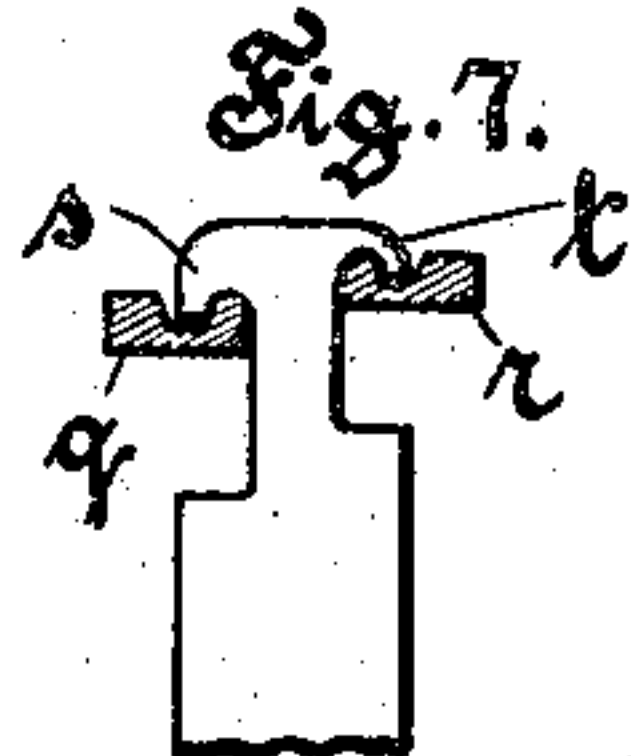


Fig. 7.

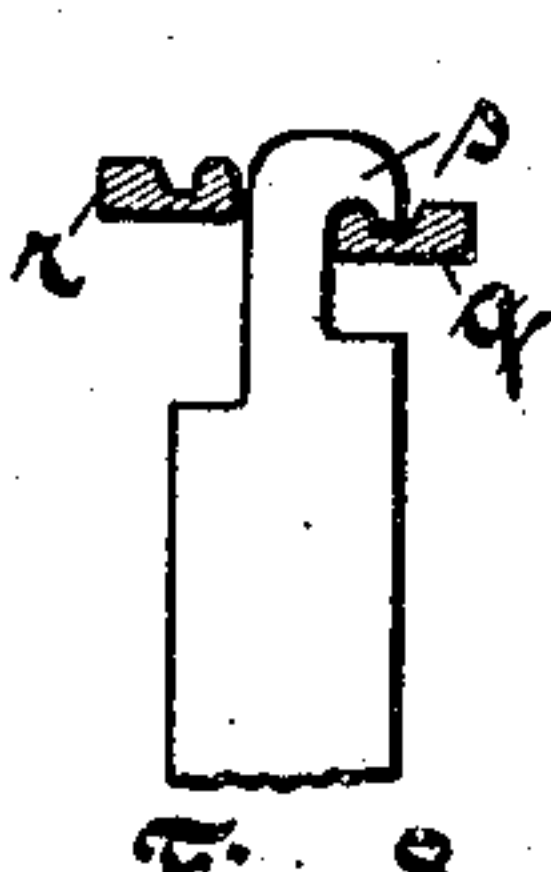


Fig. 8.

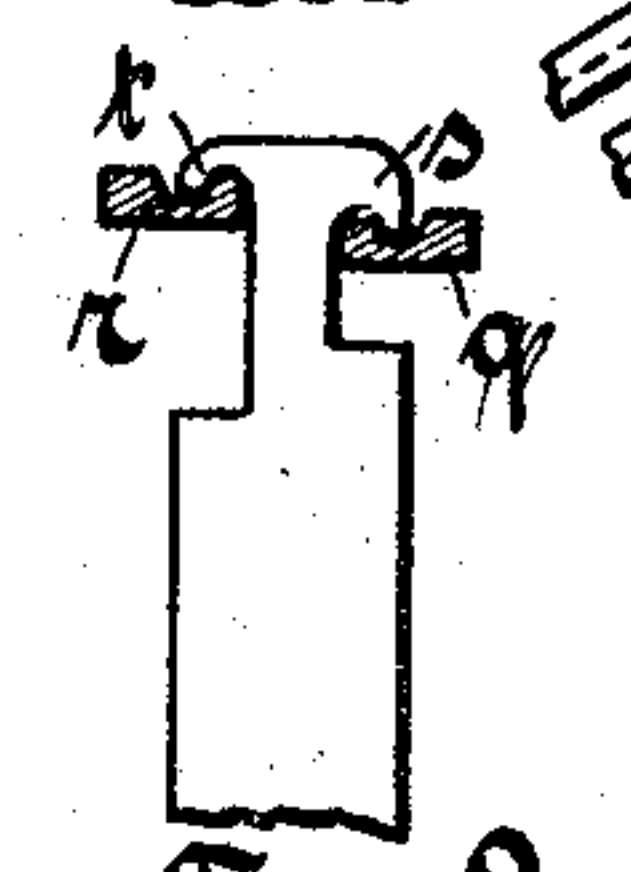


Fig. 9.

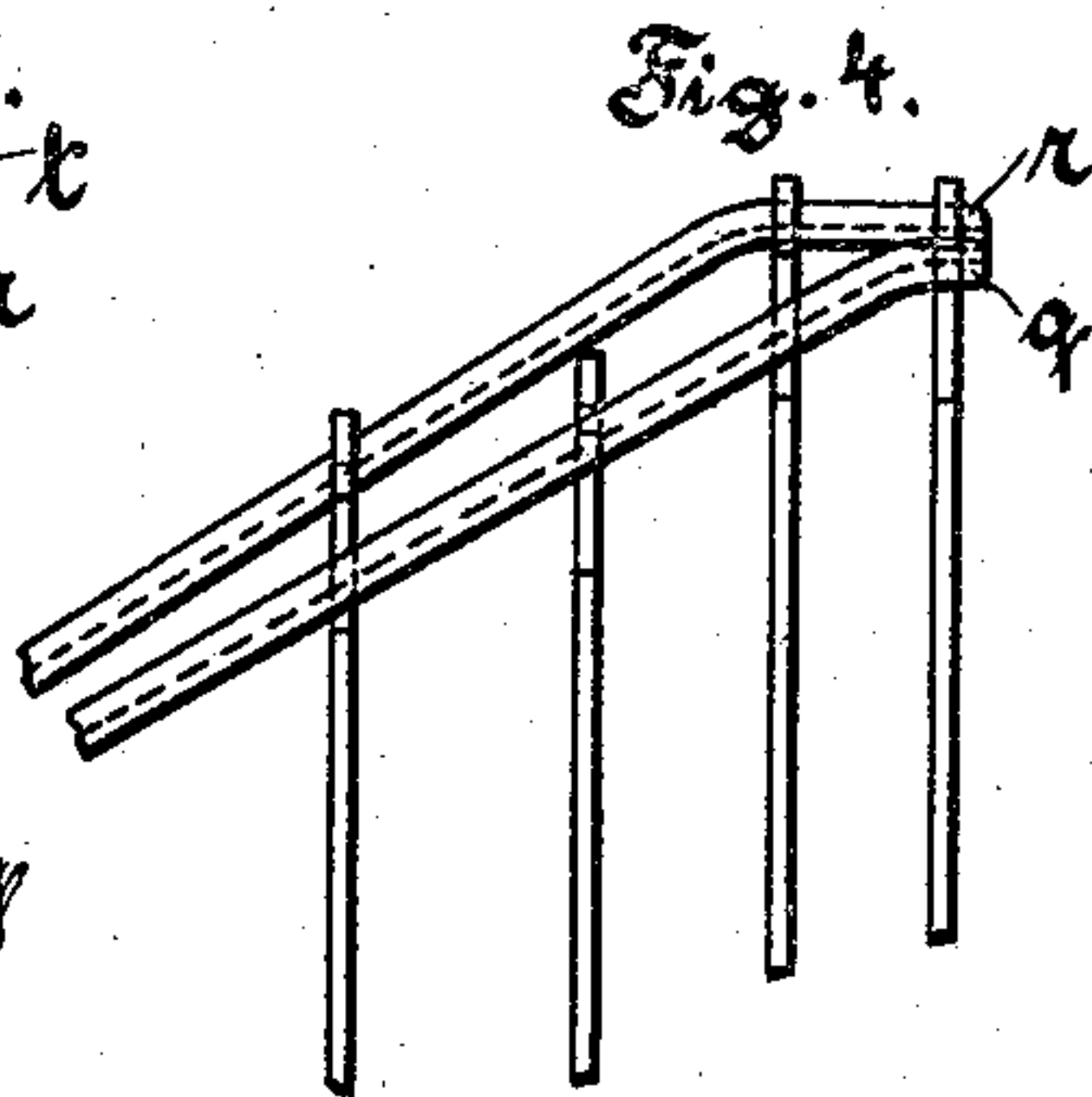


Fig. 4.

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2 SHEETS—SHEET 2.

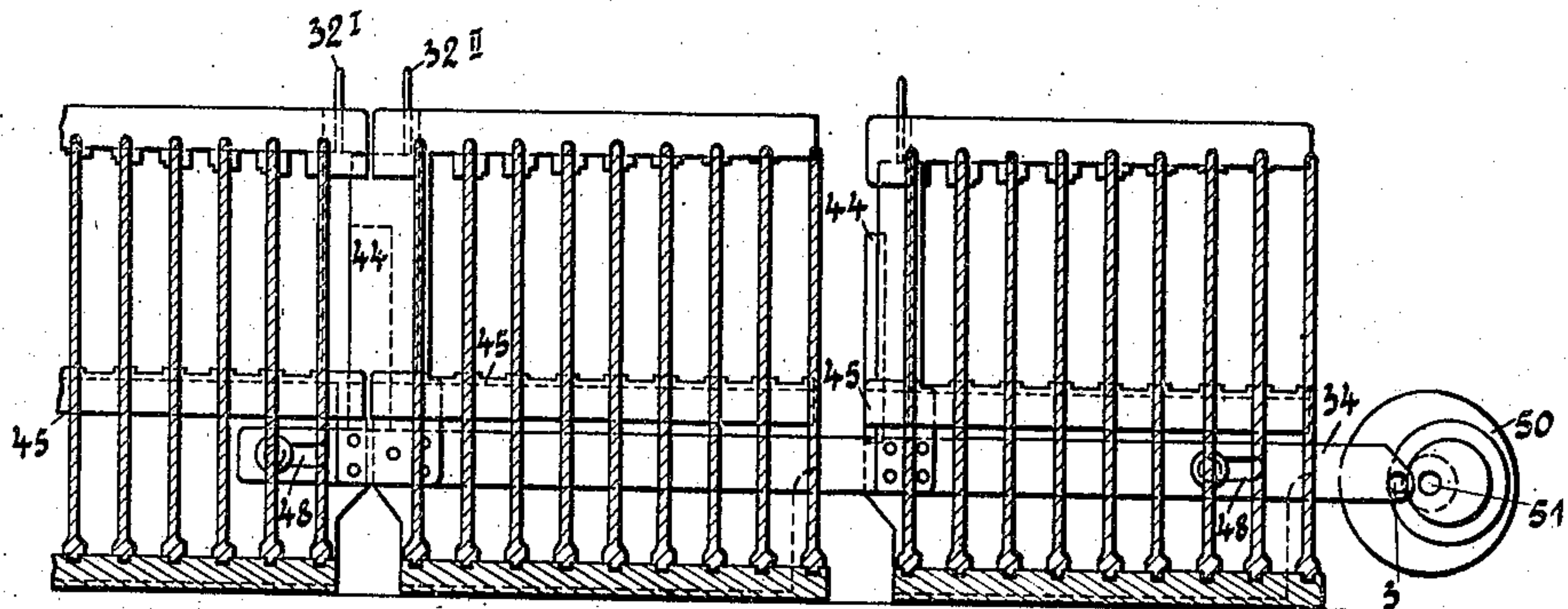


Fig. 10.

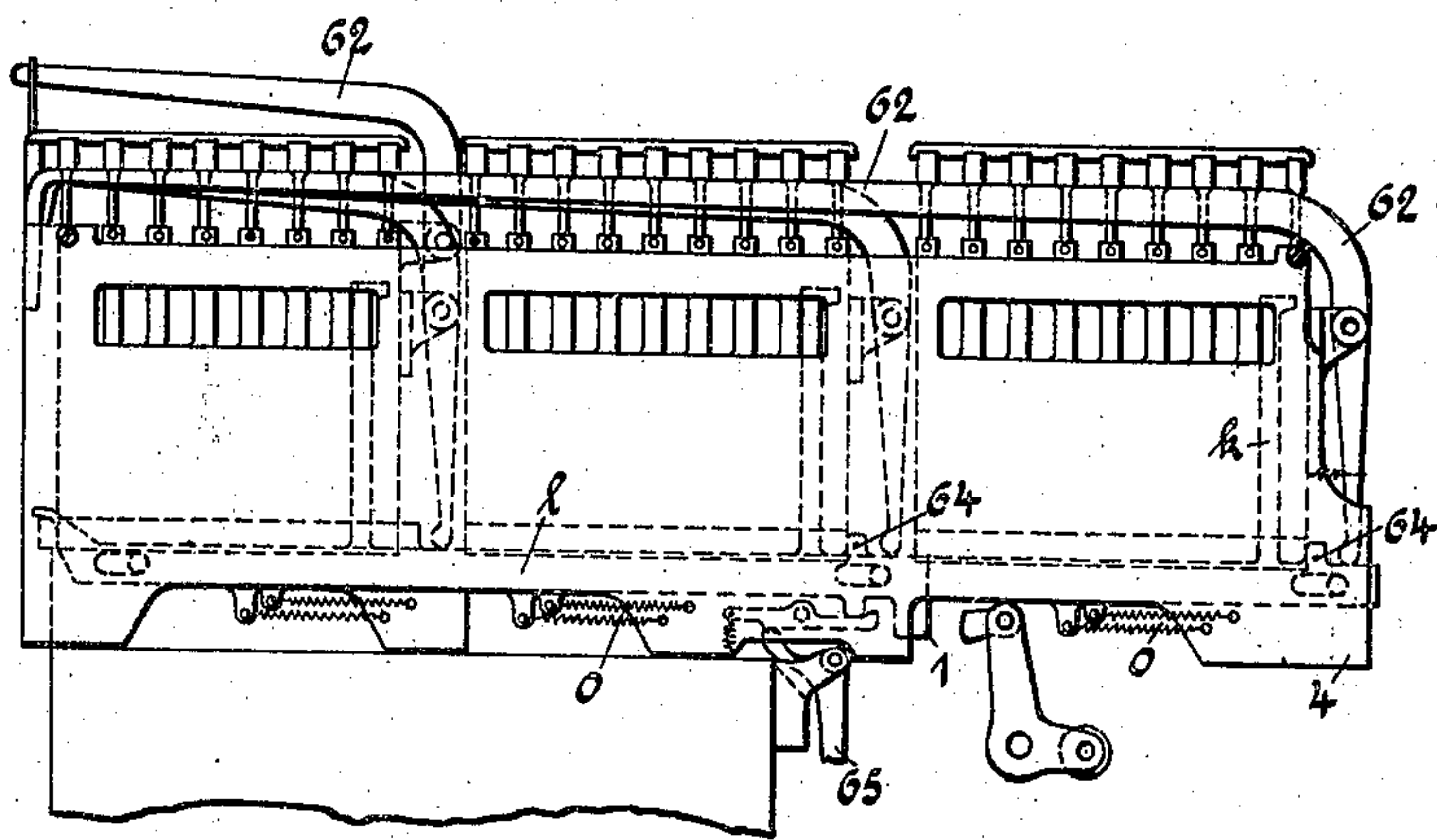


Fig. 11.

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UNITED STATES PATENT OFFICE.

HEINRICH DEGENER, OF BERLIN, GERMANY.

TYPE-SETTING AND LINE-CASTING MACHINE.

No. 924,326.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed May 23, 1908. Serial No. 434,616.

To all whom it may concern:

Be it known that I, HEINRICH DEGENER, of Hollmannstrasse 26, Berlin, German Empire, manager, having invented certain new and useful Improvements in or Relating to Type-Setting and Line-Casting Machines, do hereby declare that the following is an exact specification of the same.

My invention relates to those type setting and line casting machines known as monoline machines and as described in U. S. Patents Nos. 506,198, 605,141, 622,989, 650,296 and 711,145. In such machines the intaglio letters are carried by matrix bars, several letters being provided of each matrix bar, while there are eight different sorts of matrix bars. These sorts of matrix bars are stored in what is called a magazine. In the patents said above only one kind of character has been provided on the matrix bars, but the improvements made by the application for Letters Patent Serial No. 394,489 of 1907 enable to use two sets of type of different kinds and mixed matter to be set. The magazine of the machine known by the said application consists of single chambers combined in groups so that each group of chambers can be used for one kind of type. For the purpose of bringing back the matrices to their respective chambers the two kinds of bars must be separated by the distributing device and then the matrices of each kind or set must be divided into the single sorts by means of a sorting mechanism.

The present invention relates to a new method of distributing the matrices and also enables to produce mixed matter with three different kinds of type without any substantial alteration of the machine.

The several operations of the improved machine follow in practically the same sequence as in the known monoline type setting and casting machines. The intaglio letters are formed in matrix bars twelve or other number being provided on each matrix bar. Eight different kinds of matrix bars are employed for each set. The matrix bars are first released from the magazine and set into an assembler in the required order to form a line of type, the assembled line of matrix bars is then adjusted, carried to a mold and cast. After the casting operation the line of bars is released from the carriage and distributed to their correct chambers in the magazine. According to the present invention the so called distributing bars

or needles separate the matrices only into groups, each group containing several sorts, and the sliding rails, on which the matrices slide into their chambers, are arranged in the manner of a switch, for the purpose to separate the single groups of matrices in subdivisions, when brought on them from the distributing bars.

The improved machine is illustrated in the accompanying drawings in which—

Figures 1 to 9 show a construction of the new sorting mechanism intended only for two different kinds of type. Figs. 1 and 2 show the two groups of matrix bars, each group comprising eight kinds of bars. Fig. 3 is a plan of the sorting device for a magazine with two groups of canals of eight chambers each, Fig. 4 shows in side elevation two discharge rails with four matrix bars hanging onto them, of which bars two are sliding down, Fig. 5 shows the arrangement of the distributing rails, Figs. 6 and 7 show two matrix bars taken up by one and the same distributing rail after they have been placed on the discharge rails, Figs. 8 and 9 show two corresponding matrix bars of the other group, Figs. 10 and 11 show a widened magazine for three kinds of type, Fig. 10 being a section through the intermediate walls of the magazine and Fig. 11 an elevation from the right hand side.

The modified construction of the sorting mechanism according to my invention as shown in the Figs. 1 to 9, will be now described, for the sake of simplicity only for a combination of two different kinds of type, in which therefore two groups of matrix bars are used. Each group is assumed to have eight different matrix bars, with reference to the known machine. When the line of type has been cast and the line carriage containing the matrices moves opposite the distributor the line of matrix bars held in the carriage are liberated and the matrix bars are all brought to one level by means of the usual pusher plate for instance such as described in Wotherspoon No. 711,143 U. S. Patent. Then the receiving rails determined to transport the matrices from the line carriage to the magazine are into a position so that the matrix bars moved along by the carriage come with their hooks under the said rails, which divide the matrices into single groups and bring them before the sliding rails, on which the matrices slide in the magazine chambers, for instance as de-

scribed in Wotherspoon cited. According to my invention the sliding rails are arranged in the manner of a switch for the purpose to separate the single groups of matrices in sub-divisions. In the construction shown in the drawings, in which, as already stated, there are sixteen different matrix bars but eight different receiving rails are used. The matrix bars are, therefore, divided by the said rails into groups of only two subdivisions, so that the switch mechanism has to separate only the two different sub-divisions from each other.

As will be seen from Figs. 1 and 2, both kinds of matrix bars are provided with a distributing hook *s* arranged in the different kinds at different levels or pointing in different directions, the matrix bars being lifted out from the line by the rails by means of the said hooks. The two kinds differ from each other by one of them being provided only with a distributing hook *s*, while the other one is also provided with another sorting hook *t* arranged slightly higher and pointing in the opposite direction. The distributing hooks *s* serve, as in former systems, for distributing the cast and loosened matrix line by means of the distributing rails *u* and *v* (Fig. 5). Each rail *u* or *v* seizes all the matrix hooks *s* corresponding to its level, that is to say both those which have not any sorting hooks *t* on the back and also those which have such sorting hooks. The rails *u* and *v* bring the matrices from the line carriage to the sliding rails *q* and *r*, which are arranged so that the matrices can slide on them into their chambers. Firstly all the matrix bars engage by means of their hooks *s* with the rail *q* and are pushed into the magazine by means of a stripping off device which is not shown in the drawing. During this time however, only the matrix bars which are provided with a distributing hook *s*, can slide down on the rail *q*. The matrix bars which are also provided with the sorting hook *t*, engage on the contrary as shown in Fig. 4, during the advance of the matrix bars on the rail *q*, by means of the said sorting hooks *t* with the slightly higher rail *r* (Figs 7 and 9) and are consequently forced, during the advance by the stripping off device, to remain suspended on the inclined rail *r*. The forward part of this rail leads in a horizontal direction while the rail *q* immediately leads downward as shown in Fig. 4. Therefore the matrices, which are provided with the hooks *t* and engage by means of the said sorting hooks with the rail *r* advance during the stripping off event firstly in a horizontal direction and lose therefore all connection with the rail *q* leading immediately in an inclined direction and slide during further advance by the stripping device on the rail *r* into the magazine compartment intended for them. The ma-

trices provided only with a distributing hook *s* have already slid down the rail *q* (Figs. 6-8). This simple switch device, therefore renders possible a reduction of the number of distributing rails used, to any desired small number, for it is clear that, in the same way as in the construction described by way of example, each kind of matrix bar is divided into two sub-divisions they could also be divided into any desired number of sub-divisions and it would be merely necessary to increase the number of hooks *t* which could be arranged at different levels above each other, and to combine more than two discharge rails *q* and *r* in a suitable manner into one switch system. The improved distributing device works, therefore, in the following manner. After the casting operation the loosened matrix bars arranged with their bottom edges on the same level, are pushed sidewise with their distributing hooks *s* onto the distributing rails. Because, as said above, eight groups of matrices are used, also eight distributing rails are necessary. According to the arrangement of the distributing hooks *s* on the matrices as shown in Fig. 5, the rails are arranged in two vertical series *u* and *v* each containing four rails. The rails raise the matrix bars from the line carriage and then the series *v* first moves horizontally sidewise a little away from the other series *u*, in any known fit manner not shown in the drawing, thereby drawing the matrices hanging on the two series of rails from each other so that the sorting hooks *t* of the matrices hanging on the one series of rails get out of reach of the rails of the other series. The rails are thereupon moved in any desired manner in front of the discharge rails shown in Fig. 3, so that four rails are standing in front of one magazine group, and four in front of the other, whereupon a stripping off device first pushes all the matrix bars on the receiving rail *q* and, during the further advance, sorts them in such manner that the matrix bars provided with a sorting hook *t* continue to slide on the sorting rails *r*, and those which have not such a sorting *t*, on the contrary remain on the rails *q* and slide down on the same.

As will be seen from the drawing, the sorting hook *t* is arranged at a higher level than the distributing hook *s*. The object of this is to avoid during the first horizontal pulling apart of the matrix bars pushed on the taking off parts *u* and *v*, a fouling or collision of the sorting hooks *t* with the taking off rails *u* and *v*, and to enable the sorting hooks to slide above the taking off parts. The sorting rails *r* are accordingly made higher than the taking off rails *q*.

The distributing hooks can be arranged on the matrix bars in any desired suitable manner, for instance, all on one side, and in-

stead of hooks, other desired taking up devices could be used.

It will now be further shown, how it is possible without making important modifications in the machine frame or in the driving devices for the matrix drivers to increase still further the number of magazine chambers, so that three or more kinds of type could be used.

The drawings show in Figs. 10 and 11 the arrangement of three groups of magazine chambers corresponding to three kinds of type. I incorporate the third magazine with the two other, arranging common lateral walls 4 for all groups of magazine chambers so as to form only one piece. The bracket on which the magazine stands has the same form as on the arrangement with only two magazine-groups so that only the first and second magazine groups rest on it, while the third group projects behind the bracket. By this arrangement behind the bracket is a clear space, in which the so-called oscillator engaging the released matrix drivers 7 can operate, so leaving it at the same position at which it is arranged in the two magazine machine. The matrix drivers 7 of all magazine groups are provided with the projections 1 at the same level for the purpose to enable the arrangement of only one oscillator for all three magazine groups. In the same way, the releasing levers 65 and corresponding locking pawls are arranged in one line, so that they are brought into contact, or removed from each other by one and the same change rail. This arrangement makes it possible, without making any constructive alteration of the machine, to enlarge the magazine to the extent of another group of chambers containing another, third kind of type.

With the use of the switch device assorting mechanism, as above described, when using three or more different kinds of type, merely one or more further sorting hooks need be used. However, another sorting device well known from a former application can be utilized for this purpose. The matrices are brought from the line on the intermediate sliding rails 32^I and 32^{II} and the finger 44 seizes every time one of the matrices and pushes it along the magazine chambers.

In spite of the increase of the number of magazine chambers, the sorting driver is provided only with two fingers 44. This is rendered possible owing to the three groups of magazine chambers being arranged in such manner that the two first groups are controlled by the same finger 44. The intermediate rails 32^I and 32^{II} corresponding to these two parts of the magazine are brought so near together that the finger 44 could be made double acting. While the driving fingers of the distributing device in

the former construction have a bevel portion only at one lateral edge, the finger 44 of the construction according to this invention is beveled at both sides and made so wide that in the outermost right hand position (Fig. 10) it covers the matrix bars hanging on the intermediate bar 32^{II}, and on the contrary enables the matrix bars of the bar 32^I to pass between its left hand lateral edge and the last right hand magazine wall of the group I, on to the traveling rail 45. During the movement to the left, the intermittent advance of the matrix bars arranged on the rail 45, takes place along the first case chambers, and in the outermost left hand position of the finger 44, there is sufficient room at its right hand side to enable one of the matrix bars suspended on the intermediate bar or rail 32^{II} to slide on the rail 45 of the second magazine part. The sorting device of the third magazine part is made as in the former construction, only the matrix bars are pushed into the canals from the front backward. When there are more than three kinds of type, the symmetrical combination of each two groups of the magazine can of course be continued as often as desired. The fingers 44 are applied to and moved by the rail 34. The pushing to and fro of the rail 34 guided by means of the slots 48, is effected in a slightly different manner by means of a cam groove disk 50 secured to the spindle 51 and of a pin or roller 3 secured to the rail 34.

Having thus fully described the nature of my invention, what I desire to secure by Letters Patent of the United States is:

1. In a type setting and line casting machine the combination of distributing parts, dividing the matrix bars into groups, with a sorting mechanism dividing the said groups into sub-divisions, said sorting mechanism consisting of groups of switch-like combined slide rails, each group of slide rails comprising several rails, substantially as described.

2. In a type setting and line casting machine the combination of distributing parts, dividing the matrix bars into groups, with a sorting mechanism dividing the said groups into subdivisions, said sorting mechanism consisting of groups of switch like combined slide rails, each group of slide rails comprising two rails, substantially as described.

3. In a type-setting and line casting machine the combination of distributing parts, dividing the matrix bars into groups, with a sorting mechanism dividing the said groups into subdivisions, said sorting mechanism consisting of groups of switch like combined slide rails, each group of slide rails comprising two rails, one of which descends close behind the point of reception of the matrix bars, while the other is continued horizontally in order that the matrix bars

suspended to the latter, when sliding into their magazine chambers, should be lifted off the first rail, substantially as described.

4. In a type setting and line casting machine, the combination of a magazine consisting of two groups of canals and intended for receiving two sets of matrix bars, with a third group of magazine canals for receiving a third set of matrix bars, while using the same side walls for all magazine canals and a bracket as used in a two-magazine machine, thereby keeping open the place to the driving parts substantially as described.
5. In a type setting and line casting machine, the combination of a magazine consisting of two groups of canals and intended for receiving two sets of matrix bars, with a third group of magazine canals for receiving a third set of matrix bars, while using the same side walls for all magazine canals and a bracket as used in a two-magazine machine, thereby keeping open the place to the driving parts, the driving mechanisms being arranged beneath the third group and acting on projections of the matrix drivers of all magazine canals, these projections being arranged all in the same level, substantially as described.
6. In a type setting and line casting machine, the combination of a magazine con-

sisting of two groups of magazine canals and intended to receive two sets of matrix bars, with a sorting mechanism, distributing the separate kind of matrix bars into their proper chambers, fingers intermittently advancing the matrices along the magazine chambers for the purpose to bring each of them before its chamber, one finger being used for two groups of the magazine, substantially as described.

7. In a type setting and line casting machine, the combination of a magazine consisting of two groups of magazine canals and intended to receive two sets of matrix bars, with a sorting mechanism, distributing the separate kind of matrix bars into their proper chambers, fingers intermittently advancing the matrices along the magazine chambers for the purpose to bring each of them before its chamber, one finger being used for two groups of the magazine, being beveled at both sides and conveying, during each forward and backward movement, one matrix into one group.

In witness whereof I have hereunder set my hand in presence of two witnesses.

HEINRICH DEGENER.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.