

D. B. RAY.
Apparatus for Arranging Type for Type-Setting
Machines.

No. 142,652.

Patented September 9, 1873.

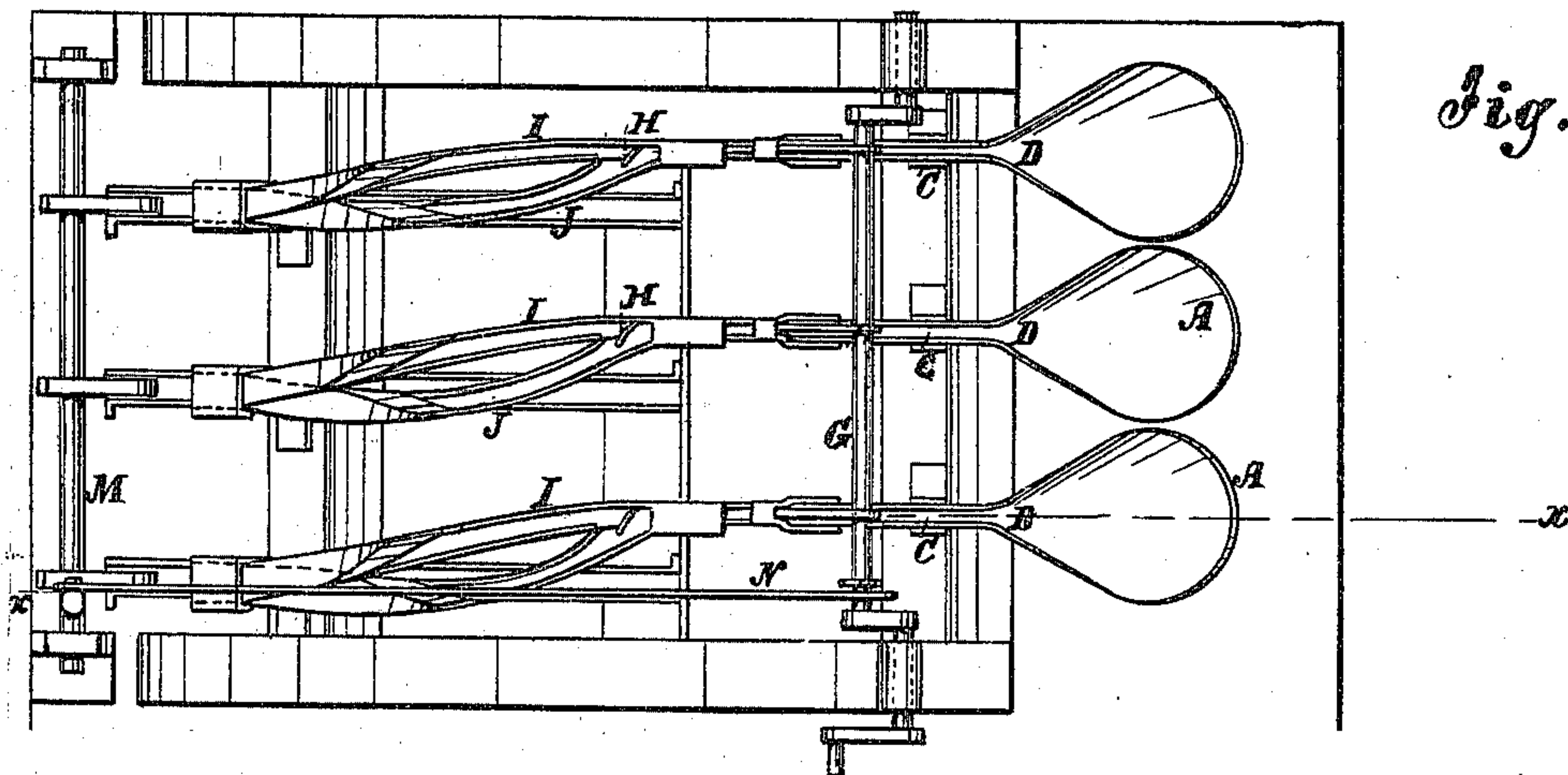


Fig. 1.

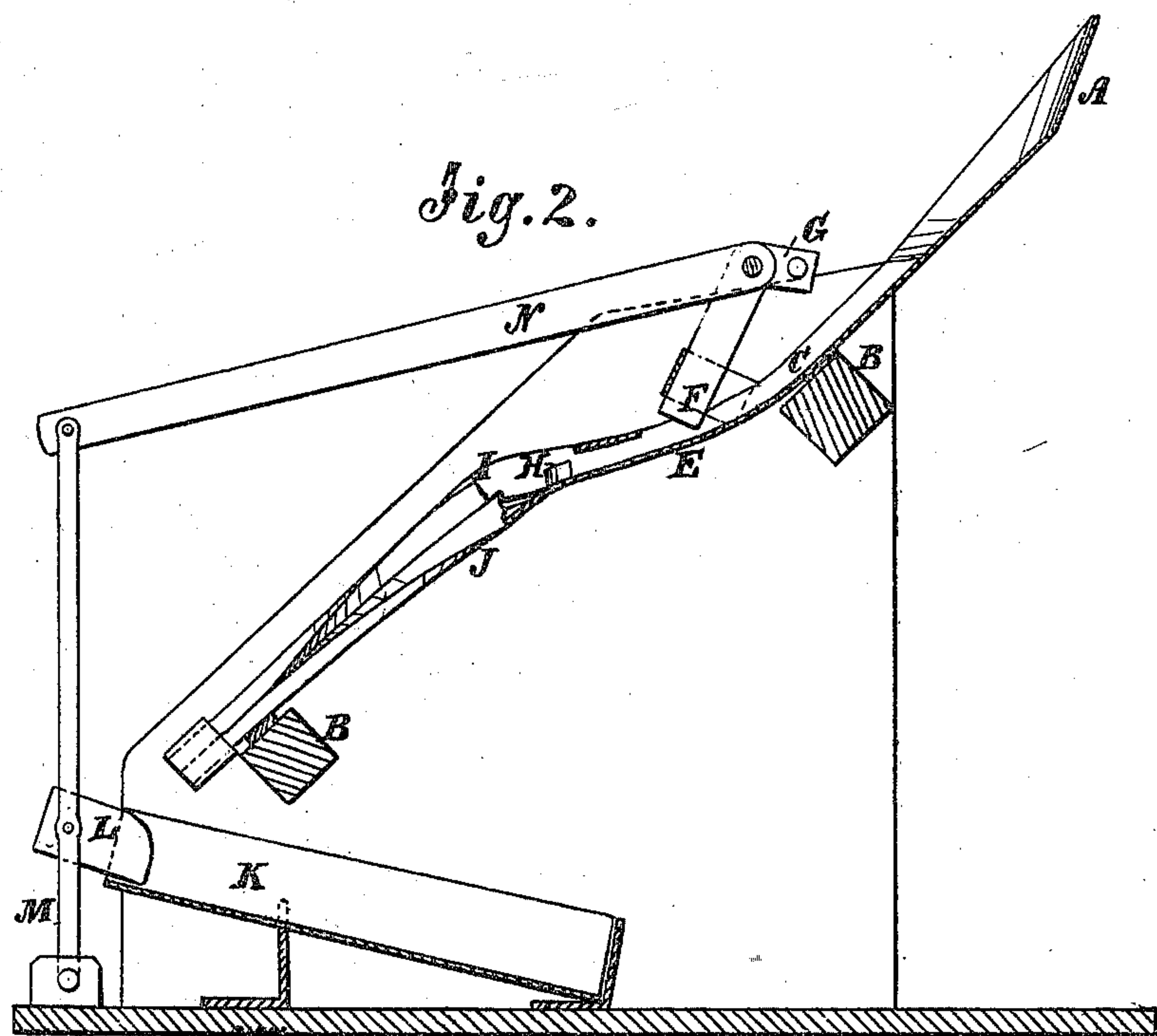


Fig. 2.

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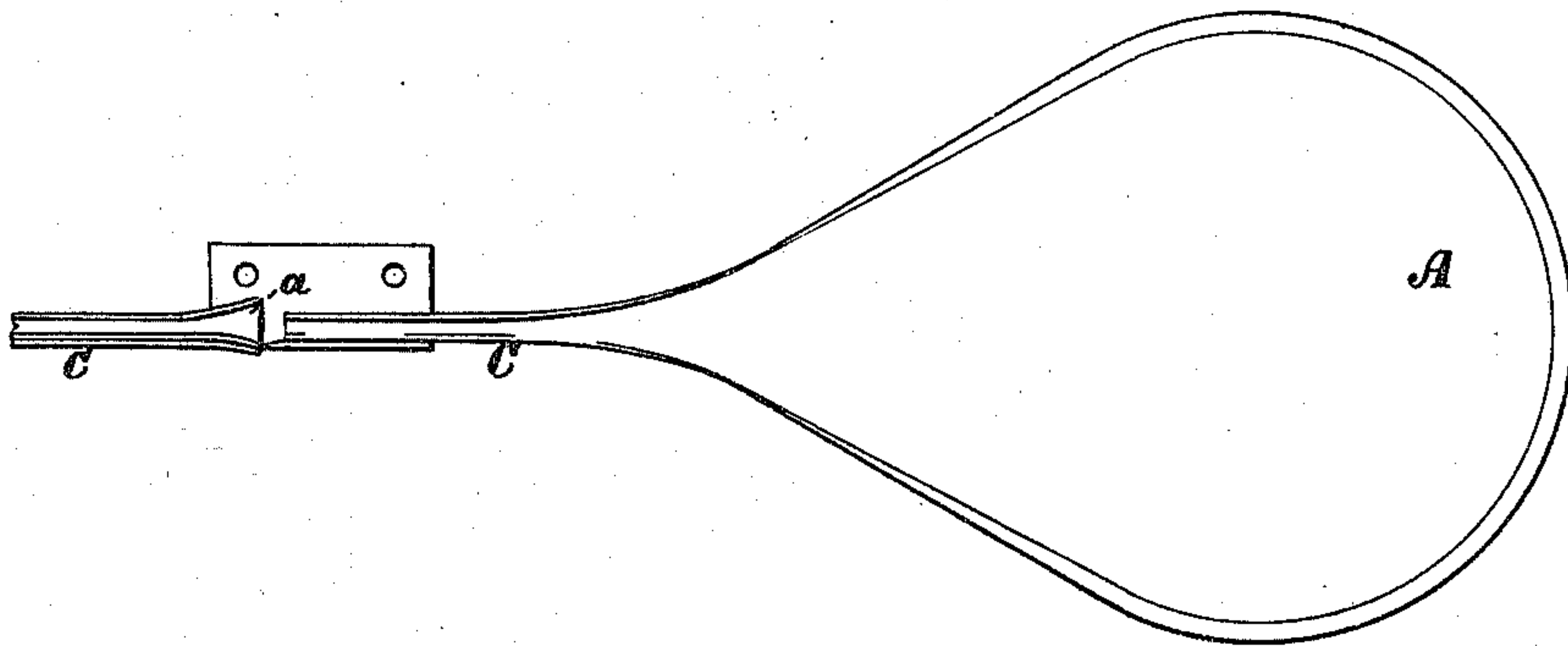
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Fig. 3



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN APPARATUS FOR ARRANGING TYPE FOR TYPE-SETTING MACHINES.

Specification forming part of Letters Patent No. **142,652**, dated September 9, 1873; application filed February 24, 1873.

To all whom it may concern:

Be it known that I, D. BRAINERD RAY, of the city, county, and State of New York, have invented an Improved Apparatus for Arranging Type in Rows for a Type-Setting Machine, of which the following is a specification:

Figure 1 is a plan view of my improved machine. Fig. 2 is a sectional elevation of Fig. 1 taken on the line *xx*; and Fig. 3 is a top view of one of the type-carriers and a hopper, showing a contrivance for shifting the type so as to slide on the edge in case they happen to come out of the hopper on the top of the carrier on their sides.

My invention consists of a new and improved apparatus for arranging type in rows for a type-setting machine. It is designed to facilitate type-setting by machinery.

The construction and operation are as follows: I arrange a series of hoppers or troughs, A, one for each letter and character used in printing, upon a frame, B at a convenient angle, (say forty degrees.) Into these hoppers or troughs the type are distributed by hand, just as they are now, into the boxes of a type-case. The type slide down to the channels or tubes C, some having their notches turned one way and some the opposite way; but the bottom and sides of said hoppers are so shaped at D that the type are all turned up edgewise as they enter the channels, and these are shaped so that they must pass through them on the edge or narrow side.

A patent was granted to me in the year 1862, in which a hopper or trough is described; but that device differed from this one in three very important particulars. The trough described in that patent has flat sides. Now, since the type must be wet when distributed, it was found that they would stick to the sides of the trough unless the trough were placed nearly perpendicular, which, in practice, would be impossible. This defect I remedy by making the sides concave, so that the type only touch at two points, and, instead of sticking, slide freely downward.

Another defect in the trough described in my patent of 1862 is, that the bottom is rounding—that is, the sides do not come together at a sharply-defined angle, thereby allowing

some of the smaller type to slide down upon the broad or flat side, instead of upon the edge, as my plan of operation requires. This defect I remedy by constructing or shaping the bottom of the trough at a sharply-defined angle, suited to the size and thickness of the type, always keeping in view the chief aim, viz., to bring the type upon the edge or narrow side.

Another fatal defect of the trough described in my patent of 1862 is, that if the trough be made deep enough and large enough for practical use, the type, as they fall from the fingers of the operator, are likely to turn over before they reach the bottom of the trough, and slide down into the tubes or channels wrong end foremost. This defect I remedy by bringing up the bottom of the trough at the upper end till it is as high as the sides, or, in other words, by giving to what at first was a plain trough, with flat sides and a deep bottom, a shape resembling the bowl of a spoon. By giving it this shape, the top of the type, as it falls from the fingers of the distributor, will strike as soon as the lower end. This prevents the type from turning and sliding face downward, for the type as it falls will be caught by the raised portion of the upper end of the trough before it has time to reverse its position. As the operator lets go the lower end, the type will fall into proper position and so slide down to the tubes. This is an improvement of vital importance.

[REMARK.—I am aware that a patent has also been granted to another person for the use of a hopper or trough; but my invention does not conflict with this one just alluded to, for the reason that the bottom of that inventor's trough or hopper is so shaped as to cause the type to pass down upon the broad or flat side, whereas my device is designed to cause the type to slide on the narrow side or edge. As that inventor's plan differs from mine throughout, the two devices, though at first apparently similar, are in reality radically different. He seeks to convey the type on its broad or flat side, and it would be fatal to his success should it glide on the narrow side or edge; whereas my plan requires me to bring the type into proper position upon the edge or narrow side, and it would be fatal to my suc-

cess should the type slide down on the broad or flat side. In other words, the very thing which he seeks to accomplish, I seek to avoid. Having different objects in view, we use devices which are different, though they might, at first glance, seem to be similar.]

The receiving tube or channel has two peculiarities. One is, it opens outward vertically a little below the upper end, as at *a*, Fig. 3, so that if from any cause the type should not pass from the hopper into the tube on its edge or narrow side, but should slide upon its flat side upon the upper edges of the tube leading from the hopper, which sometimes happens, the flaring sides of this tube or channel will bring it into the desired position. Another peculiarity is, that it is curved at *E*, so that the lower end is nearly horizontal. This is to facilitate the work of separating those type which have notches turned one way from those which have the notches turned the opposite way, as will be more fully described. A pusher, *F*, caused to move up and down the receiving tube or channel by means of a crank, *G*, is arranged with the said part, as shown. This is designed to feed the type to the separating apparatus, which is designed to separate the type which pass down the tube or channel with the notches turned one way from those turned the other way, so that they will pass into two different channels. The separating apparatus consists of a thin strip of metal, *H*, placed at an angle with the tube or channel, and in such a position that its upper edge will be even with the bottom of the main tube or channel. It is placed a little above the point of connection with the branches *I* and *J*. As the type pass through the main tube or channel, those having the notches turned upward will move straight forward over the edge of the separator into their own channel *I*, while those which have the notches turned downward will, when their notches come in contact with the separator, slide off to one side, and fall into their appropriate channel *J*. The two branches or channels are each twisted, so as to make a quarter of a turn, or thereabout. They are twisted in opposite directions, and convey the type to a type-holder, *K*, underneath.

In the patent granted to me in 1862, before mentioned, a straight tube with a twisted branch is described, in which case the straight tube itself was designed to perform the functions of a type-holder, and the type were conveyed from it to a stick by means of a key. It was found to be useless, practically, because the wet type would adhere to the sides of the straight tube, and would become clogged. They would be liable to clog, also, at the point where the twisted crank re-entered the main tube. This defect would be fatal to the success of the machine.

I remedy these defects by two very important alterations. I do not use the straight tube as a type-holder, but construct a separate holder. I do not cause the branches to re-enter each other; and I avoid the clogging and wedging by twisting both branches, so that the type will (as in the case of the concave hopper before described) touch at only two points. By this arrangement, although wet, or although a particle of sand or dirt should get into the tubes, the type will slide freely downward. By this arrangement I avoid another fatal defect in the invention patented in 1862, viz., the wear upon the face of the type. These type-holders *K* are tubes or troughs just the width of the type, and in depth nearly equal to the type. They are placed nearly horizontal, one under each of the channels or tubes just before described. The type pass from the channels or tubes into these receptacles face upward, and are arranged in rows by a series of pushers, *L*, operating back and forth by means of crank *M*. The cranks *M* and *G* are connected together by rod *N*, so as to be worked by the same means.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A trough or hopper having concave sides, which meet at the bottom at an angle of not more than ninety degrees, to cause the type to slide downward on the narrow edge or side, and having the upper end concave and spoon-shaped, for the purpose of causing the type to pass down into the tubes with the face or letter end up.

2. The type-channel *C*, widened, as shown at *a*, for the purpose of causing any type which by accident may slide down upon the upper edges of the tube upon its broad or flat side to fall into the lower channel and slide down upon its narrow side.

3. The separator consisting of a thin strip of metal, *H*, placed at an angle with the type-channel, in combination with branches, for the purpose specified.

4. The twisted branches *I* and *J*, each having a quarter turn, or thereabout, for the purpose of turning the type, substantially as specified.

5. The combination of the hopper *A* with the type-channel *C*, widened, as shown at *a*, together with the separator *H* and the branches *I* and *J*, all arranged and combined substantially as described, and for the purposes specified.

The above specification of my invention signed by me this 19th day of February, 1873.

D. BRAINERD RAY.

Witnesses:

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