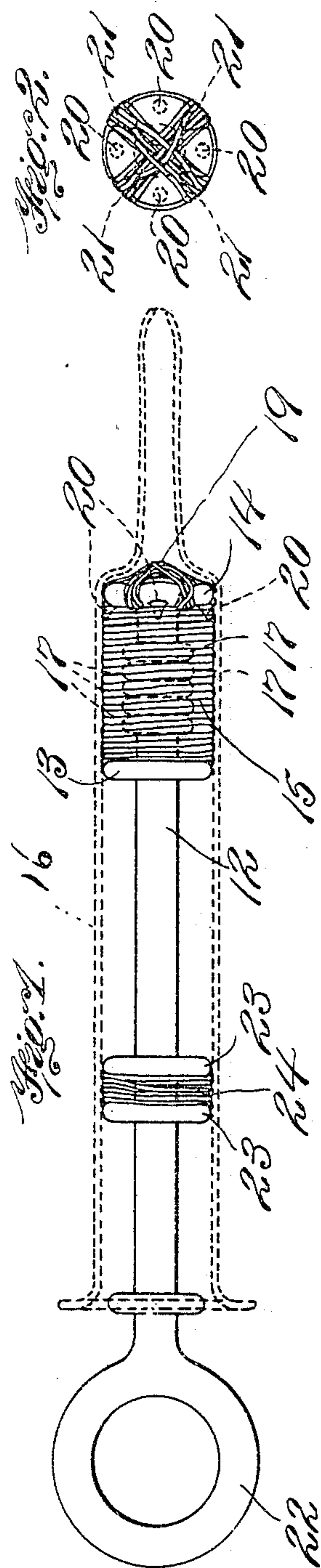


No. 788,059.

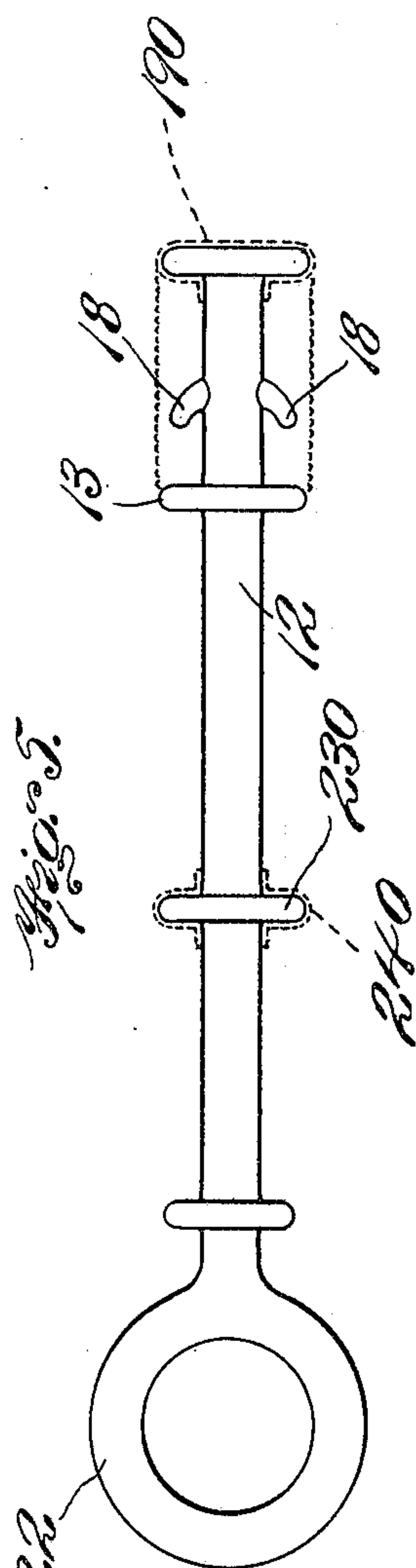
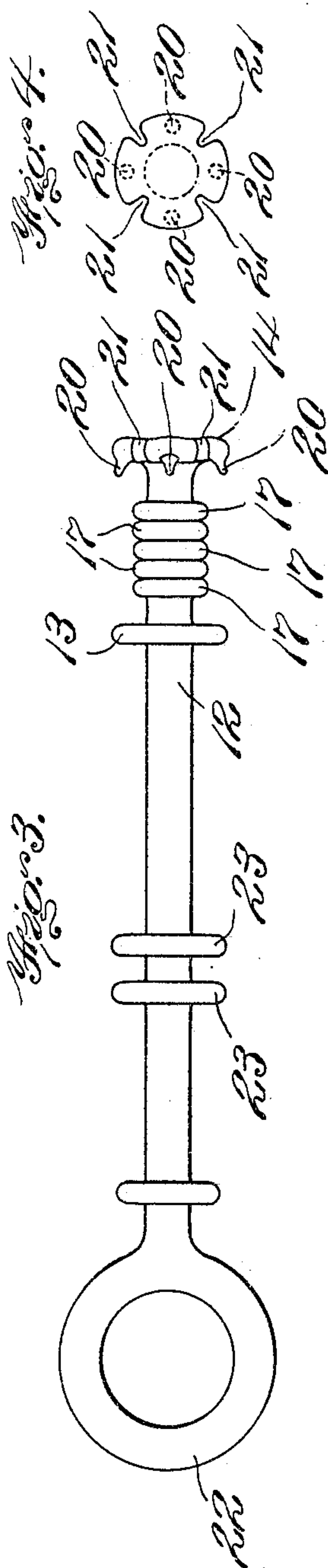
PATENTED APR. 25, 1905.

P. J. McELROY.
SYRINGE.

APPLICATION FILED JUNE 30, 1904.



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UNITED STATES PATENT OFFICE.

PATRICK J. McELROY, OF CAMBRIDGE, MASSACHUSETTS.

SYRINGE.

SPECIFICATION forming part of Letters Patent No. 788,059, dated April 25, 1905.

Application filed June 30, 1904. Serial No. 214,785.

To all whom it may concern:

Be it known that I, PATRICK J. McELROY, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Syringes, of which the following is a specification.

This invention relates particularly to syringes in which the barrel and the piston-rod are composed of glass or other vitreous material, although the invention is not necessarily limited to a syringe composed of vitreous material.

The invention has particular reference to the construction of the piston of a syringe; and the objects of the invention are as follows: first, to provide means for securely engaging the compressible material or packing of the piston-head with the piston-rod in such manner that the packing will not be displaced endwise at any point by its frictional contact with the inner surface of the barrel when the piston is being operated; secondly, to provide the piston with a yielding cushion or buffer at its outer end to cushion the blow when the piston strikes the outer end of the barrel, thus preventing liability of breakage of either the piston or the barrel; thirdly, to provide improved means for steadying the rear portion of the handle-rod by the walls of the barrel, so that the rod will have no tendency to swing laterally while in operation.

To these ends the invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of a piston embodying my invention, the barrel of the syringe being indicated by dotted lines. Fig. 2 represents an elevation of the outer end of the piston shown in Fig. 1. Fig. 3 represents a side elevation showing the body portion of the piston, the compressible packing and the other compressible parts hereinafter referred to being removed. Fig. 4 represents an end view of the piston as shown in Fig. 3. Fig. 5 represents a view similar to Fig. 3, showing certain modifications.

The same reference characters indicate the same parts in all the figures.

In the drawings, 12 represents the rod of a syringe-piston, the same having flanges or abutments 13 14, separated by a space which receives the compressible packing 15 of the piston-head, said packing being preferably composed of fibrous material in the form of a cord or thread wound upon the portion of the piston-rod between the abutments 13 and 14 as thread is wound upon a spool. The packing may, however, be made of rubber or other compressible material and affixed in any suitable way. The periphery of the packing 15 has a diameter slightly exceeding that of the abutments 13 and 14, so that it is in sliding contact with the inner surface of the syringe-barrel 16, while the peripheries of the abutments 13 and 14 are slightly separated from the inner surface of the barrel. The rod 12 is provided between the abutments 13 and 14 with means for engaging the packing 15 and preventing endwise displacement of said packing upon the rod. While the abutments 13 and 14 prevent the packing as a whole from sliding lengthwise upon the rod, they prevent it from being crowded toward one end or the other of the space occupied by the head. The packing necessarily has a tight frictional fit within the barrel, so that when the piston is moved there is a tendency to crowd the packing endwise against one or the other of the abutments 13 and 14, thus causing an enlargement of the head at or near one end and creating increased resistance to the movement of the piston in the barrel. The means employed for preventing this displacement of the packing may be variously modified. In Figs. 1 and 3 I show as the said means a series of peripheral ribs or projections 17, formed on and surrounding the rod 12 between the abutments 13 and 14, the ribs alternating with intervening grooves. The ribs at the ends of the series are preferably separated from the abutments 13 and 14, so that their outer sides form shoulders opposed to the said abutments. The packing conforms closely to all the projections and recesses of the portion of the rod between the abutments 13 and 14 and is therefore securely held or anchored at various points between the abutments in such manner as to prevent

endwise displacement at any point between the abutments.

In Fig. 5 I show the rod provided between the abutments with two oppositely-projecting
 5 projections formed as independent spurs 18, which are embedded in the packing and anchor the central portion of the latter. It is obvious that projections and securing means of various other forms may be adopted without
 10 departing from the spirit of my invention.

19 represents a cushion or buffer located upon the outer side of the outer abutment 14 in position to strike the outer end of the barrel 16 when the piston is moved outwardly.
 15 Said cushion may be composed of any suitable yielding material. As shown in Figs. 1 and 2, the cushion is composed of cords or threads of fibrous material, such as asbestos, engaged with inwardly-projecting spurs 20, formed on
 20 the inner side of the abutment 14, and with notches 21, formed in the periphery of the said abutment, portions of the stretches of the cord extending across the outer face of the abutment and through the said grooves, as indicated in Fig. 2. The cushion is formed by
 25 the intersection of the stretches. In Fig. 5 I show by dotted lines a cushion or buffer 190, which may be formed by securing a sheet of suitable compressible or yielding material to the abutment 14 in any suitable way. It will
 30 be seen that the said end cushion prevents liability of breakage of either the piston or the barrel when the piston is forced outwardly into contact with the outer end of the barrel.

35 The piston-head is located at one end of the rod 12, the opposite end of said rod being provided with a suitable handle 22. The rod must be of such length that the handle will project from the inner end of the barrel when
 40 the head of the piston is at the outer end, as shown in Fig. 1. To support any side strain or pressure that may be exerted on the rod in the operation of the syringe, I provide the rod with a steadying enlargement located be-
 45 tween the head and the handle of the piston and adapted to bear with a sliding fit on the inner surface of the barrel. The said enlargement has a periphery of yielding or compressible material, adapted to slide upon
 50 the inner surface of the barrel without scratching and wearing the latter. In the construction shown in Figs. 1 and 3 the said enlargement is composed of two peripheral flanges 23 23, formed on the rod 12, and an annular
 55 filling 24, located in the space between said

flanges and slightly exceeding the flanges in diameter, the said filling bearing yieldingly upon the inner surface of the barrel. The filling may be composed of the same material as the packing 15 or of any other suitable material. In the construction shown in Fig. 5 the said enlargement is composed of a single flange 230 and a sheet covering 240, of any suitable material, surrounding the periphery of the flange and adapted to bear on the inner surface of the barrel. The barrel 16 is or may be made wholly of glass, and the rod 12 and the various flanges and projections thereon may also be made of glass and preferably all formed as a single piece or part.

I claim—

1. A syringe-piston comprising a rod or stem provided with head-confining abutments, and a compressible packing filling the space between said abutments, the rod being provided between the abutments with means for preventing the endwise displacement of the packing.

2. A syringe-piston comprising a rod or stem provided with head-confining abutments, and with alternating peripheral projections and grooves between said abutments to engage a compressible packing.

3. A syringe-piston comprising a rod having at its outer end a packing abutment provided in its periphery with notches and at its inner side with spurs, and a yielding cushion or buffer composed of a cord or thread engaged with said spurs and notches.

4. A syringe-piston comprising a rod, a piston-head affixed to the rod, and a steadying enlargement affixed to the rod at a distance from the head and provided with a yielding periphery, the said enlargement being of substantially the same diameter as the piston-head and adapted to bear on the interior of the syringe-barrel.

5. A syringe-piston comprising a rod, a piston-head affixed to the rod, and a steadying enlargement composed of rigid flanges located side by side on the rod, and an annular filling of compressible material confined between said flanges, its periphery being formed to bear on the interior of the syringe-barrel.

In testimony whereof I have affixed my signature in presence of two witnesses.

PATRICK J. McELROY.

Witnesses:

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