2 Sheets—Sheet 1.

N. Newman,

Pump Valve.

No. 8,078. Patented May 6, 1851.

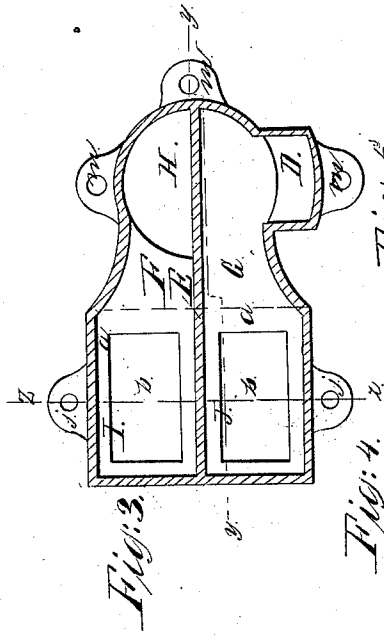

Fig: 3.

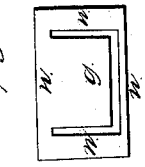

Fig: 5.

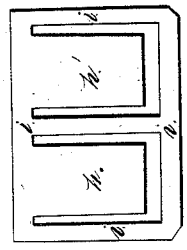

Fig: 4.

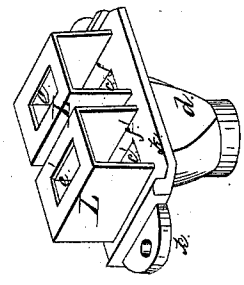

Fig: 2.

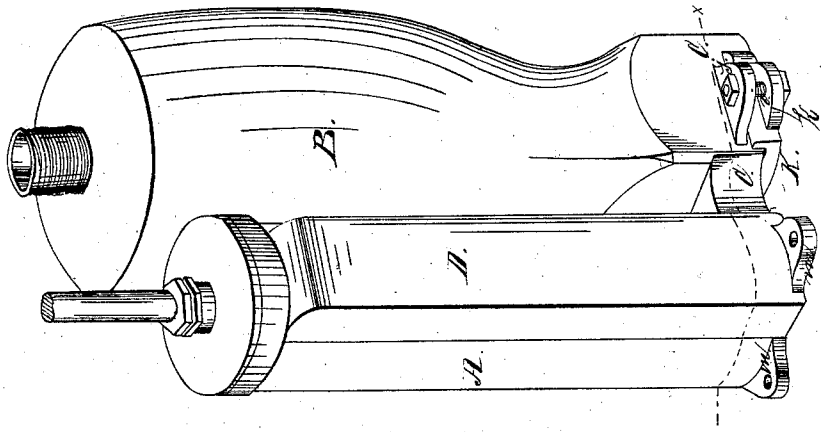

Fig: 1.

2 Sheets-Sheet 2.

N. Newman,

Pump Valve.

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Fig: 7.

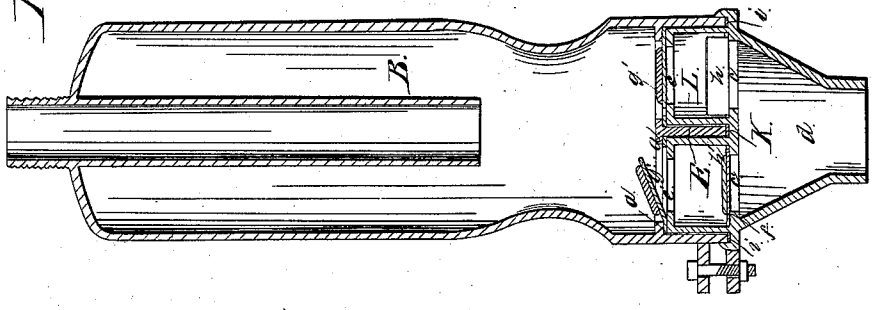
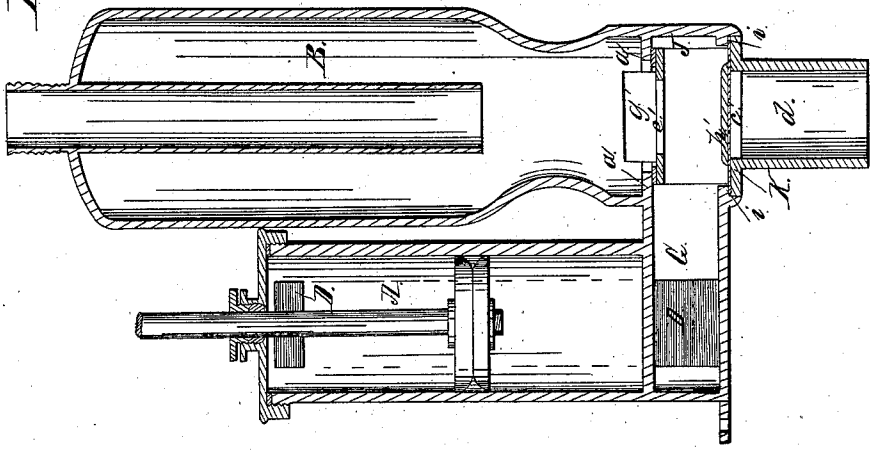


Fig: 6.



UNITED STATES PATENT OFFICE.

NELSON NEWMAN, OF CINCINNATI, OHIO.

PUMP.

Specification of Letters Patent No. 8,078, dated May 6, 1851.

To all whom it may concern:

Be it known that I, NELSON NEWMAN, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Lifting and Forcing Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, which forms part of this specification, and in which—

Figure 1 represents a view in perspective of my improved pump, Fig. 2 is a similar view of the valve seats detached, Fig. 3 is a horizontal section of the pump reversed at the line *x x* of Fig. 1, Figs. 4 and 5 are plans of the valve leathers, Fig. 6 is a vertical section of the pump at the line *y y* of Fig. 3; and Fig. 7 is a similar section at the line *z z* of Fig. 3.

My improvement consists in the particular arrangement and construction of the valve-seats and valves of the pump, which is such that it enables me to cast the barrel, air chamber, valve chest, and water passages in a single piece, and at the same time admits of the ready removal and replacement of the valves when this operation is required.

In the accompanying drawing A is the barrel and B is the air-vessel of the pump; these are both cast fast to a base C which forms the valve chest and water passages. The pump is of the variety termed double-acting and the passage by which the water is conducted to and from the upper side of the piston is cast fast to the barrel as shown at D. The base of the pump is divided into two chambers by a longitudinal partition E. Those portions which are beneath the air-vessels form the valve chests. The remaining portions constitute the passages F, G by means of which the water is conducted to and from the opposite sides of the pump piston. One, F, of these passages communicates directly with the bottom H of the pump barrel, the other communicates with the lower extremity of the side pipe D, which conducts the water to and from the upper extremity of the pump barrel. The valve chests I, J, are open beneath; the water passages F, G, are closed by a bottom plate, which is cast in one piece with the cylinder and air-chamber. The partition *a* which separates the valve chests from the air vessel above them is perforated with two openings *b*, *b*, one in each valve chest, and the annular space which intervenes between the edges of these openings and the sides of the valve chests are of sufficient width to confine the valve leathers upon the valve seats. The open lower extremities of the valve chests are closed by a plate K; this is of the form shown at Fig. 2; it is perforated with two openings *c*, *c'*, which communicate with a chamber, *d*, beneath, to which the suction pipe is secured. This plate is surmonted by two open ended boxes L L, which are sufficiently small to enter easily in the valve chests I, J. The upper faces of these boxes are perforated with openings *e e'* and form the valve seats of the axil valves, while the corresponding portions *f f'* of the face of the bottom plate form the seats of the entry valves. The exit valves are each formed out of a rectangular piece of leather cut, as shown at Fig. 5, of sufficient size to cover the annular space surrounding the opening *b* into the air-vessel. The flap of leather *g* which forms the valve is cut small enough to open freely through the opening. The entry valves are both cut out of the same piece of leather as shown at Fig. 4. This piece is of the form and size of the bottom plate and lays upon it, the flaps *h h'*, which form the two valves, entering the boxes and laying upon the valve seats, while the rim *i* of the leather forms the packing between the lower edges of the valve chest sides and the bottom plate. Lugs or ears *j* are cast upon the base of the pump, and corresponding ears *k* are cast upon the bottom, so that the latter can be securely fastened to the former by bolts *l* as shown at Fig. 1. Ears *m* are also cast fast to the base by means of which the pump is secured to the bed timbers on which it is placed.

In fitting up the pump for use the leather of which the valves is formed is cut to the proper shape, the exit valves (Fig. 5) are placed upon their appropriate valve seats, and the plate of leather of which the entry valves (Fig. 4) are formed is placed upon the bottom plate. The latter is then applied to the base of the pump, the boxes L entering the valve chests. The bolts *l* are now applied and screwed up; as they are tightened, the rim of leather *i* around the entry valves packs the joint between the bottom plate and the lower edges of the sides of the valve chests; while by the same operation the rims of leather *n* around the exit valves

pack the joints between the upper faces of the boxes L and the lower face of the partition plate *a*.

When this pump is to be used the piston is moved alternately up and down in the pump-barrel A by the application of power to the piston rod, either through the intervention of a pump-brake or some other suitable device. As the piston is drawn upward the water moving upward in the suction pipe enters at the valve *h* and passes through the passage F into the pump-barrel A beneath the piston. As the piston is depressed the valve *h* closes, and the water beneath the piston is ejected through the passage F and valve *g* into the air-vessel B; while at the same time, the water from the suction pipe is drawn in at the valve *h'*, through the passage G and side-pipe D, and enters the upper extremity of the pump-barrel above the piston; when the piston is again drawn upward the water above it will be forced out through the side pipe D passage G and valve *g'*, into the air vessel B, while a fresh quantity of water will be drawn in beneath the ascending piston. As therefore the piston is moved alternately up and down the water from the suction pipe is alternately drawn through the entry valves *h h'*, which alternately open upward to allow it to pass into the water passages F G and thence to the pump barrel, whence the water is alternately expelled through the opposite exit valves *g' g* which open upward to allow it to pass into the air vessel. This method of arranging the several parts of a pump enables me to cast the barrel, air-chamber, valve chest, and water passages in a single piece, while at the same time the valves can readily be removed and replaced when this operation becomes necessary. The facility with which a pump of this construction can be molded and cast is a great object as it enables me to manufacture it at a less cost than the double acting pumps in general use.

What I claim as my invention and desire to secure by Letters Patent is—

The combination and arrangement of the valve chest, water passages, pump cylinder and air vessel as herein described, so that the whole can be cast in a single piece and the valves and suction pipe supported and secured in place by another piece also cast in the form herein described whereby the cost of making the pump and its liability to get out of order are both lessened without impairing its efficiency or rendering it more difficult to repair.

NELSON NEWMAN.

Witnesses:
R. C. PHILLIPS,
H. E. SPENCER.