(No Model.)

J. POWELL.

STRAIGHTWAY VALVE.

No. 534,005. Patented Feb. 12, 1895.

FIG. 1.

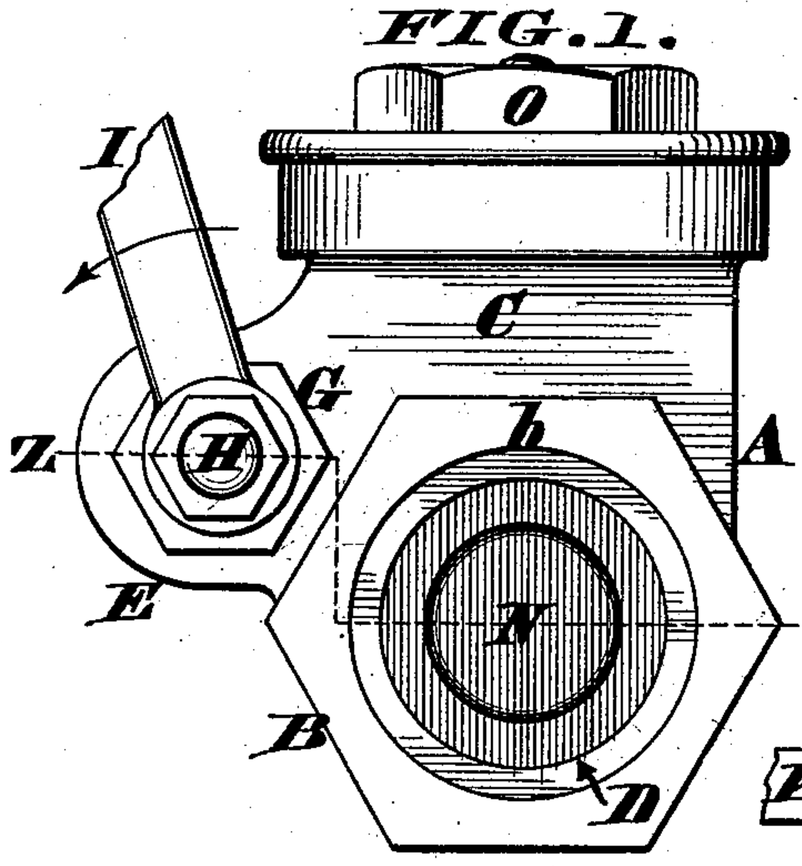


FIG. 2.

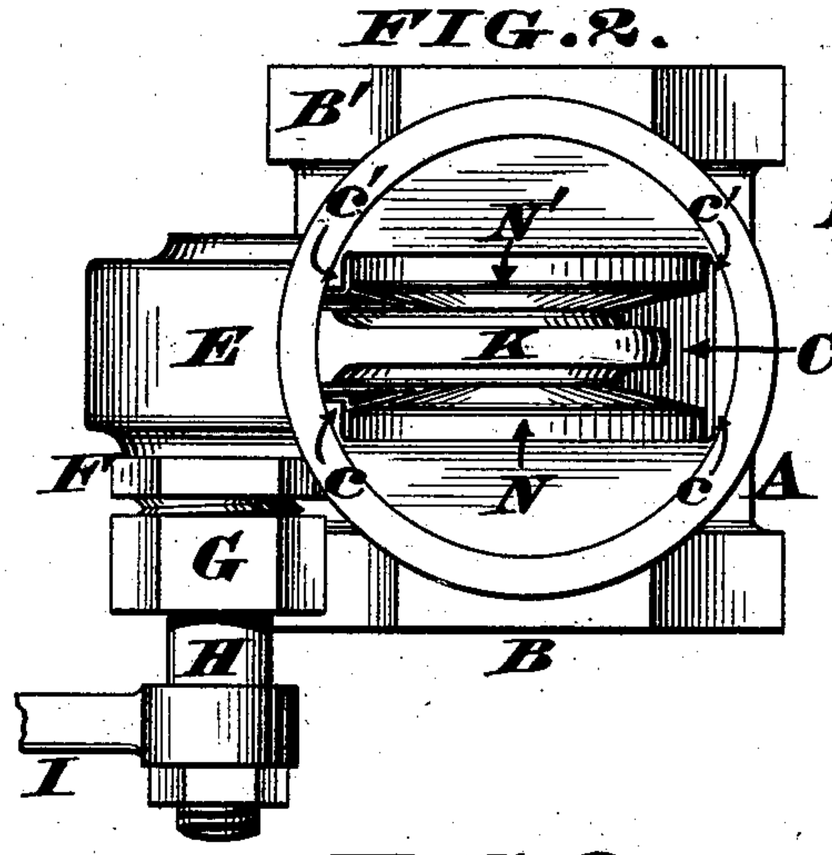


FIG. 3.

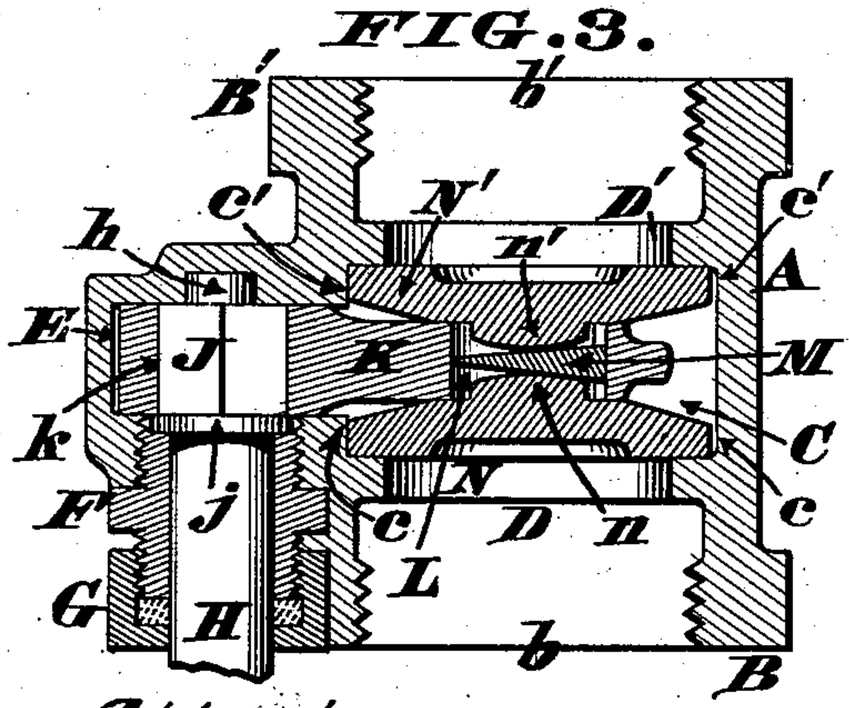


FIG. 8.

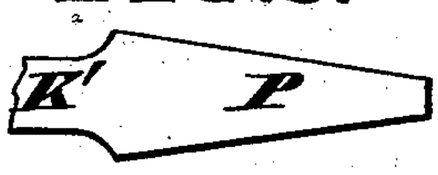


FIG. 4.

FIG. 5.

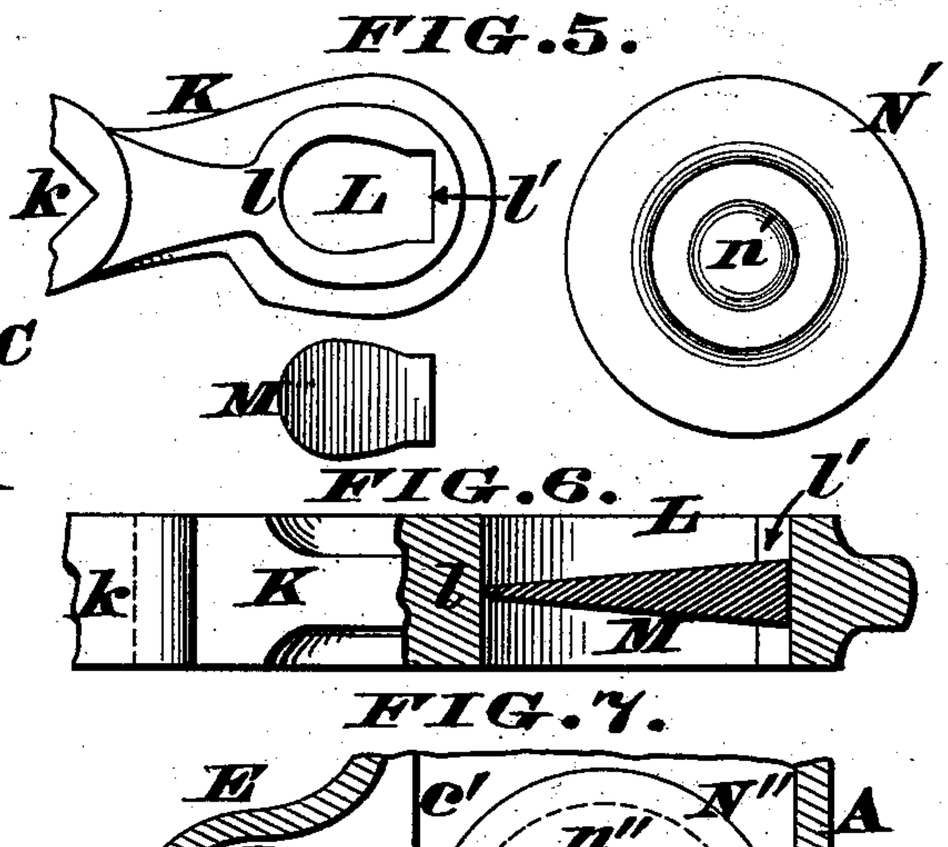


FIG. 6.

FIG. 7.

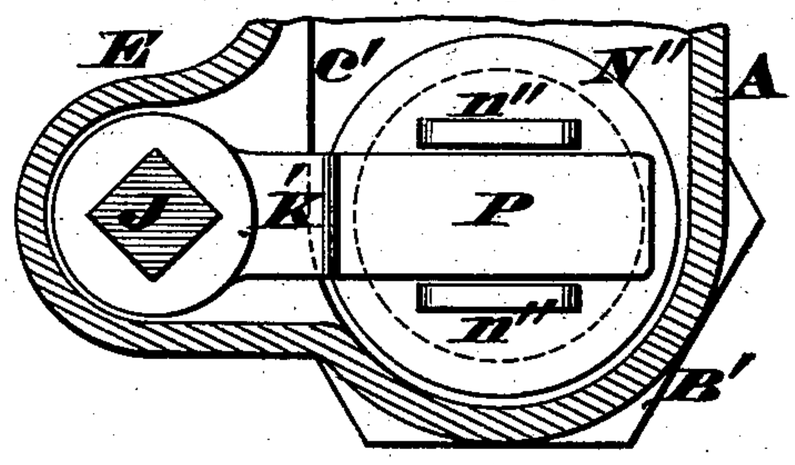
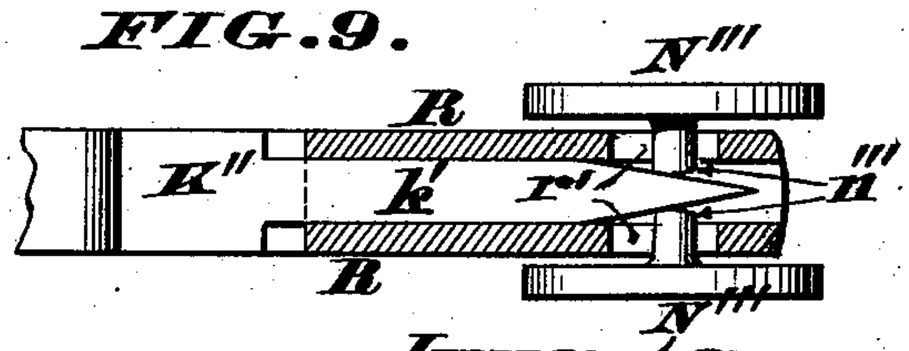


FIG. 9.



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UNITED STATES PATENT OFFICE.

JAMES POWELL, OF AVONDALE, OHIO.

STRAIGHTWAY VALVE.

SPECIFICATION forming part of Letters Patent No. 534,005, dated February 12, 1895.

Application filed June 4, 1894. Serial No. 513,404. (No model.)

To all whom it may concern:

Be it known that I, JAMES POWELL, a citizen of the United States, residing at Avondale, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Straightway Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the annexed drawings, which form part of this specification.

This invention relates to those straightway valves which include a pair of disks loosely coupled to a vibrating lever operated by a shaft having an external-handle; and my improvement comprises a novel combination of devices which compels the disks to be held very firmly against the shell, both in their open and closed positions, and yet permits them to be moved with comparatively little friction when they are swung from either one of these positions to the other. Said combination, in its preferred form, comprises a longitudinally-slotted lever, a wedge-piece, loosely-fitted within this slot, and bosses on the backs of the valve-disks, which bosses bear against said wedge, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a front elevation of my improved straight-way valve in its closed position. Fig. 2 is a plan of the same, the cap of the shell being removed. Fig. 3 is horizontal section of the valve taken at the line Z—Z, of Fig. 1. Fig. 4 is a vertical section of the closed valve taken in the plane of its slotted-lever. Fig. 5 is an elevation of a disk, the wedge-piece, and the slotted-lever separated from each other. Fig. 6 is an enlarged horizontal section through the slotted lever and the wedge-piece inserted therein. Figs. 7, 8 and 9 show modifications of my invention.

The shell or casing A, which may be of any desired size, shape and material, has pipe-ends B, B′, whose passages or channels *b*, *b′*, are in line with each other and communicate with the valve chest C, of said shell; seats D, D′, being formed near the bottom of said chest for the valves-proper to close against. Furthermore, the sides of this chest are so arranged as to serve as duplicate guides *c*, *c′*, that compel the disk-valves to travel in a proper path, in the act of being opened and closed.

Communicating with chest C is a chamber E, whose position above and to one side of the channels *b*, *b′*, is indicated by the dotted lines in Fig. 1, the front of said chamber being provided with a sleeve F, threaded at each end and having a stuffing box or packing nut G engaged with it.

H is a shaft or stem, traversing said chamber, sleeve and nut, and provided at its outer end with a handle I, while its inner end has a spindle *h*, journaled in a bearing at the rear end of the chamber. The shaft is further provided with a square J and collar *j*, the latter being at all times in contact with the inner end of sleeve F as seen in Fig. 3, and said square being engaged with the eye *k*, of a lever K adapted to vibrate up and down within the valve-chest C. Lever K is slotted longitudinally near its free end as at L, which slot is, preferably, of some irregular form, it being usually made with one semi-circular end *l*, and a straight end *l′*, as seen in Fig. 5. This irregular-shaped slot is provided for the purpose of compelling the proper insertion of the wedge-piece M, which is of metal and has its narrow edge presented toward the eye of lever K, as more clearly seen in Fig. 6. This illustration shows that the wedge is relatively narrower than the slot, in order that bosses *n*, *n′*, may enter the latter a limited distance, the bosses being projections from the backs of the disk-valves N, N′, whose outer surfaces are adapted to bear against the seats D, D′.

O is a cap secured upon the shell and having an internal stud *o* capable of adjustment to regulate the upward swing of lever K.

In fitting up my valve, the wedge-piece M is first inserted loosely within the slot L of lever K, and the two disks N, N′, are then applied to the opposite sides of said lever in such a manner as to cause the bosses *n n′* to enter said slot. The parts K, N, N′, are now passed down through the open upper end of the chest C, the pivot end of the lever being housed within the chamber E, after which act, the shaft H is applied. The square J of this shaft is passed through the eye *k*, of the lever, and the spindle *h* caused to enter the bear-

ing at the side of chamber E. Sleeve F is then screwed home, thereby causing its inner end to bear against the collar *j*, and thus prevent longitudinal shifting of the shaft H; but leaving it perfectly free to be turned either to the right or left. Packing nut G is now screwed to the sleeve, handle I attached to the shaft, and after cap O is attached to the shell, the valve is ready for use as soon as proper pipes are engaged with the couplings B, B′, of said shell. Assuming that the valves are down, so as to close both of the channels *b*, *b′*, it is evident the bosses *n*, *n′*, are now in contact with the thickest portion of wedge M, and, on this account, the valves N, N′, are forced very tightly against their respective seat D, D′. Owing to the powerful action of the wedge against the bosses, the disks can not be opened by any possible jarring or vibrations of the engine or other machine to which the valve is applied, but can be moved only by exerting considerable force against the handle I, which must be turned in the direction of the arrow seen in Fig. 1. As the handle is thus forced down, the free end of lever K swings up, which act dislodges the valves from their seats, and when said lever reaches a horizontal position said valves are comparatively loose, because the bosses *n*, *n′*, have now shifted toward the end *l* of the slot, and are no longer in actual contact with the wedging device. During the further elevation of the valves, they roll against the guides *c*, *c′*, of the chest, and after they reach a certain position, the incline M, again gradually comes into action. This wedging action of the incline increases until the lever K strikes the stop *o*, as indicated by dotted lines in Fig. 4, at which moment the thickest portion of said device M wedges against the bosses *n*, *n′*, of the valves. Consequently, said valves are again forced outwardly and caused to bear so firmly against the upper part of the sides of the chest C, as to prevent said disks accidentally falling down and instantly shutting off steam from the engine.

From the above description it is evident my valves, when either opened or closed, are wedged away from each other and firmly held against the seats or chest, but are instantly freed from this wedging action the moment they are slightly shifted from these two extreme positions.

In the modification of my invention, seen in Fig. 7, the valve N″ has on its back a pair of lugs *n″*, *n″*, which engage with a wedge P at the end of lever K′, the shape of said wedge being shown in plan at Fig. 8. In this modification the valve shaft is in the same horizontal plane as the axis of the pipe ends, and the wedging action increases in exact proportion as the incline P, swings above or below said plan.

In the other modification, seen in Fig. 9, the lever K″, has a central tongue *k′*, the end of which acts as a wedge against the bosses *n″*, *n″*, of a pair of disks N″ N‴. These bosses occupy slots *r′*, *r′*, in the sides of a slide or valve-carrier R that travels back and forth along the guide *k′*. This construction, like that seen in the preceding illustration, induces a wedging action by the lever swinging above or below the level of its pivot or shaft.

Finally, in an inferior modification of my invention, a single valve may be used instead of a pair of such devices, in which construction the slotted lever must occupy the entire space between such single valve and the opposite side of the shell, to insure the proper wedging action against said valve.

I claim as my invention—

1. The combination, in a straight-way valve, of a shell having a pair of channels; a chamber provided with a pair of guides and two valve-seats; a vibrating lever whose free end swings within said chamber and is provided with a wedge; and a pair of valves loosely coupled to said lever; the arrangement of these devices being such as to confine said valves to a rectilineal path within said guides when the free end of said lever describes an arc of a circle, and to gradually force said valves away from each other as the lever approaches the terminations of its stroke, substantially as herein set forth.

2. The combination, in a straight-way valve, of a shell having channels *b*, *b′*; a chamber C, provided with guides *c*, *c′*, and valve-seats D, D′; a vibrating-lever K, whose free end swings within said chamber and has a longitudinal-slot L; a detachable wedge M, inserted in said slot, and having its thin end presented toward the axis of said lever; and a pair of valves N, N′, having bosses *n*, *n′*, traversing said slot; the arrangement of these devices being such as to confine said valves to a rectilineal path within said guides *c*, *c′*, when the free end of said lever describes an arc of a circle, and to gradually force said valves away from each other as the lever approaches the terminations of its stroke, at which time the thicker portion of said wedge bears against said bosses, in the manner stated.

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

JAMES POWELL.

Witnesses:
JAMES H. LAYMAN,
FRANK J. DORGER.