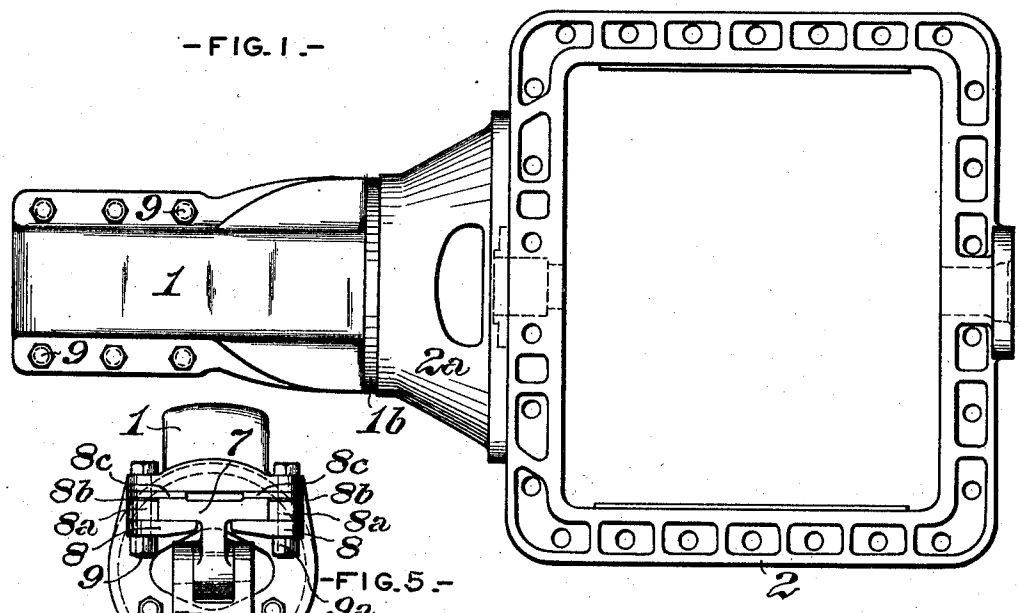
F. J. COLE & W. E. WOODARD.

VALVE STEM GUIDE FOR LOCOMOTIVES.

APPLICATION FILED MAY 3, 1912.

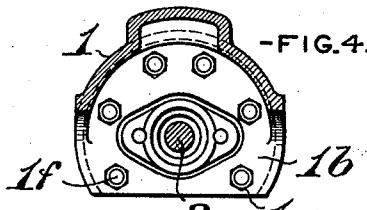
1,036,800. Patented Aug. 27, 1912.

-FIG. 1.-

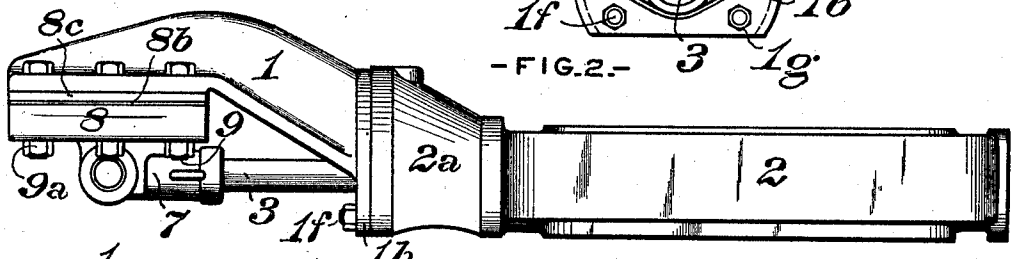


-FIG. 5.-

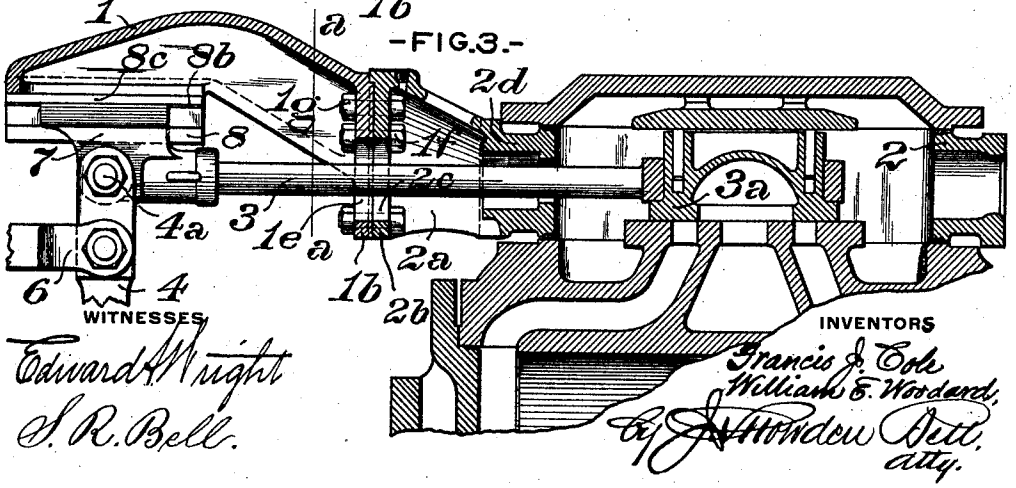
-FIG. 4.-



-FIG. 2.-



-FIG. 3.-



WITNESSES

Edward A. Wright

S. R. Bell.

INVENTORS

Francis J. Cole

William E. Woodard,

by J. Howden Dett,

atty.

UNITED STATES PATENT OFFICE.

FRANCIS J. COLE AND WILLIAM E. WOODARD, OF SCHENECTADY, NEW YORK.

VALVE-STEM GUIDE FOR LOCOMOTIVES.

1,036,800. Specification of Letters Patent. Patented Aug. 27, 1912.

Application filed May 3, 1912. Serial No. 694,821.

To all whom it may concern:

Be it known that we, FRANCIS J. COLE and WILLIAM E. WOODARD, both of Schenectady, in the county of Schenectady and State of New York, have jointly invented a certain new and useful Improvement in Valve-Stem Guides for Locomotives, of which improvement the following is a specification.

The object of our invention is to provide means for guiding the valve stems of locomotive engines fitted with Walschaert or analogous outside valve gear, which shall be of simple and inexpensive construction and easy application and repair, and shall be specially adapted for application in locomotive engines having steam distribution valves of the slide type.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings: Figure 1 is a plan or top view of a locomotive engine steam chest, illustrating an application of our invention; Fig. 2, a side view of the same; Fig. 3, a vertical longitudinal central section through the same and a portion of the cylinder; Fig. 4, a transverse section, on the line *a a* of Fig. 3; and, Fig. 5, an end view of the guide, as seen from the left.

In the ordinary constructions of locomotive valve stem guides, they are supported by being bolted at one end to a bracket attached to the cylinder casting, and at the other by being attached to the guide yoke. This construction is unsatisfactory, in the particulars of requiring careful alinement of the guide bar with the valve stem, and of the presence of offsets in the guide bar, which are frequently necessary to accommodate the adjacent parts. Further, any change in the position of the steam chest, when the latter is a casting separate from the cylinder, will change the alinement of the guides with the valve stem. An improved design of valve stem guide has also been put in service in recent practice, in which the guide is fixed to a support which projects from, and is integral with, the head of the steam chest, thereby obviating the objections above noted to the prior constructions. This, however, while advantageously applicable in locomotives having steam distribution valves of the piston type, in which the steam chests are of comparatively large diameters, is not desirably suited to the steam chests of rectangular section and small height used with slide valves, by reason of the insufficient space afforded on the ends of steam chests of such character for the insertion of the supporting head.

In the practice of our invention, an open bottomed integral extension, 2^a, is cast centrally on the rear side of the steam chest, said extension projecting rearwardly from the valve stem stuffing box, 2^d, and being formed of segmental form in transverse section, and inclined or tapered inwardly from the steam chest to its rear face. The extension, 2^a, is of sufficient length to admit of the ready insertion and removal of a stuffing box gland through the opening in its bottom, and a transverse head, 2^b, having an opening, 2^c, for the passage of the valve stem, 3, extends across its rear end. As indicated by the upper shoulder seen in Fig. 3, the rear side of the head, 2^b, is faced by being turned off under said shoulder, to insure registration with the guide support, 1, hereinafter described, at the same time that the steam chest stuffing box, 2^d, is bored out, and concentrically therewith. A guide support, 1, which is also of segmental transverse section and is provided with a flat head, 1^b, at its front end, in which there is formed an opening, 1^e, for the passage of the valve stem, is secured to the valve chest extension, 2^a, by bolts, 1^f, passing through the head, 1^b, and through the corresponding head, 2^b, of the extension, 2^a, against which it is fitted truly, and nuts, 1^g. The guide support is inclined upwardly from the steam chest extension to its rear end, at and adjacent to which it is flattened on its lower side, for the attachment of guide bars hereinafter described.

The forward end of the valve stem, 3, is connected, in the usual manner, to the distribution valve, 3^a, and a cross head, 7, of T form in transverse section, is secured upon the rear end of the valve stem. A combination lever, 4, the upper end of which is recessed or bifurcated, is coupled by a pin, 4^a, to the downwardly depending central member of the cross head, 7, and a radius bar, 6, extending to an ordinary Walschaert link or a similarly operating member, is coupled to the combination lever below the connection thereof to the cross head. The lower end of the combination lever, 4, is coupled in the usual manner, to a combination link (not shown) which is, in turn, coupled to the piston rod cross head.

The valve stem cross head, 7, is fitted to reciprocate in guides fixed to the lower side of the guide support, 1, at and adjacent to its rear end, said guides comprising a pair of lateral guide bars, 8^a, a pair of lower guide bars, 8, and a pair of upper guide bars, 8^c, these members being all independently detachable and being secured to the support, 1, by bolts, 9, and nuts, 9^a. Wear and lost motion between the cross head and guides may be taken up, as from time to time become necessary or desirable, by detachable liners, 8^b, interposed between the upper and lateral guide bars, different thicknesses of which liners may be used, as the conditions of wear may require.

It will be seen that under the construction above described, the guiding members are firmly connected to the steam chest, and the alinement in proper relation of the guide and valve stem is accurately maintained by the concentric finish of the head, 2^b, and the valve chest stuffing box. The valve stem guide can be readily erected or detached without the loss of time involved in the careful shimming or lining up required with the ordinary construction. The T section form of the cross head enables the combination lever and its connections to be supported properly and without interference with other members of the appliance.

We claim as our invention and desire to secure by Letters Patent:

1. In a guide mechanism for the valve stem of a locomotive outside valve gear, the combination of a steam chest having a stuffing box and an integral extension on its rear side, a guide support abutting against and secured to the rear of the steam chest extension, concentrically with the stuffing box, guide bars fixed to said support, and a cross head fitting between said guide bars and adapted for end connection to a valve stem.

2. In a guide mechanism for the valve stem of a locomotive outside valve gear, the combination of a steam chest having a stuffing box and an integral extension on its rear side, a guide support abutting against and secured to the rear of the steam chest extension, concentrically with the stuffing box, guide bars fixed to said support and a valve stem cross head fitting between said guide bars and having a downwardly depending central member for the attachment of a combination lever.

3. In a guide mechanism for the valve stem of a locomotive outside valve, the combination of a steam chest having a stuffing box and an open bottomed integral extension therefrom on its rear side, said extension being provided with an end head which is perforated for the passage of a valve stem, a guide support of segmental section having a head similar to that of the steam chest extension and connected detachably thereto, concentrically with the stuffing box, guide bars fixed to said support at and adjacent to its rear end, and a cross head fitting between said guide bars and adapted for end connection to a valve stem.

FRANCIS J. COLE.
WILLIAM E. WOODARD.

Witnesses:
ROBERT F. HALL,
FRED C. CLARKE.