

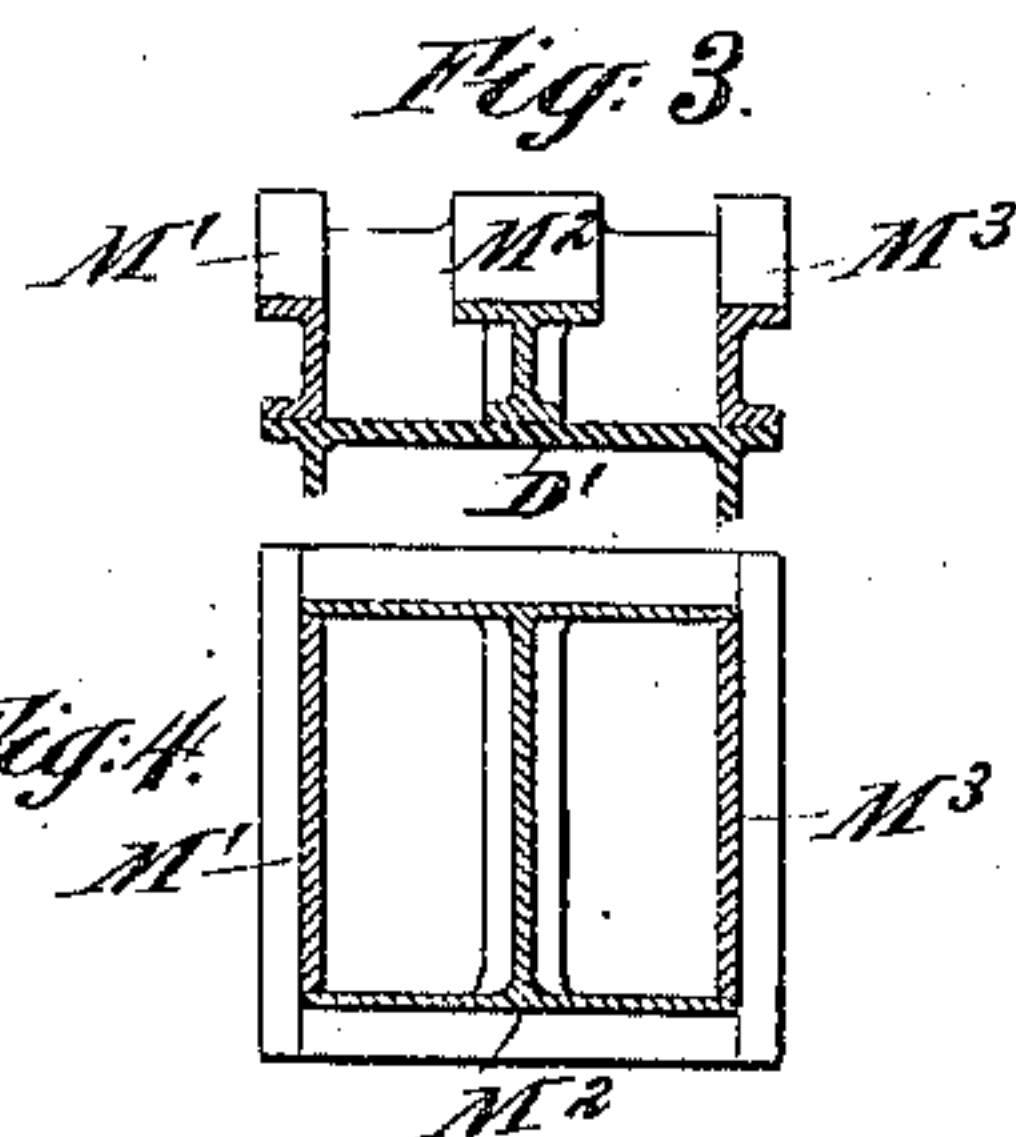
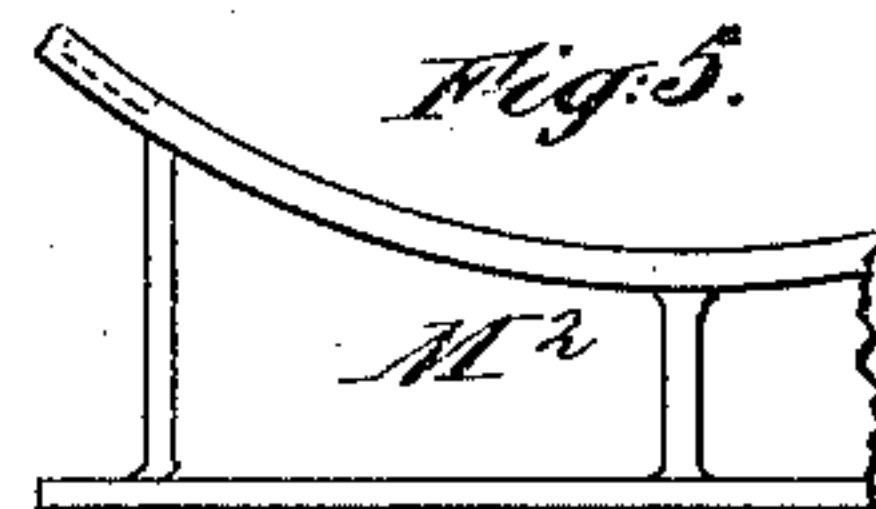
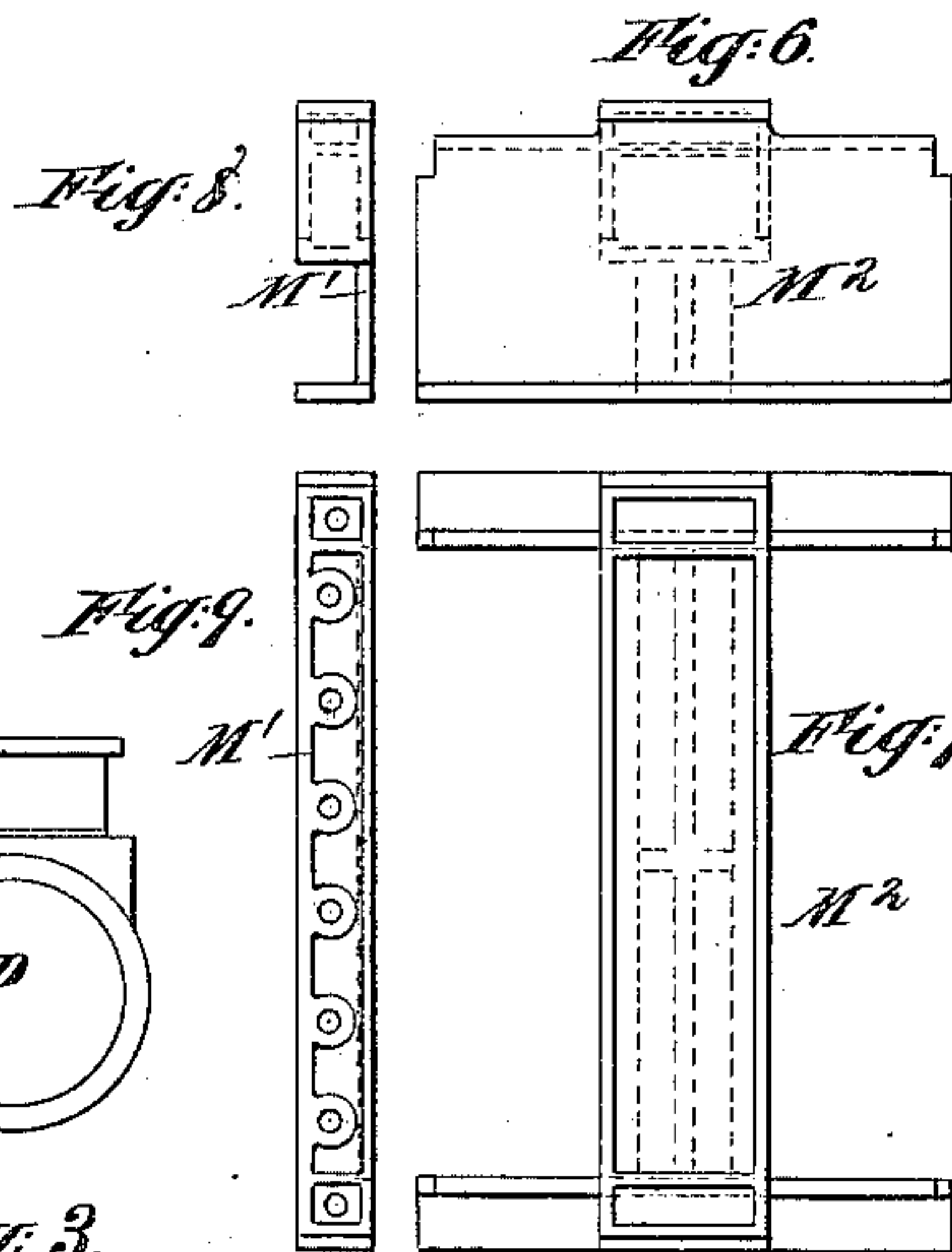
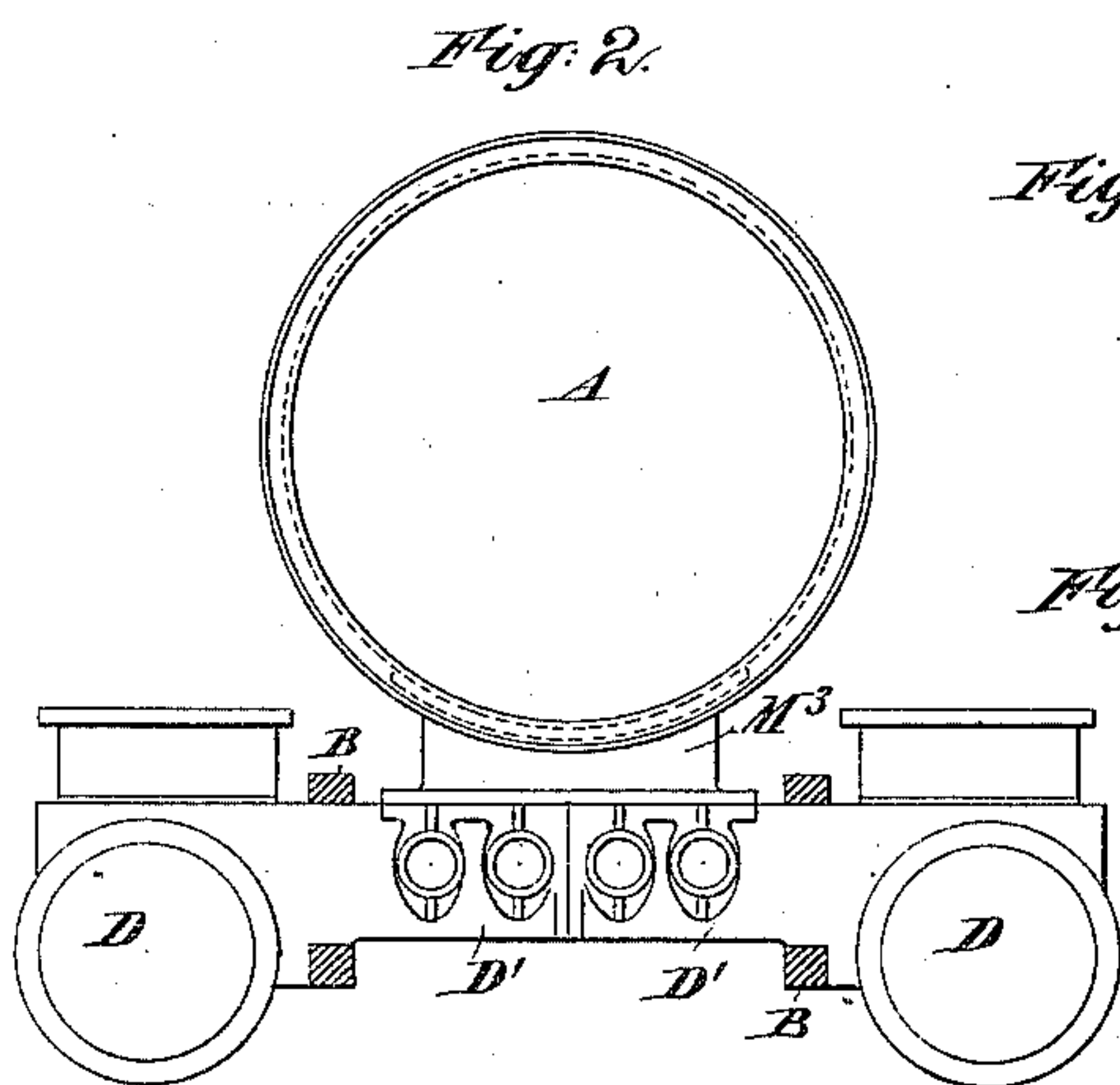
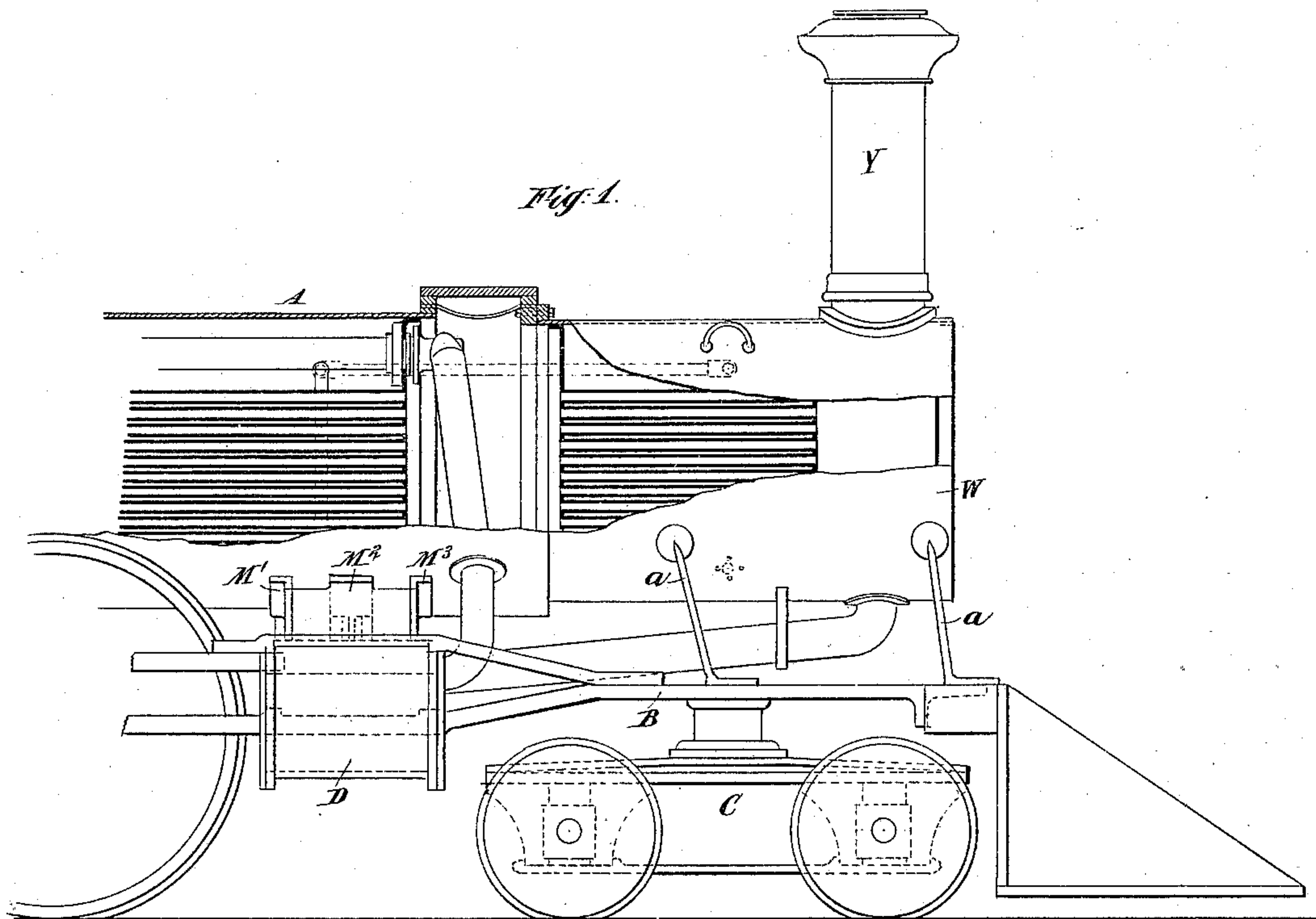
(No Model.)

H. A. LUTTGENS.

LOCOMOTIVE.

No. 307,479.

Patented Nov. 4, 1884.



WITNESSES—  
Charles R. Searle,  
J. E. Renwick.

INVENTOR—  
H. A. Luttgens  
by his attorney  
Thomas D. Peterson



# UNITED STATES PATENT OFFICE.

HENRY A. LUTTGENS, OF PATERSON, NEW JERSEY, ASSIGNOR TO THE  
ROGERS LOCOMOTIVE AND MACHINE WORKS, OF SAME PLACE.

## LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 307,479, dated November 4, 1884.

Application filed March 15, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY A. LUTTGENS, of Paterson, in the county of Passaic, in the State of New Jersey, have invented a certain new and useful Improvement in Locomotives, of which the following is a specification.

The improvement relates to the construction of the forward portion. I have devised a construction whereby a bogie or truck is employed to support the front end at a point farther forward than usual without involving difficulties or even rendering the appearance unsightly. A larger proportion than usual of the weight of the boiler and general structure is devolved upon the driving-wheels at the mid-length and rear. I have also arranged in the extended barrel of the locomotive a tubular device for imparting heat from the escaping gases to the feed-water. This heater lies in the direct path of the gases. It is easily accessible and removable for examination and repairs. I have also devised an improved construction of the firm union necessary between the boiler and the cylinders. It is important to take hold of a considerable length of the boiler-shell. I do this by a series of narrow saddles, so as to allow for the expansion and contraction of one part, while the other below does not partake of such change of dimensions.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is a general side elevation. Fig. 2 is an outline showing the relations of certain parts in cross-section. Fig. 3 is a vertical section through the center of the saddles. Fig. 4 is a corresponding horizontal section. Fig. 5 is a front view of a portion of one of the saddles on a larger scale. Fig. 6 is an end view of the central and principal saddle. Fig. 7 is a plan view thereof. Fig. 8 is an end view, and Fig. 9 is a plan view, of one of the auxiliary saddles.

Similar letters of reference indicate like parts in all the figures where they occur.

A is the forward portion of the boiler proper, having the ordinary features—tubes, steam-

pipes, &c. I have represented it as extending forward somewhat less than usual; but the framing B extends farther forward than usual, and the truck supports the structure farther forward than usual. The long space over the framing B and truck C is occupied by a strong and firmly-bolted extension, W, of the barrel of the boiler, connected to the framing B by suitable braces, *a a*; and carrying the smoke-pipe Y on its forward end, which performs the usual functions of a smoke-box. Its central and rear portions are formed with tubes and serve as a water-heater. A space immediately in rear of this extension W is a mixing-chamber, for the more complete combustion of the gases from the furnace. (Not represented.)

It is necessary to have a firm union and to take hold on a considerable length of the boiler. As I take hold by fastenings which pierce the boiler, and any rocking of their fastenings would cause a leak, I have devised a series of separate saddles,  $M^1 M^2 M^3$ , a little distance apart, each rigidly secured at the upper edge to the boiler and at the lower edge to the cross-bridge D', formed by the central extension of the cylinders D. The cylinders are usually heated by the steam up to nearly the temperature of the boiler. In such cases this part of my invention is not of much importance; but it sometimes happens that the boiler is raised to its full working temperature before any steam is let into the cylinders, in which case the cylinders remain nearly cold. Sometimes, on the other hand, after working and raising the temperature of all the parts, the bottom of the boiler may be cooled by active pumping in of cold water, while the cylinders remain hot. In either case my separate saddles can spring apart at the top and bottom and avoid mischief.

Various modifications in the forms and proportions may be made by any good mechanic without departing from the principle or sacrificing the advantages of the invention; but I esteem it important that the cylinders be placed about in the position shown, which is the usual position of the cylinders in American locomotives—that is to say, fastened to the boiler immediately in rear of the smoke-box,



or else to the smoke-box at a point immediately forward of the ordinary smoke-box or flue-sheet.

Some of the advantages due to the invention may be separately enumerated, as follows: First, by reason of the fact that the truck C is far forward, I throw a larger proportion of the weight of the boiler and entire structure upon the driving-wheels, and thus increase their adhesion. By reason of the position of the cylinders in rear of the truck, I shorten the connections, and further relieve the truck and further load the driving-wheels, and by reason of the extension W of the boiler-front I give a graceful appearance and very strongly brace the extended framing. Second, by reason of the fact that the saddles  $M^1 M^2 M^3$  are in three separate castings, with a little space between each and the next, it follows that I distribute the support along a considerable length. Each saddle may be riveted with absolute tightness to the boiler above, and bolted solidly to the cylinder-arms D' below, and the difference, often very

considerable, in the expansion by heat is allowed for by the springing of the saddles, allowing their upper edges to approach and separate, while the lower edges are at a fixed distance apart, or approach and separate to a less extent.

I claim as my invention—

1. In a locomotive, the truck C, cylinder D, and the extension W of the boiler-front, combined and arranged as and for the purpose herein specified.

2. In a locomotive having the cross-support or saddle under the boiler proper, the duplicate or divided saddles, taking hold of the boiler along two or more transverse lines, arranged to yield elastically, to allow for expansion and contraction, all substantially as herein specified.

HENRY A. LUTTGENS.

Witnesses:

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