



A.D. 1845 N° 10,990.

S P E C I F I C A T I O N

OF

ROBERT WILLIAM THOMSON.

CARRIAGE WHEELS.

LONDON:

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,

PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY :

PUBLISHED AT THE GREAT SEAL PATENT OFFICE,

25, SOUTHAMPTON BUILDINGS, HOLBORN.

Price 1s.

1857.



A.D. 1845 N° 10,990.

Carriage Wheels.

THOMSON'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, ROBERT WILLIAM THOMSON, of Adam Street, Adelphi, in the County of Middlesex Civil Engineer, send greeting.

WHEREAS Her present most Excellent Majesty Queen Victoria, by Her
5 Royal Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Tenth day of December, in the ninth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Robert William Thomsen, my eñors, adñors, and assigns, Her especial licence, full power, sole privilege and authority, that I, the said Robert
10 William Thomsen, my eñors, adñors, and assigns, or such others as I, the said Robert William Thomsen, my eñors, adñors, or assigns, should at any time agree with, and no others, from time to time and at all times during the term of years therein expressed, should and lawfully might make, use exercise, and vend, within England, Wales, and the Town of Berwick-upon-
15 Tweed, my Invention of "**AN IMPROVEMENT IN CARRIAGE WHEELS, WHICH IS ALSO APPLICABLE TO OTHER ROLLING BODIES ;**" in which said Letters Patent is contained a proviso that I, the said Robert William Thomsen, shall cause a particular description of the nature of my said Invention, and in what manner

Thomson's Improvements in Carriage Wheels.

the same is to be performed, to be inrolled in Her said Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said in part recited Letters Patent, as in and by the same, reference being thereunto had, will more fully and at large appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said 5 Robert William Thomsen, do hereby declare that the nature of my said Invention, and in what manner the same is to be performed, are fully described in and by the present Specification thereof, reference being had to the Drawings hereunto annexed (that is to say):—

The nature of my said Invention consists in the application of elastic bear- 10 ings round the tires of the wheels of carriages, for the purpose of lessening the power required to draw the carriages, rendering their motion easier, and diminishing the noise they make when in motion. I prefer employing for the purpose a hollow belt composed of some air and water tight material, such as caoutchouc or gutta percha, and inflating it with air, whereby the 15 wheels will in every part of their revolution present a cushion of air to the ground or rail or track on which they run.

Figure 1 is a side view of a wheel of this description, shewn partly in section. The tire and felly T, T, are made much broader than usual, and project considerably at both sides beyond the supporting spokes, as shewn 20 at T, T, in the cross section of the wheel given in Figure II. The elastic belt is made as follows:—A number of folds of canvas, saturated and covered on both sides with india rubber or gutta percha in a state of solution, are laid one upon the other, and each fold connected to the one immediately below it by a solution of india rubber or gutta percha, or other suitable cement. The 25 belts thus formed is then sulphurised by immersion in melted sulphur or exposure to the fumes of burning sulphur, which renders it more pliable and prevents it getting stiff on exposure to cold; or the belt may be made of a single thickness of india rubber or gutta percha, in a sheet state and sulphurized, as aforesaid, and then enclosed in a canvas cover. A strong outer 30 casing D, D (Figures 1 and II.), in which to hold the elastic belt, is then built up (so to speak) around the tire by rivetting together a series of circular segments of leather and bolting them to the tire, in the manner shewn in Figure 2. The segments at two of their edges *a, a*, Figure 2, are made to overlap each other, as shewn, and then secured in their place by passing 35 bolts G, G (Figure II.) through the tire and felly, and making them fast by nuts *g, g* (Figure II.) The elastic belt (C), Figure II., is then layed upon the portion of the segments D, D, Figure II., thus made fast to the tire and secured

Thomson's Improvements in Carriage Wheels.

in its place by bringing the two remaining and as yet unjoined edges *b, b*, Figure II., of the segments together over the casing, and connecting them together by rivets F, F (Figure II.) A pipe P, Figure 1, through which to inflate the elastic belt with air, is passed at one place through the tire of the
5 wheel, and fitted with an air-tight screw cap. I prefer distending the elastic belt with air, as being more suitable than anything else for the purpose, but they may be distended with various solid substances of an elastic quality, as for instance, metallic springs, sulphurised pieces of caoutchouc or gutta percha, or horse hair, or sponge. If the elastic belt were first stuffed with horse hair
10 or sponge, or other elastic materials, and then inflated by blowing in air to a high degree of tension, the belt would be less liable to be cut by concussion between the tire of the wheel and the roadway. Instead also of the elastic belt being made in either of the modes aforesaid, it might be formed of a number of separate tubes, of smaller dimensions, clustered together and
15 enclosed within a leather cover (D). A wheel with a belt constructed in this manner is shewn in Figures III. and IV., the former being a side view partly in section, and the latter a cross section. The tubes are nine in number, and each of length sufficient to go round the wheel. They are represented as tied at the ends, but, for greater convenience of inflation, may be closed by screw
20 caps at one end; the whole are enclosed in a leather cover D. If the three tubes which are shewn in the cross section, Figure IV., as coming next the tire, were filled with air more highly compressed than that contained in the tubes which come in contact with the ground, this would serve to graduate the resiliency of the belt, in a manner highly favorable to the efficiency of its
25 action. Any undue displacement of the air at the bearing points of the wheel may be prevented by tying the tubes across at distances of two or three feet apart, so that each tube shall be divided into a number of separate air-tight compartments. Or, instead of any of the preceding modes of construction, the belt may be formed of separate and distinct sections, as shewn in Figures V,
30 and VI., each section having its own air pipe (P), in which case the range of expansion and contraction being limited by the extent of the compartments, the belt must necessarily offer at each point of contact with the ground a greater degree of resistance to compression; and in some cases where, from the nature of the roadway, frequent concussions are likely to take place, a flat
35 strap or band of sulphurized caoutchouc or gutta percha, or other suitable elastic substance, of the width of the tire, and about half an inch in thickness, might be interposed between the tire of the wheel and the elastic belt, so as to render it less liable to rupture in the event of its being jammed between the

Thomson's Improvements in Carriage Wheels.

roadway and the tire. Where the leather cover of the elastic belt is likely to be exposed to much tear and wear, I propose to use a belt of the description shewn on the cross section, Fig. VI. Here one of the pieces D¹ is secured to the tire of the wheel by bolts or screws, and it is bent round and sewed or rivetted to the other piece D². The edges of D¹ overlap the edges of D², 5 and the outer casing E is secured to those edges by strong leather thongs. This arrangement will permit of the ready removal of the outer casing (E) when worn, and the substitution of a new casing, without disturbing the elastic belt or its attachment to the wheel. And in all cases the outer casing (D or E) may be protected from wear by covering the outer surface with flat-headed 10 metal rivets secured on the inside with small washers. For common passenger carriages the elastic belt will require to be about four or five inches in diameter, and to be inflated to such an extent as to keep the tire of the wheel two and a half or three inches from the ground, a distance which, it is presumed, will be found sufficient to admit of the wheel passing over any stones 15 or other matters projecting beyond the general level of any ordinary turnpike road without the solid tire coming in contact with them. In carriages to which these elastic belts are applied the springs now in use may be dispensed with. In waggons for the carriage of goods the belt ought to be made of stronger materials and of larger diameter than in the case of passenger car- 20 riages, and the outer leather cover should be protected by flat-headed metal rivets secured by small washers, as aforesaid. Wheels with elastic belts, such as I have described, may be used with great advantage on timber railways, especially if the modification represented in Figures VII. and VIII. are adopted. The wheels in this case might be of the common form, except they 25 should have a greater width of tire given them, and be without flanges. The carriages are proposed to be kept on the rails by guide wheels (K, K,) working on a shaft L, secured by stays to the carriages, and acting on a raised rail (M) laid between the lines of rails on which the bearing wheels run. The rails (R, R,) are to be made of longitudinal beams of timber, say, of twelve 30 inches broad and six inches deep across; ties of timber (T, T,) are to connect the two longitudinal rails together, and to these cross ties the longitudinal rail on which the guide wheels act is to be fixed. I prefer employing guide wheels to attaching flanges to the bearing wheels, but the latter also may be used. To increase the bite of the driving wheels of the locomotive 35 I insert in the outer cover of the elastic belt a large number of rivets with sharp conical heads.

The Drawing, Figure VIII., shews a side view of a pair of railway wheels

Thomson's Improvements in Carriage Wheels.

on this plan, for running on timber rails, and Figure VII. a cross section and end elevation of the same. The elastic belts are also peculiarly applicable to carriages propelled by steam on common roads. The comparatively small amount of power required to propel carriages, the wheels of which are fitted
5 with these belts, the steadiness of their motion, the absence of all jolting and consequent security of the machinery from injury, the small damage the carriages will do to roads, the absence of nearly all noise, the high speed that may safely be attained, and the great gentleness of the motion, will, I think, enable steam carriages to be run on common roads with great advantage
10 both for carrying passengers and goods.

Among many minor applications which suggest themselves I may mention the great applicability of these elastic bearings for bath chairs, rocking chairs, and other like articles, used commonly either in pleasure grounds or within doors. In the common rocking chair a rolling motion is obtained by resting
15 the legs of the chair on two circular segments. In applying my elastic bearings to this chair I propose to make the circular segments on which the chair rolls about three inches wide on their bearing surfaces, and to secure to these segments an elastic tube of about two inches diameter, so as to interpose the tube between the segments and the floor, so that the chair would roll on
20 and be supported by the elastic tube. I propose further to apply the elastic bearings to rollers for the removal of heavy bodies. Such rollers would be used in the same way that wood or iron rollers are now commonly used, that is, by being placed below the body which is to be moved. The advantage which rollers with elastic bearings would have over hard and metallic rollers
25 are, that a large number of them may be made to bear equally at the same time, even although the ways on which the body is being moved are not quite even.

And having now described the nature of my said Invention, and in what manner the same is to be performed, I declare that what I claim is,—

30 First, the application of elastic bearings round the tire of carriage wheels, as before described; and,

Secondly, the application of similar elastic bearings to the surfaces of other rolling bodies, as before exemplified.

In witness whereof, I, the said Robert William Thomson, have here-
35 unto set my hand and seal, this Tenth day of June, in the year of our Lord One thousand eight hundred and forty-six.

R. W. (L.S.) THOMSON.

Thomson's Improvements in Carriage Wheels.

HORNEL.
AND BE IT REMEMBERED, that on the Tenth day of June, in the year of our Lord 1846, the aforesaid Robert William Thomson came before our said Lady the Queen in Her Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained and specified, in form above written. And also the Specification aforesaid was stamped 5 according to the tenor of the Statute made for that purpose.

Enrolled the Tenth day of June, in the year of our Lord One thousand eight hundred and forty-six.

LONDON:

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1857,

A.D. 1845 DEC 10. N^o 10,990
THOMSON'S SPECIFICATION.

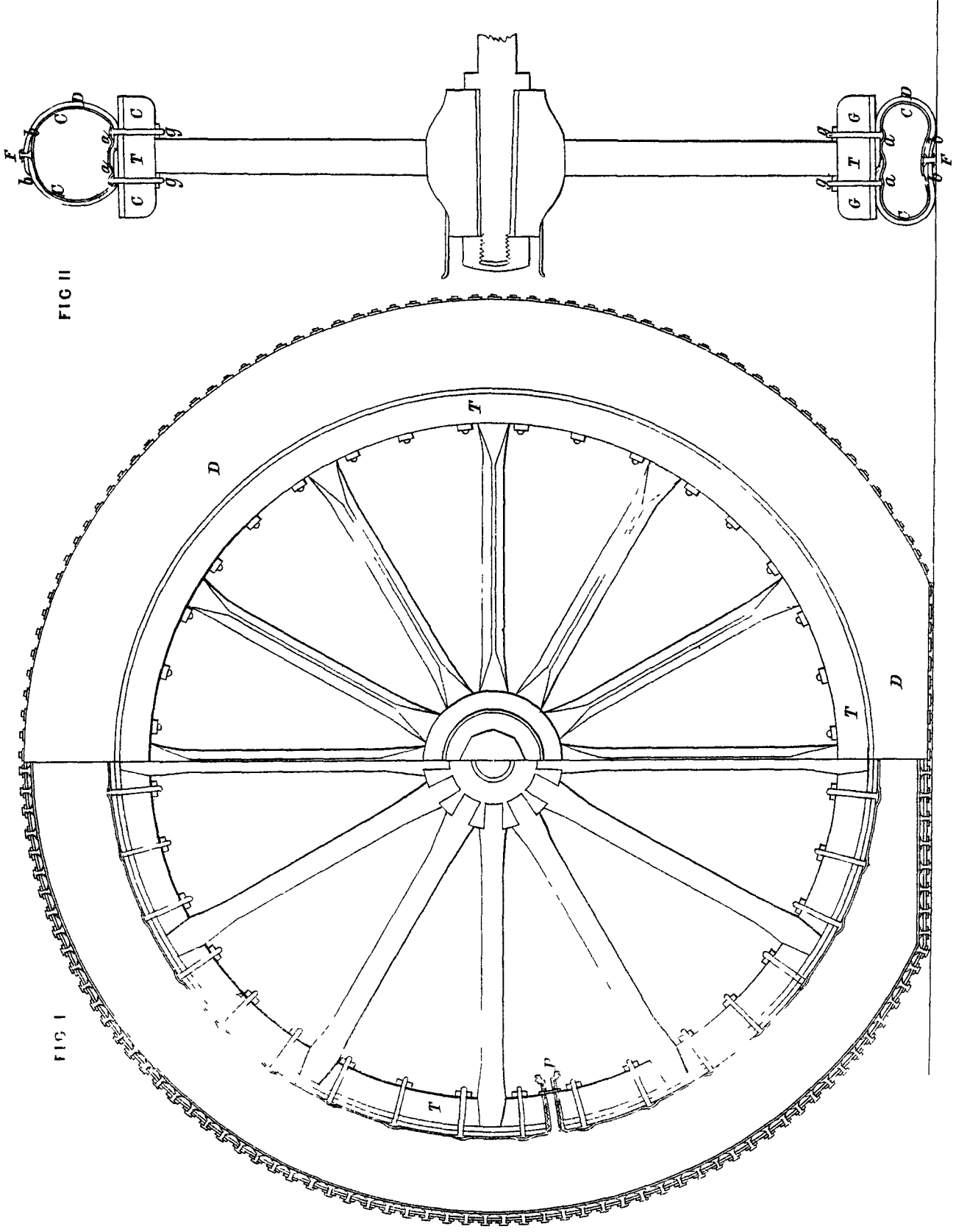


FIG I

FIG II

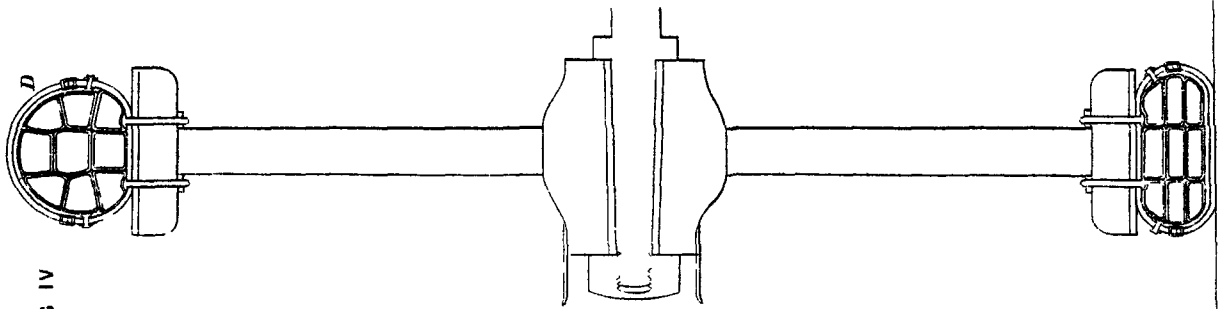


FIG IV

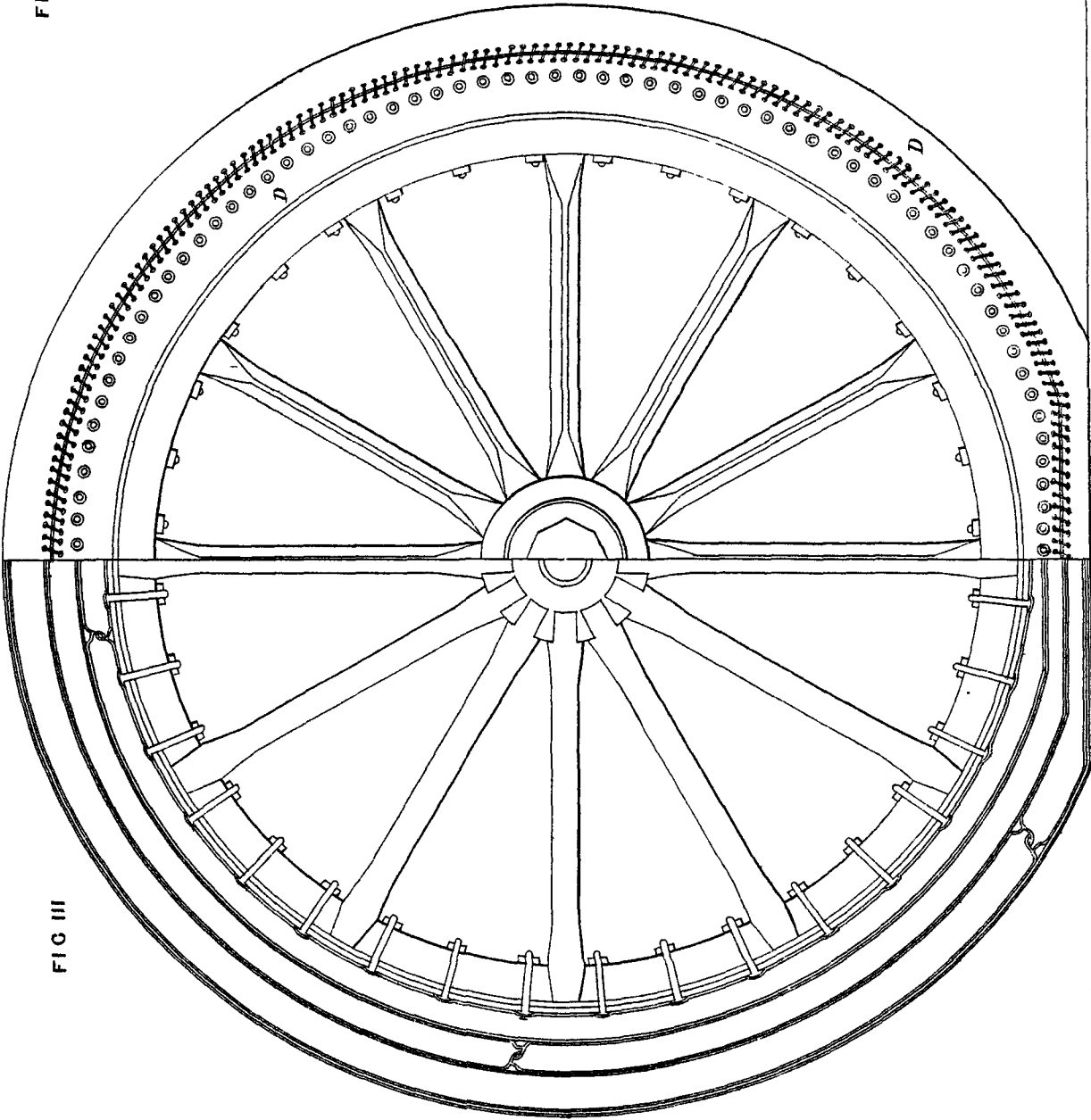


FIG III

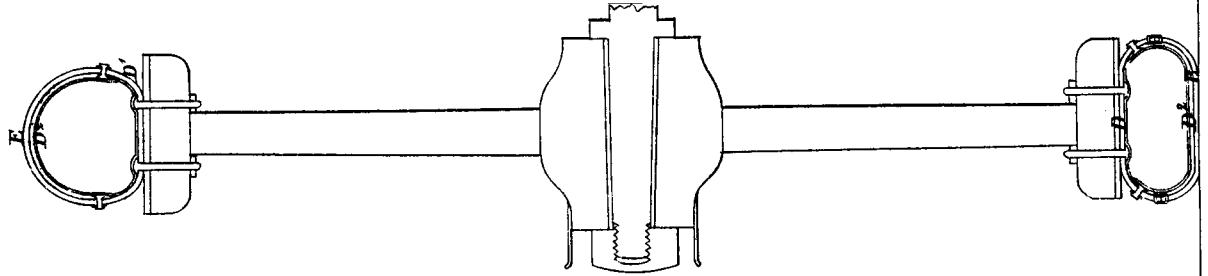


FIG VI

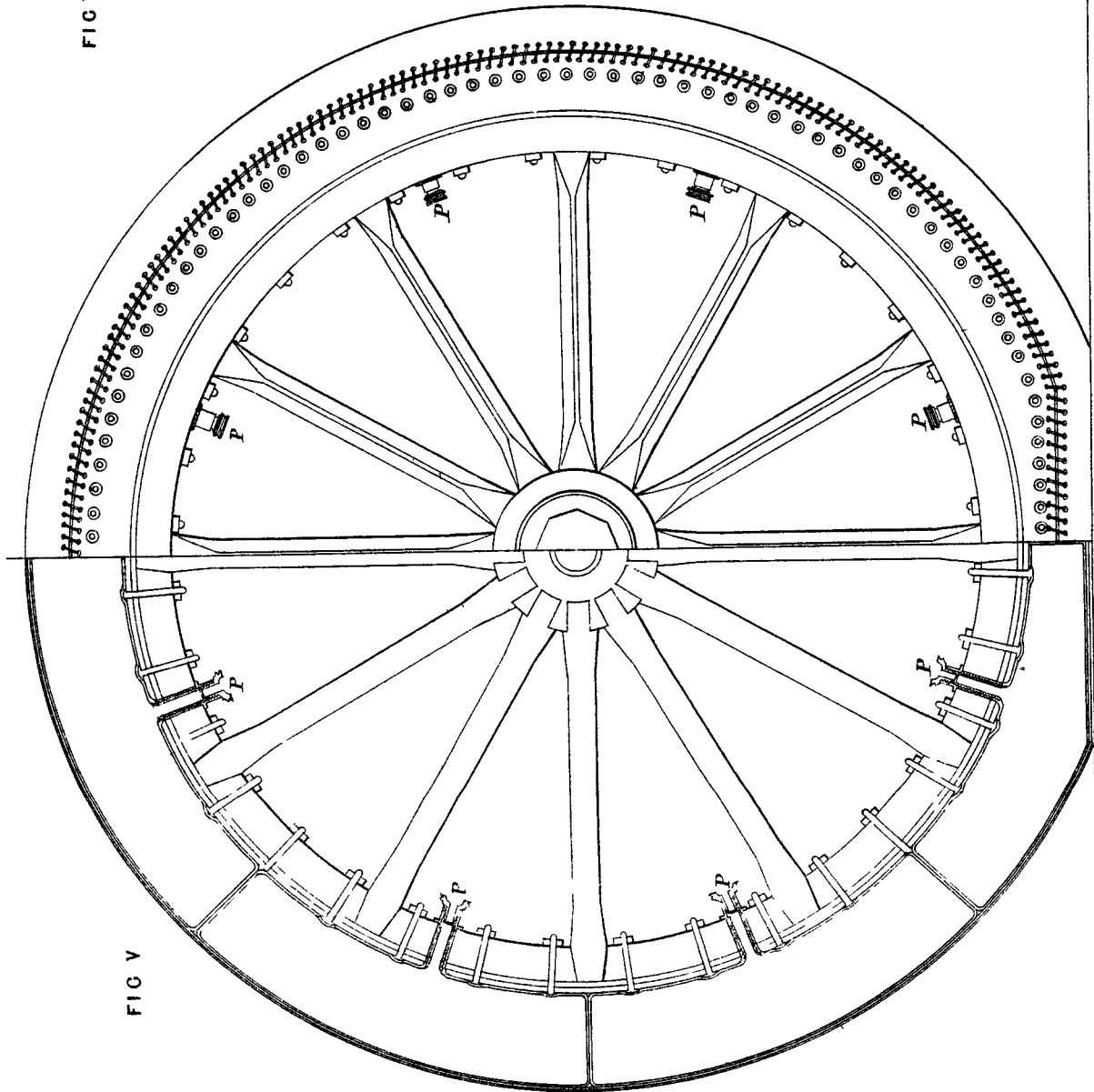
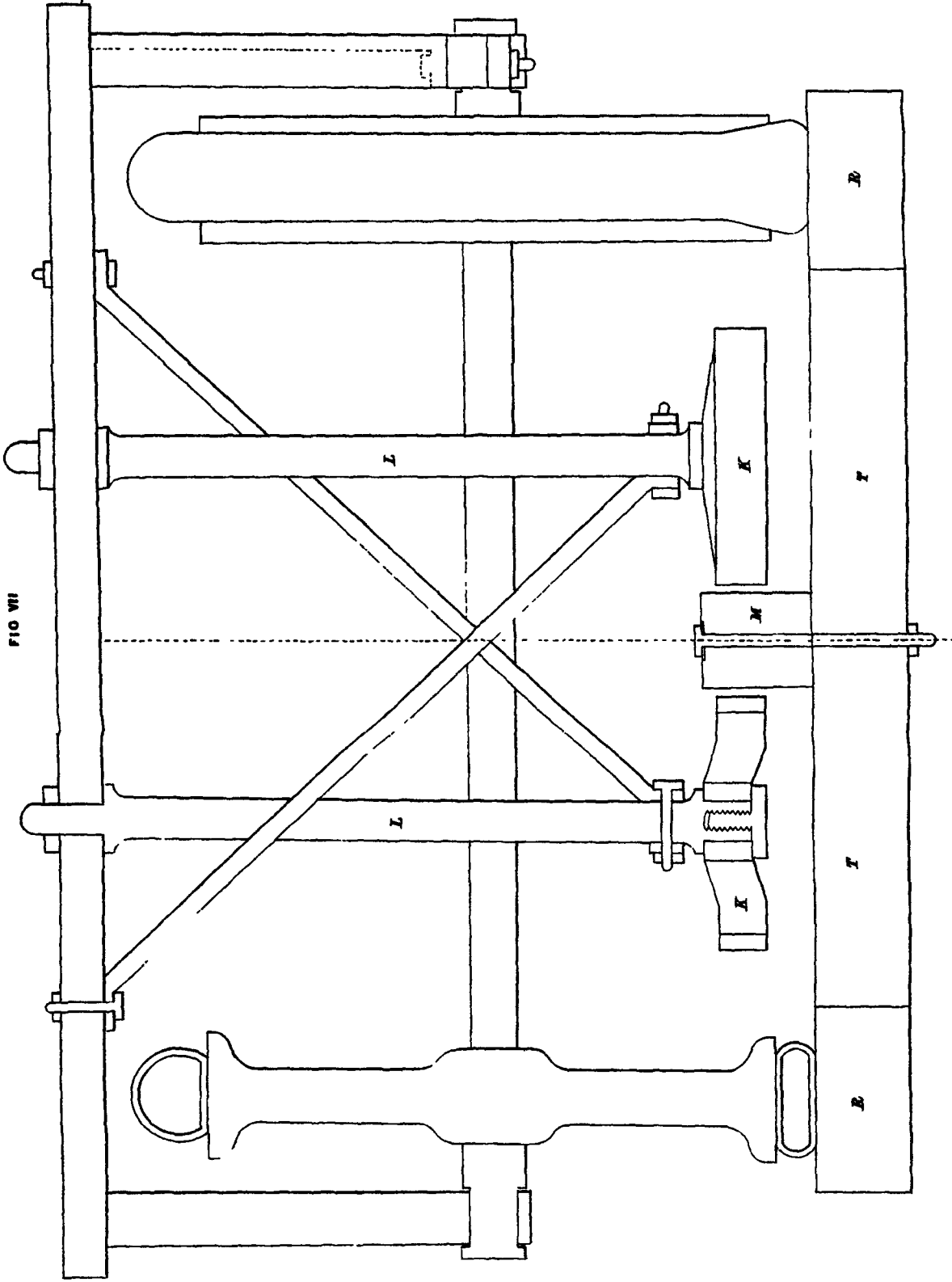


FIG V

FIG VII



The unrolled drawing is not colored.

LINCOLN - ENGINEERING CO.

