

(No Model.)

3 Sheets—Sheet 1.

J. M. GOODWIN.
TRACK LAYING DEVICE.

No. 279,092.

Patented June 5, 1883.

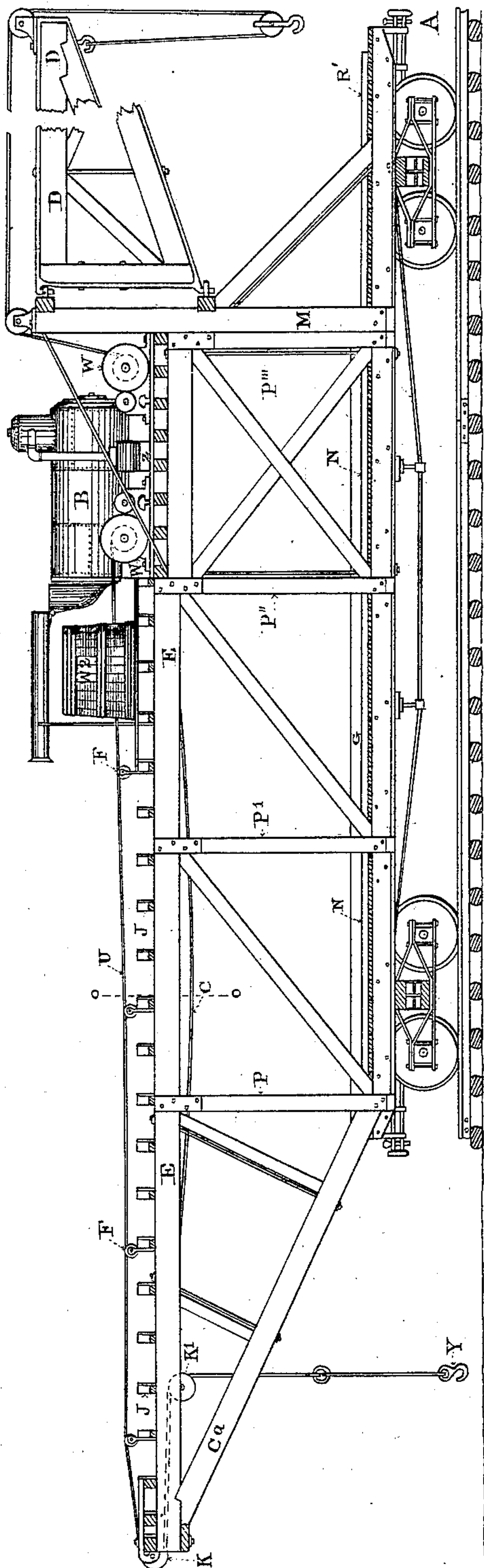


Fig. I.

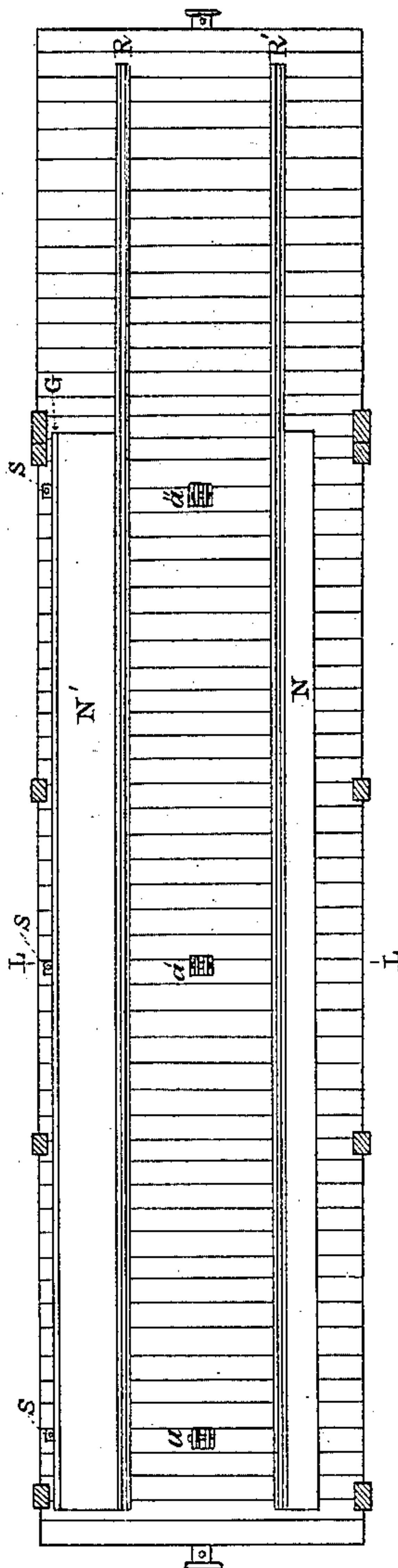


Fig. II.

Scale H. Fig. I & II.

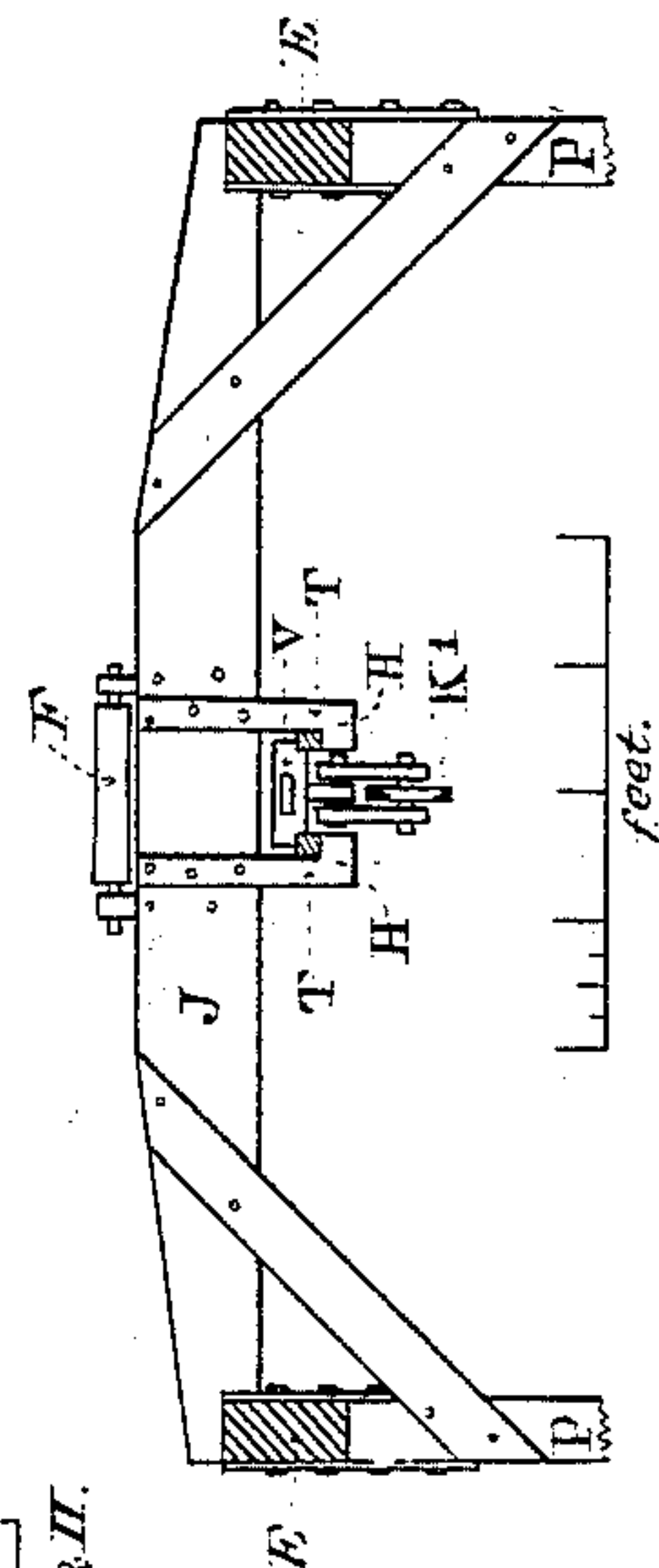


Fig. IV.

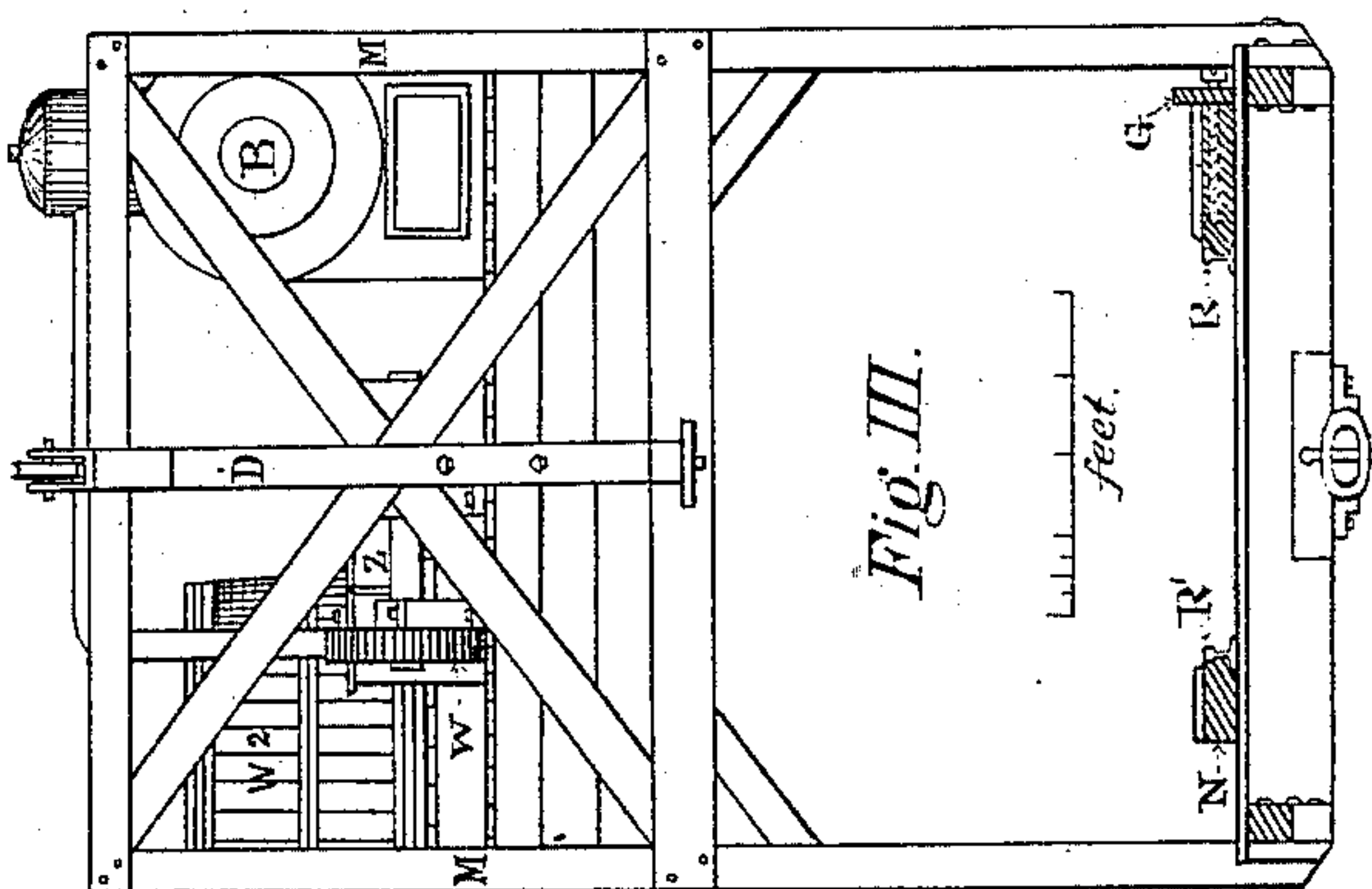


Fig. III.

Witnesses: *C E Agnew*
J M Ford

Inventor: *John M. Goodwin*

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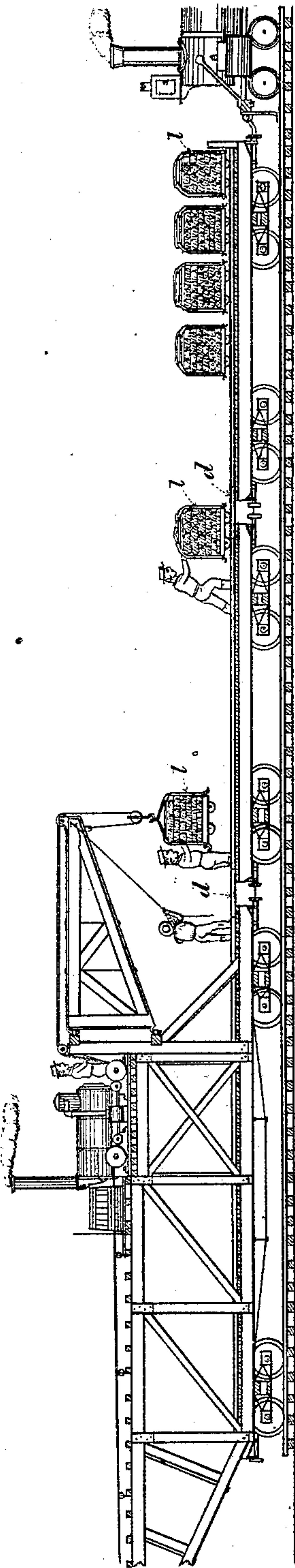


Fig. VI.

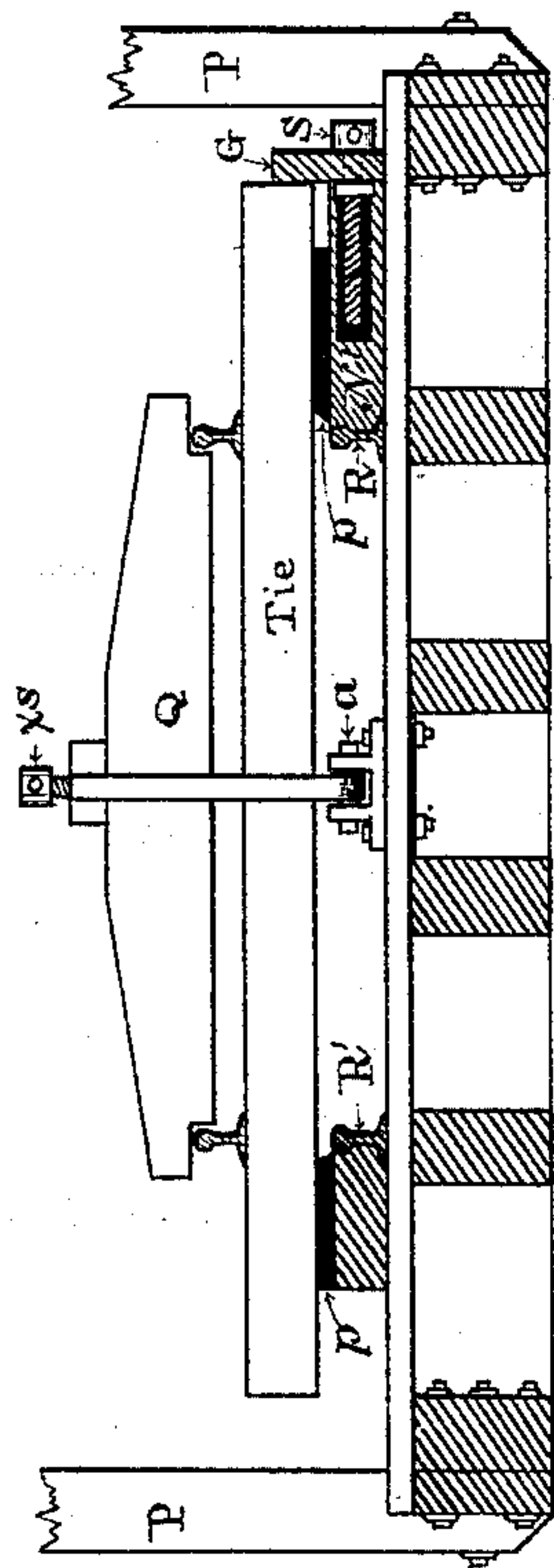


Fig. V.

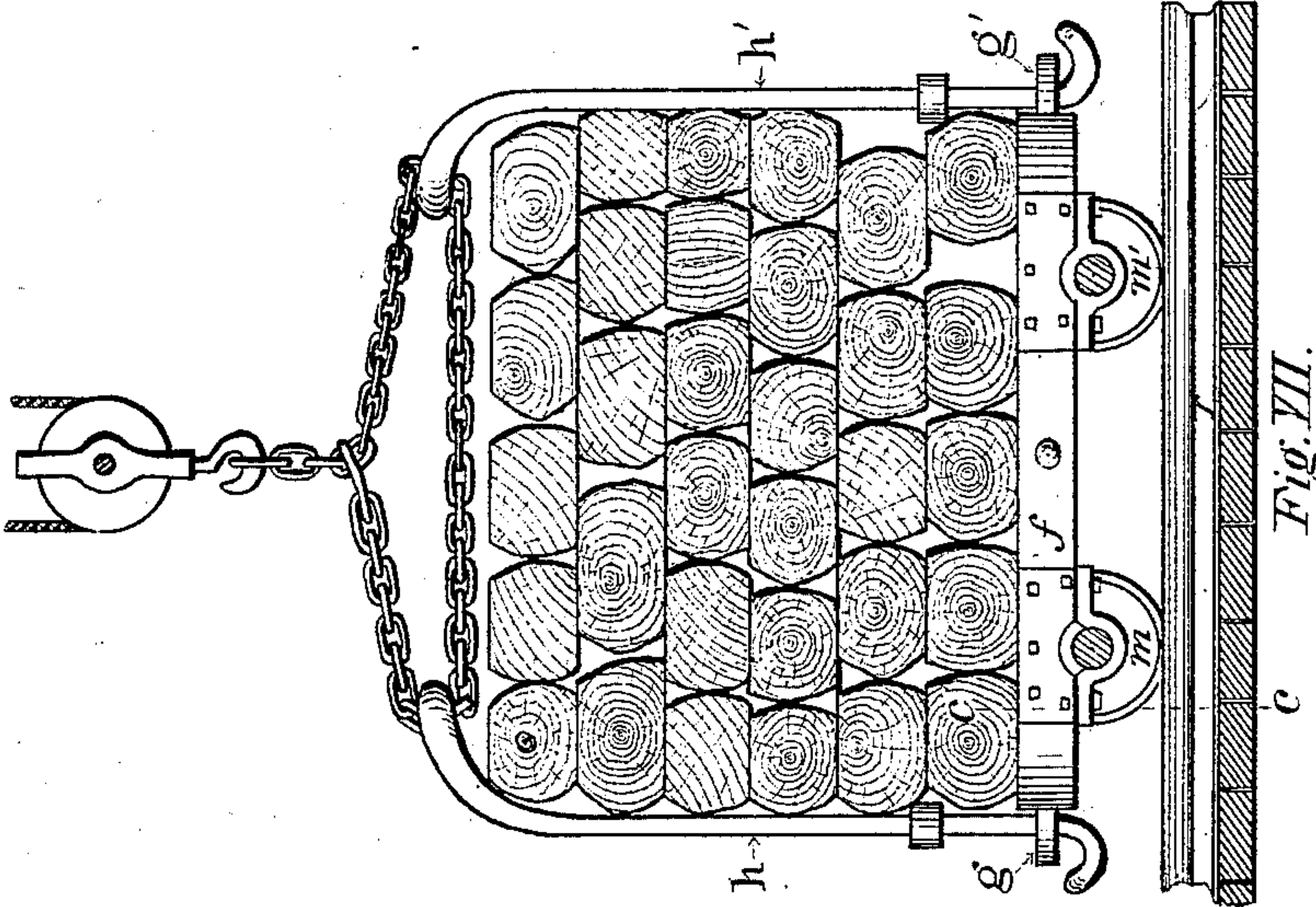


Fig. VII.

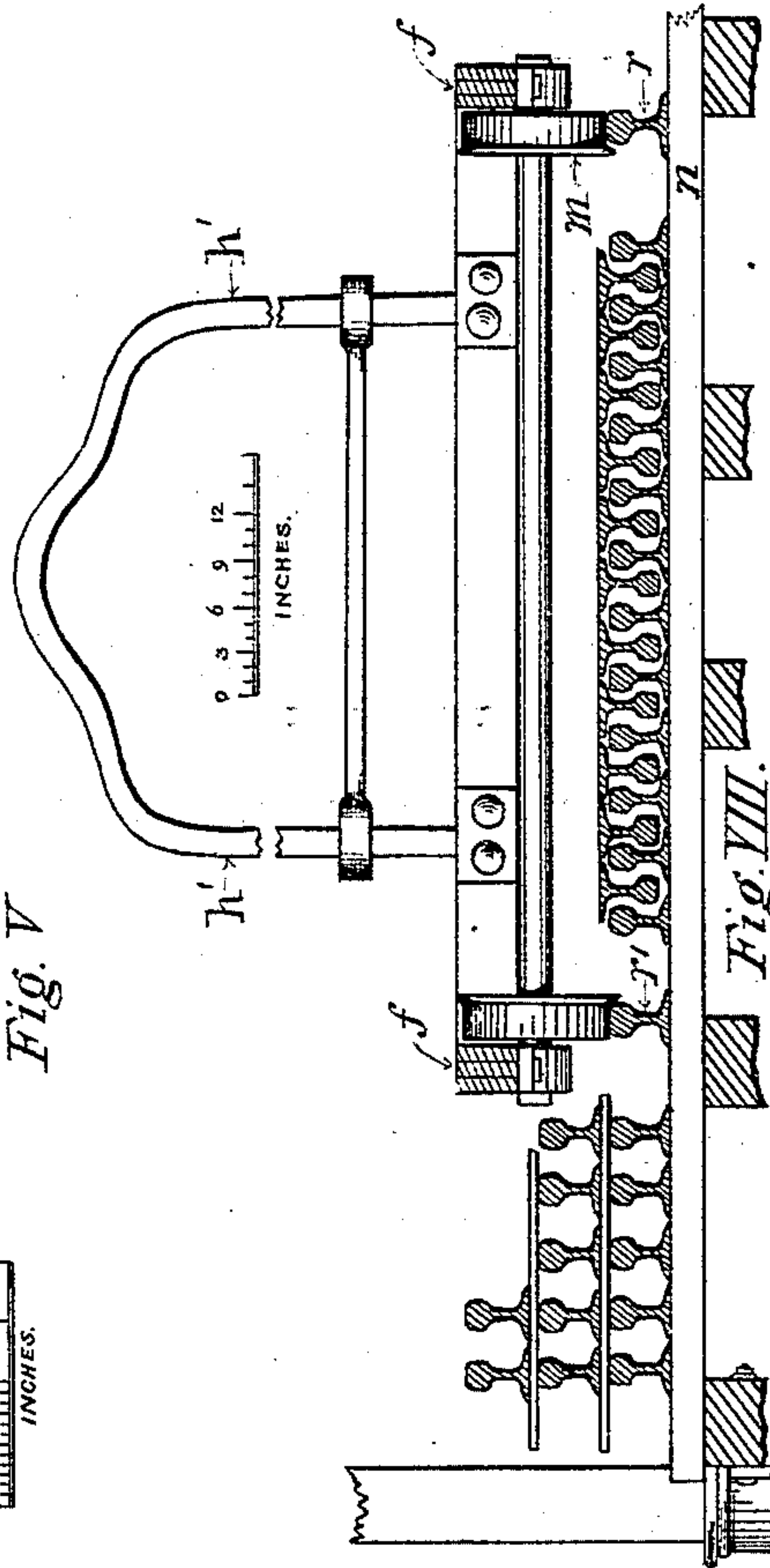


Fig. VIII.

Witnesses:

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(No Model.)

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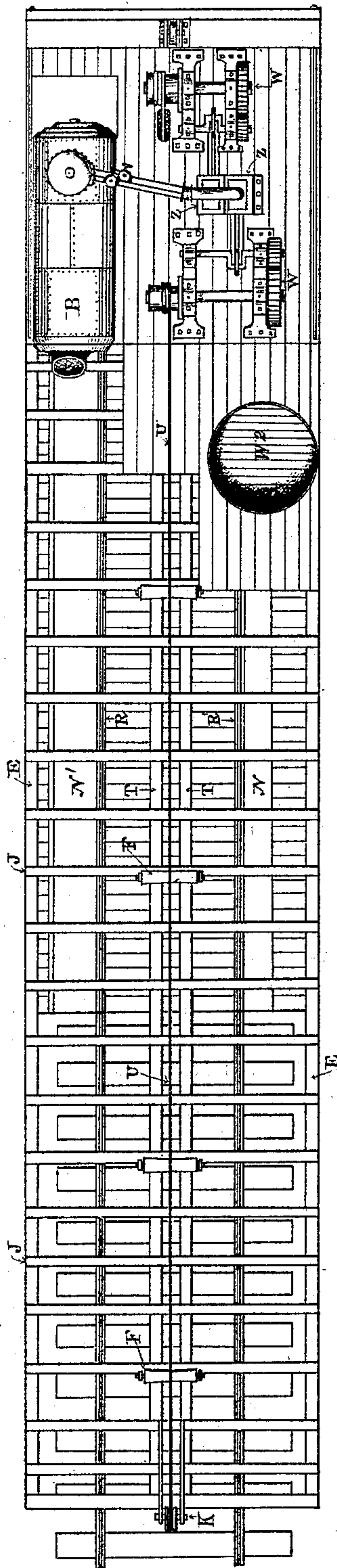


Fig. XI.

Scale of Ft., Fig. XI & XII.

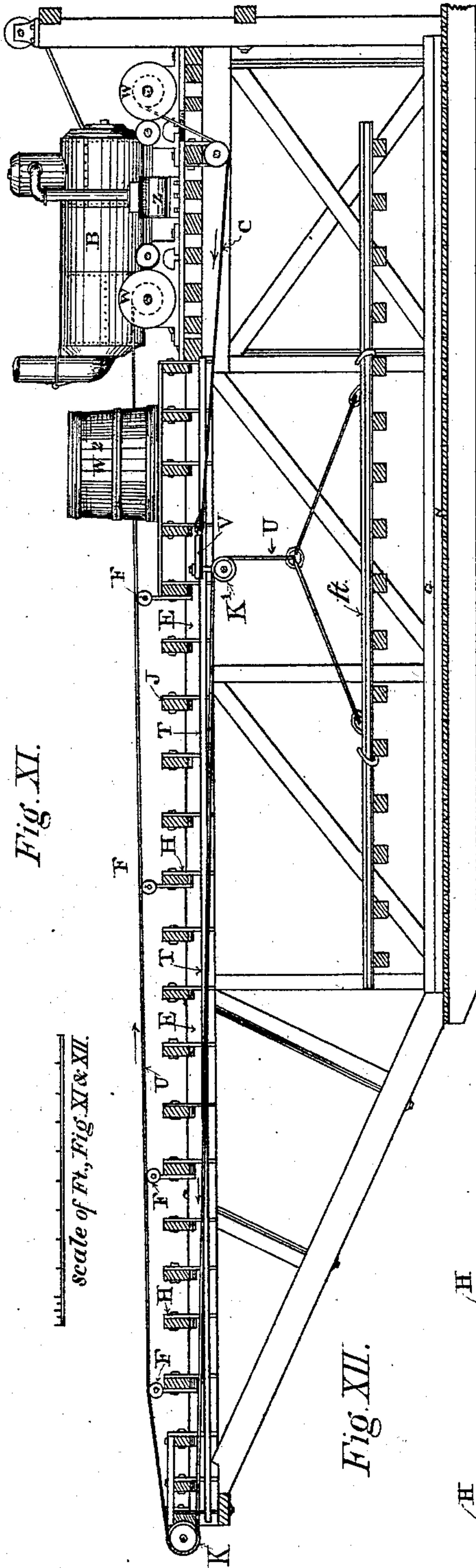


Fig. XII.

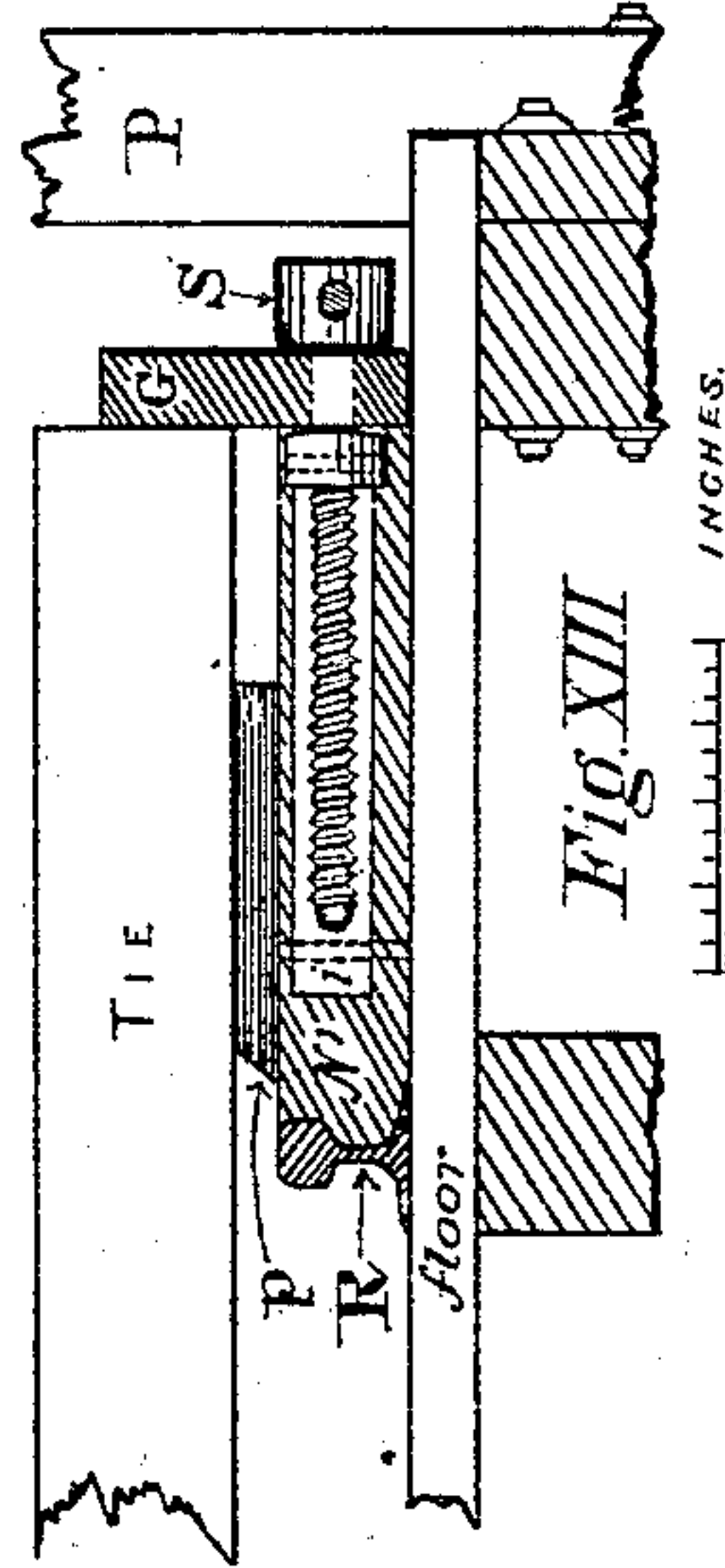


Fig. XIII.

INCHES.

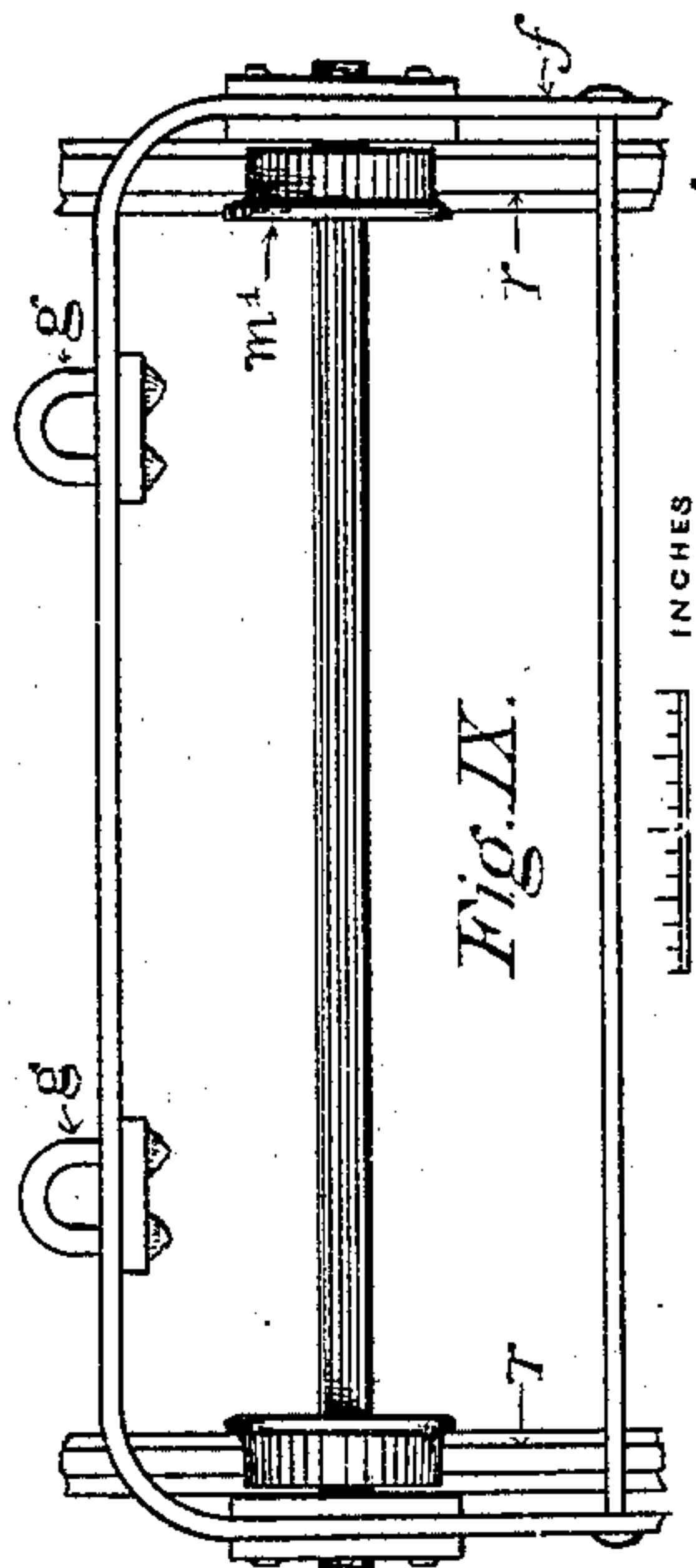


Fig. IX.

INCHES.

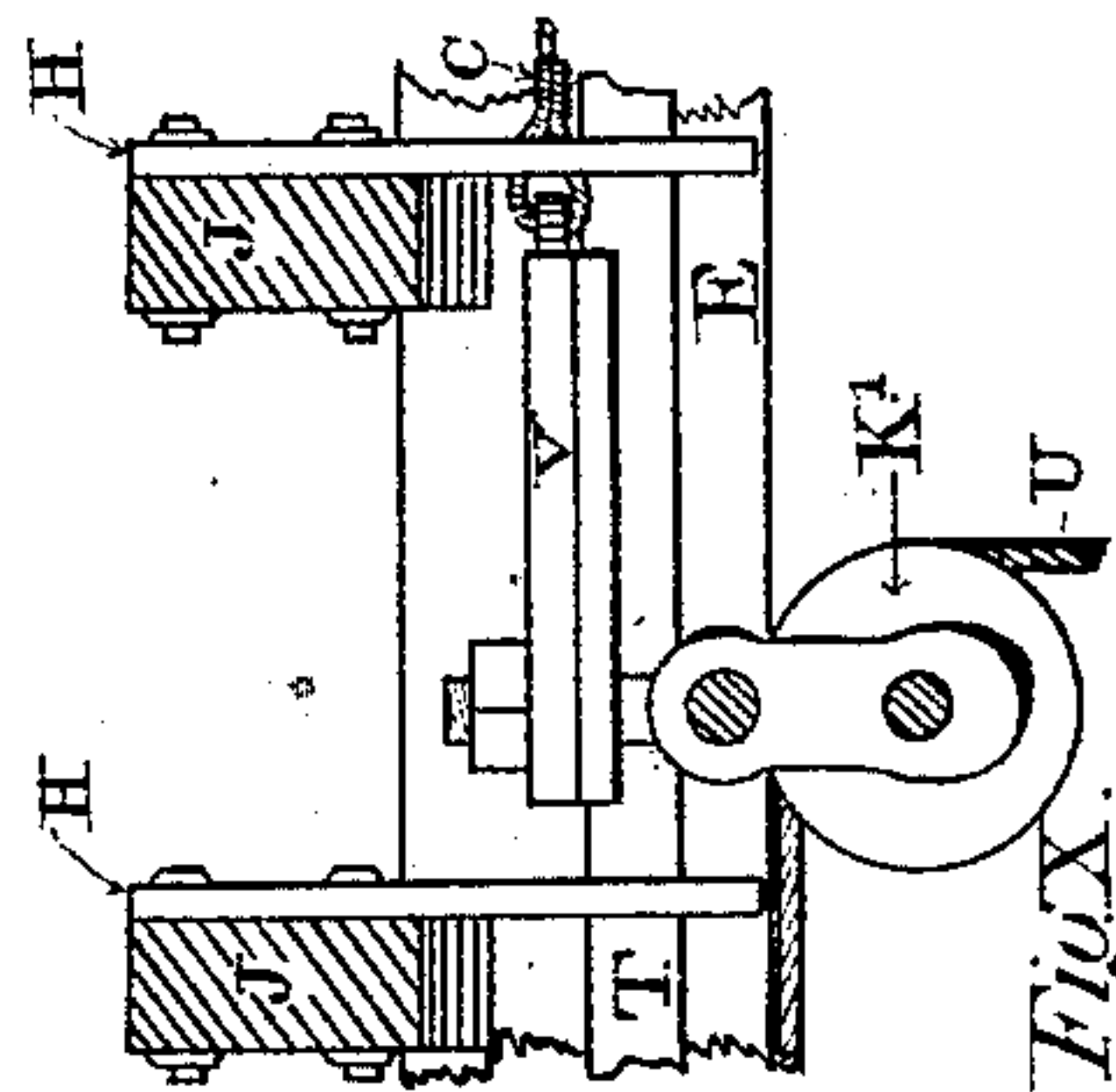


Fig. X.

Witnesses: *A. E. Agnew*
J. M. Ford

Inventor: *John M. Goodwin*

UNITED STATES PATENT OFFICE.

JOHN M. GOODWIN, OF SHARPSVILLE, PENNSYLVANIA.

TRACK-LAYING DEVICE.

SPECIFICATION forming part of Letters Patent No. 279,092, dated June 5, 1883.

Application filed June 5, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. GOODWIN, a citizen of the United States, residing at Sharpsville, in the county of Mercer and State of Pennsylvania, have invented certain new and useful Improvements in Track-Laying Devices, of which the following is a specification.

This invention relates to the operation or process commonly designated in railroad practice by the term "track-laying."

The object of my invention is to provide means for handling track materials and for laying railroad-track, by use of which the labor and cost attending those operations as heretofore performed may be materially lessened, the work of track-laying expedited, improved results as to quality of workmanship and condition of material after handling secured, and injury to road-bed arising from the use of teams in distributing ties along the same avoided.

The appliances that I have invented to effect the object named are, first, a car, called in this description the "derrick-car," supplied and fitted with a derrick constructed so that its boom may traverse from side to side and across the car, to be used for hoisting ties and track material from alongside the railroad and placing the same upon a material-car that, as hereinafter specified, will accompany the derrick-car, with certain hereinafter-described tools and devices for facilitating and perfecting the several operations necessary to the proper assembling and fastening together of rails and ties to form a frame or section of railroad-track, and for lifting and outhauling such frame of track when the same shall have been formed on the derrick-car, and lowering and depositing the same upon the road-bed of the railroad, ahead of such derrick-car, with a crane or overhang fixed at the forward end of the derrick-car, contrived so that by means of it and the appurtenances and tackle operated with it each frame of track, when put together on the derrick-car, may be lifted and carried forward and deposited on the road-bed of the railroad, ahead of the derrick-car, in position to form part of the track in process of construction, with steam-engines and proper boiler, water-tank, and other accessories, and rigging necessary to the working, for the purposes named, of the derrick and the crane aforesaid, with the appurtenances and tackle

thereto belonging, and with a track laid on the floor of said derrick-car lengthwise of the same, upon which to move lorry-cars or push-cars used to bring to the derrick-car from material-cars in the rear thereof ties, iron, and other materials as the same are needed to form the frames of track aforesaid; second, several lorry-cars, each capable of carrying about thirty-two (32) ties of ordinary size, such lorry-cars being made, preferably, of gage like that of the railroad on which the operation of track-laying is to be performed. These lorries I prefer to make entirely of iron and about four feet in length. I fit them with bails hooked to the frame of the lorry, one at each end of the same. These bails are so formed and arranged that they may be readily unhooked and laid aside or packed inside the frame of the lorry, resting upon the axles of the same when not in use. The lorry having been placed on the ground alongside the railroad and loaded with ties, the bails will be hooked on and brought to an upright position. A chain will then be passed through the two bails, binding them together. To a ring in this chain the hook of the derrick-block will be attached, and the lorry, with its load, will be thereby hoisted and placed upon a material-car accompanying the derrick-car, as aforesaid. The chain rendering through the bails will cause the bails to bear firmly against the ties on the lorry, which ties will thus be held in place during the operation of hoisting. Material-cars, as many as necessary to suit the special occasion, will accompany the derrick-car. The floor-tracks with which these material-cars are fitted, as herein described and shown, I do not broadly claim as of my invention, a similar device having been heretofore used for facilitating the moving of ties forward along a train of material-cars as a preliminary to the operation of track-laying, and for other purposes.

The floor-track aforesaid is constructed and used as here described. On the floor of an ordinary "flat" railroad-car, and on the floor of each such car where more than one are used, a track is formed and made for the purposes that I have in view, preferably of gage like that of the railroad on which the operation of track-laying is to be performed. The rails used in these floor-tracks are preferably ordi-

nary railroad-track rails, and should be shorter than the floor of the car in each instance, so that the ends of the rails, respectively, will be inside of the corresponding ends of the car-floors. When two or more cars so fitted with floor-tracks are coupled in train, the said floor-track is made continuous from end to end of such train by bridging the several spaces between the ends of the rails in such track with pieces of railroad-iron of such length that when the train is extended, as it ordinarily is when a locomotive is pulling it, the pieces aforesaid will fit into and fill said spaces. When the train is to be moved any considerable distance the bridge-pieces should be removed.

The tools and devices for facilitating and perfecting the several operations necessary to the proper formation of a frame of railroad-track with which, as aforesaid, I fit and provide my derrick-car are, first, two tie bearing-blocks, lying one outside of each rail of the floor-track aforesaid upon the floor of the derrick-car; second, an adjustable aligning gage-bar, preferably of steel, and, third, adjustable track-gages, which act also as track-clamps, all contrived and used as hereinafter described. The tie bearing-blocks aforesaid are preferably cushioned with rubber.

In the drawings accompanying this specification, Figure I is a side elevation of the said derrick-car, in which D is the traversing boom of the derrick aforesaid. C^a is the crane or overhang; Z W Z W, the steam-engines; B, the boiler, and W² the water-tank aforesaid.

Fig. II is a plan of the floor of the derrick-car, in which N N' are the cushioned tie bearing-blocks aforesaid. G is the adjustable aligning gage-bar, and a a' a'' the sockets to which the adjustable track-gage clamps are on occasion hooked.

Fig. III is an elevation of the end A of the body of the derrick-car.

Fig. IV is a cross-section of the upper frame of the derrick-car on the line O O of Fig. I.

Fig. V is a cross-section of the body of the derrick-car on the line L L of Fig. II, showing the cushioned tie bearing-blocks N N', the aligning gage-bar G, and one track-gage clamp Q in place as used. The tie bearing-blocks are made of timber, and are fixed one alongside of each rail of the floor-track on the derrick-car. Each block is preferably covered for about one foot of its width and throughout its whole length with a sheet of material selected for its quality of elasticity—such as, for example, the rubber packing of commerce. Such covering or cushion is shown in cross-section at p in Fig. V, as well as in figures hereinafter described. The top of each block, or of the elastic covering of the same, is higher than the top of the rail by which the block lies, so that ties distributed across the floor-track on the derrick-car will be by said tie bearing-blocks supported clear of the rails in said floor-track. The superior surfaces of the said blocks are throughout in one and the

same plane, and the blocks are intended to serve as a platen, upon which, by means of a straight edge and proper cutting-tools, rail-seats parallel with such plane may be formed upon ties distributed as aforesaid, and as a support and anvil upon which the operation of spiking rails to such ties may be conveniently and effectively performed.

Fig. VI is a side elevation of the derrick-car and two material-cars standing in train, with locomotive attached, represented as engaged in the operation of loading upon the train the lorry-cars aforesaid, containing track-ties.

Fig. VII is a side elevation of one of my lorry-cars loaded with ties, and represented as just lowered upon the floor-track of the material-car that stands next the derrick-car, a portion of one rail of said floor-track being shown at r. The frame of the lorry f is fitted with staples g g, into which the bails h h' of the lorry are hooked.

Fig. VIII is a cross-section of part of the body of a material-car, on which are shown the two rails r r' of the floor-track, carrying a lorry-car empty, which lorry-car is shown as in cross-section on the line c c of Fig. VII, with the bail h' attached. Fig. VIII shows, also, a lot of railroad-track rails in position as stowed for transportation on material-car.

Fig. IX shows a plan of one end half of a lorry-car without the bail.

Fig. X shows part of the top frame, E, of the derrick-car, supporting the cross-beams J J, (see Figs. I and IV,) from which beams are suspended, by the hangers H H, (see Fig. IV,) two slides, T T', Fig. IV, of which one, T, is shown in this figure, X, on which slides travels a pulley-carriage, V, with its hanging pulley K'.

Fig. XI is a plan of the top of that part of the derrick-car forward of the swinging derrick D, showing general arrangement of engines and hoisting apparatus to be operated in connection with the swinging derrick D, or with the crane or "overhang" and its appurtenances, devised as aforesaid for lifting and carrying forward frames of track and depositing the same on the road-bed.

Fig. XII is a side elevation of that portion of the derrick-car forward of the swinging derrick D and above the floor of the said car, the top frame of the car on the side next the point of view being removed, and the joists J J, &c., of the top frame and the rollers F F, &c., being shown in cross-section. This figure is intended to illustrate the manner in which a frame of track, f t, is lifted from the tie bearing-blocks preparatory to hauling such frame out to and beyond the forward end of the car and depositing it on the road-bed, as hereinafter more particularly described.

Fig. XIII is an enlarged view of a part of Fig. V, showing in cross-section one of the tie bearing-blocks N' with its cushion p, and the aligning gage-bar G, with one of its adjusting-screws S.

The several operations of loading and hand-

ling track material and of laying track I perform as here set forth, viz: A railroad-train composed of a derrick-car, equipped as described, and material-cars, as many as needed, each fitted with a floor-track, as aforesaid, and provided with a complement of lorry-cars, is moved to the point at which the rails, spikes, and fish-plates to be used are stored. The train is made up as shown in Fig. VI, the locomotive placed so as to push the train in the direction in which track-laying is to progress, with the derrick-car at the forward end of the train. The rails are loaded upon the material-cars in the usual manner, and laid lengthwise of the cars, respectively, and stowed as shown in Fig. VIII, or so as not to interfere with the passage of the lorry-cars along the floor-tracks, and five or six pairs of rails are placed upon the derrick-car in the space between the rails R R' of the floor-track on that car. The spikes and fish-plates are placed on the derrick-car. The train is then moved to the point at which the ties are stored. The derrick-car is placed opposite the ties to be loaded. The brakes on that car are then set. The locomotive then pulls the train so that the couplings are extended. The bridge-pieces aforesaid are put in place, as shown at *d d* in Fig. VI. The lorry-cars are one by one moved along the floor-tracks to within reach of the derrick, and are lifted by the derrick and set upon the ground. The lorries are then loaded with ties. Each lorry as loaded is hoisted by the derrick and set on the floor-track of the car next the derrick-car, and is pushed by hand to its proper place on the train and there secured. The first lorry loaded, is placed at the end of the train next the locomotive, and the others in order between that and the derrick-car. The ties having been loaded, the bridge-pieces are removed and the train is moved to the point at which track-laying is to be commenced. There the train is extended, as before and the bridge-pieces replaced. Two of the rails before mentioned as loaded upon the derrick-car are then taken from between the rails of the floor-track on that car and set aside against the posts on that side of said car opposite the aligning gage-bar G. The lorry next the derrick-car is then pushed forward onto the derrick-car and to the forward end of the same, the forward bail of the lorry is removed, and the lorry pushed back toward the rear of the derrick-car, ties to the number needed for one frame of track being thrown off the lorry as it moves. These ties are placed across the floor-track, their ends resting on the cushioned tie bearing-blocks N N' (See Fig. V.) The lorry is then left standing at the rear of the derrick-car. The ties just distributed are then approximately spaced, as desired, and at the same time aligned by placing one end of each tie against the aligning gage-bar G. The two rails before set against the posts of the car are then placed upon the ties, each rail inside of the line on which it is to lie when spiked to the ties. A

straight-edge is then applied to the ties on each line on which a rail is to lie when spiked, and an even bearing or "seat" for each rail on each tie is produced by adzing down each tie which, where the rail crosses it, has a thickness greater than that adopted as a standard. Ties thinner than the standard should be rejected at the time of loading from the pile; but a tie here found deficient in thickness may be brought to a proper height by placing shims under it. This operation of evenly seating the rails, if properly performed, takes the ties "out of wind" at the rail-seats, so that when the completed frame of track is laid on the road-bed the ties in it will have a better bearing on the ground than they would have if not taken out of wind. The two rails are then placed each on its seat and the adjustable track gage-clamps before mentioned are fixed upon them, as illustrated in Fig. V, in which one such gage-clamp is shown in place, as described, and moderately tightened in position by means of screws provided for the purpose. (See X S in Fig. V.) That rail next the aligning gage-bar G is then fixed in a line parallel with that bar, and the second rail is brought to gage with the first by means of the track-gages aforesaid. The track-gage clamp-screws are then further tightened, so as to cause the gages to hold the whole frame of track rigidly and firmly down upon the cushioned tie bearing-blocks. The workmen then spike the rails to the ties. The spiking completed, the track-clamps are removed, the traveling pulley-carriage V, Fig. X, is, by the engine operating the check-rope C, brought midway over the frame of track, and the hoisting and outhauling apparatus illustrated in Figs. XI and XII is attached to the said frame, preferably at four points, by means of large hooks, each attached to a chain radiating from a ring, which ring is attached to the hoisting and outhauling rope U, as shown. When the frame of track *f t* has been raised, as shown in Fig. XII, an attendant slacks away the check-rope C, two or three turns of which are around the capstan-head of that one of the two winding-engines which stands next the swinging derrick D, and at the same time the second winding-engine, operating the outhauling-rope U, hauls the frame of track out beyond the forward end of the car. When the frame is suspended beyond the end of the car, so that in descending the inboard end of it will clear the end of the car, the check-rope C is securely belayed, and an attendant at the second engine aforesaid pays out the rope U and lowers the frame onto the road-bed in position for connection with the track already laid. The splice-bars (or fish-plates when such are used) are then attached. In case of use of "chairs" an extra tie, to be used as a "joint-tie," is thrown off the lorry when it is at the forward end of the derrick-car, as aforesaid, and such tie is, before the frame is lowered to the road-bed, put in position to receive the joint when the frame is lowered. The

operations for forming and placing a frame of track are then repeated, and so on.

The aligning gage-bar G (see Fig. II) is fitted with capstan-headed screws S S S, working in sockets fixed in the edge of the cushioned tie bearing-block N', one of which screws, with its socket, is shown in large in Fig. XIII, by means of which screws the said bar may be sprung laterally into any curve necessary to make it correspond with the alignment of the railroad to which the rails, when laid on the road-bed, have to conform. When the track in process of construction needs to be curved to the "right," (the aligning gage-bar being, as indicated by the drawings, on the right-hand side of a person facing in the direction in which the car is described as moving,) a curve corresponding with that to be produced in said track is produced on the gage side of the aligning gage-bar by holding the middle of said bar in its normal position against the tie bearing-block N' and throwing the ends of the bar away from said block by means of said capstan-headed screws, respectively. A curve to the "left" is produced on the aligning gage-bar by holding the ends of the bar against the tie bearing-block and throwing the middle of the bar away from the block by means of the screws aforesaid. Each lorry, as it is unloaded in the operation of distributing ties along the floor-track of the derrick-car, is run back onto the material-car next the derrick-car, and thence set off upon the ground by the derrick; or it may be placed on top of an elevated frame erected for the purpose on said material-car. Before being set off the train or stowed away as aforesaid, about every third lorry is used to bring forward to the derrick-car from the material-cars a lot of rails. If the empty lorries are set off the train as aforesaid, they are picked up by the derrick as the train returns over the track laid to procure a new supply of track material.

A frame or roof built over the material-car next the derrick-car may be made useful, not only as a place for storing empty lorries, but as a shelter for workmen.

By use of canvas curtains and tarpaulins the derrick-car may be roofed or inclosed, so as to protect workmen against wind and weather, and thus work may sometimes be carried on when without such protection the men could not work, or could not work as effectively as with such protection. No such protection to men engaged in laying track in the ordinary manner is practicable.

The mode of operation above described is followed when track is to be laid so that each joint in each line of rails will lie opposite a joint in the other line of rails, or (adopting the term commonly used in describing this disposition of joints) with "square" joints. If track is to be laid with "broken" joints or so that each joint in each line of rails will lie opposite a point midway or about midway between the ends of a rail in the other line of

rails, the operation will be preferably as here described. In starting the track the "advanced" joint is placed on that side of the track over which the aligning gage-bar G on the derrick-car is fixed, and a piece of rail a "half-rail" in length is prepared and carried along with the derrick-car to be used, as each frame of track is ready for laying, to supplement the rail the end of which on the other side of the track is always half a rail's length behind the said advanced joint, so that the derrick-car may be moved up to the forward end of each succeeding frame, just as it would be were the track laid with square joints. The several operations on the derrick-car are performed as in case of laying track with square joints, except that when the frame is ready for spiking only one rail—viz., that on the side next the aligning gage-bar—is spiked to the ties. The other rail is placed on the ties as before, but is not spiked; and when the frame is to be lifted the loose rail is placed over against the spiked rail. A strip of iron as long as the frame of track, and suitably pierced with holes or armed with projecting spike-like points, is then tacked to the ties along the line of rail-seats on which no rail has been spiked. This in order to steady and support the unspiked ends of the ties during the operations of hoisting, carrying forward, and lowering the frame to place. The frame is then lifted, carried forward, and deposited, as before described, after which the supporting strip of iron is detached. The train is then hauled back the length of the half-rail and the unspiked rail on the frame put in place and spiked.

My tie bearing-blocks, aligning gage-bar, and adjustable track-gage clamps, or any of them, might be used in the assembling and formation of frames of track upon a platform not mounted upon wheels—as, for instance, on a floor laid in a shop or upon the ground—and by so forming frames of track and then loading them upon railroad-cars, and finally laying them on the road-bed of the railroad by means of a crane or otherwise, quite important improvements on the ordinary methods of track-laying may be effected; but, as in making up the frames on a fixed floor the materials, in passing from the stock-pile to their final position on the road-bed, are necessarily handled at least once more than in making the frames on the derrick-car, as described, I prefer to follow the modes of operation hereinbefore given in detail.

I am aware that there has been heretofore made public a description of a mode for laying track, proposing to form the track in sections, to pile such sections upon trucks and thereon carry them to the end of the track, and, by means of apparatus contrived for that special purpose and carried on a car devoted to that special use, to successively lift such sections from the trucks, swing them forward over the apparatus-car, and finally deposit the

sections on the railway; and I do not broadly claim the formation of sections of track by connecting parallel rails to sleepers; nor the piling of such sections upon cars or trucks for transportation to the end of the track in process of construction; nor the depositing of such sections successively in a line with the track already laid. I could not, however, by the use of any heretofore-described mode of forming and laying sections of track accomplish what I have as herein specified aimed to do. I have therefore devised those lorry-cars and the derrick-car with its appurtenances and that mode of assembling, forming, and laying frames of track which I have hereinbefore described.

My lorry-cars may be made to run directly upon the floor of a car without interposition of a track, and the spaces between cars may be bridged with pieces of plank, instead of pieces of railroad-iron, as described. These changes in detail would not materially affect the performance of the lorries in the operations in which, as herein described, they are to be used. In case of omission of the floor-track the wheels of the lorries should be without flanges, and about eight inches in diameter larger than when used with track.

What I claim is—

1. The car herein designated as the "derrick-car," fitted with appliances for aligning, gaging, and constructing thereupon frames or sections of railroad-track, and for laying the same upon the road-bed, substantially as shown and described.

2. The combination, with a railroad-car, of the tie bearing-blocks, adjustable track-gage clamps, aligning gage-bar, derrick, crane, engines, and tackle, substantially as described, for the purposes specified.

3. In combination with tie bearing-blocks and ties used to form a section of railroad-track, the aligning gage-bar G, constructed and operated substantially as and for the purposes set forth.

4. The tie bearing-blocks N N', fixed one alongside of each rail of a railway along and across which ties to be used in forming a section of railroad-track are distributed, preferably covered or cushioned with a material selected for its quality of elasticity, and constructed so that the superior surface of each such block, or of the elastic covering of the same, is higher than the top of the rail alongside which it lies, and so that the superior surface of each block lies throughout in one and the same plane with that of the other block, to the end that such blocks shall carry the ties so distributed clear of the rails of said railway, and shall together serve as a platen upon which, by means of a straight-edge and proper cutting-tools, rail-seats parallel with said plane may be formed upon such ties, and as a support and anvil upon which the operation of spiking rails to such ties may be conveniently and effectively performed, all as and for the purposes set forth.

5. The adjustable track-gage clamp Q, with its standard, its socket a, and its tightening-screw X S, Fig. V, constructed and operating substantially as and for the purposes described.

6. The lorry-car with its frame f, bails h h', and bail-staples g g, constructed and used substantially as and for the purposes specified.

7. The herein-described method for constructing frames or sections of railroad-tracks, which consists in loading the ties upon lorries, placing the lorries upon a track upon a car or train of cars, one of which is provided with tie bearing-blocks, an aligning gage-bar, and adjustable track-gage clamps, distributing the ties from the lorries upon the blocks in proper relation to the gage-bar, adjusting the rails upon the ties, gaging and holding them by the gage-clamps, and spiking them, all as set forth.

JOHN M. GOODWIN.

Witnesses:

FRANK PIERCE,
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