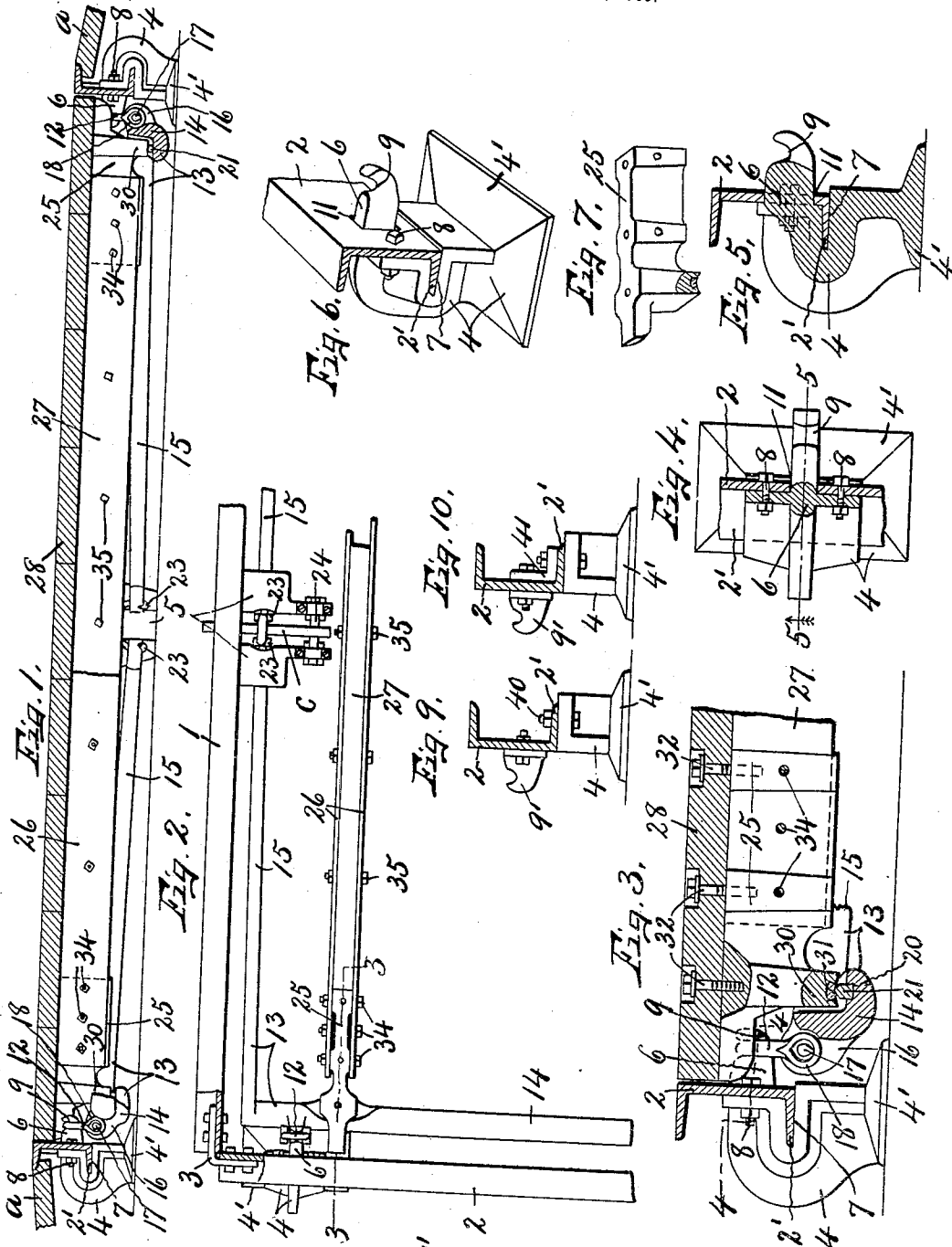


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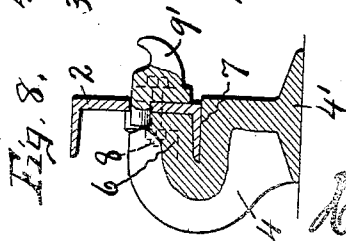
PITLESS SCALE.

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PITLESS SCALE.

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To all whom it may concern:

Be it known that I, HENRY G. BEUCKMANN, of Binghamton, in the county of Broome, in the State of New York, have invented new and useful Improvements in Pitless Scales, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to improvements in pitless scales, the essential purpose of which is to provide a complete wagon-scale adapted to be supported upon the surface of the ground, thereby avoiding the necessity for excavations for the usual pit, and in which the compensating or equalizing levers and, in fact, practically all of the essential operating parts are inclosed within a substantially horizontal rectangular frame and below the platform upon which the load is supported.

In devices of this character the strains are localized at certain points or bearings, usually in the line of travel of or directly under the wheels or runners of the vehicle in which the load to be carried is weighed, and in the specific use of pitless scales it becomes necessary to bring all of the parts within a comparatively shallow horizontal space as low down as possible, so that the vehicle may be easily drawn upon the platform.

My object therefore is to produce a comparatively light portable wagon-scale having as few parts as may be consistent with the work which it is required to perform and to concentrate the entire superimposed load upon suitable supporting feet or chains, which not only receive and reinforce the ends of the frame where the strains are most severe, but also form supports for the stirrups or hangers for the platform-supporting levers, thereby bringing the load on the platform and levers directly onto the chains instead of on the frame. In other words, I have sought to use a comparatively light but rigid rectangular frame of any available stock—such as channel or angle irons, I-beams, flat bars of iron or steel—or in some instances I may prefer to construct a frame wholly or partly of wood beams or bars; but in either case the frame will be mounted upon suitable supporting-feet adapted to rest upon the ground and to hold the frame a convenient distance above the surface of the ground to permit the platform and its supporting equalizing-levers to be supported wholly within the frame be-

tween the horizontal plane of the top of the frame and surface of the ground or bottoms of the supporting-feet, so that all of the parts of the complete scales may be assembled as a unitary structure or article of manufacture to be instantly placed in operative position upon any available ground-surface.

The object of the specific platform-stringers is to materially cheapen the structure without sacrificing the necessary rigidity and to provide this stringer with suitable bearings adapted to rest upon the corresponding seats or knife-edges of the underlying equalizing-levers, and to include in the stringers suitable wood furring or filling to which the floor of the platform may be readily spiked or nailed.

Other objects and uses relating to other parts of the scales will be brought out in the following description.

In the drawings, Figure 1 is a longitudinal vertical sectional view of my improved pitless scales. Fig. 2 is a top plan, partly in section, of a portion of one end of the main supporting-frame, showing the adjacent end or one of the platform-stringers and underlying equalizing-lever upon which said stringer rests. Figs. 3, 4, and 5 are enlarged sectional views taken, respectively, on lines 3 3, Fig. 1, 4 4, Fig. 3, and 5 5, Fig. 4, the clevis or stirrup seen in Fig. 3 being omitted from Figs. 4 and 5. Figs. 6 and 7 are perspective views, respectively, of one of the foot-rests and the bearing-section of one of the platform-stringers. Figs. 8, 9, and 10 are sectional views similar to Fig. 5, showing modified forms of foot-rest and different means for reinforcing and securing the main frame thereto.

In order to clearly illustrate the practicability and utility of my invention, I have shown a rectangular frame consisting of opposite parallel side pieces 1, similar end pieces 2, which are rigidly and permanently secured to the side pieces by any suitable fastening device, as corner-pieces 3, thereby forming a substantially rectangular open frame in which the platform and its supporting parts are movably mounted. This main supporting-frame is comparatively light and portable and is supported some distance above the surface of the ground upon suitable foot-rests or chairs 4 and 5; but the end bars 2 at the approaches, as *a*, to the platform are subjected

to the most severe bending and buckling strains, and in order that I may be able to use comparatively light material for the end bars and still maintain sufficient strength and rigidity to resist the strains of any superimposed load each of the bars 2 is seated upon and secured to a pair of the foot-rests or chairs 4, which are constructed in such manner as to reinforce and sustain the end bars 2 at the points where the strain is the greatest and in this instance are located at opposite sides of the center of the platform, substantially the same distance apart as the wheels of an ordinary wagon, so that when the wagon is driven upon the platform the foot-rests or chairs 4 will be nearly under the line of travel of the wheels as it is traveling to and from or resting upon the weighing-platform, thereby better resisting the end thrust of the vehicle when approaching the platform and also affording ample support to resist the superimposed dead load only where necessary. These foot-rests are provided with comparatively broad flat bases 4', adapted to rest upon the surface of the ground, and their upper faces may also be substantially flat, as seen in Figs. 9 and 10, for supporting any suitable form of end bar; but when steel channel or angle bars, or, in fact, any bar having a base-flange, is used I preferably provide each chair or foot-rest 4 with an upwardly-projecting return extension 6, forming with the base a channel or groove 7 for receiving the base-flange, as 2', of the end frame-bar 2. These foot-rests or chairs are preferably made of cast-iron and are arranged with the open sides of the slots 7 facing inwardly, so that the flanges of the end frame-bars 2 face outwardly, and the upward return extension 6 of each foot-rest or chair preferably abuts against the outer face of the upright web of the channel-bar 2 and is rigidly clamped thereto by clamping-bolts 8.

Associated with each of the foot-rests or chairs 4 is a hook-shape bearing or bracket 9, which, as seen in Figs. 1 to 6, inclusive, is preferably integral with the return extension 6 and projects through an opening 11 in the frame-bar 2 to support the platform-levers, and thereby throw the load directly upon the chairs or foot-rests instead of upon the ends of the frame. Each chair 4 is therefore provided with a hook-shape bracket 9, from which is suspended a swinging hanger or clevis 12 for receiving and supporting suitable equalizing-levers 13, and it therefore follows that each chair 4 supports a swinging clevis 12, those of each pair supporting one end of each of the equalizing-levers 13.

As best seen in Figs. 1, 2, and 3, each of the equalizing-levers comprises a rock-bar 14 and an inwardly-projecting arm 15, said rock-bar being arranged parallel with and in close proximity to one of the end bars 2 and is pro-

vided near its ends with radial lugs or ears 16, each having a pair of oppositely-projecting knife-bearings 17, which are seated in suitable eyes 18 in the lower swinging ends of the adjacent clevises 12. These equalizing-levers are arranged wholly within the main supporting-frame between the horizontal planes of the top of the frame and the bottom of the foot-rests 4 with sufficient clearance to permit them to swing freely the required distance.

Each parallel rock-bar 14 is provided near its ends with inwardly-projecting seats 20, upon which are mounted knife-edge bearings 21 for receiving and supporting the ends of the platform-stringers presently described. The knife-bearings 21 are arranged in a plane below but in a vertical plane some distance inside of the bearings 17 in the clevises 12, so that when the platform-stringers are operatively mounted upon the knife-bearings 21 the bars 14 and clevises 12 are free to swing upon their respective axes, such swinging motion being imparted to a counter-lever *c* through the medium of the arms 15, which are rigidly secured at one end to the ends of their respective bars 14 and extend inwardly or lengthwise toward each other to a point near the center of one of the side bars 1 and are separately and flexibly connected to suitable hooks or supports 23 on the counter-lever *c*. This counter-lever is fulcrumed at its inner end at 24 upon the chair 5, which is secured to and projects inwardly from the center of the side bar 1 and forms a convenient support for the counter-lever *c*, as well as for the center of the adjacent side bar 1, where more or less strain is produced by the action of the equalizing-lever upon the counter-lever.

I have thus far described the specific means for supporting and reinforcing a comparatively light rectangular main frame upon the surface of the ground in such manner as to permit the platform and its supporting-levers to be suspended wholly within the horizontal plane of the frame and its supports. Another important feature of my invention resides in the particular construction of platform, which consists, essentially, of a pair of opposite parallel lengthwise stringers which are supported wholly within the horizontal plane of the main frame and its supporting-chairs or foot-rests and upon the knife-edge bearings of the equalizing-levers 13 just inside of the adjacent chairs or foot-rests 4 and are therefore spaced apart a distance about equal to the distance between the wheels of the wagon, so that when a wagon is drawn upon the platform the wheels will ride nearly over the platform-supporting stringers. Each of these stringers preferably comprises a pair of comparatively short cast-iron or wrought-iron end-pieces 25, opposite parallel side bars or plates 26, and an intervening filling or bar 27, of wood, to which the

floor, as 28, of the platform may be spiked. The length of each of the stringers is nearly coextensive with the distance between the inner faces of the end bars 2, a sufficient clearance being left at the ends to allow the stringers to play freely up and down to operate the equalizing-levers 13 and counter-lever *c*. Each of the metal end pieces 25 is provided a slight distance inwardly from its outer end with a depending projection 30, having a concaved bearing-face 31, of hard steel or its equivalent, resting upon the knife-edge 21 and is provided with a series of threaded apertures for receiving screw-bolts 32, by which the end planks or floor-pieces may be secured in place upon the stringers, as best seen in Fig. 3. The parallel bars or plates 26 are secured by bolts 34 to opposite faces of the end pieces 25, and the interposed bar 27, of wood, abuts against the adjacent ends of the end pieces 25 and is rigidly clamped between the side pieces 26 by bolts 35. This produces a particularly light, strong, and efficient stringer spanning the distance between and resting upon the rock-bars 14, the stringer-sections 27, of wood, serving the double purpose of a reinforcing-truss in its association with the comparatively light side plates 26 and end bearing-pieces 25 and also permitting the flooring to be spiked thereto, thereby avoiding the necessity for furring or extra wood stringers.

The ends of the stringers—that is, the metal bearings 25—rest upon their respective knife-bearings 21, which are seated upon and near the ends of the bar 14 just inside of the outwardly-projecting ears 16, so that the stringer-bearings and adjacent bearings for the rock-bar 14 are in close proximity to avoid as far as practicable any torsional strains between the stringer-bearings and those of the rock-bar or equalizing-lever, and at the same time this relative arrangement of the foot-rests and bearings for the operating parts enables me to bring the bars 14 and bearings 25 close to the end frame-bars 2, making the whole device as compact as possible and still allowing ample clearance for the free movement of the working parts.

The upward return extensions 6 of the foot-rests or bars 4 are in most instances desirable as furnishing an economic means for supporting and reinforcing the end frame-bars 2 where the strains are most severe; but such extensions are not absolutely necessary in carrying out the objects stated, and in Figs. 9 and 10 I have shown a foot-rest or bar 4 as provided with a plain or substantially flat top, to which the end bar 2 is directly secured by means of one or more clamping-bolts 40, and in Fig. 10 I have shown substantially the same device seen in Fig. 9, except that the channel-iron 2 is reinforced by one or more corner-brackets 41, the latter,

together with the frame-bar 2, being secured directly to the top face of the foot-rest 4 by the clamping-bolt 40, the hook, as 9', being separate from the chair, Figs. 8, 9, and 10.

The parts of my improved pitless scales may be stored and shipped in a knockdown form, occupying but little space, and may be readily assembled upon the ground by simply clamping the meeting ends 1 and 2 together and mounting the frame in the foot-rests or bars 4, whereupon the rock-bars 14 may be hung in their clevises or stirrups upon the hooks 9 and the inner ends of the arms 15 connected to the hooks 23 of the swinging clevis on the counter-lever *c*. The platform-stringers are then placed upon their respective bearings 21, and the flooring 28 is then spiked or bolted to the stringers, thus completing the scales ready for use.

What I claim is—

1. In a pitless platform-scales, a rectangular frame, a pair of foot-rests secured to each end of the frame at opposite sides of its longitudinal center and adapted to rest upon the surface of the ground for supporting the frame some distance above such surface, a hook or bracket integral with and projecting inwardly from each of the foot-rests and through the frame, a clevis pivotally suspended from each bracket, platform-supporting levers pivotally hung in said clevises, parallel stringers spanning the distance between and resting upon said bars at the inside of their rocking axes, and a flooring secured to the stringers.

2. In a wagon-scales, a rectangular frame, a pair of foot-rests secured to each end of the frame for supporting the latter some distance above the surface of the ground, said foot-rests being located at opposite sides of the longitudinal center of the frame, a chair or hook-shaped bracket integral with each end of the foot-rests and projecting through the frame, swinging stirrups or clevises hung in said brackets, platform-levers pivotally hung in said stirrups within and below the upper surface of the frame and provided with knife-bearings in proximity to the stirrups and platform-stringers having end bearings of metal seated on said knife-bearings and intervening sections of wood to which the flooring of the platform may be spiked.

3. In a wagon-scales, a rectangular horizontal frame in combination with foot-rests or chairs arranged in pairs, each pair being secured to one end of the frame at opposite sides of its longitudinal center, each chair having a comparatively broad base adapted to rest upon the surface of the ground and provided with an upward extension bearing against one of the upright faces of the adjacent end of the frame to brace and reinforce said end against bending or buckling strains.

4. In a wagon-scales, a rectangular frame

having side and end pieces rigidly secured together, foot-rests or chairs arranged in pairs, one pair for each end of the frame, those of each pair being secured to said end at opposite sides of the longitudinal center of the frame, and provided with upward return extensions forming an open-sided slot for receiving a portion of the adjacent end of the frame, said upward extensions bearing against one of the upright faces of said end piece.

5. In a pitless wagon-scales, end frame-bars and chairs therefor, each having a portion thereof projecting through an opening in the frame-bar and platform-supports

mounted on the portions of the chairs projecting through said opening.

6. In a pitless wagon-scales, end frame-bars and chairs therefor, each having a portion thereof projecting through an opening in the frame-bar, and platform-supporting levers suspended from said portions of the foot-rests.

In witness whereof I have hereunto set my hand this 11th day of December, 1905.

HENRY G. BEUCKMANN.

Witnesses:

E. C. SISSON,
W. H. MORSE.