

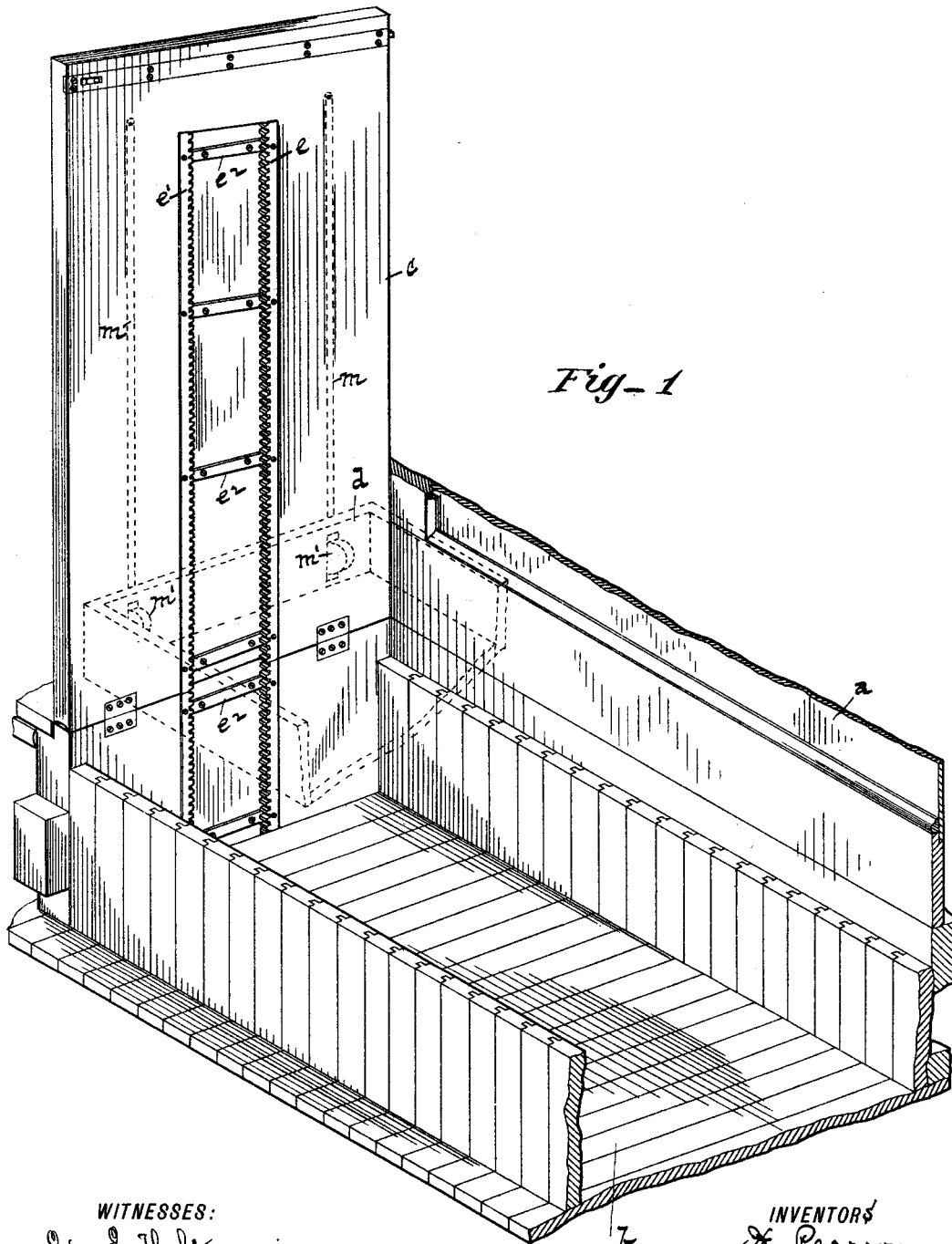
(No Model.)

4 Sheets—Sheet 1.

H. PEARSON & C. J. ROSE.
SLEEPING CAR.

No. 489,089.

Patented Jan. 3, 1893.



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4 Sheets—Sheet 2.

No. 489,089.

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Fig-4

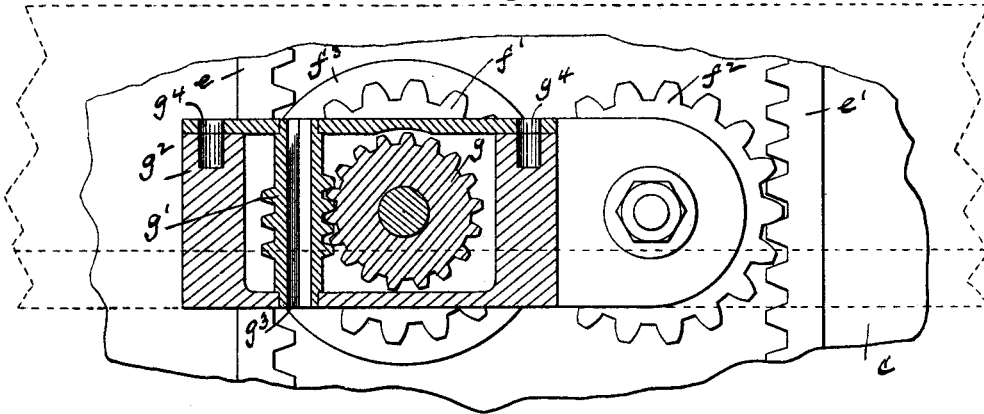
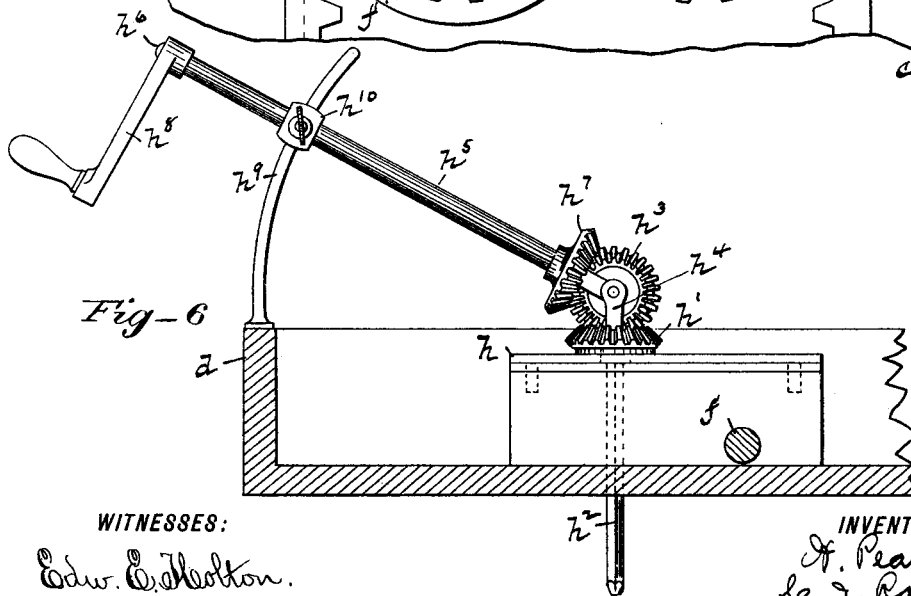
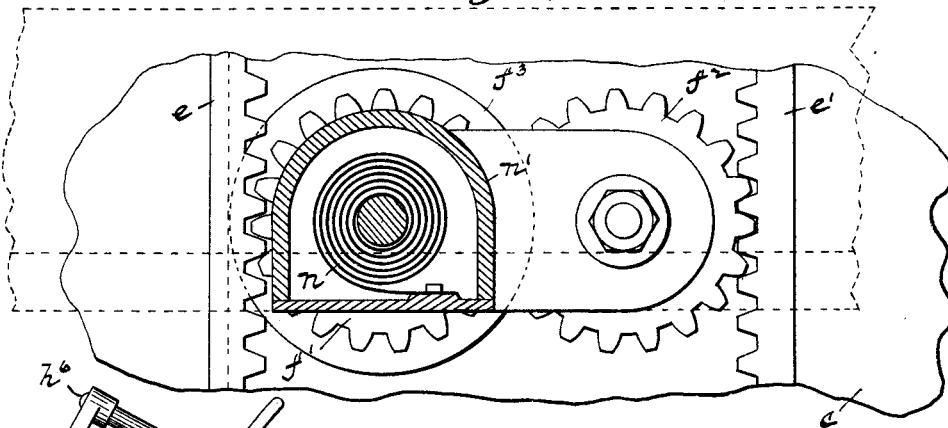


Fig-5



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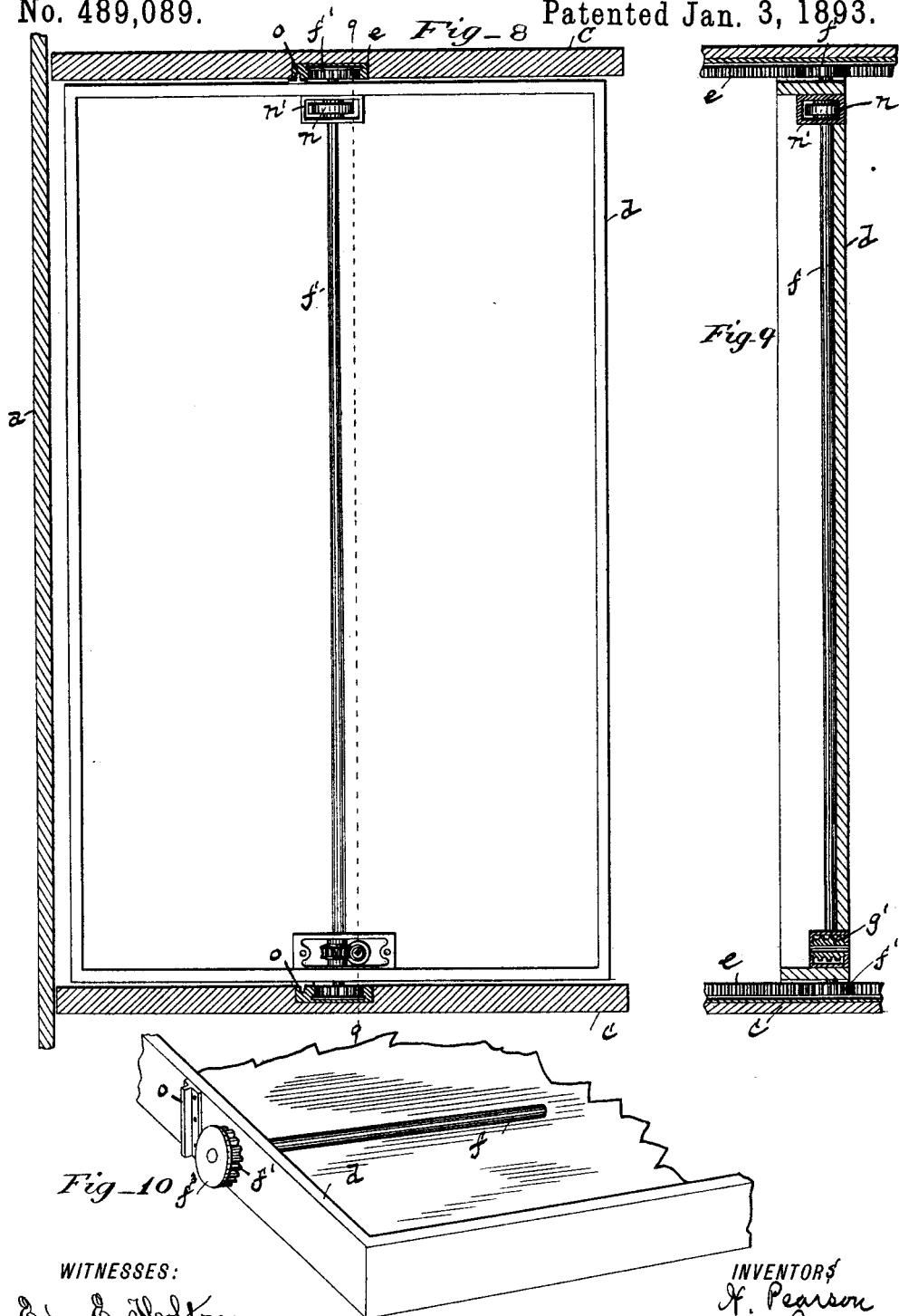
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UNITED STATES PATENT OFFICE.

HENRY PEARSON, OF BRIGHTWOOD, AND CHARLES J. ROSE, OF CHICOPEE,
MASSACHUSETTS.

SLEEPING-CAR.

SPECIFICATION forming part of Letters Patent No. 489,089, dated January 3, 1893.

Application filed April 12, 1892. Serial No. 428,845. (No model.)

To all whom it may concern:

Be it known that we, HENRY PEARSON, of Brightwood, and CHARLES J. ROSE, of Chicopee, in the county of Hampden and State of Massachusetts, have invented a new and useful Improvement in Sleeping-Cars, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

Our invention relates to that class of sleeping cars in which a compartment or well, beneath the floor of the car, is provided, into which the berths are lowered when not in use, and from which they are raised by suitable gearing for use, said compartments or wells being closed, when the berths are lowered therein, by hinged sections of the floor, which sections, when raised to a vertical position, form the partitions between the berth-sections and carry on their lower side the racks upon which the berths are raised and lowered. For a more particular description of such form of car reference is made to Letters Patent No. 403,265, issued to L. J. Harris, May 14, 1889. The objects of our invention are to provide means for raising and lowering the berths which will obviate the necessity of using two shafts at the ends of each berth and an intermediate shaft extending along one side of the same, as shown in said Letters Patent; to provide an improved arrangement of racks and pinions for raising and lowering the berths, with a view to securing increased ease and steadiness of movement to the latter; and, to provide an auxiliary spring or springs to assist the devices for moving the berths in one direction.

To these ends our invention consists in the combination and arrangement of parts herein-
after fully described and particularly pointed out in the claims.

Referring to the drawings, in which like letters designate like parts in the several figures, Figure 1 is a view in perspective and partial cross-section of a portion of the side wall of a car and of one of the wells or compartments for the storage of the berths, the section of the car floor forming the cover therefor being shown in its vertical position. Fig. 2 is a plan view of one of the berths, and a cross-section of the partitions between the berth sections.

Fig. 3 is a longitudinal, vertical section thereof, taken upon line 3—3 of Fig. 2. Fig. 4 is a cross-section taken upon line 4—4 of Fig. 2. Fig. 5 is a cross-section taken upon line 5—5 of Fig. 2. Fig. 6 illustrates one form of means for operating the shaft which raises and lowers the berth. Fig. 7 illustrates another form of means for such purpose. Fig. 8 is a view similar to Fig. 2, illustrating a slightly modified form of the berth raising and lowering means. Fig. 9 is a longitudinal section, taken upon line 9—9 of Fig. 8. Fig. 10 is a view in perspective of a portion of one end of the berth shown in Fig. 8.

Referring to Fig. 1, the letter *a* designates a portion of the side wall of a sleeping car, *b* a well or compartment beneath the floor of said car, and *c* a hinged section of the floor, which closes said well when in its horizontal position and serves as a partition between the berth sections when raised to a vertical position, there being two of such hinged floor sections to each well, as by reference to patent to Harris, hereinbefore mentioned, will more fully appear. The letter *d* designates one of the berths adapted to be lowered into and raised from the well *b*. As shown in said patent to Harris the berths are raised and lowered upon racks secured to the underside of the hinged floor sections and to the end walls of the well, which racks are engaged by pinions upon shafts supported in bearings at the ends of the berth, and extending parallel with said ends, a third shaft, extending along the front side of the berth, having gear connection with said pinion-carrying shafts, and serving as a means for revolving the latter shafts simultaneously as it is itself revolved by suitable worm and worm-gear connections. In such construction, the axes of the pinions being parallel with the ends of the berth, the tendency of the pinions is to spread the racks apart, to counteract which tendency T-shaped ribs to project into similarly shaped grooves in the floor sections are provided, in said patent. Such tongue and groove connection between the berth and the floor sections is objectionable for the reason that it is liable to cause a binding action between said parts which will greatly impede, if it does not entirely prevent, vertical movement of the berth,

and this tendency will increase with increased wear of the teeth of the pinions and racks respectively. From the very nature of the case it is of the utmost importance that the berth operating means in a car intended for both day and night use, shall be of such a nature that the berths can be quickly and easily moved from their inoperative to their operative positions, and vice versa, and free from any liability to become clogged or rendered inoperative from any cause. Our first improvement, therefore, consists in providing racks and pinions for raising and lowering the berths, so arranged as to obviate the tendency to force the two floor sections away from each other, and for this purpose we employ pinions whose axes are perpendicular to the ends of the berth and racks whose teeth face in a direction parallel with said ends. As shown in Figs. 1 to 5 inclusive, we utilize two racks e e' , facing in opposite directions, which are suitably secured to the floor section c within a recess in the latter and to the end wall of the well and are preferably connected together by means of the cross-bars e^2 .

The letter f designates a shaft extending from end to end of the berth d , at a point slightly to one side of the transverse center of the latter. At its extreme ends said shaft carries the pinions f' , which mesh with the racks e of the two floor sections c . Two idler pinions f^2 , supported upon studs projecting from the ends of the berth, mesh with said pinions f and also with the racks e' , as clearly shown in Fig. 2. The pinions f' f^2 thus have their axes perpendicular to the ends of the berth, and are adapted by their engagement with each other and with the racks to raise or lower the berth as the case may be, when shaft f is revolved in one or the other direction, with a steady and even movement, and without any wedging action upon the floor sections c to force the latter apart.

To secure entire accuracy of register of the pinions f' with the racks e , the former can be provided with a peripheral flange to enter a recess in the racks, as shown at f^3 , if desired, but such construction is not essential to the successful operation of said parts.

Various forms of means for manually revolving shaft f can be employed, one of the most simple of which is illustrated in Figs. 2 and 3, in which the letter g designates a worm-gear mounted upon said shaft, adjacent to one of the ends of the berth, and g' designates a worm revolubly mounted in a housing g^2 secured to the end of the berth, and meshing with said gear. Said worm can be provided with a squared head to receive a wrench of any suitable form, but we prefer to provide it with a central opening g^3 of angular form in cross-section, and to use in connection therewith the operating device shown in Fig. 6, the same consisting of a base h provided with downwardly projecting pins to enter holes g^4 in the upper side of housing g^2 , a bevel gear h' revolubly mounted upon

said base and having depending therefrom a rod h^2 adapted to closely fit within the opening in worm g' , a bevel gear h^3 supported upon a standard h^4 upon said base and meshing with said gear h' , a sleeve h^5 revolubly supported upon a rod h^6 pivotally connected at one end to said standard h^4 , said sleeve carrying at one end a bevel gear h^7 which meshes with gear h^3 and at its opposite end a handle h^8 , and an arc-shaped support h^9 adapted to rest upon the outer edge of the berth and having adjustably secured thereon a bearing block h^{10} which supports the outer ends of sleeve h^5 and rod h^6 . By revolving sleeve h^5 by means of its handle, a revolving movement is transmitted to rod h^2 and the worm through the bevel gears, while the adjustment of the block h^{10} upon the support h^9 enables the angle of the sleeve to be varied at will as the berth is raised or lowered. By means of this device, which can be instantly applied to and removed from a berth, the latter can be quickly and conveniently raised and lowered by a person standing in front thereof, and the use of a plurality of shafts permanently connected to the berth is obviated. In Fig. 7, however, we have shown a modified construction in which the worm k is located within a housing at the front side of the berth, and motion is transmitted to shaft f therefrom, through a cross-shaft k' , which carries at one end the worm gear k^2 and at its opposite end the bevel gear k^3 , which meshes with a similar gear k^4 on shaft f . The worm in this case being readily accessible from the front side of the berth, the device shown in Fig. 6 will be unnecessary.

Whatever system of gearing for raising and lowering the berth be employed, we regard it as of vital importance that some means be provided for assisting the action of said gearing, by counteracting to some extent the weight of the berth and the friction of the gearing. The second branch of our improvement, therefore, consists in the combination with gearing for raising and lowering a berth in the manner described, of means, preferably a spring or springs, for assisting the action thereof in raising the berth.

In Fig. 1 we have represented by broken lines at m m , two steel springs of the form known as ribbon springs, which have one end thereof secured to the under side of the floor sections c in substantially the plane occupied by the berth in its highest or operative position, and have their opposite ends coiled within casings m' secured to the end of the berth. The tendency of the springs to again coil themselves within their casings after being drawn from the latter, constantly tends to move the berth from its lowest to its highest position and augments the positive action of the gearing. We much prefer, however, to use the form of spring shown in Figs. 2 3 5 8 and 9, the same consisting of a coiled ribbon spring n , located within a housing n' and surrounding shaft f , said spring being connected at its

opposite ends to said housing and shaft respectively, in such manner that revolution of the shaft in a direction to lower the berth will wind up or contract the coil, and movement of the shaft in a direction to raise the berth will permit the coil to unwind or expand. Such arrangement of the spring has a similar effect upon the movement of the berth to that first mentioned, viz:—to partially counteract the weight of the berth and facilitate its upward movement, and possesses the additional advantages that the spring will retain its elasticity for a period co-extensive with the life of the gearing, and occupies but a small space. Other variations in the form, number, and arrangement of springs for the purpose can be made within the spirit of our invention.

In Figs. 8 9 and 10 we have shown a form of the invention in which the racks e' and pinions f^2 are omitted, the berth being raised and lowered by means of the pinions f' and racks e simply. In this form, some means for retaining the berth in a horizontal position must be employed, and we have shown as one example of such means vertically disposed lugs o upon the ends of the berth, which project into vertical grooves in the floor sections c . As this function is secured by the idler pinions f^2 and additional rack e' first described, without the possibility of any binding action between the berth and its supports, however, we prefer to employ the first mentioned construction.

It will be observed that by means of the construction herein shown and described we insure to this class of sleeping cars durability, certainty and ease of operation, of its berth operating mechanism, in that we overcome all tendency of the rack and pinion mechanism to spread the vertically disposed floor sections apart, obviate all binding action between the berth and its supports, and provide an auxiliary spring or springs to augment the action of the gearing. By reducing the number of shafts and gears and, consequently, the number of parts to be lubricated, we reduce the liability to soil the bed clothing and the apparel of the occupant of the berth with oil, as well as the odor arising from the latter, to a minimum, and thereby obviate what might become a serious objection to this form of car.

Having thus fully described our invention, what we claim and desire to secure by Letters Patent is

1. In a sleeping car, the combination with a berth-storing well or compartment located beneath the level of the floor of the car, and two hinged sections of the floor adapted to close said well or compartment and to be raised to a vertical position to form partitions between the berth-sections, of a rack secured to the under side of each of said floor sections the teeth of which racks project therefrom toward one of the side walls of the car, a berth adapted to occupy said well or compartment, a shaft

extending longitudinally through said berth at or near the transverse center thereof, said shaft carrying at its ends pinions which engage said racks, and means substantially as described for manually revolving said shaft, arranged and operating substantially as set forth.

2. In a sleeping car, the combination with a berth-storing well and hinged floor sections for closing said well as described, of a rack secured to the under side of said floor sections, a berth adapted to occupy said well, two pinions operatively connected to said berth at the ends of the latter and engaging said racks respectively, the axes of said pinions being perpendicular to the ends of the berth, and means substantially as described for revolving said pinions simultaneously, substantially as set forth.

3. In a sleeping car, the combination with a well located beneath the plane of the floor of the car, and two hinged sections of the floor adapted to close said well and also to form partitions between the berth-sections, said floor sections being provided with racks on their under side, of a berth adapted to occupy said well when not in use, a shaft extending longitudinally through said berth at or near the transverse center thereof, said shaft carrying at its ends pinions which engage the racks on said floor sections, and carrying between its ends a worm-gear, a housing secured to the berth, a worm revolvably supported in said housing and meshing with the worm-gear on said shaft, and means substantially as described for manually revolving said worm, substantially as and for the purpose set forth.

4. In a sleeping car, the combination with a well or compartment located beneath the level of the floor and two hinged sections of the floor adapted to close said well or compartment and also to serve as partitions between the berth-sections, each of said floor-sections having upon its under side two racks facing in opposite directions, of a berth adapted to occupy said well or compartment when not in use, a shaft passing longitudinally through said berth and carrying at its ends two pinions which engage one of the racks on each of said floor sections, two idler pinions revolvably secured to the opposite ends of the berth, which pinions engage the second rack on each of said floor sections and also mesh with said first mentioned pinions respectively, and means substantially as set forth for manually revolving said shaft, arranged and operating substantially as described.

5. In a sleeping car, the combination with a berth-storing well or compartment located beneath the level of the car floor, a berth adapted to occupy said well or compartment when not in use, and means for lowering said berth into and raising it out from said well or compartment, of an auxiliary spring or springs for assisting the upward movement of the berth, substantially as set forth.

6. In a sleeping car, the combination with a

berth-storing well or compartment located beneath the level of the floor, a berth adapted to occupy said well or compartment when not in use, and gearing connected with the berth
 5 and engaging corresponding devices connected with the berth-support for raising and lowering the same, of an auxiliary spring or springs so disposed as to partially counteract the weight of the berth and assist its upward
 10 movement, arranged and operating substantially as set forth.

7. In a sleeping car, the combination with a well or compartment located beneath the floor of the car, hinged floor sections adapted to
 15 close said well and also to form partitions between the berth-sections, said floor sections having racks secured to their under side, and a berth adapted to occupy said well or compartment when not in use, of a shaft extending
 20 longitudinally through said berth and carrying at its ends pinions which engage the racks on said floor-sections means substantially as described for manually revolving said shaft to raise and lower said berth, and
 25 a spring operatively connected with said shaft and exerting pressure thereon in a direction to cause an upward movement to the berth, substantially as and for the purpose set forth.

8. The combination with a vertically mov-

able sleeping-car berth, of a shaft extending 30 longitudinally through said berth at or near the transverse center thereof and having at its ends suitable gear connection with the berth supports whereby revolution of said shaft will raise and lower the berth, a worm 35 supported in a suitable housing on the berth and engaging a worm-gear on said shaft, and means for revolving said worm from a point at the side of the berth, said means comprising a base adapted to be detachably connected 40 to the housing, a gear revolubly supported upon said base and having means for operatively engaging the worm, a sleeve revolubly mounted upon a hinged bar and carrying a gear at one end and a handle at its opposite 45 end, an intermediate gear for transmitting the motion of one of said first mentioned gears to the other, an arc-shaped support adapted to rest upon the berth at the front side thereof, and a bearing for the outer end 50 of said sleeve adjustably secured upon said support, arranged and operating substantially as set forth.

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Witnesses:

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