April 26, 1955 O. C. HOLLSTEIN 2,707,137

TABLE WITH ADJUSTABLE TOP

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Fig. 1.

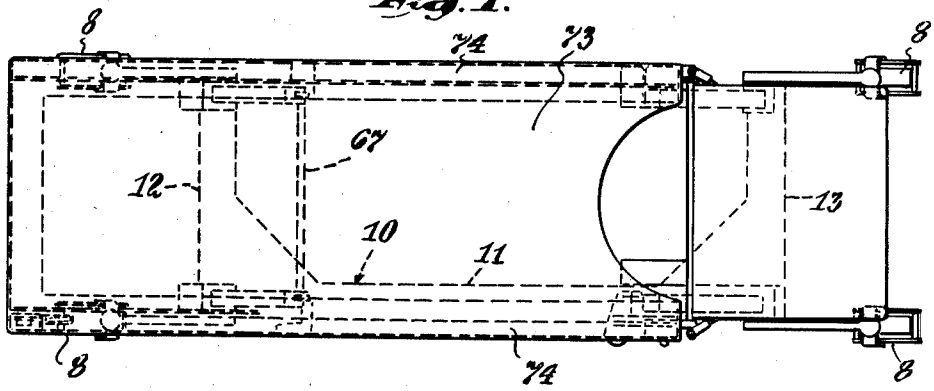


Fig. 2.

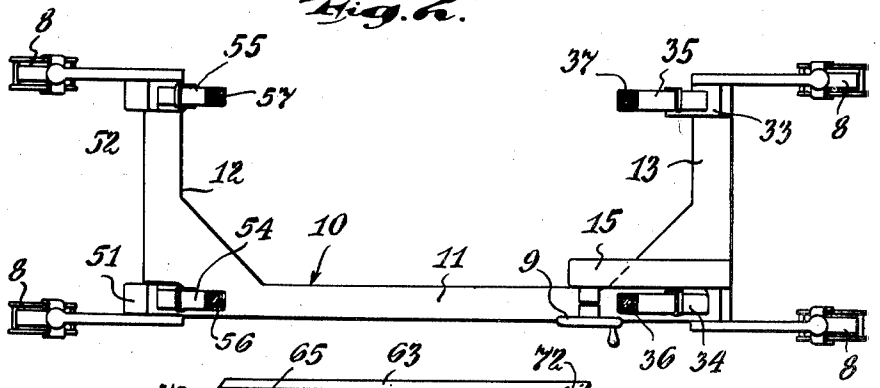
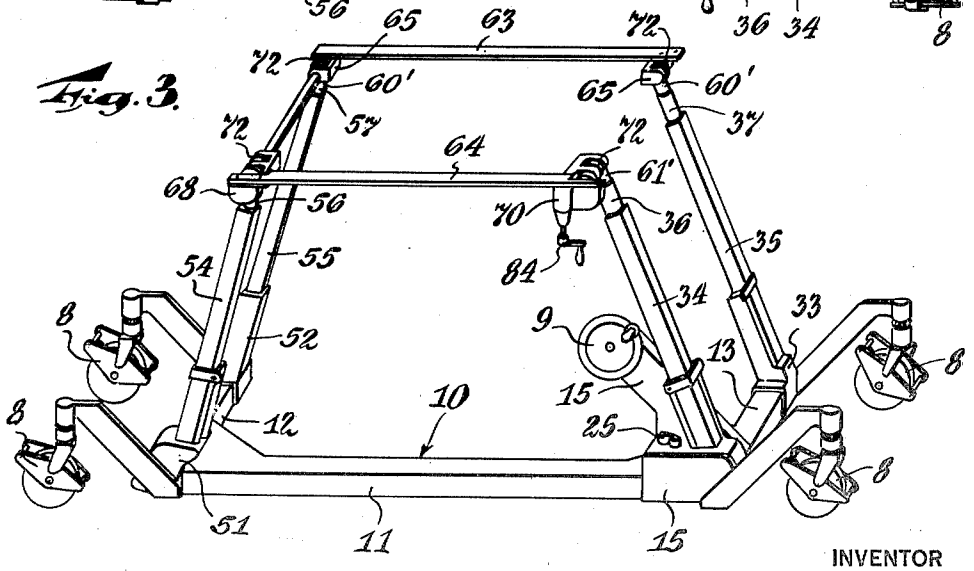


Fig. 3.



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Fig. 4.

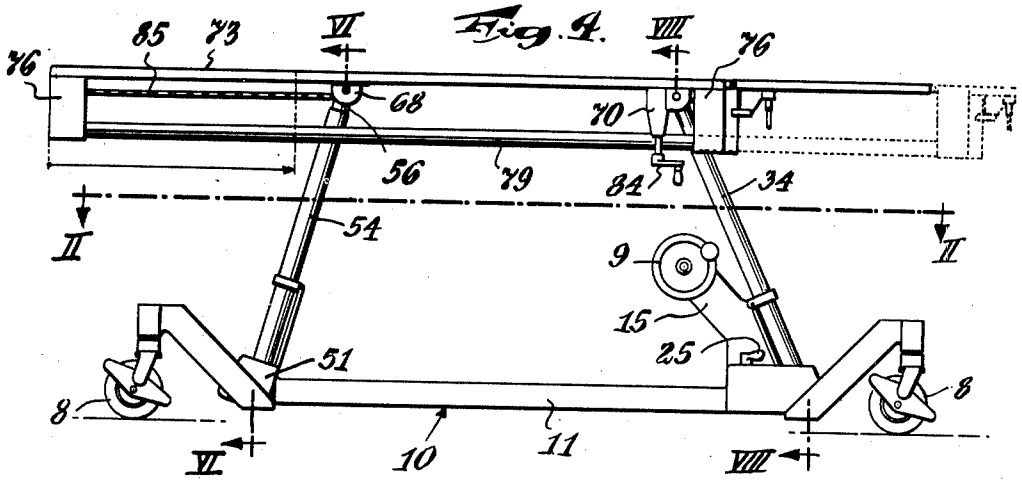
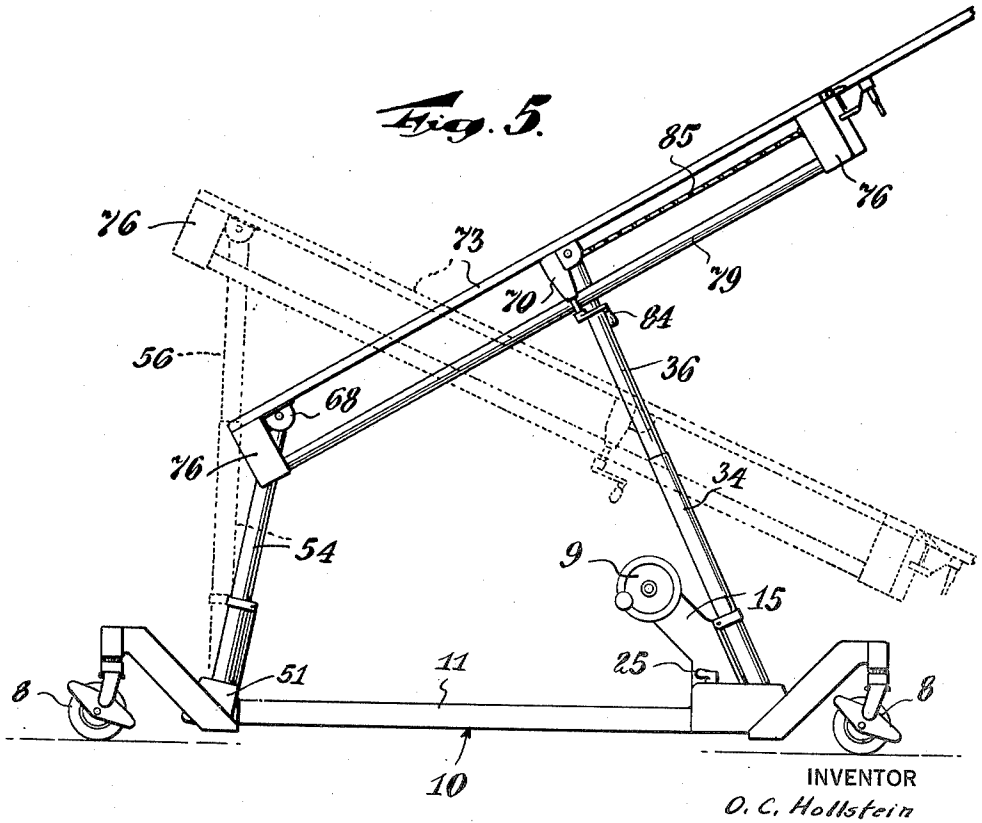


Fig. 5.



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Fig. 6.

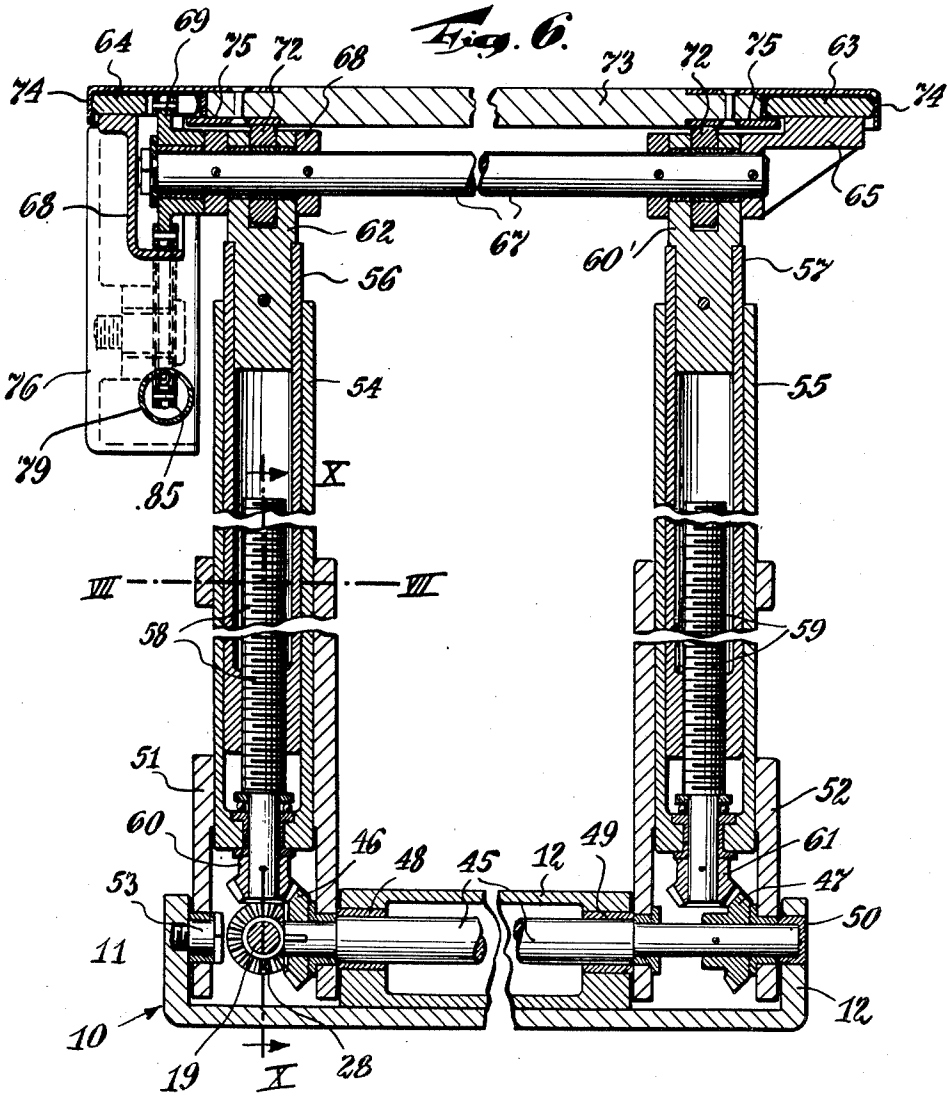
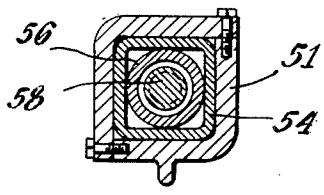


Fig. 7.



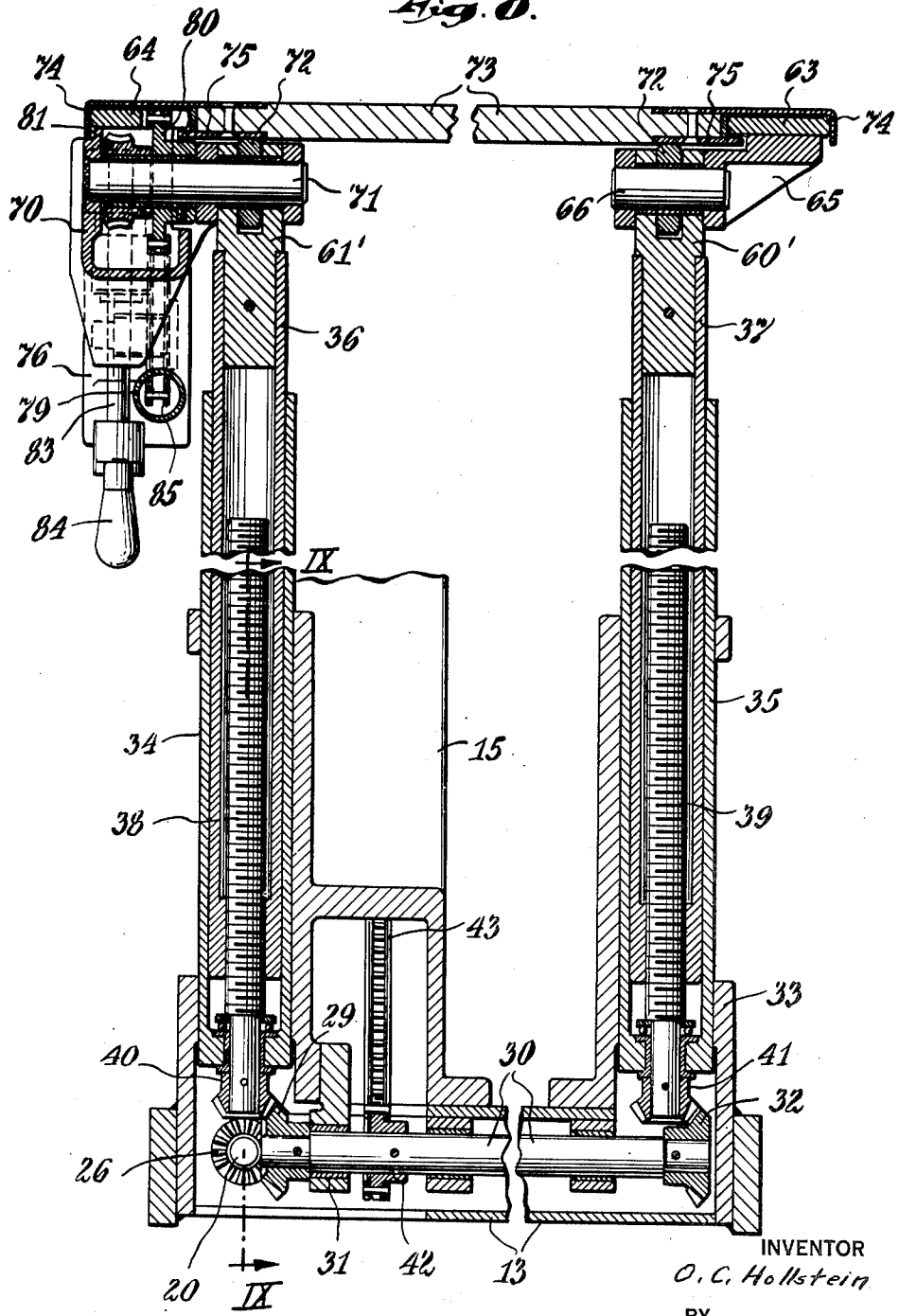
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Fig. 8.



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Fig. 9.

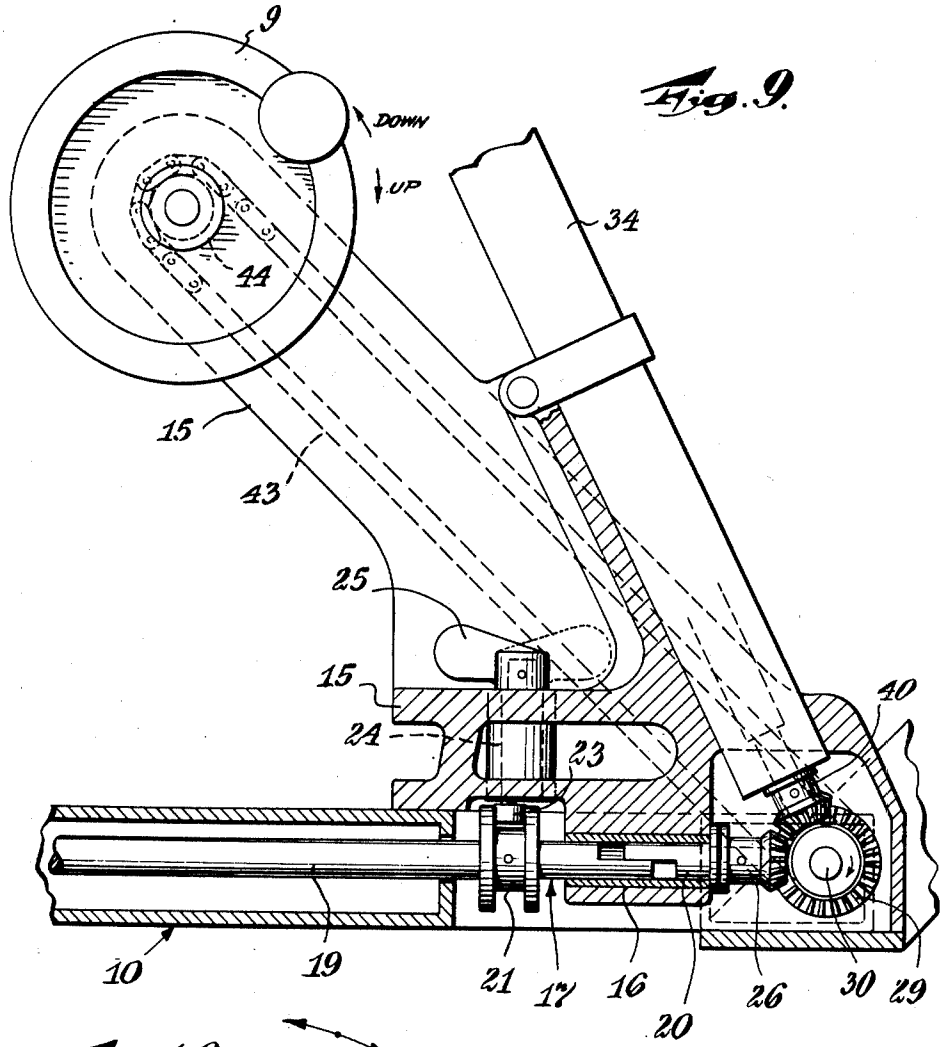
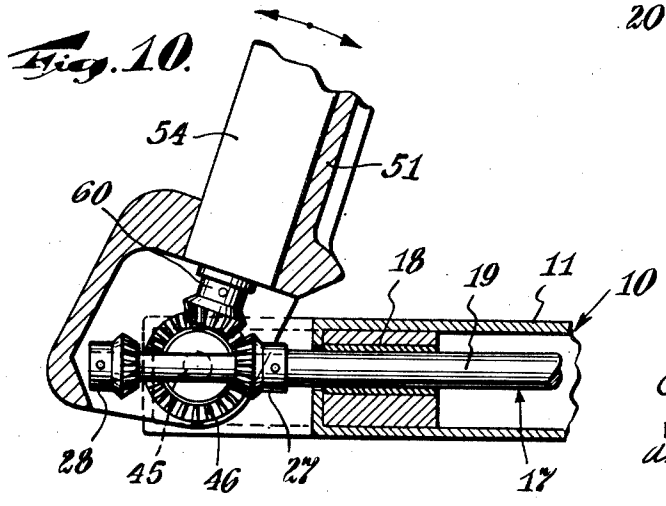


Fig. 10.



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Fig. 11.

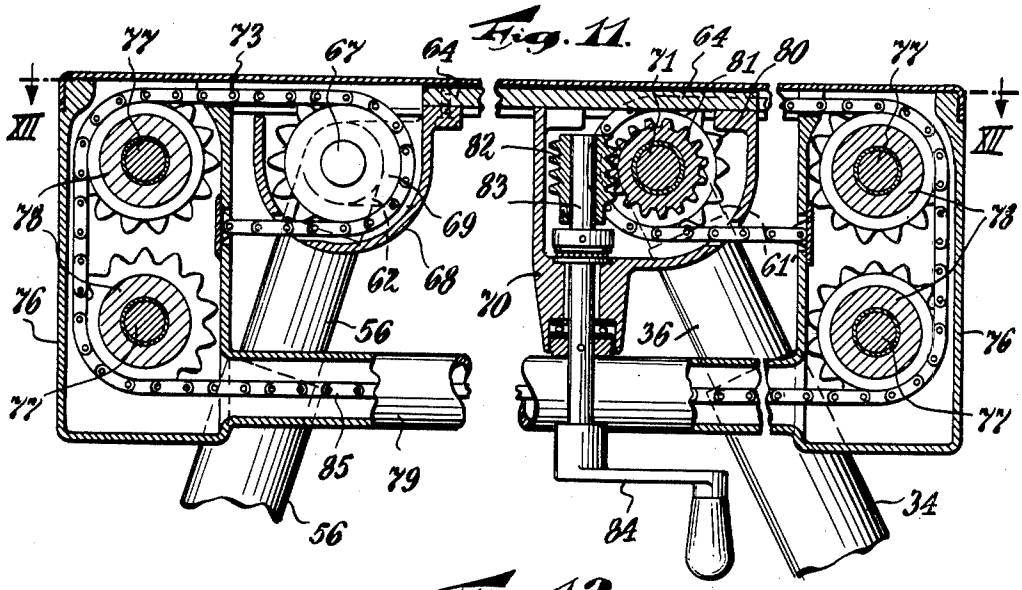
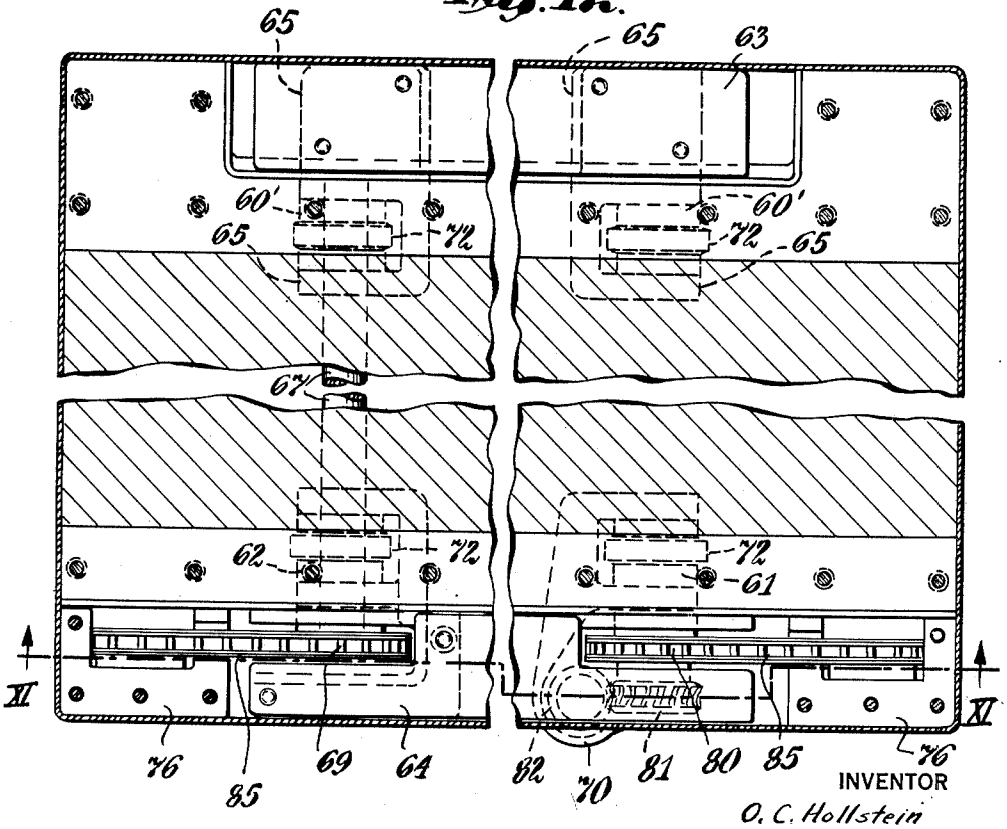


Fig. 12.



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2,707,137

TABLE WITH ADJUSTABLE TOP

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Application February 26, 1952, Serial No. 273,390

5 Claims. (Cl. 311—6)

This invention relates to tables and more particularly to mobile tables finding use especially in hospitals.

In one of its more specific aspects this invention is directed to mobile X-ray tables which may be used for a number of different purposes in a hospital. These novel tables permit the ready and easy placing of a patient thereon, transportation to the X-ray room, then to the operating room and finally to the bedroom, thus requiring handling of the patient only twice, onto the table and then to the bed because these tables may serve not only as supports during transportation, but also during the taking of the X-rays and also during operation. These tables are especially useful in those cases where excessive handling is to be avoided.

In addition, they are particularly useful in those cases where in addition to transportation, the patient may have to be moved back or forth without moving the entire table, or up or down to locate the patient in a particular horizontal plane, or to tilt the patient at a particular angle to the vertical. All of the foregoing may be accomplished without removing the patient from the table.

These, as well as other, advantages and objects of the invention will be readily apparent from the following description and drawings, wherein:

Fig. 1 is a top plan view of a novel table embodying the invention.

Fig. 2 is taken on line II—II of Fig. 4.

Fig. 3 is a perspective view of the table shown in Fig. 1, but with the top and the top operating mechanism omitted.

Fig. 4 is a side view of the embodiment of the invention shown in Fig. 1.

Fig. 5 is a view similar to Fig. 4 and illustrates various angulations of the table top.

Fig. 6 is a cross sectional view taken on line VI—VI of Fig. 4.

Fig. 7 is a cross sectional view taken on line VII—VII of Fig. 6.

Fig. 8 is a cross sectional view taken on line VIII—VIII of Fig. 4.

Fig. 9 is a cross sectional view taken on line IX—IX of Fig. 8.

Fig. 10 is a cross sectional view taken on line X—X of Fig. 6.

Fig. 11 is a cross sectional view taken on line XI—XI of Fig. 12.

Fig. 12 is a cross sectional view taken on line XII—XII of Fig. 11.

As shown in the drawings, one form of X-ray table embodying the invention, comprises a base **10** which is of generally U shape, having an elongated hollow side **11** and a pair of hollow ends **12** and **13** which are shorter than side **11** and are parallel to each other. Secured to base **10** are four large caster rollers **8**. Mounted on the base **10** is a casting **15** rigidly secured thereto at one end of side **11**. Casting **15** has a bearing **16** for a two piece shaft **17** which is also carried by a bearing **18** mounted in the side **11**. The shaft **17** consists of two permanently interlocked parts **19** and **20** so that the length of shaft **17** may be varied at will. The shaft part **19** has a double flange collar **21** keyed thereto. Located between the flanges of collar **21** in a cam roller **23** eccentrically carried by a rotatable pin **24**, having a short handle **25** and carried by the casting **15**. Secured to the short part **20** of the shaft **17** is a bevel gear **26**, and secured to the other part **19** of shaft **17** are a pair of spaced oppositely disposed bevel gears **27** and **28**. The handle **26** may be rotated to swing

cam roller **23** to either the left or right to slide the shaft part **19** to dispose either gear **27** or **28** in operative position. The bevel gear **26** meshes with a bevel gear **29** secured to one end of a shaft **30** carried by bearings **31** in side **13**. The other end of shaft **30** has a bevel gear **32** secured thereto. Secured to the side **13** is another bracket **33**. The brackets **15** and **33** are rigidly secured to base **10**. Secured to brackets **15** and **33** and extending upwardly therefrom and at an angle thereto are hollow columns **34** and **35** respectively.

These columns **34** and **35** are rigidly and fixedly connected to the respective brackets **15** and **33** and are always maintained in the same position with respect to the base **10**. The columns **34** and **35** serve as supports and guides and have respective telescopic supporting columns **36** and **37** therein. These columns **36** and **37** are threaded at their lower ends and make threaded connections with respective threaded shafts **38** and **39**. Said shafts **38** and **39** are journalled in bearings at the lower ends of columns **34** and **35** respectively, and carry bevel gears **40** and **41** respectively. Said gears **40** and **41** respectively mesh with bevel gears **29** and **32** so that upon rotation of the shaft **30** in one direction the screws **38** and **39** are rotated to cause the columns **36** and **37** to move upwardly. When rotation of shaft **30** is in the opposite direction, columns **36** and **37** are caused to be moved downwardly. The direction of rotation of shaft **30** is determined by which of the particular bevel gears **27** and **28** is in operative position or meshing engagement with gear **26**. Also mounted on the shaft **30** is a sprocket **42** over which is mounted a drive chain **43** which is also coupled to a drive sprocket **44**, actuatable by a crank wheel **9** carried at the end of an extension of the supporting bracket **15**.

Mounted in the side **12** is a rotatable shaft **45** having bevel gears **46** and **47** secured to the ends thereof. The shaft **45** is mounted in bearings **48** and **49** carried in the side **12** and one end of the shaft is also mounted in a bearing **50** carried by the side **12**. Supporting brackets **51** and **52** are swingably supported on the base **10**. The bracket **51** is mounted on a bearing carried by a short stud shaft **53** secured to side **11** and also on a bearing carried by and freely mounted on the shaft **45** at one end thereof. The bracket **52** is mounted on bearings carried by and freely mounted on the shaft **45** at the other end thereof. Columns **54** and **55** are rigidly secured to brackets **51** and **52** and respectively carry telescopic supporting columns **56** and **57**. The lower ends of columns **56** and **57** are threaded and make threaded engagement with screws **58** and **59** whose plain lower ends are journalled in the lower portions of columns **54** and **55** respectively. Said screws **58** and **59** at their lower ends respectively carry bevel gears **60** and **61** which respectively mesh with the bevel gears **46** and **47**, which upon rotation serve to move the columns **56** and **57** up or down depending upon the direction of rotation of shaft **45**. Fixedly secured to the upper end of each of the columns **37** and **57** is a U-shaped bearing bracket **60'** and fixedly secured to the columns **36** and **56** respectively are similar U-shaped brackets **61'** and **62**.

Table top supporting strips **63** and **64**, disposed parallel to each other, are respectively connected to columns **36—56** and columns **37—57**. Each end of the strip **63** carries a bracket bearing **65**. One of said brackets **65** is pivotally coupled with the bracket **60**, carried by column **37**, through a short stud shaft **66**. The other bracket **65**, as shown in Fig. 6, is coupled with the other bracket **60**, carried by column **57**, through a shaft **67** which extends in the space between one end of supporting strips or plates **63** and **64** to couple the plates **63** and **64**. One end of strip **64** carries a housing bracket **68** which is coupled with the bracket **62** through the shaft **67**. The shaft **67** carries, within bracket **68**, a sprocket wheel **69** which is freely rotatable thereon. The other end of strip **64** carries a housing bracket **70** which is coupled with bracket **61'** through a stud shaft **71**. Located within the bights of the brackets **60'**, **61'** and **62** and freely rotatable on the shafts **66**, **67** and **71**, are table top supporting rollers **72**. Resting on said rollers **72** is a table top **73**.

The table top **73** has elongated guide flanges **74** extending the length thereof and said flanges **74** are disposed outside of the strips **63** and **64**. The table top **73** has lower guide flanges **75** located close to and below

the inner lower marginal faces of plates **63** and **64**. Depending from the table top **73** are a pair of housings **76**, each carrying a pair of shafts **77** on which are rotatably mounted sprockets **78**. Communicating with the housings **76** is an elongated tube housing **79**.

The shaft **71** has freely mounted thereon a combination sprocket **80** and worm wheel **81** fixedly coupled to each other and freely movable in unison on shaft **71**. Meshing with the worm wheel **81** is a worm gear **82** carried at one end of a shaft **83** journalled in bracket **70**. The other end of the shaft **83** has a handle or crank **84** connected thereto. The worm gear **82** meshing with the worm wheel **81** serves as a drive for gear **82** and also as a lock therefor. One end of a chain **85** is anchored to one of the housings **76** and this chain passes therefrom around sprockets **69**, a pair of sprockets **78**, through tube **79** around the other pair of sprockets **78** around sprocket **80** and its other end is anchored to the other housing **76** (see Fig. 11). Upon actuation of the handle **84** it drives the worm gear, which in turn drives the chain **85** so that the table top may be moved lengthwise back and forth on the guide and supporting strips **63** and **64**. By the employment of the worm gear **82** and wheel **81**, an automatic lock is acquired when worm gear **82** is stationary.

The operation of this unique table is as follows: If it is desired to move the table top **73** in the righthand direction and to the dotted line position as shown in Fig. 4, this may be easily and readily accomplished by merely actuating the handle **84** in the appropriate direction. Thus by rotation of the handle **84** the position of table top **73** with respect to base **10** may be varied as required. When it is desired to raise or lower the table top **73** to vary its horizontal position with respect to the floor, for example, this may be done by shifting the handle **25** towards the right as shown in Fig. 4 to shift the shaft part **19** towards the right whereupon gear **27** is moved to and locked in inoperative position and gear **28** is moved to and locked in operative position, whereby gear **28** is in meshing engagement with gear **46**. Then the wheel **9** is rotated to rotate shaft **30**, which in turn rotates the screws **38** and **39** and also rotates shaft **17** which in turn rotates shaft **45** which in turn rotates screws **58** and **59**. In this manner, columns **36**, **37**, **56** and **57** may be simultaneously raised or lowered in unison. When it is desired to tilt the table from horizontal position as shown in Fig. 4 to the tilted position as shown in full lines of Fig. 5, the handle **25** is turned to the left whereupon gear **28** is disengaged and gear **27** is engaged with gear **26**. Then the wheel **9** is rotated causing rotation of shaft **30** causing rotation of the screws **38** and **39** in one direction and also rotation of shaft **17** in turn causing rotation of the shaft **45** which in turn causes rotation of the screws **58** and **59** in a direction opposite to the direction of rotation of the screws **36** and **37**, whereupon the vertical movement of the columns **36** and **37** is in a direction opposite to the direction of movement of the columns **56** and **57**. In this general manner tilting the table to the positions either shown in full or dotted lines of Fig. 5, depending what is required at the moment, may be readily accomplished without disturbing the patient.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A table comprising a base, a top, means carried by said base and extending upwardly therefrom, said top supported by said means, means for moving said top back and forth along its longitudinal axis while said base is stationary, and means for moving said top vertically with respect to said base while maintaining said top at substantially the same angle to the horizontal and also for tilting said top while the base is stationary, said last mentioned means including a variable length drive shaft a bevel gear secured to one end of said shaft and a pair of oppositely disposed bevel gears at the other end of said shaft, said first mentioned bevel gear always being located in the same position and the position of said oppositely disposed bevel gears being variable while that of said first mentioned bevel gear remains unchanged when the length of said drive shaft is varied.

2. A table comprising a base, a pair of extensible supports rigidly secured to said base at one end thereof and extending upwardly therefrom, a pair of extensible supports pivotally secured to said base at the other end thereof, a top, said top carried by said supports, all of said supports being pivotally coupled with said top, means for simultaneously increasing the length of both pairs of supports and to increase the length of one pair of said supports while decreasing the length of the other pair of said supports, said means including a variable length shaft and a pair of oppositely disposed bevel gears at one end thereof.

3. A table comprising a base, a pair of extensible supports rigidly secured to said base at one end thereof and extending upwardly therefrom, a pair of extensible supports pivotally secured to said base at the other end thereof, a top, said top carried by said supports, all of said supports being pivotally coupled with said top means for simultaneously increasing the length of both pairs of supports and to increase the length of one pair of said supports while decreasing the length of the other pair of said supports, a screw operatively coupled with each of said extensible supports to vary the length thereof upon rotation of said screw, a shaft operatively connected to the screws of said first pair of supports, a shaft operatively connected to the screws of said other pair of supports, a shaft operatively connected to said first mentioned shaft and adapted to be operatively variably connected to said second shaft to actuate all the screws in one direction and one set of screws in one direction and the other set in the opposite direction.

4. A table comprising a base, a pair of extensible supports rigidly secured to said base at one end thereof and extending upwardly therefrom, a pair of extensible supports pivotally secured to said base at the other end thereof, a top, said top carried by said supports, all of said supports being pivotally coupled with said top means for simultaneously increasing the length of both pairs of supports and to increase the length of one pair of said supports while decreasing the length of the other pair of said supports, a screw operatively coupled with each of said extensible supports to vary the length thereof upon rotation of said screw, a bevel gear secured to each of said screws, a shaft, a bevel gear carried by each end of said shaft and meshing with the gears of the screws operatively coupled with said first pair of supports, another shaft, bevel gears carried by said other shaft and meshing with the gears of the screws operatively coupled with said other pair of supports and a variable length shaft, a gear secured to said variable length shaft and meshing with one of the gears carried by said first mentioned shaft, a pair of bevel gears carried by said variable length shaft at the other end thereof and being oppositely disposed and means for varying the length of said variable length shaft to operatively connect either of said aforementioned gears with a gear carried by said second mentioned shaft.

5. A table comprising a base, a pair of supporting columns rigidly secured to said base and extending upwardly therefrom, a screw carried by each of said columns and a bevel gear secured to each of said screws, another pair of supporting columns secured to said base at the other end thereof and being swingable with respect to said base, a screw carried by each of said swingable supporting columns and a bevel gear carried by each of said last mentioned screws, a supporting element operatively connected to each of said screws and being vertically movable with respect to said base upon rotation of said screws, a shaft carried by said base, a pair of bevel gears secured to said shaft and meshing with the bevel gears secured to said first mentioned screws, a shaft carried by said base, a pair of bevel gears connected to said second mentioned shaft and meshing with said bevel gears secured to said second mentioned pair of screws, a variable length shaft, a bevel gear secured to one end thereof and meshing with one of the bevel gears on said first mentioned shaft and another pair of bevel gears disposed in opposing relationship, means for driving one of said shafts and means for locking in meshing relationship with one of the bevel gears of said second mentioned shaft or either of the said oppositely disposed gears.

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