

Feb. 17, 1953

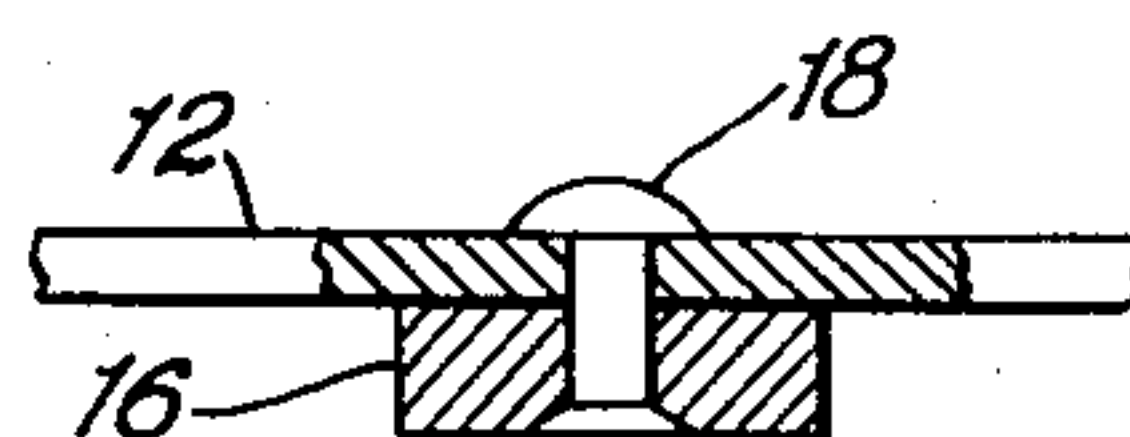
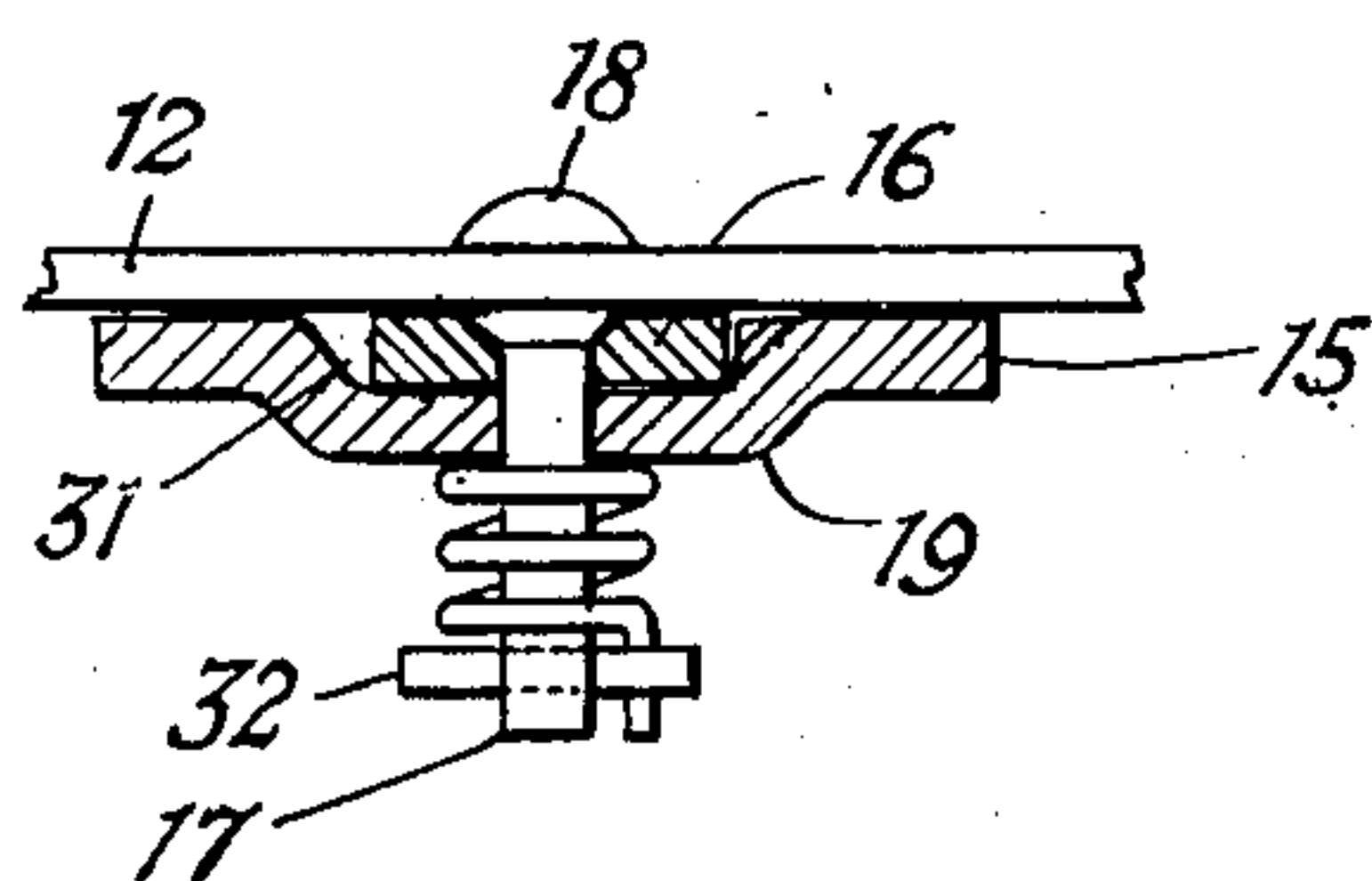
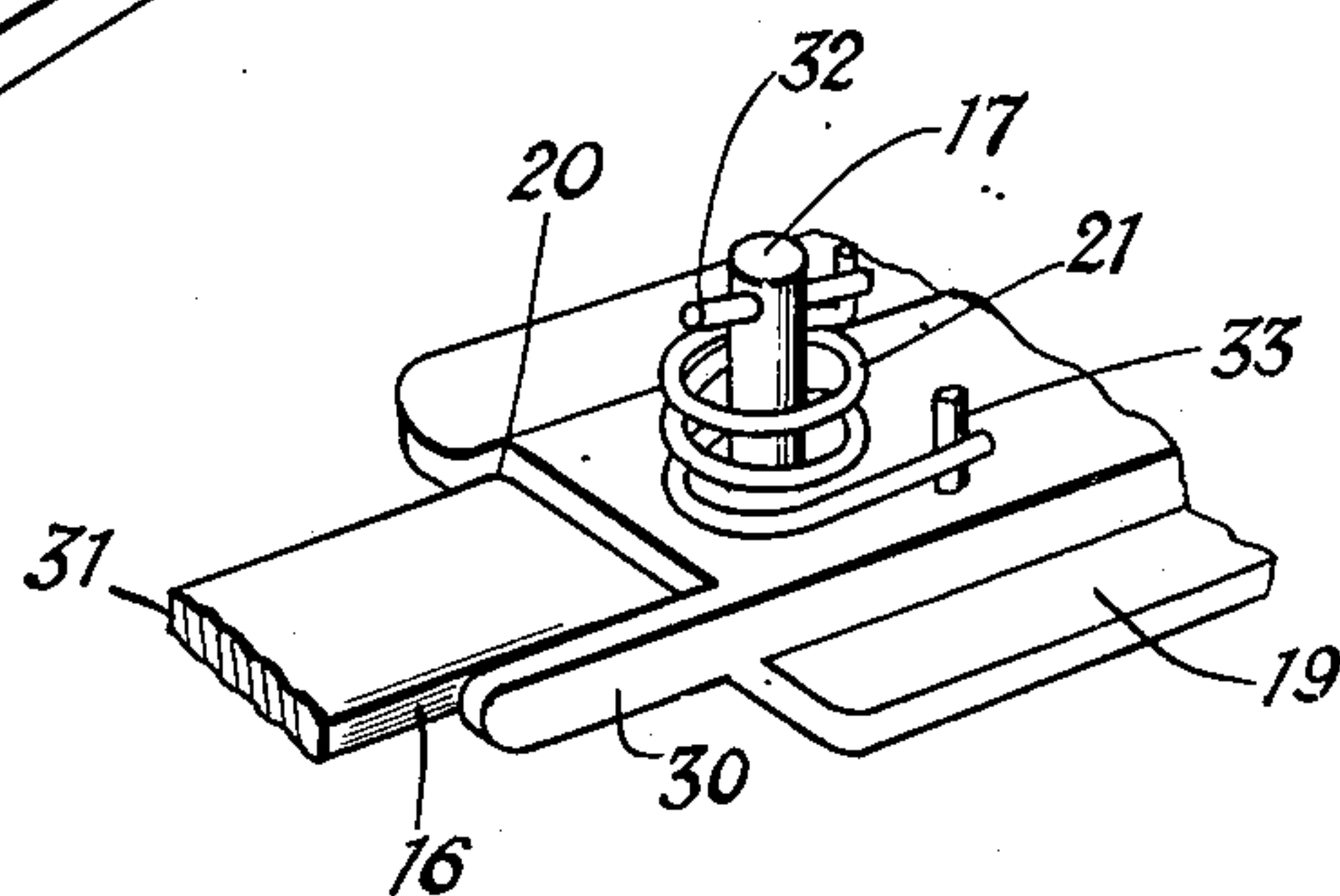
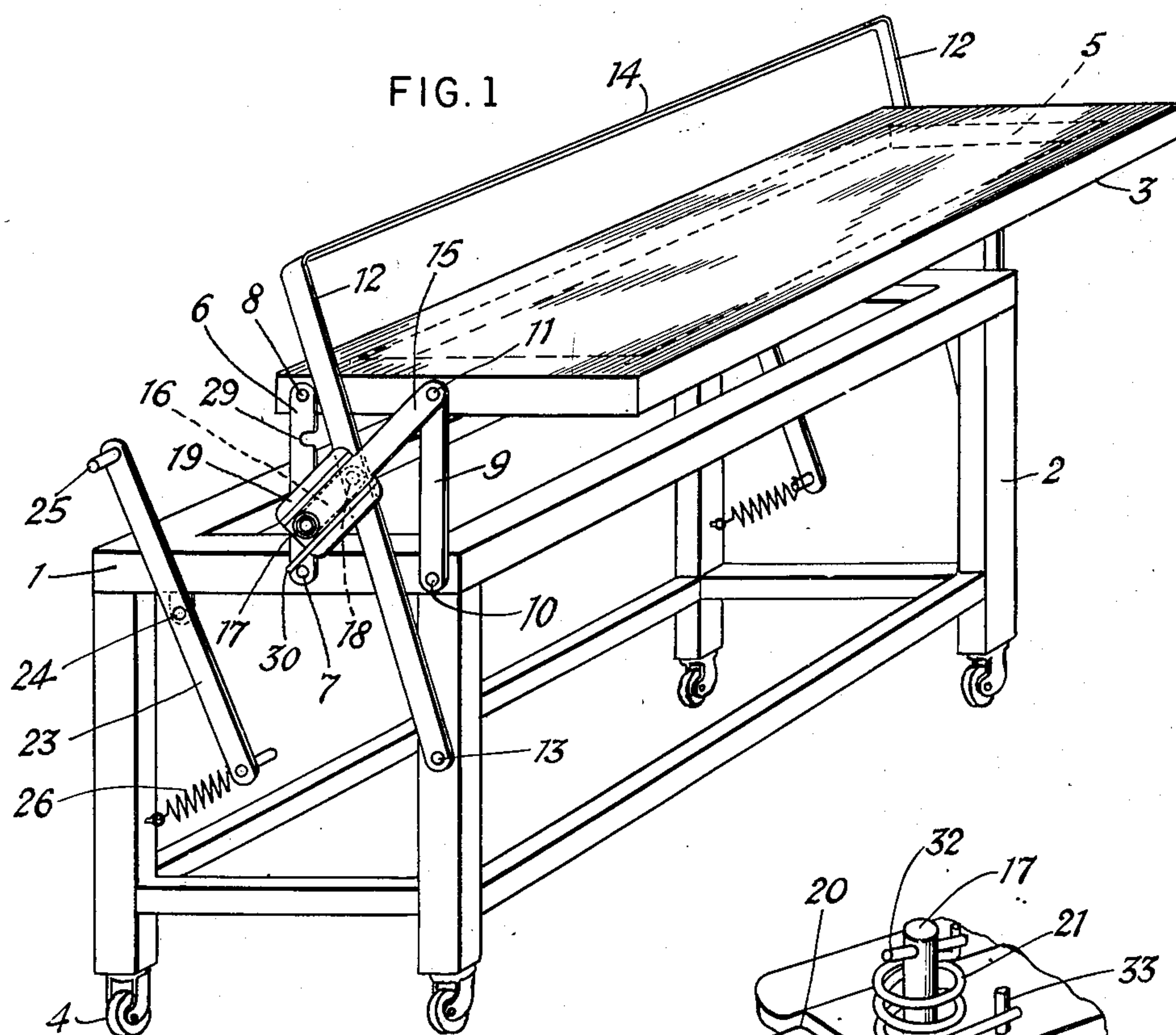
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2,628,369

MOBILE COT

Filed July 2, 1951

2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

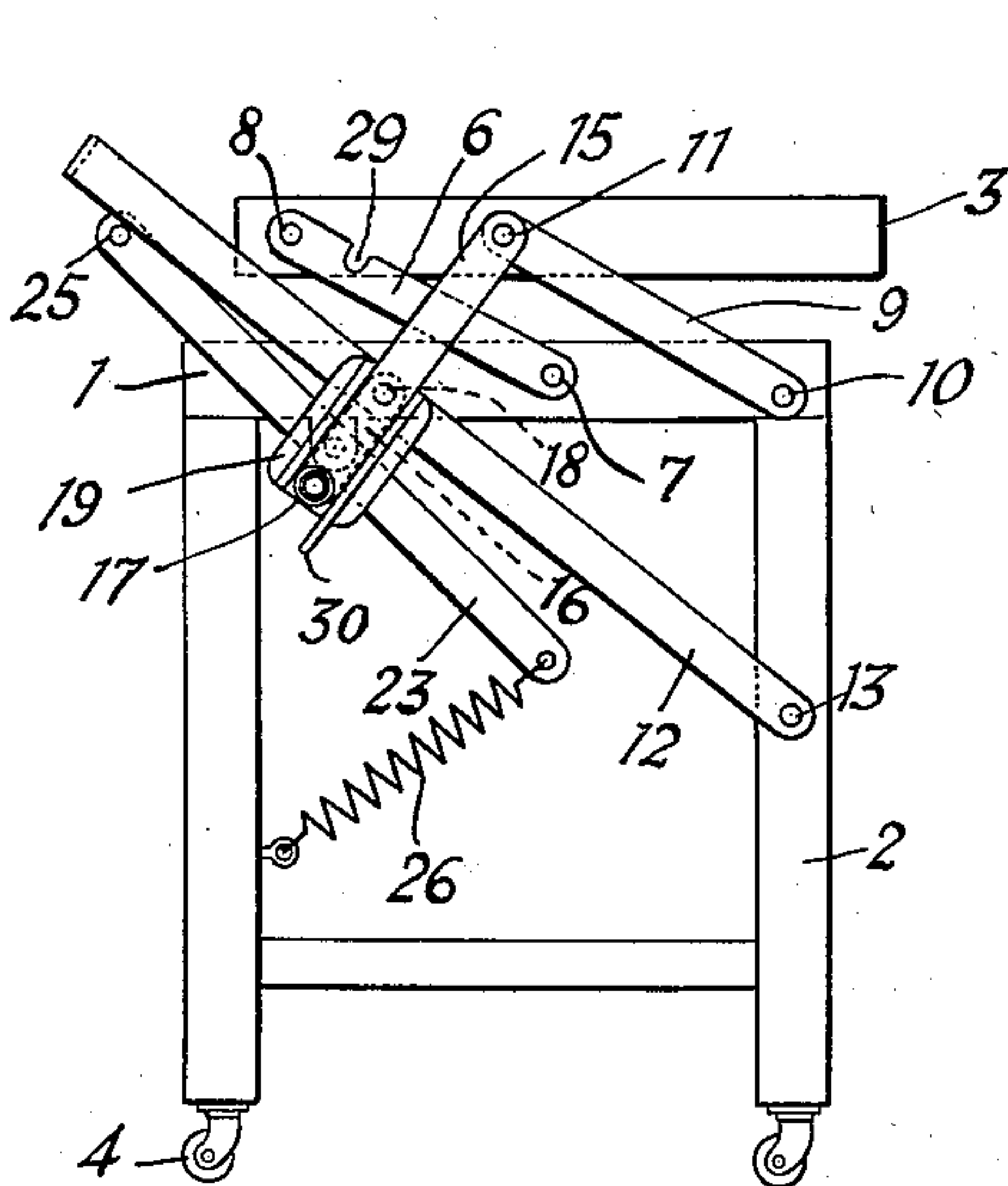


FIG. 2

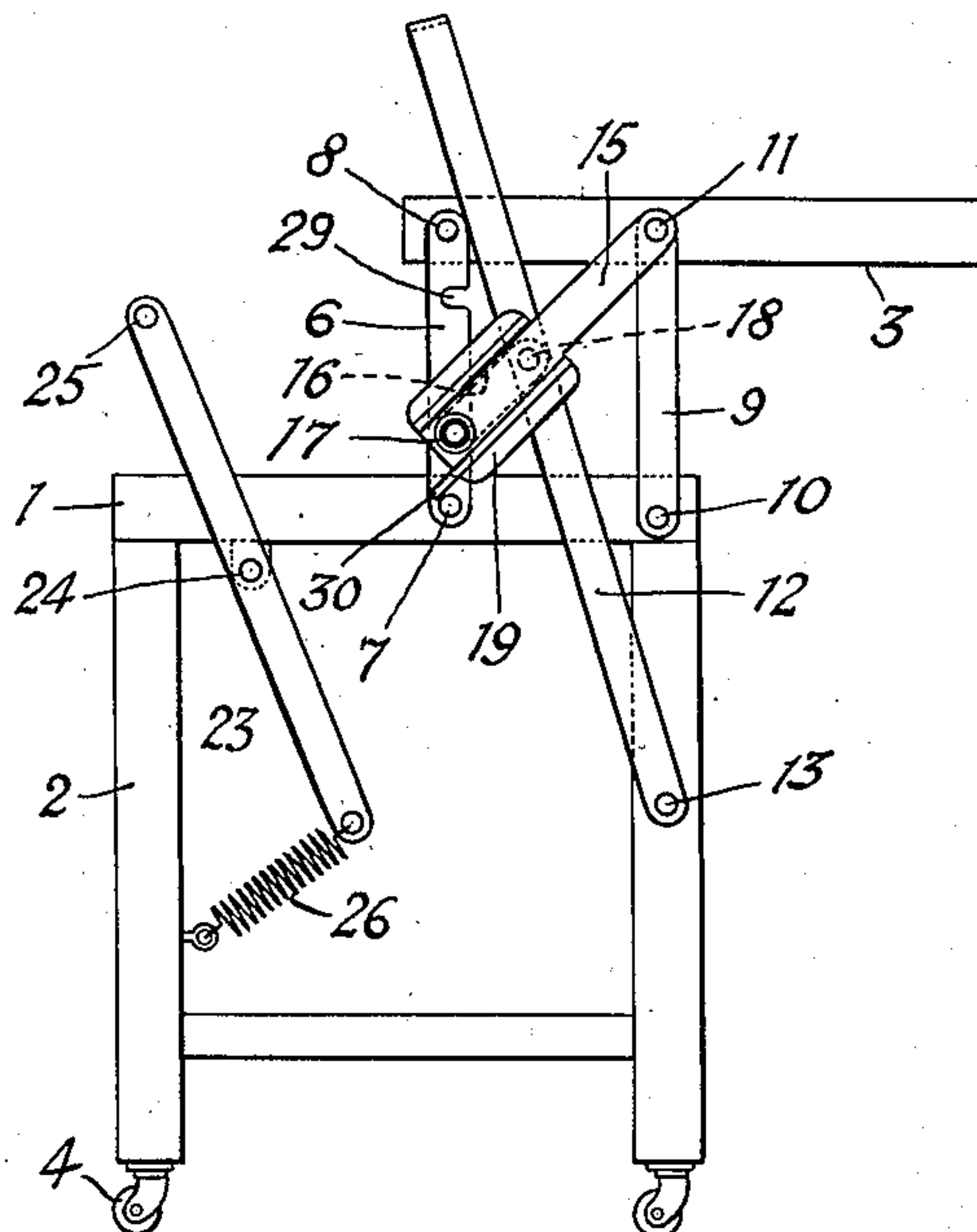


FIG. 3

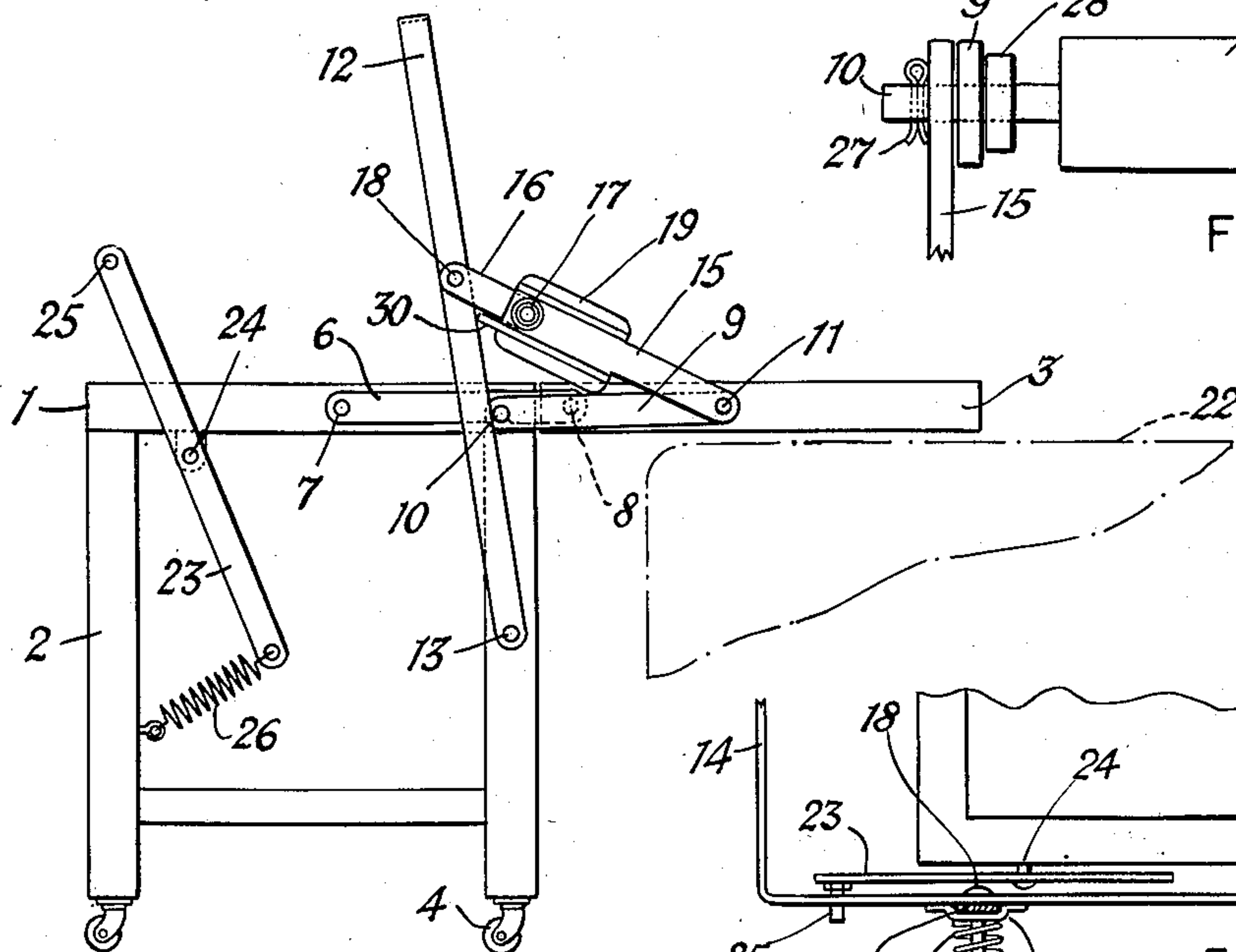


FIG. 4

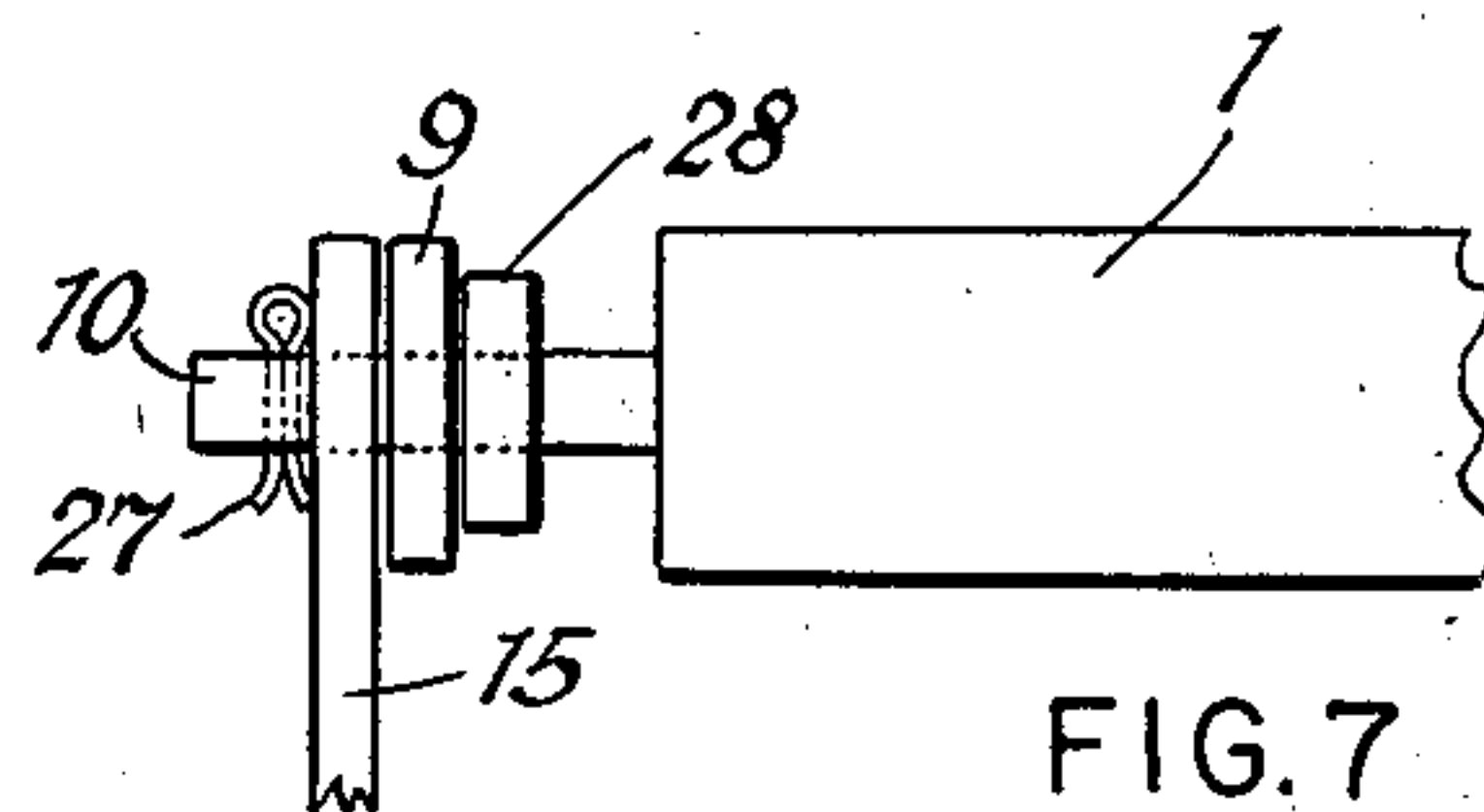


FIG. 7

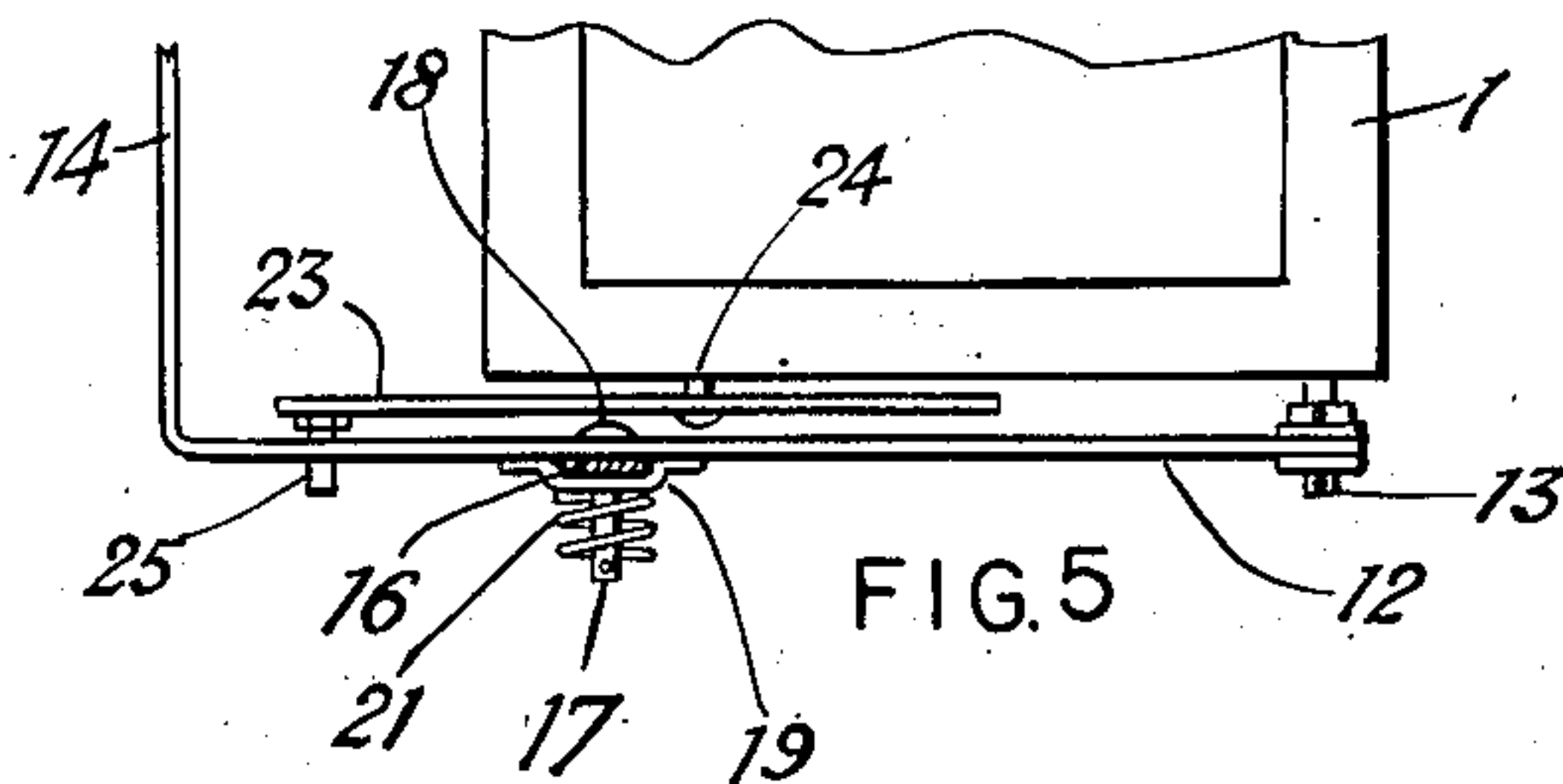


FIG. 5

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## UNITED STATES PATENT OFFICE

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## MOBILE COT

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6 Claims. (Cl. 5—86)

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My invention is an improved hospital cot or bed; particularly a wheeled cot built chiefly to serve as a mobile stretcher for transferring a patient from a bed to another point when such a change is necessary; and returning the patient to the same bed afterwards.

An important object of the invention is to provide a mobile cot that has a lifting frame at its top, so connected to the main framework as to be capable of manipulation to cause it to project at one side over a bed or operating table. Moving the patient is thus made easy because either the patient can then shift himself upon the frame, or at most the patient's body has only to be raised high enough for the lifting frame to be passed under it. The lifting frame is then swung up and back till it is down upon the top of the cot, which can at once be rolled away. The removal of the patient from the cot can also be readily accomplished, because the lifting frame is now actuated so that it again projects to one side over the bed or table, and the patient either exerts himself, or his body is held up by the attendants as the cot is withdrawn, and the patient is lowered again into a restful position.

A further object of the invention is to provide a cot with such a lifting frame comprising parts which are inexpensive to produce, can be quickly assembled, and are certain and effective in operation; so that the entire unit is quite simple in design, but nicely adapted to serve its intended purpose.

Other objects and advantages of this invention are set forth in the ensuing description, and the drawings illustrate a preferred construction in which the invention is embodied. The claims define the novel features, but I do not wish to be restricted in all details to the exact structure shown herein. The design may of course be varied in minor respects without omitting or radically altering any of the characteristics which are essential parts of the apparatus.

On the drawings:

Figure 1 is a perspective view of a cot according to this invention with the lifting frame elevated.

Figure 2 is an end view of such a cot with the lifting frame balanced upon it.

Figure 3 is an end elevation with the lifting frame raised.

Figure 4 shows the cot in end elevation with the lifting frame projecting at one side in position to extend across the top of a bed, table or other support for the body of a patient;

Figure 5 is a top view of part of the structure; and

Figures 6, 7, 8 and 9 show details.

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The cot or stretcher comprises a top having the form of a rectangular frame 1, supported upon legs 2. Connected to the top is the lifting frame 3, which can be swung to project at one side, or folded down upon the top 1. At the lower ends, each of the legs 2 has a caster or wheel 4. The lifting frame 3 is also preferably rectangular in outline; and the frame 3, also the top of the main framework, if desired, are filled with strong fabric webbing or cloth 5, extending from side to side and from end to end and firmly secured at the edges to bear the weight of the patient's body. The legs of course may be made of vertically adjustable sections, so that the cot may be used with beds and tables of different heights.

The lifting frame 3 is coupled to the top 1 by means of links disposed to permit the frame 3 to be swung outward to one side, and to be pulled back and lowered to rest upon the top 1. At each end there is a link 6, attached by a pivot pin 7 to the top near the middle; and secured at its opposite extremity by a pivot pin 8 to the end of the frame 3 adjacent a corner at one side. A second link 9 at each end is joined at one end by a pivot pin 10 to a corner of the top on the opposite side; and at its other extremity to the end of the frame 3 near the middle by a second pivot pin 11. When the frame 3 is swung up from the top, the links 6 and 9 are rotated on the pivots 7 and 10, and when the links have moved far enough, the frame 3 will project outward at the side of the top, in substantially horizontal position; as indicated in Figure 4.

To each leg of the cot, directly beneath the pivot 10, is pivotally connected a lever 12, the pivot pin on the leg being indicated by the numeral 13, and the two levers 12 are connected at their outer extremities by a bar 14. The two levers 12 and the bar 14 constitute a member which is manipulated to operate the frame 3.

The levers 12 are each connected by a pair of links 15 and 16 to the frame 3. The upper link of each pair 15 is attached to the adjacent pivot 11, or some other convenient point on the end of the frame 3; and the other, lower link 16 is pivotally secured as at 17, to the lower end of the adjacent link 15 and to the adjacent lever 12 as at 18, some distance from the pivot 13 of said lever. The pivots 18 may be rivets with round heads at one end engaging the levers 12, and countersunk at the opposite ends in the links 16. See Figure 9. The lower end 19 of each link 15 is relatively wide, and on its inner face it has a longitudinal recess or groove 20 in which the adjacent lower link 16 can be seated. The pins 17 are studs fixed to the links 16 and project through openings in the ends 19 of the links 15 beyond



the outer faces of the ends 19 of the links 15 and each stud 17 is encircled by a strong coiled spring 21, fixed to the stud at one extremity and the link 15 at the other. The force of these springs tends to move the links 16 so that they can be folded and seated in the grooves 20, the links 16 then extending from the studs 17 towards the pivots 11. The pins or studs 17 are secured to the link 16 by welding, riveting or otherwise so that they are rigidly mounted at the end of said links, as shown on Figure 8 which is a section through links 15 and 16 at the stud 17.

Figures 1, 2 and 3 show the entire mode of operation. The nurse or other attendant forces the bar 14 upward and the thrust of the links 15 and 16 raises the frame to the position of Figure 3. Further movement of the bar 14 swings the frame outward and downward to project from one side of the top 1, partly across the bed 22, as indicated on Figure 4, and the patient either moves himself or is lifted upon the frame 3.

When the frame swings up from the top 1, the levers 12 push upon the pins or bolts 13, thus pulling upward on the links 16. Through the studs 17, the links 16 push the links 15 upward to raise the frame 3. All this while the short links 16 are seated in the grooves 20 along their entire lengths, but when the links 6 and 9 reach the vertical, the weight of the frame 3 is now exerted on the links 15 and 16. The pull of the links 15 on the studs 17 is out of line or "off center" with respect to the studs or pivots 13 and tends to make these links unfold and straighten out. If there is no patient on the frame 3 this time, the attendant checks bar 14 with one hand and grasps the side of the frame 3 with the other. The frame can even be pushed a little to carry it downward, the links 16 then turning against the force of the springs 21 and slipping out of the grooves 20 till they reach fully distended position, as shown in Figure 4. The frame 3 now rests on the bed 22 and is ready to receive the patient, and the levers 12 are inclined away from the frame 3, so as to be within easy reach of the attendant when the frame with the patient is raised.

When the bar 14 is pulled back, the links 6 and 9 keep the frame horizontal; and the entire frame 3 moves in a semicircle till it once more rests on the top 1. The patient now is supported by the webbing 5 and rests comfortably on the frame 3. When the frame passes through mid-position, as in Figure 3, the attendant checks the bar 14, and steadies the frame with his hand as the links 16 fold again towards the links 15, the studs 17 turning so as to ease the springs 20, and finally, when the frame rests on the top 1, the links 16 slip back into the grooves 20.

When the patient is to be moved from the cot, either back to the bed or upon an operating table, the same procedure is followed. First the cot is rolled to the side of the bed or table, and the bar is worked to get the frame 3 over the top of the bed 22. The bar 14 is now lifted and the frame 3 is manipulated and controlled as before and swings up and outward in a sidewise direction again, coming to the position seen on Figure 4. The patient's body is then transferred to the bed or table and the cot withdrawn. Of course whenever the patient is able, lifting by the attendant is unnecessary. As the frame passes through mid-position shown in Figure 3, the weight of the patient will cause the links 15 and 16 to unfold and straighten out, against the force of the springs 21. The bar 14 is checked or

pulled back a little to facilitate unfolding the links 15 and 16, and the frame can be steadied by hand to prevent its downward motion from taking place too fast and ending too abruptly.

Another lever 23 is preferably mounted at each end of the top 1 on pivot pins 24. Each lever 23 has a lateral stud or bent upper end 25 which extends under the adjacent lever 12. At the opposite end, tension springs 26 secure the levers 23 to the adjacent legs 3. These springs are distended when the frame carrying a patient is depressed, so as to be down fully on the top 1, and when the patient and frame are raised, the force of the springs 26 reduces the amount of effort required of the nurse or other attendant. When the frame 3 is not loaded, the springs 26 tend to lift the levers 12 at the ends 25, and the bar 14 and frame 3 are balanced a little above the top 1, as in Figure 2.

The links 15 have their lower ends 19 farther from the ends of the top 1 than the outer faces of the levers 12, with the links 16 in between. See Figure 5 which omits the links 6, 9, 15 and 16 for the sake of clearness. The springs 21 on the studs 17 are therefore on the outer faces of the ends 19. The upper ends of the links 15 overlie the upper ends of the links 9 and the links 9 and 15 can be held on the pivots 10 by cotter pins 27. The other pivots on the frame 3 and top 1 may also carry cotter pins or other suitable means to retain the levers and links mounted thereon. The pivots 10 also have collars 28 spaced from the top 1, and the links 6 have notches 29 in the lower edges to seat upon the pins 10 between the collars 28 and the ends of the frame 1 when the frame 3 is in the position of Figure 4. The ends of the links 9 are then between the ends of the frame 3 and the links 15.

The webbing 5 can of course be secured to the frame 3 by any suitable detachable fastening means, so that the webbing can be loosened from the frame 3, after lifting a patient, and left under him when the frame 3 is raised again; being afterwards removed. As shown on Figures 3 and 4 the links 16 move counterclockwise when they straighten out. When folding they turn on their pivots 17 in the opposite direction. One side of the groove 20 in the end 19 of each link 15 has a projection 30 to engage the side of the lever 16 when unfolded and serves as a stop and prevents the links 16 from rotating in the wrong direction when folding. As shown in Figure 8 one side of the groove 20 is rounded or bevelled somewhat as indicated at 31 to facilitate the unfolding of the link 16 from the groove 20, and each spring 21 always yields and is compressed or wound up by a fixed pin 32 passed through the end of the stud 17, when the link 16 moves into cross position on the end 19 having the groove 20. One end of each spring 21 presses against the fixed transverse pin 32 in the end of the stud 18 bearing it. The other end of each spring is held fast by a stud 33 on the end 19 of the link 15.

The pivots 13 of the levers 12 are shown in outline only on Figures 1, 2, 3 and 4, but they may carry washers on each side of the levers 12, a collar to space the levers as far as necessary from the top 1, and cotter pins to hold the levers 12. See Figure 5.

The cot is therefore well calculated to gain all the ends of the invention.

Having described my invention, what I believe to be new is:

1. A cot having a framework comprising a top, legs supporting the top, a lifting frame above



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the top, links pivotally connecting the ends of the lifting frame to the ends of the top, levers pivotally connected to the legs at one side of the top, a bar uniting the free ends of the levers, and additional links pivotally connecting the levers to said frame, and being pivotally connected to each other, one of said additional links having a recessed end adjacent the other, so that when said additional links are folded together, the other is received in said recessed end.

2. A cot having a framework comprising a top, legs supporting the top, a lifting frame above the top, a link at each end pivotally connecting the top adjacent its longitudinal center to said frame at a side thereof adjacent one side of the cot, another link at each end having a pivot pin connecting it to the top at the opposite side of the cot and pivotally connected to the middle of said frame, levers pivotally mounted on the legs at the last named side, a bar joining the free ends of said levers, and links pivotally connecting the levers to said frame to enable the frame to be moved into projecting position at the last-named side of the top, the first named links then resting on said pivot pins.

3. A cot having a framework comprising a top, legs at each side supporting the top, a lifting frame above the top, links pivotally connecting the ends of the frame to the ends of the top, levers pivotally connected to the legs at one side of the cot, a bar joining said levers at their free ends, links connecting said levers to said lifting frame, additional levers pivoted at each end of the framework and having ends projecting beneath the aforesaid levers, and a spring connecting each of said additional levers to a leg at the opposite side of the cot, said springs being under tension when the frame is on the top, and the first named levers are engaged by the projecting ends of said additional levers.

4. A cot having a framework comprising a top, legs supporting the top, a lifting frame above the top, links pivotally connecting the ends of the lifting frame to the ends of the top, levers pivotally connected to the legs at one side of the top, a bar uniting the free ends of the levers, and additional links pivotally connecting the levers to said frame, the last-named links comprising a pair at each end, one link of each pair being pivotally connected to the adjacent lever at one end, and the other pivotally connected at one end to the frame, said one link having a fixed stud at its opposite end pivotally connecting it to the adjacent end of said other link and a spring adjacent each stud affixed at its ends to said stud and the other link and stressed to urge said links to folded position.

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5. A cot having a framework comprising a top, legs supporting the top, a lifting frame above the top, links pivotally connecting the ends of the lifting frame to the ends of the top, levers pivotally connected to the legs at one side of the top, a bar uniting the free ends of the levers, and additional links pivotally connecting the levers to said frame, the last-named links comprising a pair at each end, one link of each pair being pivotally connected to the adjacent lever at one end, and the other pivotally connected at one end to the frame, said one link having a fixed stud at its opposite end pivotally connecting it to the adjacent end of said other link and a spring adjacent each stud affixed at its ends to said stud and the other link and stressed to urge said links to folded position, the adjacent end of said other link having a longitudinal groove into which said one link when folded is seated.

6. A cot having a framework comprising a top, legs supporting the top, a lifting frame above the top, links pivotally connecting the ends of the lifting frame to the ends of the top, levers pivotally connected to the legs at one side of the top, a bar uniting the free ends of the levers, and additional links pivotally connecting the levers to said frame, the last-named links comprising a pair at each end, one link of each pair being pivotally connected to the adjacent lever at one end, and the other pivotally connected at one end to the frame, said one link having a fixed stud at its opposite end pivotally connecting it to the adjacent end of said other link and a spring adjacent each stud affixed at its ends to said stud and the other link and stressed to urge said links to folded position, the adjacent end of said other link having a longitudinal groove into which said one link when folded is seated, said cot having additional levers pivoted at each end of the framework and having ends projecting beneath the aforesaid levers, and a spring connecting each of the additional levers to a leg at the opposite side of the cot, said springs being under tension when the frame is down on the top and the first-named levers are engaged by the projecting ends of the additional levers.

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