June 16, 1942. J. KREMER 2,286,284

SELF-LIFTING FLATIRON

Filed May 9, 1938 2 Sheets-Sheet 1

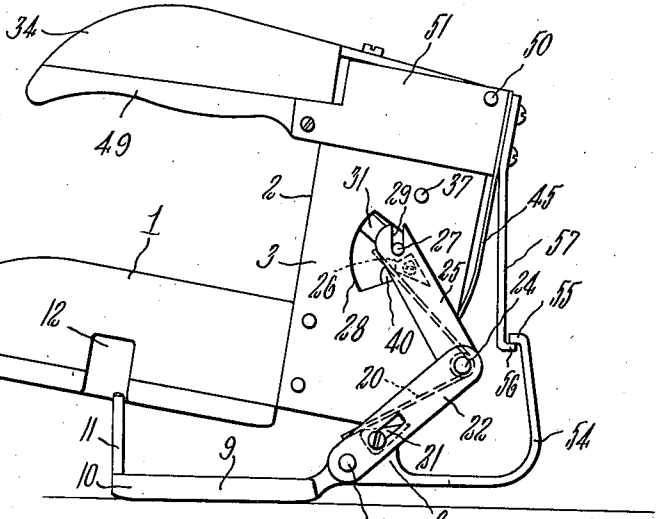


Fig. 1.

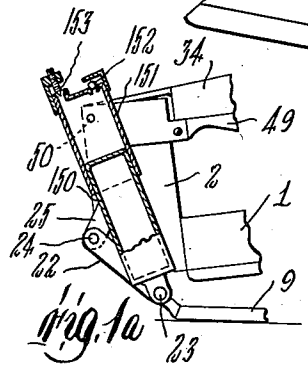


Fig. 1a

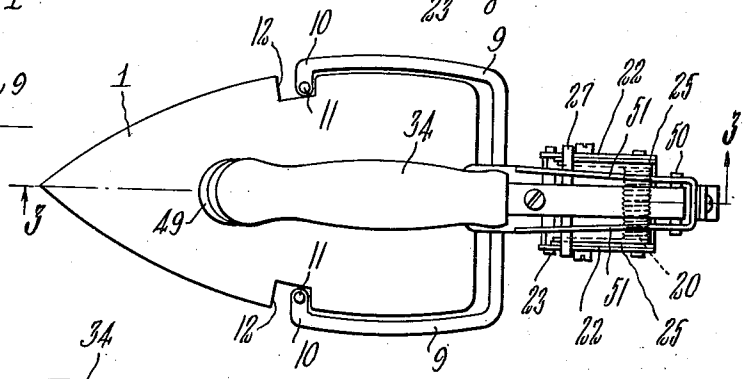


Fig. 2.

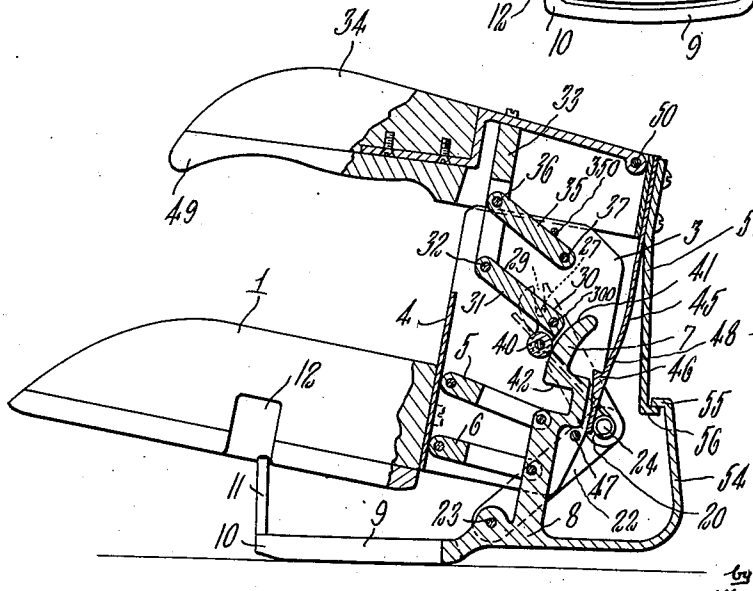


Fig. 3.

Inventor
John Kremer
by Wright Brown Quinby & Clay
Attys.

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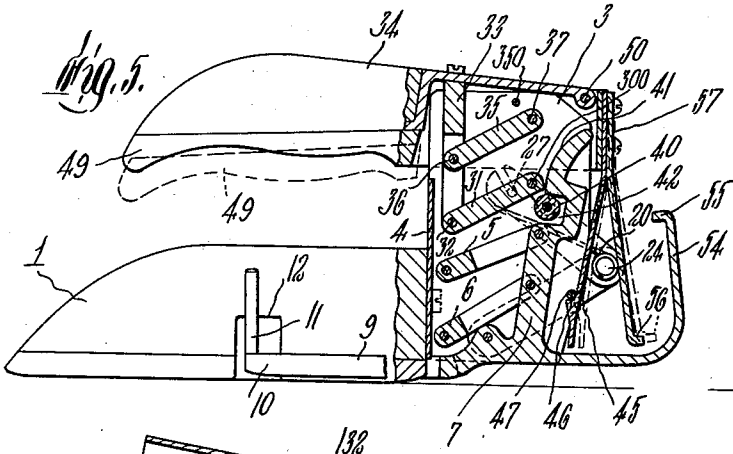


Fig. 5.

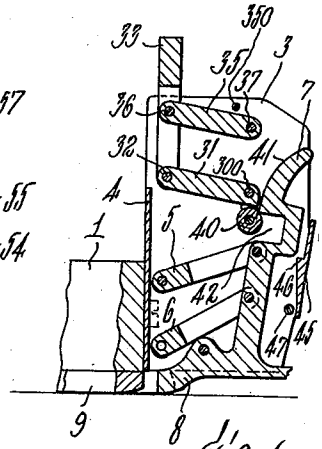


Fig. 4.

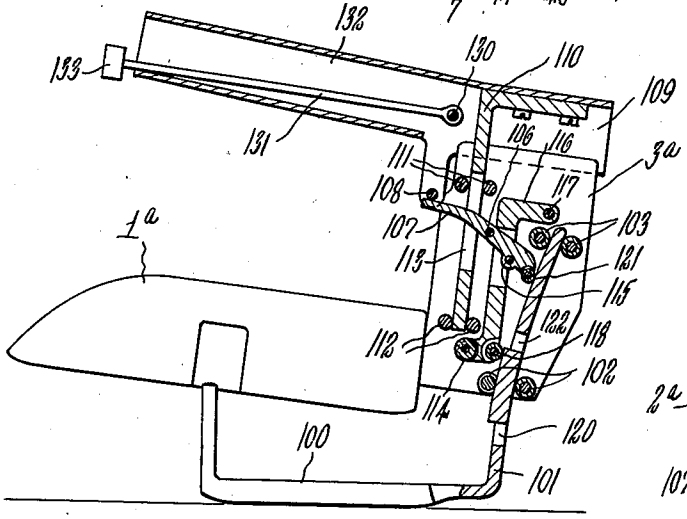


Fig. 6.

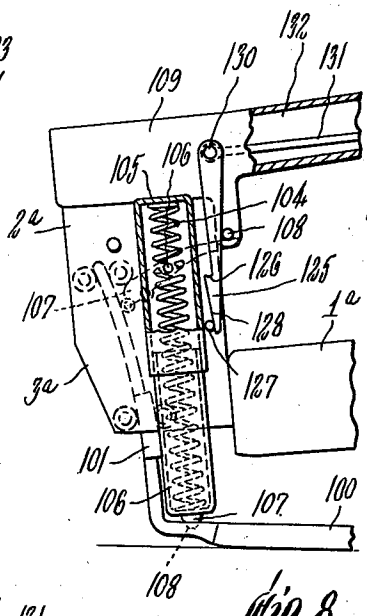


Fig. 8.

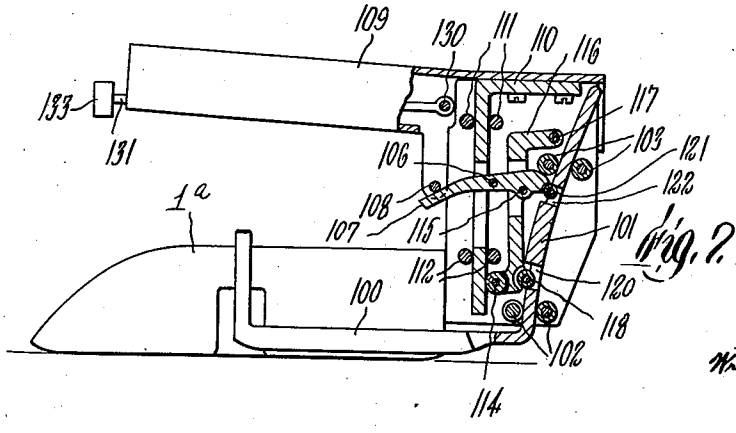


Fig. 7.

Inventor
John Kremer
by Wright, Brown, Quinby & Clay
Attys

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UNITED STATES PATENT OFFICE

2,286,284

SELF-LIFTING FLATIRON

John Kremer, New York, N. Y.

Application May 9, 1938, Serial No. 206,820

12 Claims. (Cl. 38—79)

This invention relates to flat irons or sad irons and has for an object to provide a stand carried by the iron itself, and which can be lowered and cause lifting of the iron body to an elevated inoperative non-scorching position out of contact with parts which might be liable to damage from continued contact with the hot iron.

A further object is to provide such a stand which will in no way interfere with the normal use of the iron.

Another object is to provide actuating means for effecting relative motion between the iron and stand which is easy and natural for actuation by the user of the iron, the handle remaining in substantially the same angular relation with the iron body at all times.

A further object is to provide for automatic lifting of the iron body on removal of the user's hand from the handle, but in a manner which will cause no jar or shock to the operator and whereby only slight, easy and smooth pressure is required to lower the iron into operative condition.

A further object of the invention is to provide a construction whereby when the iron is lowered the stand will be raised at least as high as and preferably above the lower face of the iron, all in a countinuous easy downward motion of the handle.

A further object is to provide a construction whereby the iron may be lowered and simultaneously slid forward on the work easily and without catching.

Further objects and advantages will appear from a more complete description of certain embodiments of the invention shown in the accompanying drawings, in which

Figure 1 is a side elevation of an iron embodying the invention, the iron being in elevated position relative to its stand.

Figure 1*a* is a fragmentary view partly in elevation and partly in section showing a time-controlling device for the lifting action.

Figure 2 is a top plan of the same.

Figure 3 is a longitudinal section on line 3—3 of Figure 2.

Figure 4 is a view similar to a portion of Figure 3, but showing the iron lowered to operative position and the stand about to be lifted.

Figure 5 is a view similar to Figure 3, but with the iron in operative position and the stand elevated.

Figure 6 is a view similar to Figure 3, but showing a modified construction.

Figure 7 is a view somewhat similar to Figure 6, but showing the iron in operative condition.

Figure 8 is a fragmentary view of the constructions of Figures 6 and 7 partly in elevation and partly in section and showing the iron lifting means.

Referring first to the construction shown in Figures 1 to 5, at 1 is shown the iron body having fixed thereto a casing member 2. As shown this casing member comprises a pair of spaced side plates 3 and an integral front wall portion 4. Between the side plates 3 is shown pivoted the forward ends of a pair of links 5 and 6, the rear end of each of which is pivoted to an arm 7 upstanding from an iron supporting stand 8. This stand is provided with a pair of feet 9 which are spaced apart to receive the body portion 1 therebetween and the forward ends of which are inturned as at 10 and provided with upstanding ends or horns 11 which are adapted to ride in recesses 12 in opposite sides of the iron body member 1. These horns are provided to reduce possibility of the stand catching in the work being ironed. When the stand 8 is in its lowered position, as shown in Figures 1 and 3, the iron body 1 is supported in inoperative elevated position in non-scorching relation to work upon which the stand 8 may be resting. This is a lower limit of motion of the stand relative to the body member.

The upper limit of motion of the stand with relation to the body member is shown in Figure 5, in which the bottom of the stand is lifted to at least as high as the lower face of the body member 1, and preferably higher, where it is out of contact with the work which is being ironed so that it cannot catch therein as the iron is moved in its normal use. The iron body is normally held lifted as by means of a spring 20, one arm of which is shown as resting against an abutment block 21 adjustably secured to one of a pair of links 22, the lower end of each of which is pivoted as at 23 to the stand 8. The links 22 are pivoted at 24 to a second pair of links 25, the spring 20 being shown as coiled about the pivot 24. The upper end of the spring 20 may engage an abutment block 26 adjustably secured to the link 25 at the opposite end of the pivot 24 from the link 22 carrying the block 21. The spring is thus quite direct in its action, and since it does not act through an extended train of adverse ratio mechanism, it need be only just heavy enough to lift the weight of the iron body and to counterbalance the weight of the handle member on which the spring also acts as will be described. Little pres-

sure is then required to lower the iron body to operative condition.

The upper ends of the links 25 are slotted as at 29 and take over a pin 27 which extends through arcuate slots 28 in the wall members 3. Between the wall members 3 the pin 27 has fixed thereon a bell crank 30 fulcrumed at 300, and one arm of which, as 31, is pivoted at 32 to an arm 33 secured to a handle member 34. A link 35 is pivoted at one end as at 36 to the arm 33 and at its other end as at 37 between the plates 3, the link 35 and the arm 31, together constituting what is substantially a parallel motion connection between the handle 34 and the casing 2 so that the handle 34 is guided for up and down motion relative to the body 1. The other arm of the bell crank lever 30 carries a cam roller 40 which bears against an arcuate cam face 41 at the upper end of the arm 7, so that when the stand 8 is in its depressed position, holding the iron body lifted, the handle 34 is also held lifted relative to the iron body by reason of the engagement of the cam 40 on the cam face 41 and by the upward pressure of the spring on the fulcrum pin 27. By exerting downward pressure on the handle 34, however, the handle and the iron body 1 may be moved downwardly as a unit, the cam roller 40 riding on the cam 41, preventing relative downward motion between the handle and the body portion until the body portion is depressed into contact with the table or other support such as the goods being ironed with its lower face nearly level with the lower face of the stand 8, the lower face level being the position shown in Figure 4. Due to the narrowness of the feet 9 they may indent the relatively soft facing of the ironing table or the goods being ironed more than the iron body, so that their lowest position may be a little below the bottom face of the lowered iron body, so that the lifting of the stand begins while the lower face of the stand is lower than the iron. At this point the cam roller 40 has ridden off the lower end of the cam face 41 and is being forced into a depression 42 beneath it by exerting further downward pressure on the handle 34. This downward pressure which moves the handle down relative to the iron body, and forces the roller 40 into the depression 42 acts, through the mechanical advantage multiplying lever mechanism comprising the lever 30 and its connections, to lift the arm 7, and with it the stand 8, into the position shown in Figure 5, where the stand is preferably out of contact with the material upon which the iron body rests. The iron, being depressed, is now in operative condition, but to avoid the necessity of the user of the iron exerting downward pressure on the handle to maintain the iron in operative position, latch means may be provided for this purpose. This means, as shown, comprises a spring latch element 45 having a shoulder 46 adapted to snap in under a cross pin 47 extending between the side plates 3. This latch member 45 is preferably provided with a resilient shank portion 48, the upper end of which is secured to the rear portion of a latch lever 49. This latch lever is shown as pivoted as at 50, as shown, being provided with side plates 51 between which the handle 34 is positioned. The latch lever 49 forms a lever gripping end portion, the upper portion of which is the handle 34, so that when the iron is in use the user grasps the latch lever as well as the handle 34 and holds the latch lever elevated with the latch portion 46 in latching engagement with the pin 47. With the parts thus latched together, the user of the iron can lift the iron bodily from the work and replace it without releasing the stand for depression into its supporting position shown in Figures 1 and 3, but should the operator release the handle, the outer end of the latch 49 would then by its weight move downwardly into the dotted line position shown in Figure 5, and retract the latch portion 46 from the pin 47, whereupon the spring 20 would then be free to depress the stand from substantially its upper limit of motion where it was held by the latch and to lift the iron body into the position shown in Figures 1 and 3.

The action of the spring 20 in lifting the iron is first exerted through a portion of the mechanical advantage mechanism, the spring acting through the lever 31 to lift the handle relative to the iron body until the link 35 strikes the stop pin 350, which may be a rivet securing the side members 22 together, after which the spring acts quite directly to lift the iron body and handle together. While the first portion of the lifting spring action is through a disadvantage leverage, the weight of the handle is the only load, the more direct action being available to lift the heavier weight of the iron body as well as the handle. Because of this direct action there is little friction to be overcome in lifting the iron body and handle so that the spring need be only slightly stronger than necessary to counterbalance the weights of these parts. Under these conditions a very light pressure is all that is necessary to lower the iron body to operative position and lift the stand. The small amount of total motion of the torsion coil of the spring results in only slight pressure increase as the iron body is lowered which is also desirable since it makes for easy action.

In order that the user of the iron may lower the iron body into operative position without any liability of his hand being pinched between the latch lever 49 and the handle 34 as the handle is grasped, means may be provided for holding the latch lever 49 in its latching position when the iron body is lifted to its inoperative position. For this purpose the rear end of the stand 8 is shown as provided with an upstanding inwardly inclined arm 54 provided with an in-turned hook 55 at its upper end, which, when the iron body is in its lifted position, engages over an oppositely facing hook 56 of an element 57 secured to the rear end of the latch lever 49 so that in the position shown in Figure 3, the hook 56 has been pulled downwardly and the latch lever 49 closed up against the lower face of the handle 34.

In Figures 6 to 8 is shown a modification. Referring to these figures, the iron body 1a has secured thereto the casing 2a having the side wall members 3a. The stand which supports the iron body elevated is shown at 100 and it is provided with an upstanding post 101 at its rear end which is slidably guided between pairs of rolls 102, 103 journaled between the side wall members 3a. It is normally urged into its depressed position shown in Figure 6 and with the iron body elevated, and as shown in Figure 8 this may be accomplished by a spring 104 seated within the telescopically related tubular members 105 and 106. This spring may be long relative to the amount of its compression when the iron body and handle are lowered so that its action is relatively constant and even. The member 106 has a foot 107 at its lower end which rests in a depression 108 in the rear end portion of the stand 100. The tubular member 105 has secured thereto a pin 106 which extends through an

opening in the adjacent side plate 3a and is secured to a cam lever 107. The forward end of this cam lever 107 has riding thereon a cross pin 108 in a handle member 109. This handle member is mounted for movement up and down relative to the iron body 1a and the casing 2a and for this purpose it is provided with a guide bar 110 which passes down between two pairs of guide rolls 111 and 112. This guide bar 110 is provided with a slot 113 therethrough through which the lever 107 extends. This lever 107 is fulcrumed at 115 on an arm 116 fulcrumed at 117 between the plates 3a. At its lower end it carries a roller 118 which may ride on the forward face of the post 101 and when the post 101 is in its elevated position, shown in Figure 7, with the iron body depressed and the stand 100 raised, it may extend into an opening 120 through this post, this roller reaching the opening 120 by the time the iron body reaches its full depressed position and before the stand 100 has been raised. This permits the arm 116 to swing to the right, the lower end of the bar 110 engaging a roller 114 journaled on the arm 116 forcing the arm to do this (see Figure 7), whereupon a roller nose element 121 on the lever 107 is thrown into a perforation 122 through the post 101, and engages beneath the upper edge of this perforation. Depression of the handle 109 relative to the iron body then rocks the lever 107 about its fulcrum 115 and pries the post 101 upwardly, thus lifting the stand 100 into the position shown in Figure 7. The spring 104 acting on the pin 106 acts to lift the handle 109 relative to the iron body 1a as well as to lift the iron body itself, and the riding of the roller 121 of the lever 107 against the forward face of the post 101 prevents the handle from moving downwardly relatively to the iron body until after the iron body has been moved down to its operative position where the nose end of the lever 107 can pass into the opening 122. Thereafter, further downward motion of the handle acts to lift the stand 100 as previously described. Latch means may be provided for holding the iron body 1a in operative downward position, and, as shown in Figure 8, this comprises a pivoted latch arm 125 having a hooked portion 126 which may be engaged beneath the fixed pin 127 carried by one of the side frame members 3a. Below the hook 126 the latch member 125 has an inclined cam face 128 which rides along the locking pin 127 so as to lead the guide pin to the hook 126 when the handle is depressed. The upper end of this latch arm 125 is shown as fixed to a rock shaft 130 and within the handle 109 this rock shaft has fixed thereto a latch actuating arm 131 which extends out through the hole 132 of the handle 109 and at the forward end of which it may be provided with an actuating head 133. The iron being in operative position and there held by the hook 126 engaging beneath the pin 127, it is only necessary for the operator to lift the head 133 slightly to release the latch and permit the spring 104 to depress the stand 100 and to lift the iron body 1a. It will be noted that with this mechanism the removal of the user's hand from the handle is not effective to cause the iron to be lifted, but a releasing action must be given to the head 133.

This modification also differs from that previously described in its slidable guiding of the stand and the handle relative to the iron body rather than employing pivotal links as in the construction first described. In both constructions, however, the handle is prevented from moving downwardly relative to the iron body until the iron body is in its operative position, whereupon the handle is released for a further downward motion which is effective to lift the stand, and in both constructions the parts are so related that a continuous downward motion of the handle is effective first to lower the iron body and then to lift the stand, the lifting of the stand being accomplished through a mechanical advantage mechanism which further compresses the iron-lifting spring, but under a pressure which is not substantially different from that necessary to depress the iron body itself. It will be noted that the weight of the iron body opposes the spring during the first part only of the downward motion of the handle, and that this aid to the depressing action is not effective when the stand is raised above the iron, the weight of the stand being then a load in addition to the pressure of the spring. The multiplying lever mechanism is thus employed to make up not only for this decrease of effective weight opposing the spring, but also the additional load of lifting the stand. Thus a substantially continuous smooth downward motion of the handle accomplishes both the lowering of the iron body and the lifting of the stand and without shock or jar to the hand of the user.

If desired the lifting of the iron, whether accomplished automatically, or by manual release, may be time-controlled so as to be appreciably retarded or delayed, thus to avoid sudden motion of the iron body on removal of the user's hands, which might not only be unpleasant for the user, but might in some cases tend to upset the iron. Such time control may also be employed in place of a latch, so that downward pressure of the user's hand is required to maintain the iron lowered, a substantial time of release of this pressure, for, say, somewhat more than a second, resulting in the lifting of the iron. It should not prevent the quick return of the iron to lowered position at any time. Referring to Figure 1a, the time control is illustrated as essentially a one-way acting dash pot comprising a piston 150, preferably made hollow to reduce its weight, slidable in an air cylinder 151. In the head of the cylinder is an outwardly opening ball check valve 152 which permits free escape of air from the cylinder, and a needle valve 153 which provides for an adjustably slow entrance of air. As shown, the cylinder 151 is pivoted as at 50 to the handle 34, and the piston is pivoted to one of the links 22, so that the handle may be depressed and the stand lifted without substantial obstruction, the air escaping from the cylinder through the check valve as well as the needle valve, but when the handle is released, the air can enter the cylinder past the needle valve only at a slow rate predetrmined by the setting of the needle of this valve.

From the foregoing description of certain embodiments of this invention, it should be evident to those skilled in the art that various changes and modifications may be made without departing from the spirit or scope of this invention as defined by the appended claims.

I claim:

1. A device of the class described, comprising a body member, a handle, a stand, means supporting said handle and stand for up and down motion relative to said body member, at one limit of motion said stand being below said body member and at the other limit being at least as high as the base of said body member, said handle

supporting means including connections maintaining said handle in substantial parallel positions with respect to said body member, connections between said handle and stand for raising said stand relative to said body member on depression of said handle relative to said body portion, and means normally holding said body member elevated with relation to said stand and said handle portion elevated with relation to said body member in which condition said stand supports said body member lifted in non-scorching position.

2. A device of the class described, comprising a body member, a handle, a stand, means supporting said handle and stand for up and down motion relative to said body member, in one limit of motion said stand being below said body member and the other limit being at least as high as the base of said body member, connections between said handle and stand for raising said stand relative to said body member on depression of said handle relative to said body member, means normally holding said body member elevated with relation to said stand and said handle portion elevated with relation to said body member in which condition said stand supports said body member lifted in non-scorching position, and means for retarding the elevation of said body member from its lowered position to a predetermined rate.

3. A device of the class described, comprising a body member, a handle, a stand, means supporting said handle and stand for up and down motion relative to said body member, at one limit of motion said stand being below said body member and at the other limit being at least as high as the base of said body member, said handle supporting means including connections maintaining said handle in substantial parallel positions with respect to said body member, connections between said handle and stand for raising said stand relative to said body member on depression of said handle relative to said body member, means for preventing downward motion of said handle relative to said body member until said body member has been lowered, and means normally holding said body member elevated with relation to said stand and said handle portion elevated with relation to said body member in which condition said stand supports said body member lifted in non-scorching position.

4. A device of the class described, comprising a body member, a handle, a stand, means supporting said handle and stand for up and down motion relative to said body member, at one limit of motion said stand being below said body member and at the other limit being at least as high as the base of said body member, connections between said handle and stand for raising said stand relative to said body member on depression of said handle relative to said body member, means for preventing downward motion of said handle relative to said body member until said body member has been lowered, means normally holding said body member elevated with relation to said stand and said handle portion elevated with relation to said body member in which condition said stand supports said body member lifted in non-scorching position, and means for retarding the lifting of said body member from its lowered position to a predetermined rate.

5. A device of the class described, comprising an iron body member, a stand carried by said body member for up and down motion relative to said body member between limits at one of which said stand supports said body member in lifted non-scorching position and at the other of which the said stand is elevated above the lower face of said body member, spring means normally holding said stand depressed and said body member lifted, a handle member carried by said body member for up and down motion relative to said body member and restricted to substantially parallel positions with respect to said body member, and means including a mechanical advantage mechanism actuated by depression of said handle member relative to said body member after said body member has been substantially depressed for forcing said stand to its upper limit of motion against the action of said spring means.

6. A device of the class described, comprising an iron body member, a stand carried by said body member for up and down motion relative to said body member between limits at one of which said stand supports said body member in lifted non-scorching position and at the other of which the said stand is elevated above the lower face of said body member, spring means normally holding said stand depressed and said body member lifted, a handle member carried by said body member for up and down motion relative to said body member while maintained in substantially parallel position relative thereto, means including a mechanical advantage mechanism actuated by depression of said handle member relative to said body member after said body member has been substantially depressed for forcing said stand to its upper limit of motion against the action of said spring means, and latch means for holding said stand at its upper limit of motion, said mechanical advantage mechanism being so proportioned that a continuous substantially smooth downward motion of said handle is effective to lower said body member to operative position and then to lift said stand relative thereto.

7. A device of the class described, comprising an iron body member, a stand carried by said body member for up and down motion relative to said body member between limits at one of which said stand supports said body member in lifted non-scorching position and at the other of which the said stand is elevated above the lower face of said body member, spring means normally holding said stand depressed and said body member lifted, a handle, means supporting said handle for up and down motion while maintained in substantial parallel positions with respect to said body member, means actuated by depression of said handle relative to said body member after said body member has been substantially depressed for lifting said stand to its upper limit of motion, and latch means for holding said stand at substantially its upper limit of motion, said latch means including an element movable with said handle relative to said body member beneath said handle and biased to a latch-released position spaced from said handle and normally held by a hand grasping said handle in latched position.

8. A device of the class described, comprising an iron body member, a stand carried by said body member for up and down motion relative to said body member between limits at one of which said stand supports said body member in lifted non-scorching position and at the other of which the said stand is elevated above the lower face of said body member, spring means normally holding said stand depressed and said body

member lifted, a handle member, means supporting said handle member for up and down motion while maintained in substantial parallel positions with respect to said body member, latch means for holding said stand at substantially its upper limit of motion, a latch controlling element extending along a portion of said handle member, and means holding said element adjacent to said handle member in the raised body member position, whereby the hand of the user is protected from being pinched between said element and said handle member.

9. A device of the class described, comprising a body member, a handle, a stand, means supporting said stand and said handle for motion relative to said body member, at one limit of motion said stand extending below said body member and at the other limit being at least as high as the base of said body member, means tending to hold said stand at said one limit and to return it thereto on removal therefrom, connections from said handle for moving said stand to said other limit, and means to retard the return movement of said stand to said one limit to a predetermined rate.

10. A device of the class described, comprising an iron body member, a stand carried by said body member for up and down motion relative to said body member between limits at one of which said stand supports said body member in lifted non-scorching position and at the other of which said body member is lowered and the lower face of said stand is at least as high as the lower face of said body member, a handle movably mounted with respect to said body member, a lever connected to said handle and fulcrumed on said body member, and a spring reacting between said stand and said lever between its fulcrum and said handle, said stand having a cam portion slidable relative to and in engagement with a portion of said lever and preventing rocking of said lever except when said body member is in substantially its lowered position, said lever and stand including parts cooperating when said body member is in said lowered position to cause swinging of said lever by motion of said handle relative to said body member to lift said stand.

11. A device of the class described, comprising an iron body member, a stand carried by said body member for up and down motion relative to said body member between limits at one of which said stand supports said body member in lifted non-scorching position and at the other of which said body member is lowered and the lower face of said stand is at least as high as the lower face of said iron body, a handle movable relative to said body member and connected to said stand through a mechanical advantage mechanism to cause motion in one direction of said handle relative to said iron body to lift said stand, and a spring reacting between said mechanism and said stand, said device including means causing the first portion of the spring action on release of said iron body to return said handle relative to said iron body to permit lowering of said stand and the remainder of its motion to act independently of said mechanism to lift said iron body and handle as a unit relative to said stand.

12. A device of the class described, comprising an iron body member, a stand carried by said body member for up and down motion relative to said body member between limits at one of which said stand supports said body member in lifted non-scorching position and at the other of which said body member is lowered and the lower face of said stand is at least as high as the lower face of said iron body member, a handle movable relative to said body member and connected to said stand through a mechanical advantage mechanism to cause motion in one direction of said handle relative to said iron body member to lift said stand, a spring reacting between said mechanism and said stand tending to lift said handle and body member relative to said stand, and abutment mechanism limiting the motion of said handle relative to said body member and causing further action of said spring after such limit has been reached to raise said body member relative to said stand.

JOHN KREMER.