

Oct. 17, 1933.

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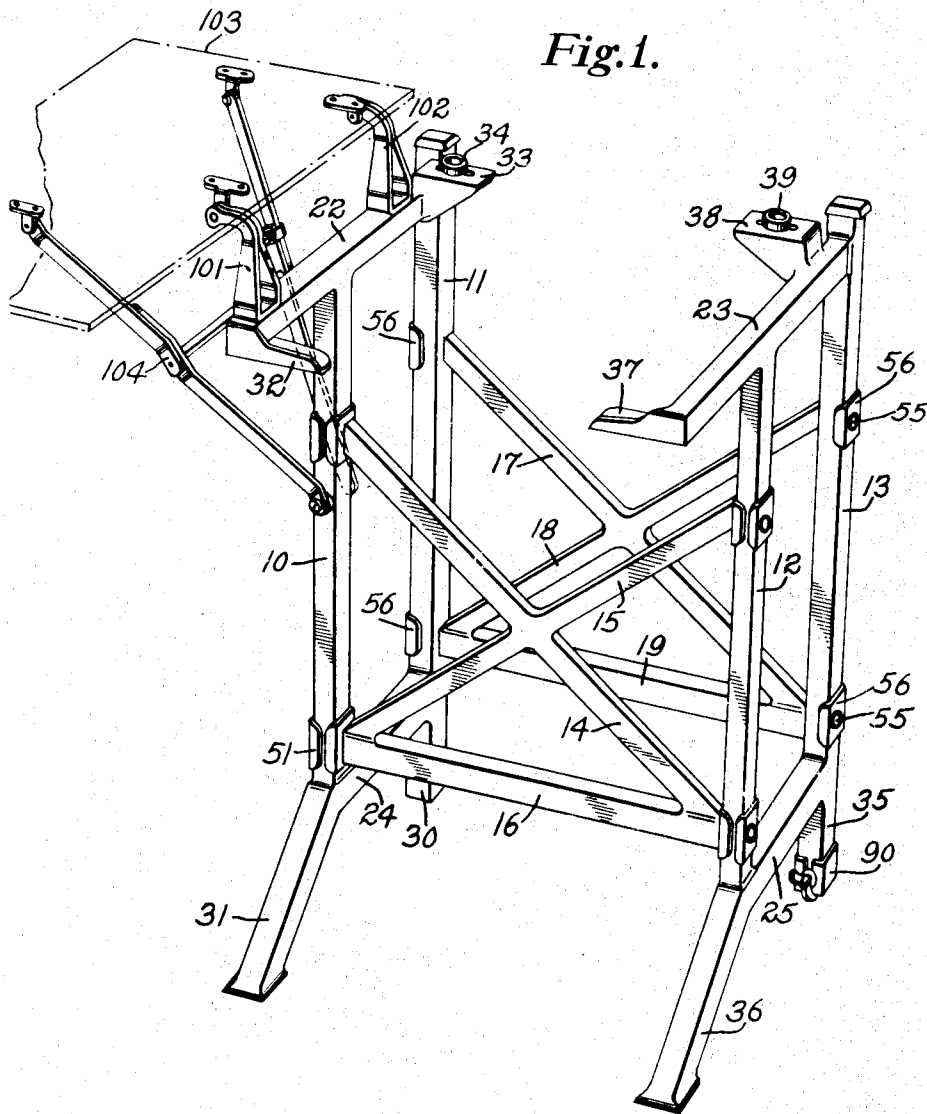
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SUPPORTING STAND FOR BUSINESS MACHINES

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4 Sheets-Sheet 1

Fig. 1.



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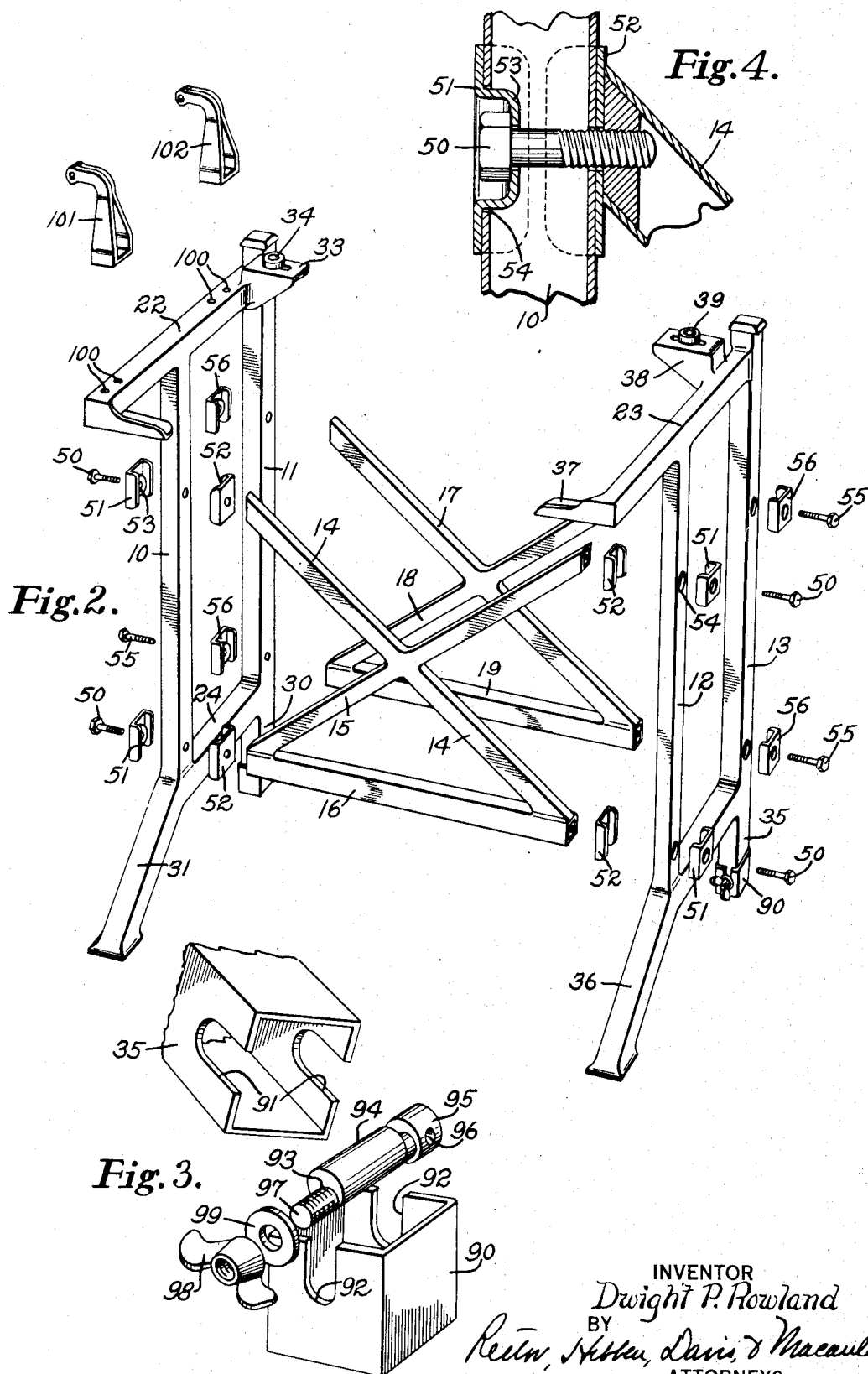
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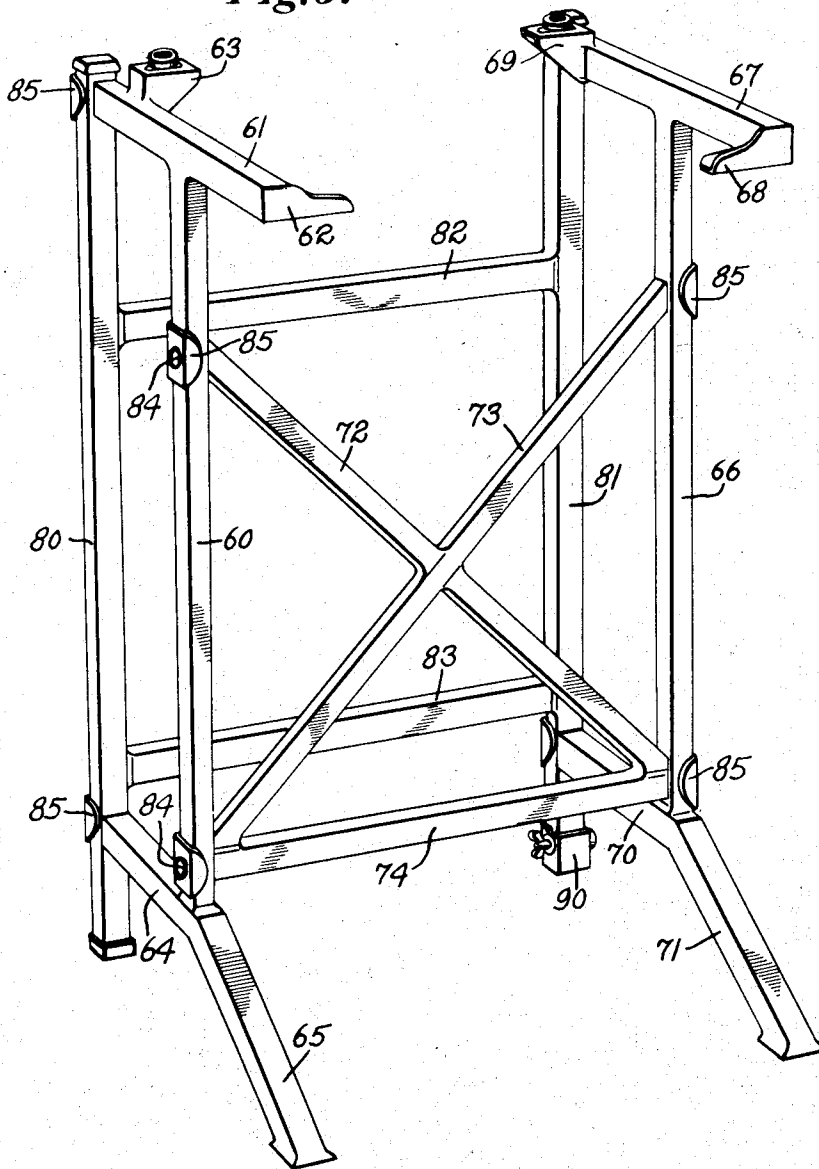
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Fig. 5.



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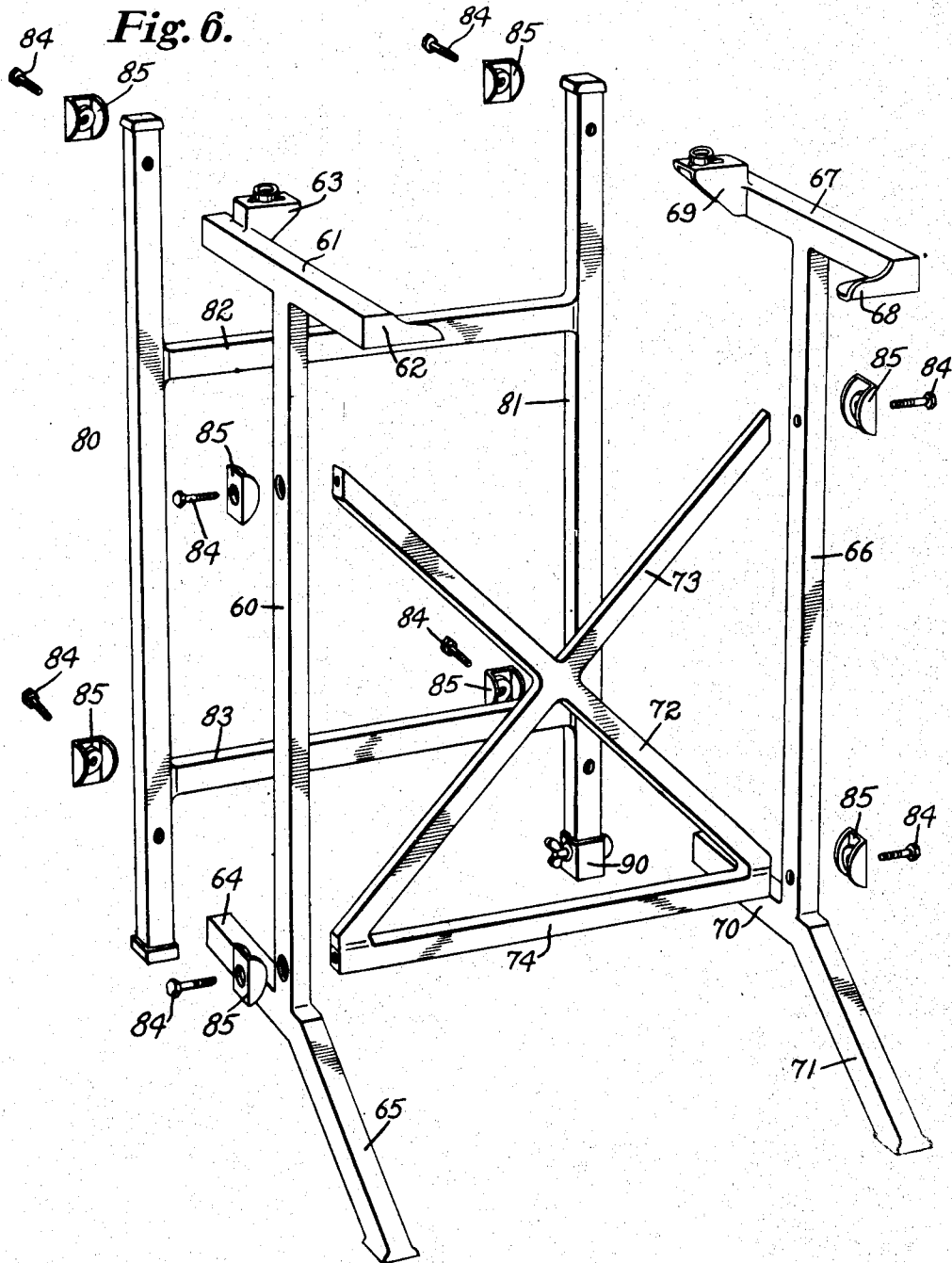
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UNITED STATES PATENT OFFICE

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SUPPORTING STAND FOR BUSINESS
MACHINES

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7 Claims. (Cl. 45—117)

This invention relates to a supporting stand for business machines such as calculating or book-keeping machines having carriages that are tabulated across the machine while it is being operated.

Much difficulty has been encountered in providing a stand for this class of machine which has sufficient rigidity. A bookkeeping machine is fairly heavy and this heavy mass must be supported at a considerable height above the floor. The base of the supporting stand cannot extend forward to the front of the machine as space must be left for the knees of an operator. This means that the stand has a relatively small base. When the paper carriage of one of these machines is stopped in being tabulated from column to column, or after having skipped two or three columns, or when it is returned across the machine, the jar of stopping the carriage tends to vibrate the machine when it is supported on a stand. This moves the amount keys slightly under the eyes of the operator and interferes with rapid operation. Furthermore, these stands usually support a paper table at the side on which stacks of checks or other papers may be supported and the jar of stopping the carriage sometimes shakes down the stack of papers and confuses them. It is very desirable to have a stand that is absolutely rigid, but, of course, the stand cannot be made extremely heavy because it has to be moved from place to place about an office. It should not be made expensive and it should be made so that it can be shipped easily in a flat package and assembled quickly when it arrives at its destination. Heretofore these stands have almost universally been made of round metal bars or tubing and, while a great deal of effort has been expended to make these stands rigid, they have never been as rigid as desirable. The present invention is directed to a solution of this problem and the manner in which this problem is solved will appear as the description progresses.

The general object of the invention is to provide an improved supporting stand for business machines.

A more particular object is to provide an improved stand that is extremely rigid and at the same time light and inexpensive.

A further object is to provide an improved stand that is made of a minimum number of pieces which can be shipped in a flat package and then quickly assembled into a completed stand.

A still further object is to provide on a business

stand of the character described a means for quickly and easily levelling the stand when it rests on an uneven surface.

Other objects and advantages of the invention will appear from the following specification and drawings.

An embodiment of the invention is shown in the accompanying drawings in which;

Figure 1 is a perspective view of one species of the stand in completed assembled condition.

Fig. 2 is a separated perspective of the stand shown in Fig. 1.

Fig. 3 is a separated perspective of the adjusting shoe for leveling the stand when it rests on an uneven surface.

Fig. 4 is a partial sectional elevation showing how the diagonal brace pieces are connected to the side pieces.

Fig. 5 is a perspective view of another species of the stand.

Fig. 6 is a separated perspective of the stand illustrated in Fig. 5.

The first point to be noted is that a minimum number of parts are used to obtain the necessary rigidity. It is possible that, by providing a multitude of cross braces between the vertical standards of a stand of this character, rigidity could be obtained, but the problem is to obtain the requisite rigidity with a minimum number of parts of light weight, the whole construction being such that the various parts of the stand, when separated from each other, are substantially flat so that the parts can be shipped in a small flat package.

Referring to Fig. 1, it will be observed that the stand comprises four corner posts or standards 10, 11, 12 and 13. The front corner posts 10 and 12 are joined by diagonal braces 14 and 15 which extend from near the top of one front corner post to the bottom of the opposite front corner post. A horizontal cross brace 16 extends between the front corner posts near the bottoms thereof.

The rear corner posts of the species shown in Fig. 1 are joined by diagonal cross braces 17 and 18 and by a horizontal cross brace 19. This is the preferred construction, but it has been found that, for stands for lighter machines, the cross braces illustrated in Fig. 5 are sufficient between the rear corner posts, that is, a horizontal cross brace 22 near the top and a similar horizontal brace 23 near the bottom of the rear corner posts.

The cross brace construction described unites the two front corner posts and the two rear corner posts into rigid structures which are firmly braced against swaying sidewise.

The front and rear corner posts, Fig. 1, on each side of the stand are joined by upper side bars 22 and 23 and by lower side bars 24 and 25. These side bars prevent forward and backward swaying of the stand, there being a smaller tendency for the stand to sway backward and forward than to sway sidewise owing to the fact that the jar of stopping the paper carriage causes a side thrust.

Viewed as an entirety the bracing construction is such that it also serves to prevent twisting or weaving movement of the stand.

Another point to note is that the stand is made of metal tubing of rectangular cross section. While a given length of rectangular metal tubing is apparently no more rigid than the same length of round metal tubing of the same specifications, it has been found, after considerable experiment, that a stand built of rectangular metal tubing has a great deal more rigidity than one made of round metal tubing. The reason for this appears to be due, in part, at least, to the fact that the rectangular metal tubing provides flat faces of contact at the points where the various pieces making up the stand are connected together. Also the ends of the cross braces can be made flat and they are of considerable area. These flat ends abut against flat faces on the vertical pieces making up the sides and ends of the stand. When the parts are clamped together these flat abutting faces with their relatively large area of contact tend to prevent swaying and weaving of the stand.

A further advantage obtained from the use of rectangular tubing is that the tubing can be easily welded together so that the stand can be made of a minimum number of integral pieces. The making of various portions of the stand integral eliminates relative movement between the various pieces of tubing making up the integral parts and thus assists in securing greater rigidity.

The description heretofore given visualizes the stand in its broader aspects and is applicable to all species. Two species have been illustrated and it is to be noted that, in both species, the stand is made up of only four pieces, the nuts and washers for fastening the pieces together not being considered as actual pieces of the stand, but merely as fastening means for connecting the four pieces together. The species illustrated in Figs. 1 and 2 will be described first.

As illustrated in Fig. 2, the stand comprises right and left side pieces joined by front and rear cross pieces, each of the side pieces and each of the cross pieces being an integral unit.

The left side piece includes the front and rear corner posts or standards 10 and 11 integrally united with the upper and lower side bars 22 and 24. These four parts form an integral unit. The rear corner post 11 extends below the side bar 24 to form a left rear foot 30 and the lower side bar 24 extends forward and downward to form a left front foot 31. The upper side bar 22 extends forward beyond the front corner post 10 and this front end is provided with an inwardly extending shelf or platform 32 for receiving the left front foot of a business machine. Extending inwardly from the rear end of side bar 22 is another shelf or platform 33 provided with a slot in which is mounted an adjustable cup 34 adapted to receive the left rear foot of a business machine. The cup 34 is adjustable sideways in the slot in platform 33 and its height may also be varied by adjusting the nut that holds it in place.

The right side piece includes the front and rear corner posts or standards 12 and 13 integrally united with the top and bottom side bars 23 and 25. The rear standard 13 extends downward to form a rear right foot 35 and the lower side bar 25 extends forward and downward to form a lower right front foot 36. The upper side bar 23 extends forward beyond the vertical standard 12 and is provided with an inwardly extending platform 37 forming a support for the right front foot of a business machine. The side bar 23 has a rear inwardly extending platform 38 that forms a support for the right rear foot of a machine. The rear platform 38 is provided with an adjustable cup 39 similar to the cup 34.

It will be noted that the front platforms 32 and 37 are lower than the rear platforms 33 and 38 so as to give the machine a pitch that is essential to comfortable operation.

The front cross brace unit comprises the two diagonal braces 14 and 15 which are integrally united to make an X-shaped piece. The two diagonal members are cut out, fitted together, and then welded together to make one rigid X-shaped piece. The horizontal cross brace 16 is welded to the lower arms of the X-shaped piece thus making up an integral cross brace piece adapted to unite the front ends of the two side pieces. It will be readily appreciated that this construction prevents any weaving or twisting relative to one another of the members making up the bracing unit.

The rear bracing unit is a duplicate of the front unit. It comprises the two diagonal braces 17 and 18 which are integrally united to form an X-shaped piece having its lower arms united by the horizontal brace 19 which is integrally connected to them.

The front and rear bracing units are interchangeable and hence, in manufacturing, it is not necessary to make two different kinds of units for the front and the rear of the stand.

It will be noted that each of the four pieces just described is substantially flat which enables them to be neatly packed for shipping in a relatively small flat box.

The four pieces making up the stand can be quickly and securely fastened together by means of bolts and washers illustrated in Figs. 2 and 4. It is to be observed that the ends of the diagonal members making up the cross pieces and the ends of the horizontal members are flat and of relatively large area. These flat faces abut against the flat faces of the side pieces. The ends of the rear cross brace unit abut directly against the faces of the vertical standards 11 and 13, but, because the front vertical standards 10 and 12 are of slightly smaller cross section than the rear standards, it is necessary to interpose flat channel shaped washers between the ends of the front cross brace unit and the vertical standards 10 and 12. However, when the front vertical standards are made the same size as the rear standards, the front cross brace unit abuts directly against the inner side faces of the vertical members 10 and 12.

For the purpose of enabling the cross brace units to be bolted to the side pieces, suitable nuts are fastened in the ends of the pieces of metal tubing making up the cross brace units as illustrated in Fig. 4. Preferably, these nuts are fitted into the ends of the tubes and welded in place so as to form an integral part of the cross brace structure.

The front cross brace unit is united to the ver-

tical standard or corner posts 10 and 12 by means of bolts 50 which pass through channel-shaped washers 51 that fit over the outside of the vertical standards, the bolts passing through similar washers 52 fitting the inside of the standards. The bolts are screwed into the nuts in the ends of the tubing of the cross brace units. The outer channel-shaped washers are countersunk at 53 (Fig. 4) and their countersunk portions fit into holes 54 in the vertical standards so that the heads of the bolts are flush with or below the outer face of the washers. This gives the stand a neat appearance and tends to hold the washers more securely and more properly in place.

The rear cross piece is fastened to the vertical standards 11 and 13 by similar bolts 55 passing through channel-shaped washers 56 having countersunk openings similar to those of the outer washers at the front.

The construction just described provides a stand comprising only four pieces. Each piece is made of rectangular metal tubing and each is integral. Each piece is very light and the whole stand, relatively speaking, is quite light. The pieces are substantially flat when the stand is knocked down and may be shipped in a relatively small flat box. The integral nature of the side pieces prevents any back and forward movement between the vertical standards. The integral nature of the cross braces prevents any weaving or twisting movement of these braces and makes for rigidity. When the parts are connected together the brace pieces are so located and are so rigid that no swaying of the stand takes place. The flat faces that abut one another in the connecting of the cross brace units to the side pieces and the relatively large area of the flat engaging faces tends to prevent any weaving or twisting of the stand, the total result being that a very light and rigid stand is provided which is constructed in such a manner that it is relatively inexpensive, easy to assemble and knock down and capable of being conveniently packed for shipment.

The species illustrated in Figs. 5 and 6 differs in its construction from the species just described but, nevertheless, it is made of only four pieces and these four pieces individually and collectively have the same advantages as those heretofore described.

The left and right side pieces of the stand illustrated in Fig. 6 include only one vertical member. These two side pieces are joined by a cross brace unit of the same kind as those heretofore described. The stand is then provided with a rear piece or section which includes two rear corner posts that are joined together by upper and lower horizontal cross braces.

The left side piece of Fig. 6 comprises a vertical corner post or standard 60 which supports a top horizontal side bar 61. Both the standard and the side bar are made of rectangular metal tubing. The side bar 61 extends both to the front and rear inwardly extending platforms 62 and 63 forming supports for the feet of a business machine. Integrally united to the lower end of the standard 60 is a bottom horizontal side bar 64 that extends both to the front and the rear of the standard 60, said bar being made of rectangular metal tubing. The forwardly extending portion is inclined downward to form a front foot 65.

The right side piece of Fig. 6 comprises a vertical standard 66 which supports a top side bar

67 integrally united to it and extending both to the front and rear of the vertical member 66. The two parts are made of rectangular metal tubing. The top side bar 67 carries front and rear inwardly extending platforms 68 and 69 for receiving the feet of a business machine. Integrally united to the lower end of the standard 66 is the bottom side bar 70 which extends both to the front and rear of the vertical standard 66. The front extension of this side bar is inclined downward to form a right front foot 71.

The cross brace unit comprises the diagonal braces 72 and 73 which are integrally united together. The lower arms of the braces are integrally united by a horizontal cross piece 74. Each of the parts is made of rectangular metal tubing.

The rear section comprises the rear corner posts 80 and 81 which are made of rectangular metal tubing and which are joined by an upper horizontal cross piece 82 and a lower horizontal cross piece 83 both of the cross pieces being of rectangular metal tubing and integrally united to the corner posts so that the rear section comprises an integral unit.

It will be observed that each of the sections making up this species is substantially flat and may be packed with the same facility as the sections of the species first described. Also each of the sections is integral so that all the parts making it up are rigidly held together.

The parts making up this second species are fastened together by bolts and washers 84 and 85 of the same kind heretofore described and the stand is assembled by first uniting the side pieces together by means of the cross brace unit and then connecting the rear section in place.

These stands are used in all sorts of places and in many cases the surface of the floor on which they must stand is uneven. This makes it desirable to have some means for compensating for the unevenness in the floor and, for this purpose, there has been provided a novel adjustment or shoe that may be fitted on one or more of the feet of the stand.

As illustrated in Fig. 3, this shoe comprises a tubular member 90 that telescopes over the lower end of one of the feet such as the foot 35. The foot is slotted at 91 and the telescoping member 90 has similar slots 92 of somewhat smaller size. Positioned in the slots is a rotatable pin 93 carrying an eccentric cam 94 that engages in the slots in the end of the foot 35. A head 95 is provided on this pin by means of which it may be turned and which prevents the pin from moving through the slot. This head may be provided with openings 96 for the receipt of a nail or similar article for turning the head in the event it cannot be turned by grasping it with the fingers. The opposite end of the pin is screw-threaded at 97 for the receipt of a thumb nut 98 which bears against a washer 99 that engages the outer surface of the telescoping member 90. When this shoe is in place it is held in the position it occupies by turning the thumb nut down slightly so as to clamp the parts together. If it is desired to adjust the height of the foot the thumb nut is loosened and the head 95 is turned. This causes the cam 94 to engage the upper end of the slots 91 in the foot to force the telescoping section 90 downward if it is desired to make the foot longer. If it is desired to make the foot shorter, the head is turned in the opposite direction whereupon the weight of the parts will force the telescoping section 90 farther onto the foot. When the length of the foot has been adjusted properly

the thumb nut is tightened to hold the parts in place.

These stands may or may not be provided with a shelf for the receipt of papers. Such a shelf has been illustrated in connection with the species shown in Fig. 1, but no shelf has been shown associated with the species of Figs. 5 and 6, although one may be provided if desired.

For the purpose of supporting such a shelf, the left upper side bar 22 (Fig. 2) is provided with holes 100 for receiving bolts that connect the supporting brackets 101 and 102 to the side bar. Pivoted to these supporting brackets is a table 103 (Fig. 1) which may occupy the horizontal, dotted-line, position illustrated in Fig. 1 or be swung down to the side of the stand. For the purpose of supporting the table in its horizontal position, a toggle link mechanism 104 is provided which may be broken to enable the table to be swung down beside the stand. It is not necessary to understand the details of this toggle mechanism for an understanding of the present invention as the mounting for the table is of the usual form heretofore employed.

It is to be understood that the structure shown is for purposes of illustration only and that variations may be made in it without departing from the spirit and scope of the invention as defined by the appended claims.

I claim:

1. A supporting stand for business machines comprising four spaced corner posts, a diagonal brace connected to each of the front corner posts adjacent the top thereof and extending diagonally downward and connected to the opposite front corner post adjacent the bottom thereof, braces connected to and extending between the rear corner posts, bottom side bars connected to and extending from each of the front corner posts to the corresponding rear corner posts near the bottom of said posts, top side bars connected to and extending from each of the front corner posts to the corresponding rear corner posts adjacent the tops of said posts, said top side bars extending forward beyond the front posts, and individual platforms supported at the top of said stand for receiving the feet of a business machine.

2. A supporting stand for business machines comprising four spaced corner posts, a diagonal brace connected to each of the front corner posts adjacent the top thereof and extending diagonally downward and connected to the opposite front corner post adjacent the bottom thereof, a horizontal cross brace extending between and connected to the front corner posts adjacent the bottom ends thereof, braces connecting the top and the bottom ends of the rear corner posts together, bottom side bars connected to and extending from each of the front corner posts and the corresponding rear corner posts near the bottoms thereof, top side bars connected to and extending from each of the front corner posts to the corresponding rear corner posts near the tops thereof, said top side bars extending forward beyond the front corner posts, and individual platforms supported at the top of said stand for receiving the feet of a business machine.

3. A supporting stand for business machines comprising four corner posts having flat abutment faces for receiving the ends of cross braces, diagonal braces connecting the front corner posts, each of said braces extending from a point adjacent the top of one of the front corner posts to a point adjacent the bottom of the opposite corner post, a horizontal cross brace connected

to the front corner posts near the bottoms thereof, said diagonal braces and said cross brace having flat ends of substantial area abutting the flat abutment faces of said corner posts, rear braces connected to and extending between the rear corner posts, said rear braces having flat ends of substantial area abutting the flat abutment faces on said rear corner posts, top side bars connected to and extending between each of the front corner posts and its respective rear corner post near the bottoms of said posts, top side bars connected to and extending between the front corner posts and the respective rear corner posts adjacent the tops of said posts, said top side bars extending forward beyond the front corner posts, and individual platforms supported by said stand at the top thereof for receiving the feet of a business machine.

4. A supporting stand for business machines comprising four corner posts made of metal tubing of substantially rectangular cross section, diagonal cross braces connected to and extending between said front corner posts, each brace extending from near the top of one front corner post to near the bottom of the opposite front corner post, a horizontal cross brace connected to and extending between the front corner posts near the bottoms thereof, said diagonal braces and said horizontal brace being made of metal tubing of substantially rectangular section with the ends of said tubing flat and abutting the flat side faces of the metal tubing of said corner posts, braces of metal tubing of substantially rectangular section connected to and extending between said rear corner posts with the ends of said braces flat and abutting the flat faces of the rear corner posts, bottom side bars of rectangular metal tubing connected to and extending between the front corner posts and the respective rear corner posts, top side bars of rectangular metal tubing connected to and extending between the front corner posts and the respective rear corner posts near the tops of said posts, said top side bars extending forward beyond the front corner posts, and individual platforms supported by said top side bars for receiving the feet of a business machine.

5. A supporting stand for business machines made in four pieces comprising right and left side pieces each of which comprises two vertical standards connected near the top and near the bottom by horizontal cross pieces, each of said side pieces having front and rear feet at its bottom and front and rear individual platforms at its top for receiving the feet of a business machine, said front platforms being located forward of the front vertical standards of the side pieces, a front bracing piece connected to and extending between said side pieces at the front thereof, and a rear bracing piece connected to and extending between said side pieces at the rear thereof.

6. A supporting stand for business machines made of four pieces comprising right and left integral side pieces each of which comprises two vertical standards joined at their tops and at their bottoms by cross pieces, each of said side pieces being also provided with front and rear feet at their bottom and with front and rear individual platforms at their top for receiving the feet of a business machine, said front platforms being supported at points forward of the front vertical standards of each side piece, a front brace piece connected to and extending between said side pieces at the front, a rear brace piece connected to and extending between said side pieces

at the rear, each of said brace pieces being an integral unit and comprising an X-shaped portion with the bottom arms of the X connected by a horizontal cross piece.

- 5 7. A supporting stand for business machines made of four pieces comprising right and left side pieces each of which comprises a vertical standard with a top bar connected thereto and extending both to the front and the rear of said
10 standard and a bottom bar connected to said standard and extending both to the front and the rear thereof with the front portion of said

bottom bar inclined downwardly to form a front part, a third piece comprising a brace connected to and extending between said right and left side pieces, said brace piece comprising an X-shaped portion having its lower arms joined by a horizontal portion, and a fourth piece forming a rear section consisting of two vertical standards joined by upper and lower cross braces, said rear section being connected to the ends of the upper and lower bars of said right and left side sections.

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