No. 686,226. Patented Nov. 5, 1901.

H. JOHN.

METAL SHEARS.

(Application filed May 23, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

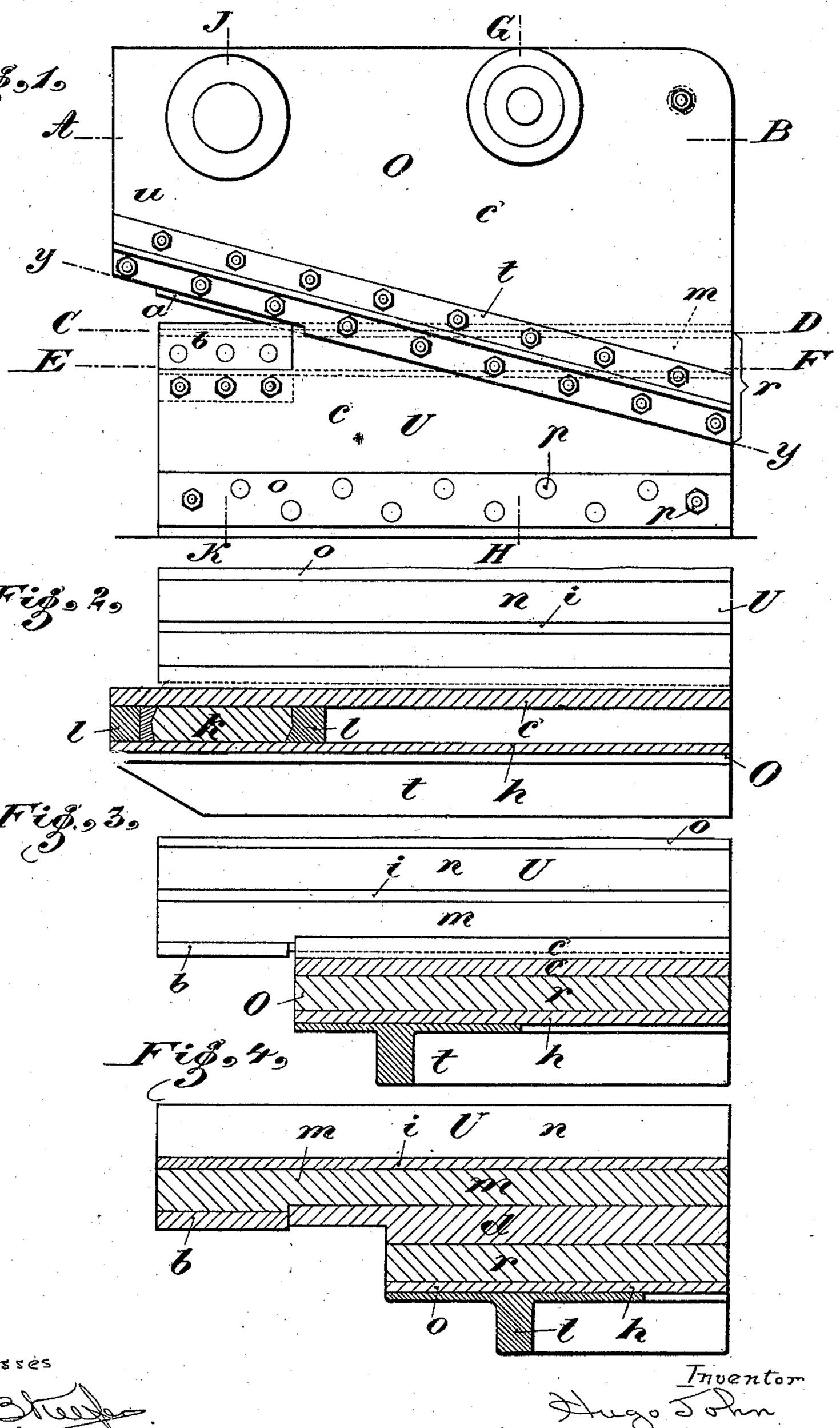

Fig. 2.

Fig. 3.

Fig. 4.

Witnesses

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Fig. 5.

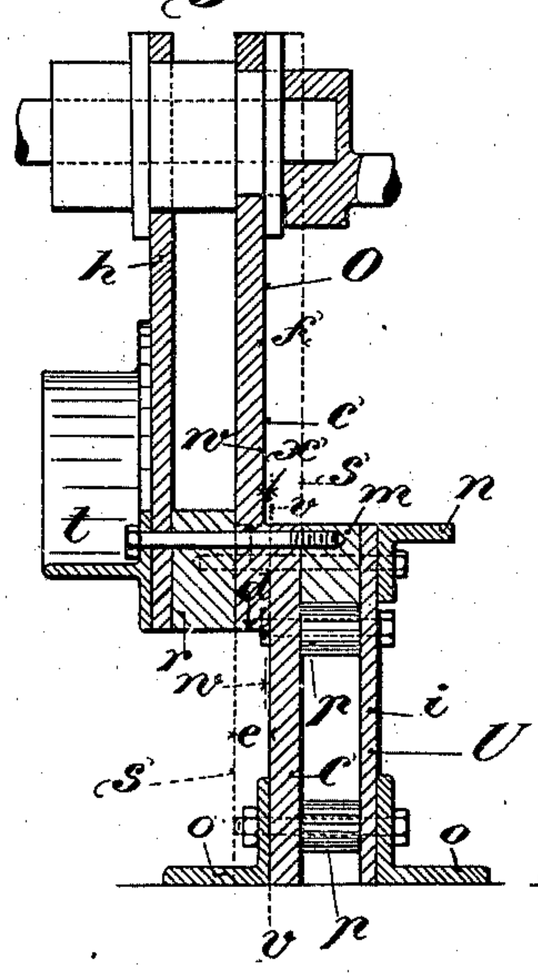


Fig. 6.

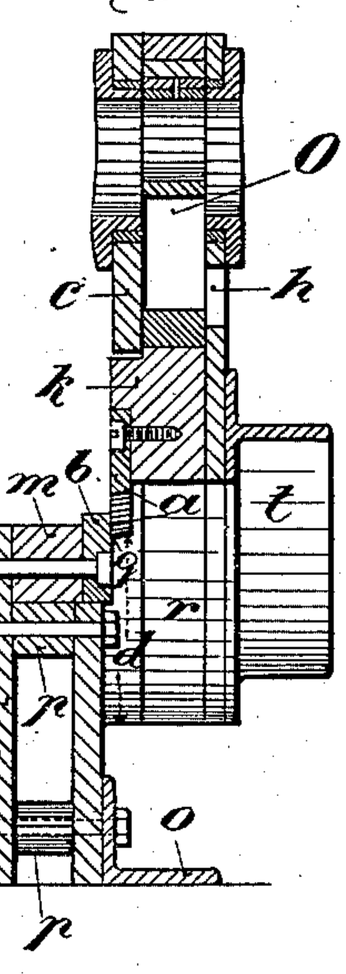


Fig. 7.

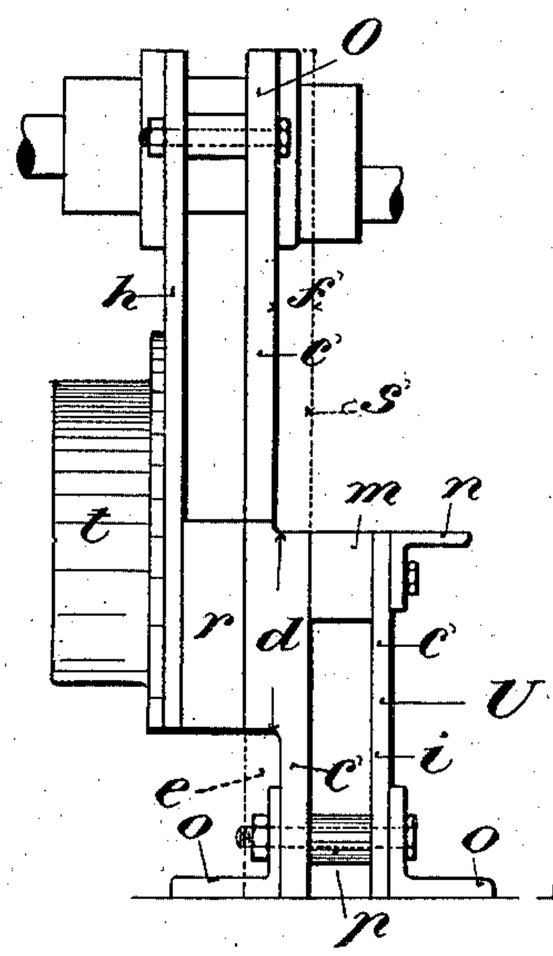
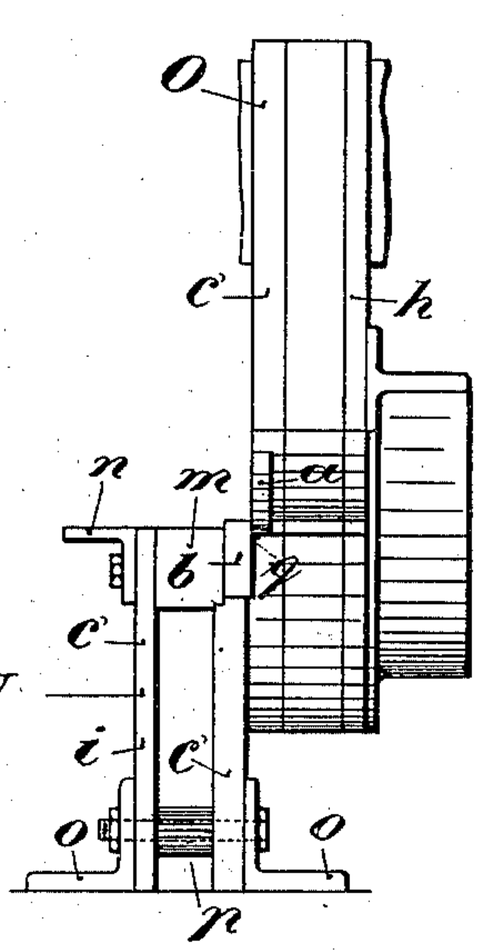


Fig. 8.



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UNITED STATES PATENT OFFICE.

HUGO JOHN, OF ERFURT, GERMANY.

METAL-SHEARS.

SPECIFICATION forming part of Letters Patent No. 686,226, dated November 5, 1901.

Application filed May 23, 1901. Serial No. 61,655. (No model.)

To all whom it may concern:

Be it known that I, HUGO JOHN, manufacturer, a subject of the King of Prussia, German Emperor, residing at Erfurt, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Metal-Shears, of which the following is a specification.

My invention relates to improvements in metal-shears.

It is well known that machine-tool frames built up of iron plates have been found to answer exceedingly well for plate-shears and stamping-machines, possessing the advantage over cast-iron frames, inasmuch as the various plates constituting the frame can be selected so as to procure a high and accurately-calculable tensile strength. Machine-tool frames built up of iron plates, notwithstanding their greater strength, are of considerably less weight than cast-iron frames, and may therefore be employed with advantage for portable machinery, as well as for machine-tools suspended during their operation. The frame for plate-shears of my invention permits of the cutting of metal plates of unlimited length and width and is built of sheet metal. The frames for such shears intended to cut up metal plates of unlimited length and width were hitherto mostly made of cast-iron and in isolated cases only of forged Siemens-Martin steel. To shear metal plates, as stated, necessitates an arrangement of the part of the frame which carries the bottom cutter so as to permit the severed part of the metal plate to be freely displaced in a straight line and the remaining or uncut portion of the metal plate, which is still in continuity with the latter, to be displaced either in a straight line or with an inclination downward and in a manner as to permit both parts cut from the full-sized metal plate to be advanced without spreading out the cut—that is, without distending the two severed portions at the point of cutting. For this reason these frames were arranged in such a fashion at the level of the cutters that the respective parts of the frame at the support or head-stock of the upper cutter had a lateral shoulder in the horizontal plane which necessitated a special strengthening of the two parts of the frame by strong lateral ribs. Notwithstanding such lateral staying the strength of such frames was very inferior, more especially at the shouldered portion between the top and bottom cutter-frames, and breakages were of frequent occurrence at the shoulder part referred to. In order to apply the advantages of shear-frames built up of iron plates to this particular kind of shears, I employ one frame each for the top and bottom cutter. The annexed drawings illustrate such a shear-frame, wherein—

Figure 1 shows this frame in lateral elevation. Fig. 2 is a horizontal section of same in the line A B, Fig. 1, through the top cutter-frame. Fig. 3 is a section on line C D, Fig. 1, through the top cutter-frame just above the bottom cutter. Fig. 4 is a horizontal section on the line E F, Fig. 1, through the top and bottom cutter-frames. Fig. 5 is a vertical section on the line G D, as seen from the rear end of the frame. Fig. 6 is a vertical section on the line J K as seen from the front side of the frame. Fig. 7 is a back view of the same. Fig. 8 is a front view of the same.

Referring to the drawings, O designates the frame for the top cutter *a*, while U indicates the frame for the bottom cutter *b*. The first is hereinafter referred to as the "top frame" and the latter the "bottom frame." The two are joined by means of a strong metal plate *c*, which is planed out of a solid piece of plate *s*, (indicated in the drawings by dotted lines,) so as to form a middle part *d*, common to the top part O and the bottom part U, commencing behind the inner cutting angle of the two cutters *a b* and increasing in thickness wedge fashion toward the rear end of the frame in the direction of the line *y y*. (See Figs. 1, 3, 4, 5, 6, 7, and 8.) From *d* upward the metal plate *c* is planed to the extent *f* on the side facing toward the bottom cutter *b*, while from *d'* downward it is planed off on the side facing toward the bottom cutter to the extent *e* with a beveled edge *y y*. To this plate *c*, which is common to both frames O and U, the sides *h* of the frame O and *i* of the bottom frame U are joined on and fixed laterally. The support or head-stock *k* of the top cutter *a*, Figs. 2 and 6, placed between *c* and *h*, is guided in a suitable manner between slides *l*. The side *i* of the bottom frame U is rigidly joined to the plate *c* by a strong

piece *m*, which at the same time forms a table. The side *i*, moreover, carries the angle-iron *n*, which is joined on, so as to form a table. Feet *o*, of angle-iron, serve to give sufficient stability to the whole frame. The sides *c* and *i* are kept at a suitable distance from each other in the lower part by collars *p*.

Behind the cutting-plane *q* of the cutters *a b* a wedge-shaped strengthening-block *r*, which increases in height toward the rear, is inserted between the plates *c* and *h*, commencing at *s*, and rigidly joined to them. On the top frame O at the side a T-iron *t* is attached, so as to run in an oblique direction *y y* along the lower edge of the thick part *d* of the common plate *c*. This T-iron extends from the upper edge of the freely-carried head *u* to the rear end of the frame and stays to top frame O, against the bottom frame U, sufficiently to preclude all fear of any gaping of the cutters *a b* when cutting plates. Like the T-iron *t* in the case of the top frame O the small insertion *m*, in conjunction with the angle-iron *n* in the case of the bottom frame U, serves to prevent the bending away of the bottom cutter *b* during the act of cutting.

In order to insure the necessary clean cut of the cutters *a b*—that is to say, to prevent the cut, or rather the two parts, from being pressed or drawn away from each other by friction against the sides of the frame—the shoulders *e* on the bottom frame U and *f* on the top frame O are arranged in any known manner and are of such dimensions that a free extent *x* of from eight to ten millimeters is left between the flush line *v v* of the inner delimitation of the bottom frame U and the flush line *w w* of the top frame O.

When using shears of the kind described, the metal plate lying on the table *m n* advances on it horizontally as long as cutting continues, while the cut-off piece advances on the opposite side *y y* of the frame.

Such a frame built up of iron plates possesses the advantages of high resistance and is secured against lateral bending away, which would cause the cutters to "gape," and realizes the purpose of cutting plates of unlimited length and width; but at the same time it is materally lighter, and therefore cheaper and more portable, than all wrought-iron or cast-iron shear-frames hitherto produced for the same purpose.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a frame of the class described a plate having a body portion provided with upward and downward extensions at its opposite edges, a top plate and a bottom plate arranged opposite the respective extensions, a wedge-shaped member between the top plate and the upper extension, thickest at the rear end thereof, a spacing member between the lower plate and the lower extension, means for securing said parts together, and angle-irons connected to the outer faces of the respective sections.

2. In a frame of the class described a plate having a body portion provided with upward and downward extensions at its opposite edges, a top plate and a bottom plate arranged opposite the respective extensions, a wedge-shaped member between the top plate and the upper extension, thickest at the rear end thereof, a spacing member between the lower plate and the lower extension, means for securing said parts together, and angle-irons connected to the outer faces of the respective sections, and one of said angle-irons being horizontally disposed and its upper face being flush with the upper edge of the lower extension and also with the said spacing member to thereby form a table.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HUGO JOHN.

Witnesses:
MAX MEYER,
WILHELM BINDEWALD.