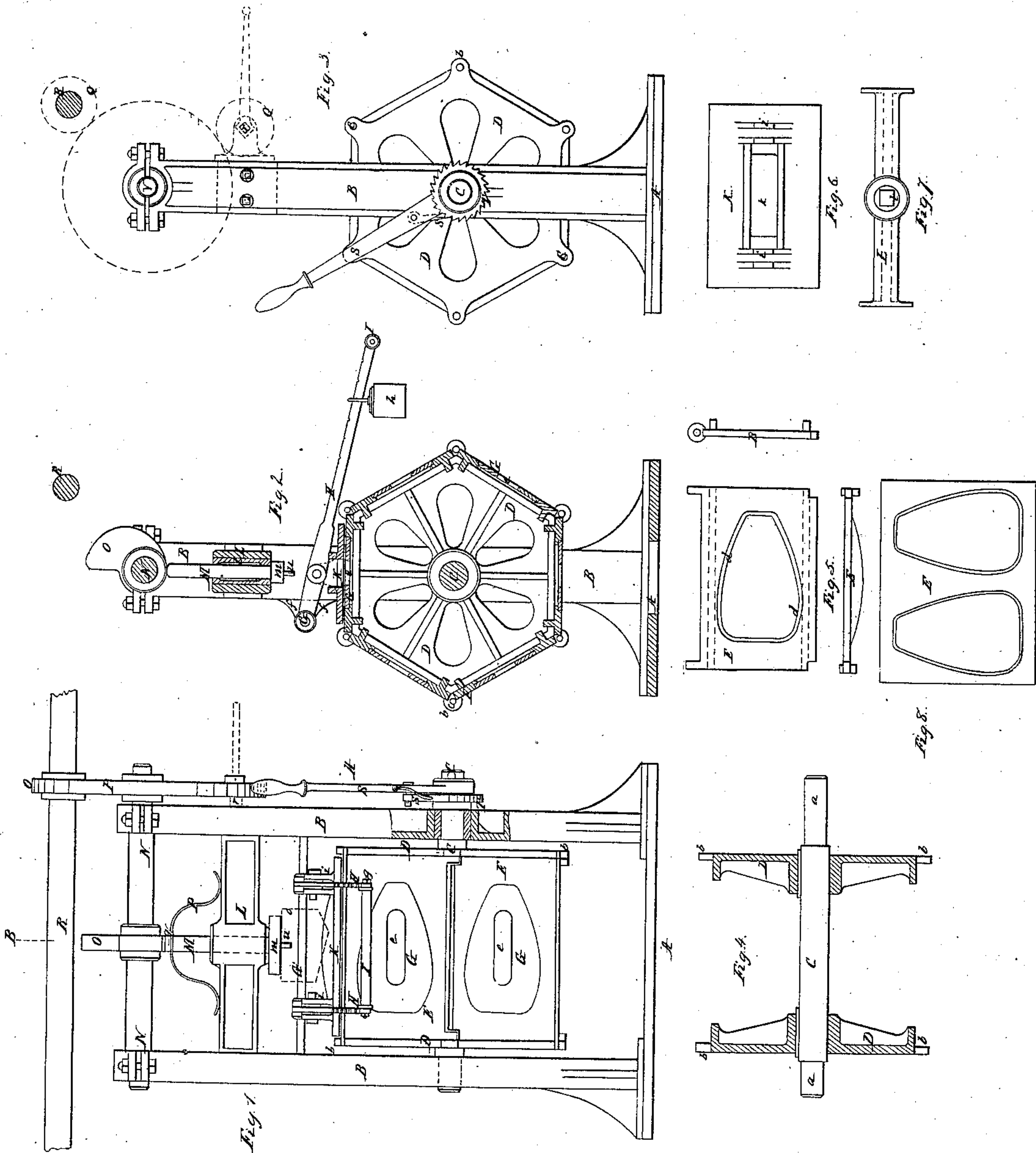


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No. 18,291,

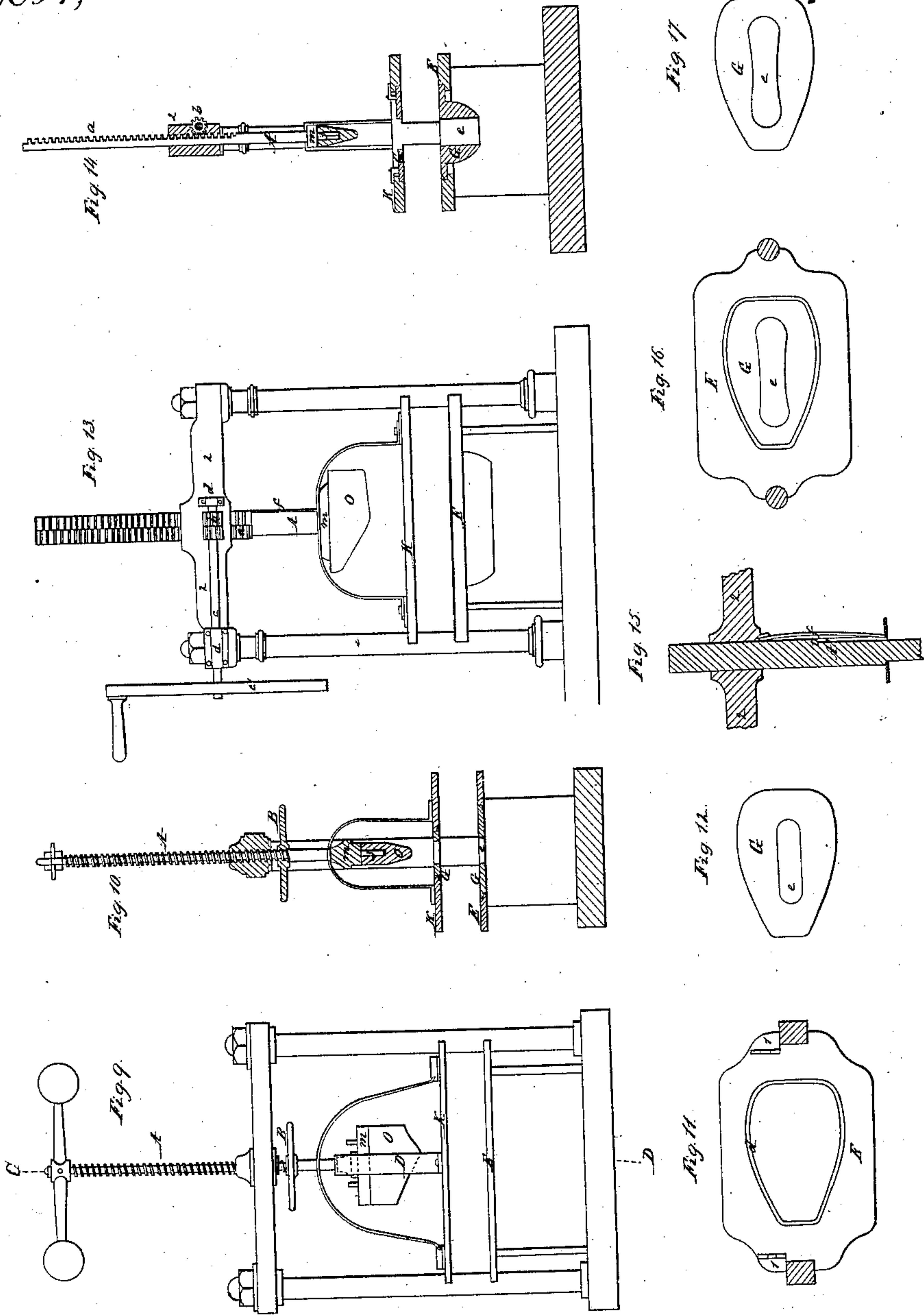
Patented Sept. 29, 1857.



S. Middleton,  
Upper Machine,

No 18,291,

Patented Sept. 29, 1857.





# UNITED STATES PATENT OFFICE.

SAMUEL MIDDLETON, OF NEWPORT MARKET, ENGLAND.

MANUFACTURE OF THE UPPERS OF BOOTS AND SHOES WITHOUT SEAMS.

Specification of Letters Patent No. 18,291, dated September 29, 1857.

*To all whom it may concern:*

Be it known that I, SAMUEL MIDDLETON, of No. 15 Porter street, Newport Market, in the county of Middlesex, England, a subject  
5 of the Queen of Great Britain, have invented or discovered new and useful Improvements in the Manufacture of the Uppers of Boots and Shoes of Leather Without Seams; and I, the said SAMUEL MIDDLETON, do hereby  
10 declare that the nature of my said invention and the manner in which the same is to be performed are particularly described and ascertained in and by the following statement thereof, that is to say:

15 My invention relates to the manufacturing of the uppers of boots and shoes of leather heretofore usually made with seams either by sewing (technically termed "closing") or otherwise connecting together the separate  
20 or divided parts of the material and consists in exerting pressure upon lasts or forms acting upon pieces of leather and made to pass therewith through plates or dies of metal whereby I cause a flat piece of  
25 leather when acted upon and made to pass as aforesaid to assume and retain the external shape of such said lasts or forms.

In order to explain my said invention as completely as possible I now proceed to describe the best means I am acquainted with  
30 for carrying the same into practical effect reference being had to the illustrative sheets of drawings hereunto annexed and to the numeral figures and letters of reference  
35 marked thereon respectively as follows:

*Description of the drawings.*—At Sheet 1 Figure 1 is a front elevation partly in section of a machine constructed according to my said invention adapted for the manufacture  
40 or production of the uppers of boots and shoes of leather without seams. Fig. 2 a transverse and vertical section through the line A B at Fig. 1. Fig. 3 a side elevation at A Fig. 1 of the above machine. Figs. 4,  
45 5, 6, 7, 8 exhibit detached portions hereinafter referred to. At Sheet 2 two other forms of construction of machines for the above purposes as also detached portions thereof are exhibited. Fig. 9 is a front elevation  
50 of one of such said machines; Fig. 10, a transverse and vertical section thereof through the line C, D at Fig. 9; Figs. 11 and 12, detached portions of the same hereinafter referred to. Figs. 13 and 14 are  
55 similar views of the other of such said ma-

chines and Figs. 15, 16, and 17 detached portions thereof.

At each of the foregoing figures of each sheet of drawings similar letters of reference are employed to denote corresponding  
60 parts in so far as such parts appear or can be seen at each of such said figures respectively.

At Figs. 1, 2, 3 of Sheet 1, A is a foundation plate; B, B, standards securely affixed  
65 thereto and supporting the following parts: C is an axle of wrought or cast iron the journals *a, a* of which work in suitable bearings formed in or connected to the standards B, B. D, D are hexagonal shaped castings  
70 securely fixed on the axle C as exhibited at Fig. 4. These castings are formed with lugs *b* for the purpose of connecting thereto by pins or screws at (*c*) plates of metal E, E. One of these plates is shown detached at  
75 Fig. 5 where it will be seen that the center of said plate has a hole formed therein with a rabbet *d* upon which rests another plate of gun metal or brass G shown at Fig. 1 corresponding in its external shape to the opening  
80 in the plate E. The center of the plate G is also formed with an opening at *e* constituting a die or draw plate through which the article to be manufactured is pressed in the manner and by the means hereinafter  
85 fully described. G', is a wrought iron rod the ends whereof are securely fixed to the parts *f, f* of the standards A, A. H, H are levers one end of each of which passes loosely over the rod G', and the other and  
90 opposite ends of said levers are connected together by a rod *g* and handle I. The upper edges of the levers H, H are notched for suspending weights *h* therefrom said weights being employed for the purpose hereinafter  
95 mentioned. K is a casting (shown detached at Fig. 6). This casting is connected by the lugs *i, i* and pins to the levers H, H. There is an opening *k* formed through the center of the casting K somewhat larger than the  
100 opening *e* in the plate G or there may be a plate of gun metal or brass similar to that before described and marked G fitted into the opening *k* which must then be formed larger to receive it. When a separate plate  
105 is not used it will then be necessary to galvanize or otherwise coat or cover the underside of the casting K to prevent the oxid of the metal injuring the material which is to be operated upon. L is a casting the ends  
110



whereof are securely fixed by bolts and nuts to the standards B, B. Through the center of this casting a hole is formed in which fits a piece of brass or gun metal *l* as at Fig. 7 in which a square hole is formed and into and through this said hole a square piece of metal M fits and slides. *m* is a shoe piece fixed to or formed upon the piece M to which is connected by a split pin *u* a wooden last or "dummy" *o* with its sole next to the piece M employed for giving the first shape to the leather. The piece M is held up by the elastic force of the spring *p* and the pin *q* which rests thereon as at Fig. 1. N is a strong wrought iron shaft the ends whereof are supported by and revolve in suitable bearings connected to the upper part of each of the standards B, B. O is a cam or snail securely fixed upon the shaft N immediately over the piece M. P is a spur wheel keyed on the shaft N and Q is a smaller toothed wheel or pinion taking or gearing into the wheel P for imparting motion thereto. If the machine is to be worked by steam power then the wheel Q may be fixed upon a shaft R as exhibited but if it is desired to work the said machine by manual power then the wheel or pinion Q may be mounted upon a short stud *r* connected to the standard B as denoted by the dotted lines at Figs. 1 and 3 and motion imparted thereto by a lever handle fixed upon the stud *r*. S is another lever handle the lower end whereof fits loosely upon the axle C. *s* is a pawl and spring connected to the handle S as at Figs. 1 and 3. This pawl takes into the teeth of the ratchet wheel T which is securely fixed upon the axle C. Upon moving this handle upward the pawl will pass over the teeth of the ratchet wheel but upon moving said handle downward the axle C will be moved and with it the castings D and parts connected thereto. If desirable the whole of the before mentioned operations of the machine may be rendered self acting instead of actuating some of the parts by hand as above stated.

I now proceed to describe the mode of operating with the above machine for manufacturing the uppers of boots and shoes of leather without seams as follows:

*Mode of operating.*—I first cut a piece of ordinary tanned leather of the external shape of the plate G but a little larger in size such said plate being made or marked of various sizes in accordance with the different sizes of boots and shoes. I then place the leather in a dry state upon the plate G and lift up the plate K by the handle I and by means of the lever S bring the plate G with the leather thereon under the plate K. I then lower the plate K thereon and adjust the weights *h*, *h* until I attain the required degree of pressure necessary to hold the leather flat while the last or form

with the leather is being forced through the opening *e* in the plate G which is effected by the rotation of the cam O pressing upon the rod N. I would here state that it is desirable to push down by hand that part of the leather against which the top of the last or under side of the dummy first comes into contact to prevent the leather being unnecessarily stretched and to facilitate the operation of shaping the same to the said last or dummy.

In cases where it is desirable to manufacture the uppers of more than one boot or shoe at a time in the above machine the same may be effected by arranging the plates E and G and pieces of leather in the order exhibited at Fig. 8 in which case it will only be necessary to employ as many separate cams O on the shaft N as there are pieces of leather to be shaped at one time in other respects the machine is the same as above described.

I now proceed to describe the construction of the machines or apparatus exhibited at Sheet 2, which are also adapted to the manufacture or production of the uppers of boots and shoes without seams, observing that the main principle of action in these machines is the same as that above described namely the exerting of pressure upon a last or form passing through dies or metal plates with holes in them. The construction of these last mentioned machines differs from that exhibited at Sheet 1 in the following respects: Instead of arranging and disposing the plates or dies G around an axis so as to bring each one successively underneath the pressure plate K I adapt only one plate or die to each machine and the other parts of the said machines I arrange or construct as follows: As regards Figs. 9 and 10, A is a screw for exerting pressure on the "last" or "form;" B, a wheel the center of which fits upon the screw A. I employ this wheel for bringing and maintaining the pressure plate K in forced contact with the leather when placed upon the plate or die G and I cause such pressure by means of the spring C upon which the wheel B presses. D is a piece of metal for lifting the plate K after the leather has been shaped to enable the same to be removed from the machine. This operation may be facilitated by making the parts 1, 1 of the plate E hinged as at Fig. 11, by which upon turning up such parts the plate may be drawn out, and as regards the machine exhibited at Figs. 13 and 14 it differs in detail from that lastly above described in the following respects: Instead of the screw A at Figs. 9 and 10, I employ a rectangular shaped sliding piece A, to one side of which a double rack *a* is securely fixed into the teeth whereof a double pinion *b* takes or gears. The axis C of such said



pinion is supported by bearings *d* in which it revolves and has rotary motion imparted thereto by a lever wheel *e'* fixed upon the axis *c* as at Fig. 13, and I employ the following method for causing forced contact of the plate K upon the leather which it is desired to operate upon in place of the wheel B at Fig. 9: I use a piece of steel *f* (seen better at Fig. 15). The top of this piece I form rounded and when such said piece is out of use it lies in a recess \* formed in the piece A as at Fig. 15. Similar letters of reference are employed to denote such other parts of this machine as are employed for a similar purpose to those of the machine before described with reference to Figs. 9 and 10.

The operations of the machine exhibited at Figs. 13 and 14 are as follows: Supposing the several parts to be in the position shown at these figures, the operator first places the leather upon the plate G. He then imparts motion to the wheel *e'* by which the rack *a*, plate K and last or form *o* will be lowered, and when the plate K has been fairly deposited upon the leather and previous to the last or form *o* operating thereon the necessary pressure is exerted upon the leather as before stated by the beveled shoulder 1 of the groove \* (shown at Fig. 15) forcing the upper part of the piece *f* out of the said groove, the upper end of such said piece being firmly held by the underside of the cross piece, Fig. 2, which is suitably formed to receive and retain it in the position exhibited, and by these means I cause pressure upon the leather. The piece A continuing to descend by turning around the lever wheel *e'* forces the last or form *o* upon the leather, both of which pass through the hole in the plate or die G, and thus the necessary shape is imparted to the leather without seam or joint of any kind. The direction of motion

of the wheel *e'* is then reversed, thus raising the piece A and the pin 3 which previously held up the last or form *o* is at the same time drawn out of it, thus leaving the said last or form in the leather and when the shoulder 1 of the groove reaches the head of the piece *f* such piece will again fall into the groove \* and the pressure thus be removed from the spring C and plate K, after which the piece A continuing to ascend will lift the plate K from the leather sufficiently high for the plate or die G to be removed with the leather and last or form thereon which is placed in a convenient situation to dry gradually. Another similar plate is then substituted in its place and the operation repeated as before. The upper thus far shaped before being used in the manufacture of boots and shoes requires to be lasted and then cut.

Having now fully described and set forth the nature and object of my said invention of improvements in the manufacture of the uppers of boots and shoes without seams, together with the best means I am acquainted with for carrying the same into practical effect, I would remark in conclusion that I am aware that drinking cups and the blinds for horses' bridles have been stamped out of leather; therefore I limit my claim to making the uppers of boots and shoes.

What I claim as my invention and desire to secure by Letters Patent of the United States of America, is,

Stretching and forming the upper leather, for boots and shoes from a single piece of leather, without seams; substantially as described in the foregoing specification.

SAMUEL MIDDLETON.

Witnesses:

BENJ. BROWNE,  
HENRY FULLER.