

(No Model.)

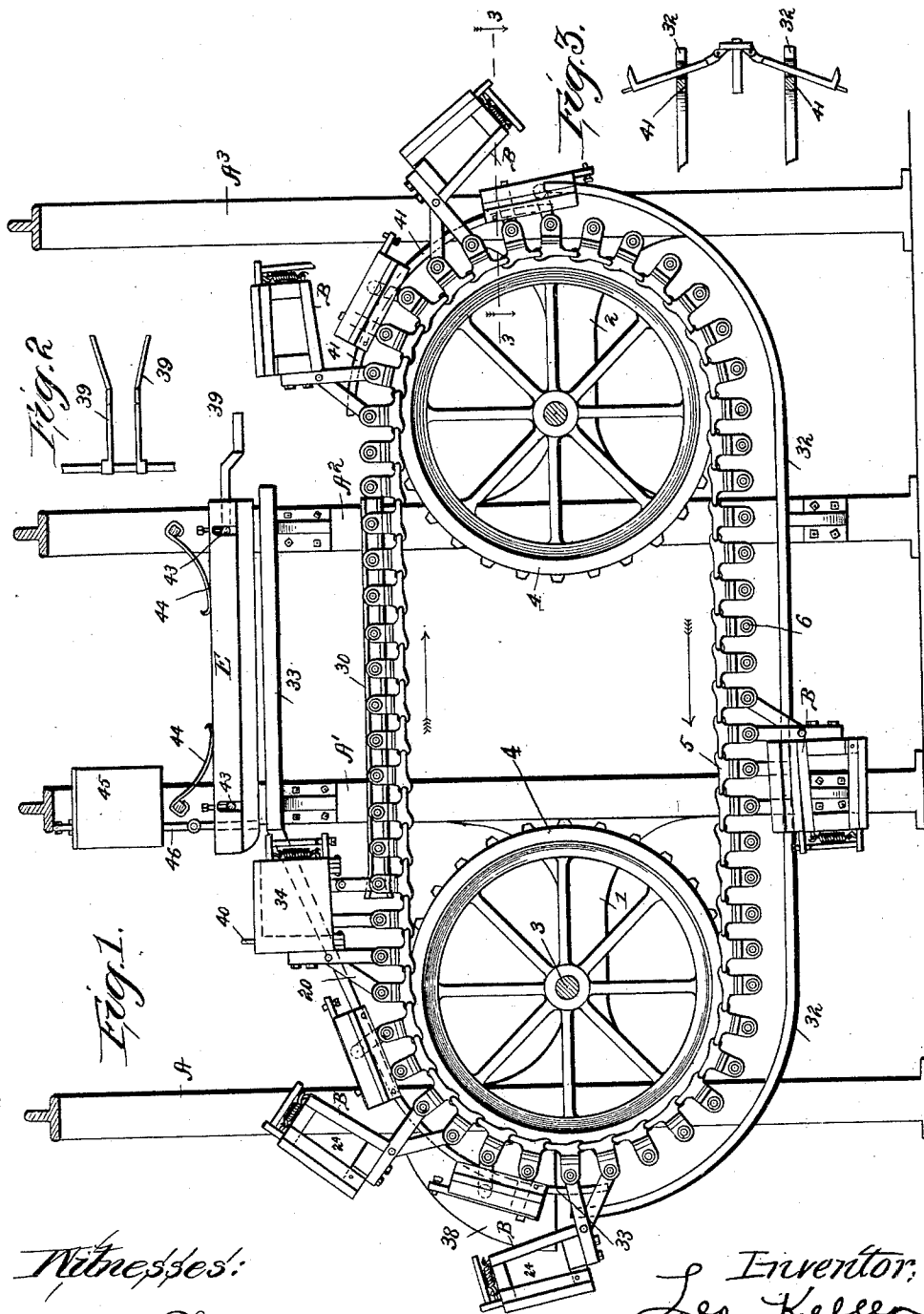
3 Sheets—Sheet 1.

L. KELLER.

CAN FORMING AND SOLDERING MACHINE.

No. 476,927.

Patented June 14, 1892.



Witnesses:

Wm. M. Rheem:

Otto Luebkert

Inventor:
Leo Keller

By *Loz Kennedy Atty*

(No Model.)

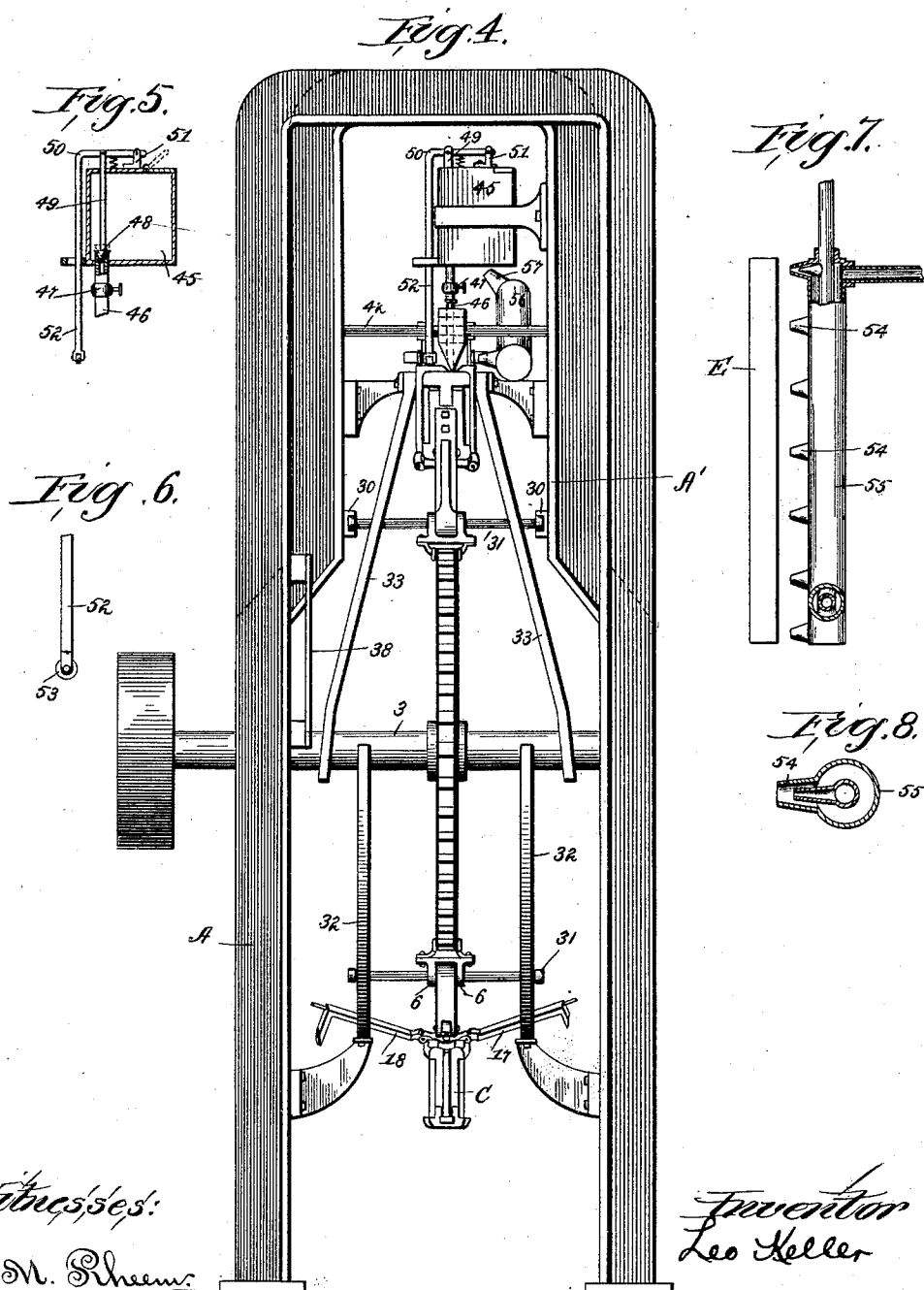
3 Sheets—Sheet 2.

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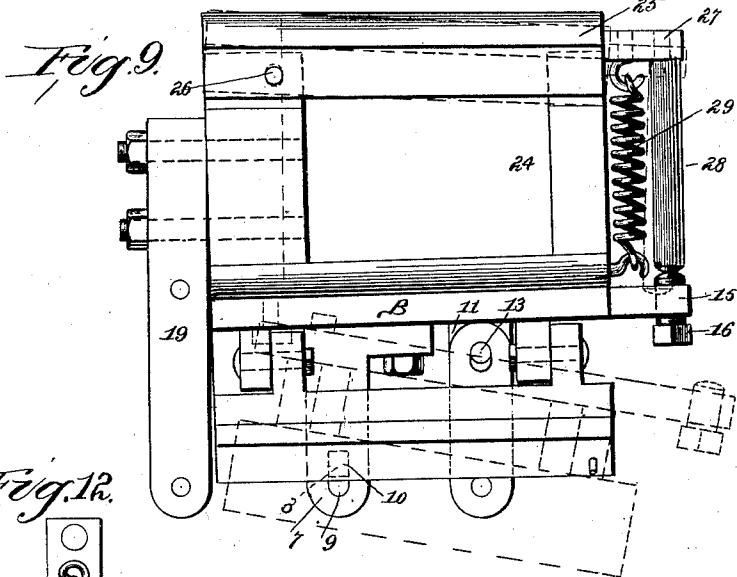


Fig. 12.

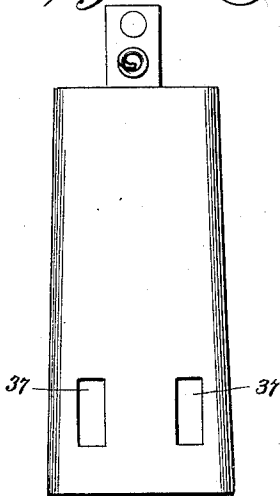


Fig. 10.

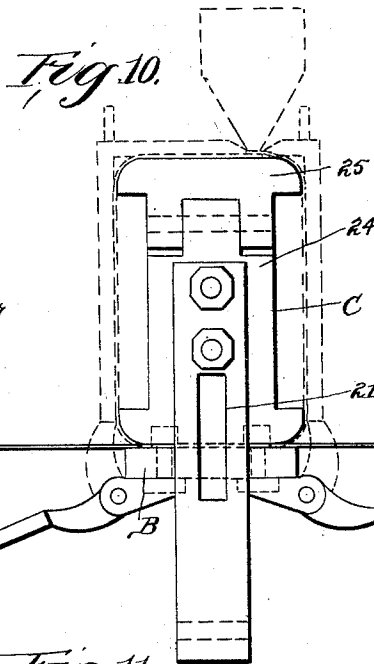


Fig. 13.

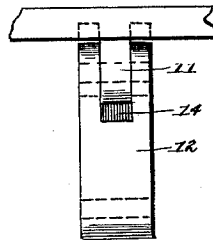
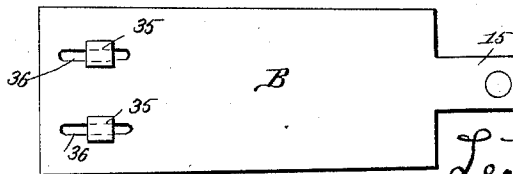


Fig. 11.



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Wm. M. Rheem.

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UNITED STATES PATENT OFFICE.

LEO KELLER, OF CHICAGO, ILLINOIS.

CAN FORMING AND SOLDERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 476,927, dated June 14, 1892.

Application filed January 12, 1892. Serial No. 417,873. (No model.)

To all whom it may concern:

Be it known that I, LEO KELLER, a citizen of the Empire of Germany, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Can Forming and Soldering Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a novel construction in a machine for forming and soldering cans, the object being to provide a machine of this character that will accomplish the above results in an expeditious and efficient manner.

The invention consists in the features of construction and combination of parts herein-after fully described and specifically claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a side elevation of the operative parts of my machine with the sides of the frame removed for convenience of illustration. Fig. 2 is a detail view of the deflecting-rails for throwing out the wings of the former. Fig. 3 is a detail fragmentary sectional view on the line 3 3 of Fig. 1. Fig. 4 is an end elevation of the machine with a section of the sprocket-chain removed for convenience of illustration. Fig. 5 is a detail sectional view of the solder-pot. Fig. 6 is a detail elevation of the lower end of the rod connected with valve of said solder-pot. Figs. 7 and 8 are details of the heating devices for the soldering-iron and pot. Fig. 9 is a detail side elevation of the former-plate and former-block detached. Fig. 10 is an end elevation of same. Fig. 11 is a top plan in detail of the former-plate. Fig. 12 is a bottom plan of the former-block. Fig. 13 is a detail view of connection between former-plate and chain.

Referring to said drawings, A, A', A², and A³ indicate the supporting arches or frame of the machine, consisting, preferably, of four arches arranged equidistant, as shown in Fig. 1. Between the arches A and A' and A² and A³ are the supporting or connecting pieces 1 and 2, and upon these connecting-pieces 1 and 2 are mounted the shafts 3, upon which the sprocket-wheels 4 are arranged. The

sprocket-wheels 4 are connected by a sprocket-chain 5, and said sprocket-chain is provided with downwardly-projecting bearing lugs or ears 6. One of the shafts 3 is provided with suitable means for rotating the same.

The devices for shaping or forming the can consist, essentially, of two principal members, a former-plate B and former-block C. In Fig. 1 of the drawings the said sprocket-chain is shown as provided with only six pairs of these forming devices; but it will be understood that in practice for each four in number of the lugs 6 a pair of these forming devices is provided, the others being omitted in Fig. 1 for convenience of illustration. In said Fig. 1, however, enough of these forming devices are shown as to illustrate the operation of my machine.

The plate B is provided near its rear end with a downwardly-projecting finger 7, that is rigidly secured to the lower face of said plate, while the lower end of said finger 7 is secured to one of the lugs 6, preferably by a yielding connection attained by inserting a piece of elastic material 8—such as a piece of rubber or any other elastic cushion—between the pivot 9, that holds the finger to one of the lugs, and the wall of the slot 10, forming said finger. Near the forward end of the plate and to the under face thereof is located a lug 11, that is pivotally secured between the bifurcated upper end of the link 12 by means of pivoted opening 13. The pivot-apertures in the upper end of said link are slotted, and an elastic cushion 14 is located between the bifurcated portion of the link, so that the lower end of the lug 11 rests thereon, thereby providing a yielding and pivotal connection between the forward end of the plate B and said link. The lower end of the link is pivotally secured to the pair of lugs just in advance of the lugs 6, to which a downwardly-projecting finger 7 is pivoted. It will thus be seen that when that portion of the chain to which the plate is secured is traveling in a straight line between the sprocket-wheels the plate will be held parallel thereto; but when such portion of the chain is going around the sprocket-wheels the plate conforms to such movement by reason of the pivotal connection above described. The forward end of

the plate B is provided with a projection 15, through which an adjusting-screw 16 passes, to be referred to more fully hereinafter.

On either side of the plate B are pivoted the wings 17 and 18, more fully referred to hereinafter. The former-block C, around which the can is formed, is secured to the sprocket-chain just in the rear of the plate B and is in cross-section and elevation of the shape that it is desired that the can should take. To the rear end of the former-block is a rigid downwardly-projecting arm 19, that is pivoted at its lower end to the pair of lugs 6, just in the rear of the lugs to which the rear finger 7 of the plate is secured, and the length of said arm is so arranged with relation to the size of the former-block and the location of the plate that when that portion of the chain to which it is secured is traveling between the sprocket-wheels and link 20, pivoted at one end to the pair of lugs 6, just in the rear of lugs 6 to which arm 19 is attached, and at its other end in a slot 21 in said arm 19, it will hold the block down upon the plate, as shown in Figs. 1, 4, and 9. When, however, such portion of the chain passes around the wheel, the lugs on the different sections of the chain are separated slightly by reason of the curvature of the wheel, so that the link 20 will draw the arm 19 backward a little distance, and thus take the former-block off of the plate. The wings 17 and 18 of the plate are of such a length that when the former-block rests on said plate said wings will reach to the upper edge of the block, and the said wings are provided at their outer ends with flanges 22 and 23, that lap over and rest upon the upper face of the former-block, as shown in dotted lines in Fig. 10. The flange 23 is longer than the flange 22; but the combined length of both flanges is such that they do not quite meet on the upper face of the block. The said former-block C is formed in two pieces 24 and 25, said part 25 being pivotally secured to the other part, and such parts are capable of a slight movement relatively to each other. It will of course be understood that the sides of the former-block gradually taper to give the tapering shape to the can that is formed thereon, as shown in Fig. 12, and the pivotal connection between such parts 24 and 25 is located adjacent the larger end of the former-block. A pivot 26 secures such parts together, and the upper part 25 is provided with a forwardly-projecting finger 27, which is provided with a downwardly-projecting pin 28, and a spring 29, connecting the parts 24 and 25, serves to hold the part 25 at the lower limit of its movement when the former-block is not resting upon the plate. When, however, the former-block and plate are together, as shown in Fig. 1, the pin 28 strikes the upper end of an adjacent screw 16, and thereby lifts the upper part 25 of the block against the tensions of the spring 29, as shown in Figs. 1 and 4. The arches A' and A² are provided with guide-rails 30, that re-

ceive the outer ends of guide-arms 31, that are convenient extensions of the pivots between the lugs 6 and connecting-pieces joining the plate and block therewith. The said guide-rails are horizontally arranged and serve to give to the said former-block and forming devices when passing between the wheels a straight, horizontal, and unyielding movement. During the time that the can-forming devices are passing between the said wheels the overlapped edge of the piece of tin carried thereby is acted upon by the soldering devices, which are carried by the said arches A' and A², in a suitable manner.

It will of course be understood that the wings 17 and 18 are free to swing upon their pivots; but in their passage to the plate over the rear wheel 4 to the forward wheel the said wings are held from swinging down upon the former-block by means of the rails 32, upon which the wings 17 and 18 rest, as shown in Fig. 4. The said rails 32 follow the curve of the chain to about the height of the shafts 3, where they terminate; but before the rails 32 end another pair of rails 33 commence and engage the other side of said wings before the wings leave the rails 32. The rails 32 engage the inner face of said wings, while the rails 33 engage the outer face thereof, and the whole follow the curve of the chain to a point about over the shafts 3 and gradually come nearer to each other as they ascend, so that as the plate rises the wings will be elevated in an obvious manner.

The piece of tin from which the can is to be formed is placed upon the plate B just after the wings thereof have left the rails 32, and said piece of tin 34 rests upon two holds or gages 35 upon plate B. The said gages 35 are secured to pins or bolts that pass through slots 36 in said plate B and are suitably secured beneath the plates by nuts. The said gages 35 are arranged within the slots, so that the forward edge of the blank 34 is located about the forward edge of the plate and former-block, and said gages 35 can be adjusted along the slots to always bring the said blank into the correct position when for any reason such adjustment is necessary. The lower face of the block is provided with openings or recesses 37, that receive the said gages 35. Secured to the supporting-arches A, and preferably to the left limb thereof, is a side gage-plate 38, Figs. 1 and 4, so that when the blank is placed upon the plate and one edge rests upon the side gage 38 the blank is in the correct position for being formed into a can. It will be seen that as the block moves toward the plate and is thrown down thereupon, as before described, the pin 28 upon said former-block will strike the adjusting-screw and elevate the said pivoted part 25, which makes the blank of the correct shape. The wings are then lifted by the rails 33 and bend the tin blank up against the sides of the former-block and over on top of the same, so that the edges of the tin slightly

overlap each other, the blank being of such length to accomplish this result. When this happens, the former-block is about to move under the soldering-iron, and the rails 33 are then located parallel to each other, so that the wings are held in their closed position until the soldering operation is finished. As soon as the former block and plate pass from under the soldering-iron the rails 33 terminate and two deflecting-rails 39, secured to the arch 32, strike upwardly-projecting pins 40 on the wings 17 and 18, and by the divergence of said rails the wings are thrown outwardly from the former-block C and fall upon curved parallel rails 41, which prevent the said wings from falling too far. The wings 17 and 18 rest upon these curved rails 41 until they reach the upper end of the rails 32 at about the height of the shaft 3, whereat the said curved rails 41 terminate, and the said wings are then engaged on their inner face by the rails 32. Just as the said wings are thrown outwardly by the deflecting rails 39 the curvature of the sprocket-wheel 4, around which that portion of the chain to which the shaping device is attached has commenced to pass, will separate the former-block C and the plate B, as hereinbefore described, and when said parts are separated the spring 29 will draw the upper pivoted part 25 downwardly, and thus diminish the size of the former-blocks, so that the can that has been formed and soldered thereon can be easily removed.

It will be noted that the yielding connection between the plate B and the sprocket-chain to which it is secured, as attained by the use of the cushions 8 and 14, Figs. 9 and 13, hereinbefore described, serves to accommodate blanks of different thickness that may be placed upon the plate, so that when a piece unusually thick is acted upon the said plate will give slightly to accommodate the same, and thus prevent breakage of the parts or misforming of the can. The said cushions are strong enough to hold up the plate under all ordinary circumstances and only give when a plate of unusual thickness is placed thereon.

The soldering-iron E is held between the arches A' and A² and supported from cross-pieces 42, secured thereto. The said iron is provided with slotted openings 43, through which said cross-pieces 42 pass, and springs 44 bear upon the upper face of said soldering-iron to hold it down upon the can as it passes under the same, but is adapted to yield and conform to the thickness of the same. A pot or receptacle 45 is supported from the arch A' and is adapted to hold the melted soldering material, and from the bottom of the receptacle 45 a pipe or passage 46 leads to the forward end of the soldering-iron and passes through the same, having a solid connection therewith. The said pipe 46 is provided with a stop-cock 47, by means of which the quantity of soldering material passing there-through can be regulated. The soldering material is fed automatically by means of the

valve 48, that controls the communication between the pot and receptacle 45 and the pipe 46. The stem 49 of said valve passes upwardly and through the pot or receptacle and is pivoted to the horizontal arm of the bent lever 50, that is pivoted to a bracket 51 in the top of said receptacle. The other arm of said lever (indicated by 52) extends downwardly and is provided on its lower end with an anti-friction roller 53, that is located in the path of one of the wings of the plate, preferably wing 18.

From the foregoing description it will be seen that as soon as the plate and former-block arrive under the soldering-iron the wing 18 will lift the arm 52 of the lever 50 upon the valve 48, whereupon the molten solder will pass through the pipe 46 onto the overlapping portion of the can that is under the opening in the soldering-iron through which said pipe 46 passes. The said valve will be opened until the wing 18 passes by the anti-friction roller 53, so that the soldering will be distributed along the entire lapped portion of the can, and thereby join the edges of the blanks together.

It will be noted that the soldering-iron is much longer than the can, so that after the joint has been soldered the can will still pass under the rest of the soldering-iron, so as to be sweated.

In Figs. 4, 7, and 8 is shown the heating devices for the soldering-pot 45 and iron E, which consists of a series of burners 54, upon a pipe 55, to which mixed gas and air is fed in a familiar manner. The burners 54 are located in position to deliver their flames against the soldering-iron, while from one end of the pipe 55 a branch 56 leads upwardly and is provided with a burner 57, located to deliver its flame to the bottom of the soldering-iron and keep the soldering material therein in a molten condition.

I claim as my invention—

1. A can forming and soldering machine comprising a traveling plate provided with pivoted wings, a traveling former-block adapted to be thrown upon said plate, guide-rails to throw said wings around said former-block, and a soldering-iron constructed to operate on the blank when folded on the former-block.

2. A can forming and soldering machine comprising a traveling chain or carrier trained around a couple of wheels, a plate provided with pivoted wings connected with said carrier, a former-block connected with said carrier, the connections between said former-block and plate and carrier being such that said former-block will be thrown upon the plate when passing from one wheel to another, guide-rails for throwing said wings upon the former-block, and a soldering-iron constructed to operate on the blank when folded on the former-block.

3. A can forming and soldering machine comprising a traveling plate provided with pivoted wings, a traveling former-block adapt-

ed to be thrown upon the plate, guide-rails 33 for throwing said wings around said former-block, deflecting-rails 39 for throwing said wings away from said former-block, rails 32 for holding said wings extended, and a soldering-iron constructed to operate on the blank when folded on the former-block.

4. A can forming and soldering machine comprising a traveling plate having guide-heads 35 and pivoted wings, a traveling former-block adapted to be thrown upon said plate, a side gage 38, secured to the frame of the machine, guide-rails to throw said wings around the former-block, and a soldering-iron constructed to operate on the blank when folded on the former-block.

5. A can forming and soldering machine comprising a traveling plate having pivoted wings, a traveling former-block adapted to be thrown upon said plate, said former-block consisting of two members pivotally connected with each other, a spring for holding said members together, a pin or abutment on one of said members, adapted to strike the plate when the former-block is thrown thereon and extend said members, guide-rails for throwing said

wings around the former-block, and a soldering-iron constructed to operate on the blank when folded on the former-block.

6. The combination, with the traveling plate and former-block of a can forming and soldering machine, of a soldering-iron located in the path of said former-block and plate, constructed to operate on the blank when folded on the former-block and supported in yielding bearings, a soldering-pot having a pipe or passage whose end is located near the forward end of said former-block, a valve controlling the admission of the soldering material through said pipes or passage, an arm connected with and operating said valve, located in the path of wings upon said plate, guide-rails for throwing said wings around the former-block, and heating devices for said pot and soldering-iron.

In testimony whereof I affix my signature in presence of two witnesses.

LEO KELLER.

Witnesses:

HARRY COBB KENNEDY,
OTTO LUEBKERT.