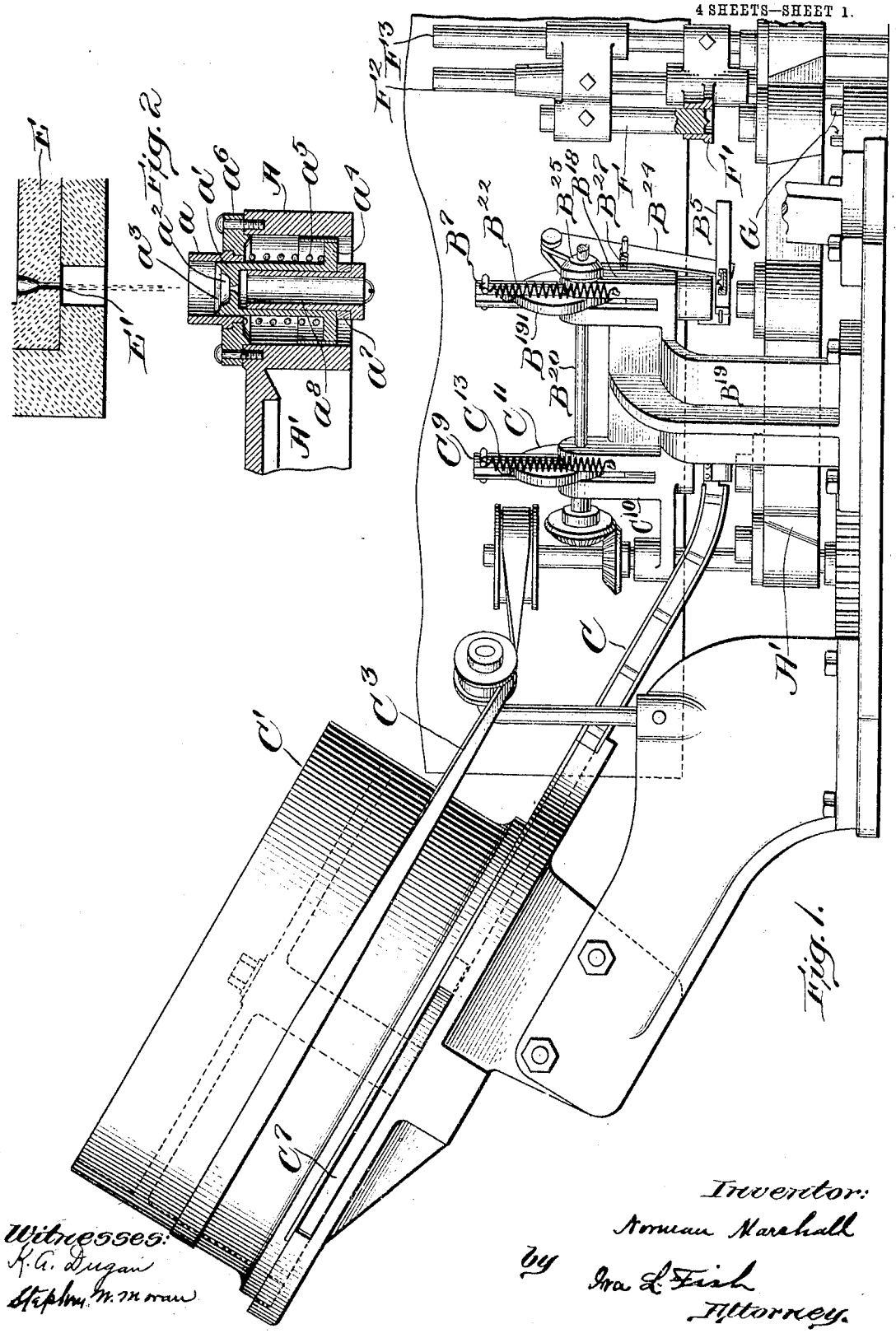
No. 856,972. PATENTED JUNE 11, 1907.

N. MARSHALL.

MACHINE FOR MAKING LAMP BASES.

APPLICATION FILED SEPT. 20, 1905.

4 SHEETS—SHEET 1.



Witnesses:
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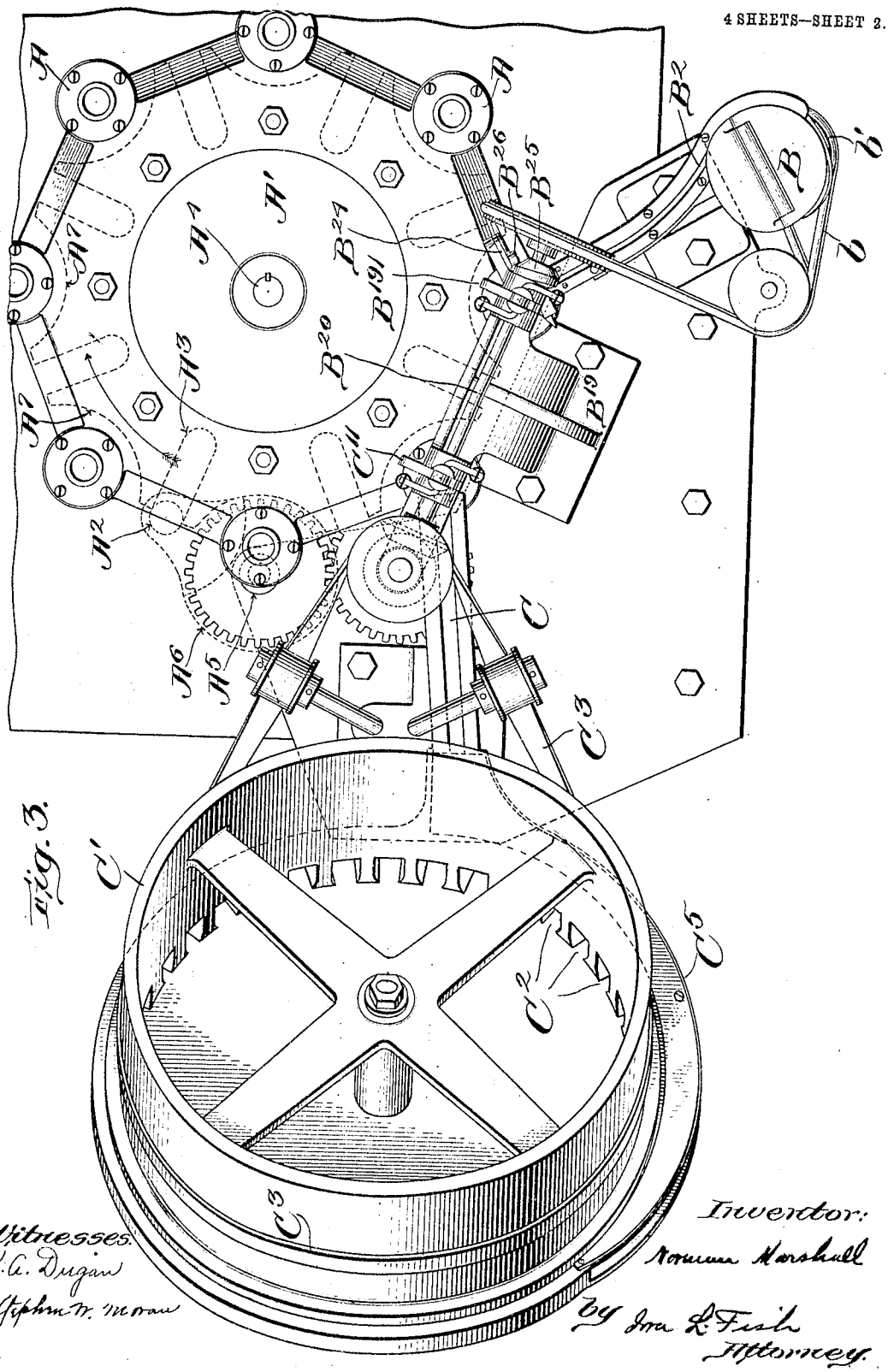


Fig. 3.

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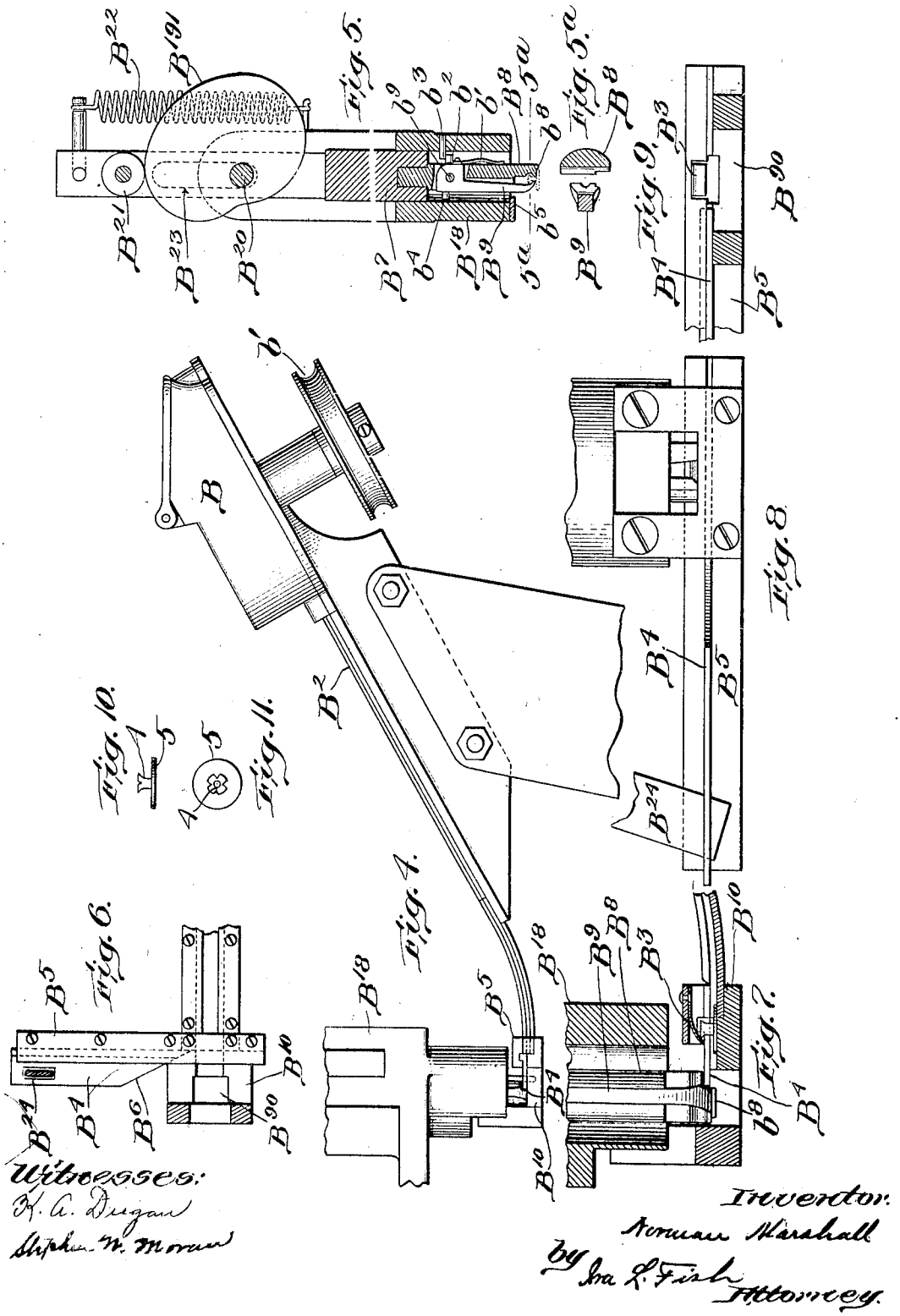
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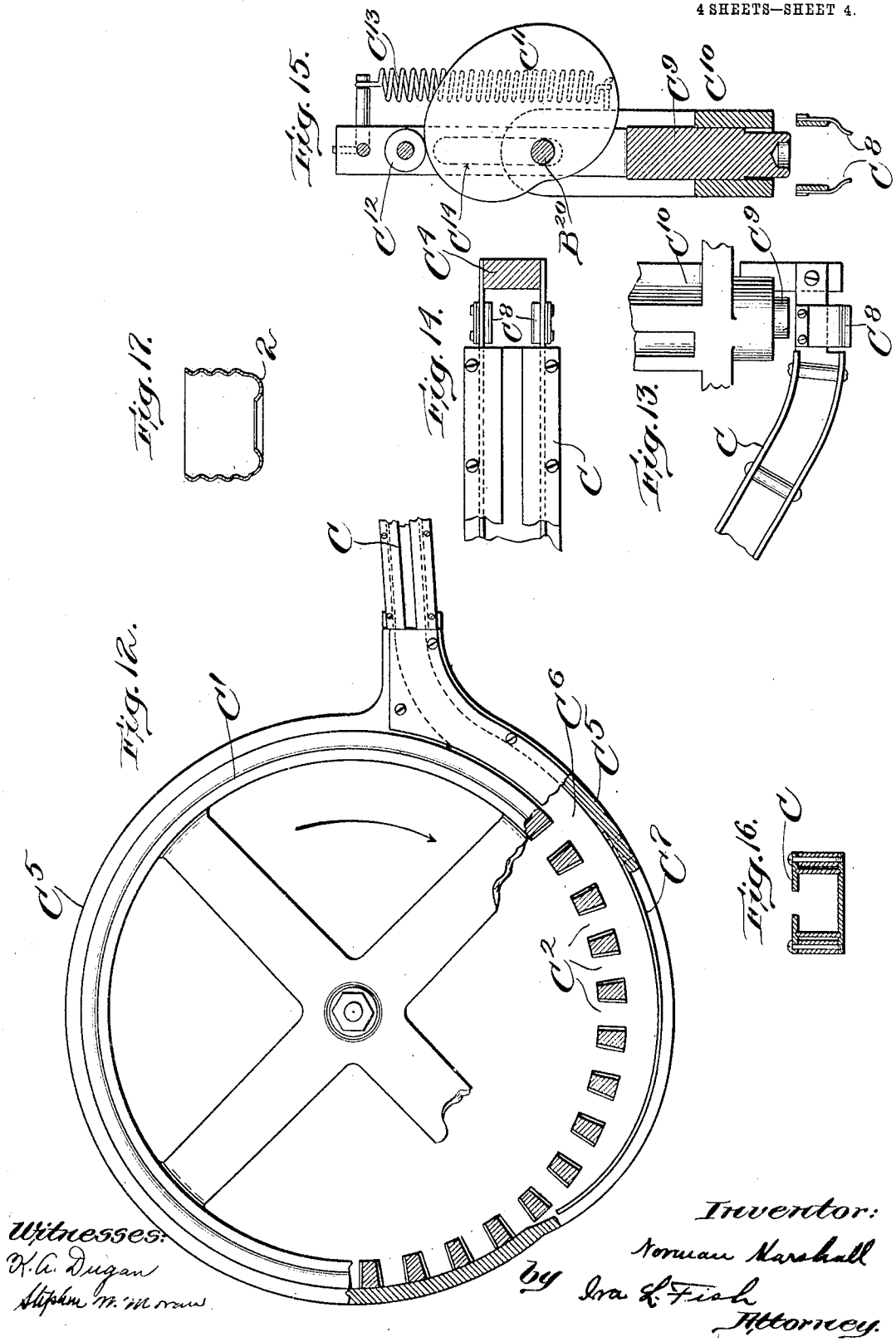
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UNITED STATES PATENT OFFICE.

NORMAN MARSHALL, OF NEWTON, MASSACHUSETTS.

MACHINE FOR MAKING LAMP-BASES.

No. 856,972. Specification of Letters Patent. Patented June 11, 1907.

Application filed September 20, 1905. Serial No. 279,291.

To all whom it may concern.

Be it known that I, NORMAN MARSHALL, a citizen of the United States, and a resident of Newton, Middlesex county, Massachusetts, have invented certain new and useful Improvements in Machines for Making Lamp-Bases, of which the following is a specification.

The invention relates to machines for manufacturing bases for incandescent lamps in which the outer shell and center terminal are united by a web of glass or other fusible insulating material.

In machines of this character as heretofore constructed, an example of which is shown in the patent to Swan No. 774,403 dated November 8, 1904, the metallic shell of the base and the metallic center contact have been introduced into the molds within which the bases are formed, by the operator, the introduction of the molten glass and molding of the glass, and the ejecting of the finished base being automatically performed by the machine.

It is the purpose of the present invention to combine with the other mechanisms involved in the automatic manufacture of the bases, mechanisms for automatically feeding and introducing the metallic shells and center contacts into the molds so that the operations incident to the manufacture of the completed base may be automatically and rapidly performed during the operation of the machine.

In embodying the broader features of my invention in simple and efficient mechanisms, I have employed certain further features of invention relating more especially to the construction and arrangement of the separating and feeding devices for the shells and contacts which are not essential to the broader features of invention but are of importance in contributing to the efficiency and reliability of the machine.

The various features of the invention will be understood from the following detailed description of the mechanisms in which I have embodied them and will be set forth in the claims.

In the accompanying drawings—Figure 1 is an elevation of so much of the machine as is necessary to an understanding of the present invention. Fig. 2 is an enlarged sectional detail showing the construction of mold and the manner of supplying molten glass or other insulating material thereto. Fig. 3 is a plan view showing the mold carrier and operating mechanism therefor and the mechanisms for feeding the shells and contacts, the glass furnace and molding mechanism being omitted for the sake of clearness. Fig. 4 is a detail elevation showing the mechanism for separating and feeding the center terminals. Fig. 5 is a vertical sectional view showing the devices for transferring the center terminal from the end of the feed chute to the mold. Fig. 5^a is an enlarged section on line 5^a—5^a Fig. 5. Fig. 6 is a detail plan view showing the devices at the end of the feed chute. Fig. 7 is an enlarged sectional view of the devices at the end of the feed chute. Fig. 8 is a front elevation of the devices shown in Fig. 7. Fig. 9 is a vertical sectional view transversely of opening 90 Fig. 7. Figs. 10 and 11 are views of the center contact. Fig. 12 is a plan view of the hopper of the shells. Fig. 13 is an enlarged elevation showing the devices at the lower end of the feed chute for the shells. Fig. 14 is a plan view showing the lower end of the feed chute. Fig. 15 is a vertical sectional view showing the devices for transferring the shells from the end of the feed chute to the molds. Fig. 16 is a transverse sectional view through the feed chute for the shells. Fig. 17 is a view showing the metallic shell for the lamp base.

In the machine shown in the drawings a series of molds or receptacles A shaped to receive the outer shell and center contact of the lamp base and to hold them in proper relation to each other, are mounted upon a rotary carrier A′ and by the movement of this carrier each mold is brought into position to receive the center contact, then into position to receive the outer shell, then into position beneath the discharge outlet from the glass furnace, then into position beneath the molding devices, and finally into position where the completed base is removed from the mold.

The rotary carrier A′ may be given the proper intermittent movements to bring the molds successively into position for the various operations, by any suitable operating mechanism, and in the construction shown is given such movements by means of a crank pin A^2 carried by a constantly rotating shaft and arranged to engage radial slots A^3 formed in a disk which is secured to the shaft A^4 upon which the carrier is mounted. The shaft A^5 to which the crank pin A^2 is secured

is also provided with a segmental locking disk A^6 which coöperates with segmental locking surfaces A^7 formed on the slotted disk, the engagement of the segmental disk A^6 and surfaces A^7 acting to lock the mold carrier in position between successive movements.

The molds may be of any suitable construction and are conveniently constructed as shown in Fig. 2. As shown in this figure the mold consists of a cylindrical tube *a* secured to the carrier A′, the tube being of proper size to receive the metallic outer shell of the lamp base and forming the outer walls of the mold. The bottom of the mold is formed by the upper end of a plunger *a′* which is recessed at a^2 to receive the center contact and retain it in proper position and is also recessed at a^3 to receive the lower end of the shell. The plunger *a′* is provided with a flange a^4 and is held in normal position by means of a spring a^5 introduced between the flange a^4 and the fixed plate a^6 which carries the tube *a*. The plunger *a′* is supported against the tension of the spring by engagement with a bar a^7 extending across the opening in the carrier A′ within which the plunger is mounted, and the plunger is guided upon a fixed stud a^8 secured to the carrier A′ and extending up within the plunger. With this construction the plunger *a′* acts to support the parts during the forming of the base and may then be raised against the tension of the spring to eject the finished base from the mold.

The mechanism for feeding the center contacts into position above the molds and for introducing the contacts into the molds, is shown in Figs. 1 and 3–8. The center contacts for the bases, which the machine being described is designed to manufacture, are of the form shown in Figs. 10 and 11, and consists of a thin metal disk 5 having a hollow stem 4. A quantity of these contacts are placed in a hopper B within which is a rotary brush or other agitating device, driven by means of a belt *b* which passes over a pulley *b′* secured to the shaft which carries the agitating device. The wall of the hopper is provided with one or more openings corresponding in shape to the shape of the center contact and as the contacts are agitated within the hopper, certain of them register with the opening or openings in the wall of the hopper and pass through said opening or openings and into a feed chute B^2. These contacts slide down the feed chute B^2 which thus becomes filled with a series of contacts, the contact at the lower end of the series engaging a spring stop B^3. Individual contacts are separated from the series in the feed chute by means of a reciprocating separator in the form of a slide B^4 which is mounted in a transverse guideway B^5 arranged at the lower end of the guideway. The slide B^4 is provided with a bevel front end, the inclined surface B^6 of which forms a cam surface for feeding the contact at the end of the series in the feed chute forward past the yielding stop B^3 and into position above the mold. The slide B^4 is so arranged that the pointed end of the slide as it advances, passes back of the stem 4 of the contact at the end of the feed chute, and during the continued forward movement of the slide, the inclined surface B^6 acts against this stem to force the contact forward. This forward movement of the contact brings the stem 4 between the jaws B^8 B^9 which are mounted upon the lower end of a reciprocating plunger B^7 and form a carrier for transferring the terminals from the feed chute to the receptacles A. The fixed jaw B^8 of the carrier is recessed to receive the flared upper end of the stem and is provided with a lip b^8 which lies at one side of the disk 5. The movable jaw B^9 is pivoted at b^9 and is forced toward the fixed jaw by a spring *b′*. The lower end of the jaw B^9 is extended laterally to underlie the flared end of the stem 4 and may be provided with a recess for engaging the stem.

When the plunger B^7 is in its upper position the carrying jaws are in position at the end of the feed chute B^2 and above an opening B^{90} in the plate B^{10}. At this time the jaw B^9 is held away from jaw B^8 by the engagement of a pin b^2 with a fixed stop b^3 so that the stem of the contact may pass between the jaws. The contact is prevented from dropping through the jaws by the flare at the outer end of the stem.

The feed chute and plate B^{10} are so arranged that the intermittent movement of the carrier A′ brings the receptacles successively into position to register with the opening B^{90} in the plate B^{10}. During the time that the receptacle remains at rest directly beneath the plate B^{10} the plunger B^7 is depressed. As the plunger starts downward the pin b^2 on the movable jaw B^9 moves away from the stop b^3 so that the jaw is forced against the stem of the contact by the spring *b′*. During the continued downward movement of the plunger B^7 the jaws carry the contact downward into the receptacle A. As the plunger approaches its lower position a pin b^4 on the jaw B^9 engages a fixed stop b^5 thus opening the jaws and releasing the terminal which drops into position in the bottom of the receptacle. Upon the return of the plunger B^7 the pin b^2 strikes the stop b^3 opening the jaws ready for the reception of the succeeding terminal.

The plunger B^7 is mounted to reciprocate in a head B^{18} carried by a bracket B^{19} and is bifurcated at its upper end to receive a cam which is secured to a constantly rotating cam shaft B^{20}. The plunger carries a roll B^{21} which is held in engagement with the cam by springs B^{22} and the plunger is slotted at B^{23} for the passage of the shaft B^{20} and to accom-

modate the movements of the plunger under the action of the cam B^{19} and spring B^{22}. The cam is so shaped and the rotation of the shaft B^{20} so timed that the plunger B^7 is depressed and returned during the interval between successive movements of the mold carrier A'.

The slide B^4 is reciprocated in proper time to separate individual contacts and feed them to the carrying jaws by means of a lever B^{24} pivoted to the bracket B^{19} and having its lower end arranged to engage an opening in the slide B^4. This lever is operated by a cam B^{25} secured to the cam shaft B^{20} and engaging a roll B^{26} carried by the lever, the roll being held in engagement with the cam by a spring B^{27}.

The molds are carried by the carrier A' from the position where they receive the center contacts, to position beneath the lower end of a second feed chute C from which the metallic shells are transferred to the molds. The feed chute C is constructed and arranged to guide and support the metallic shells which, in the form of base for which the machine being described is designed to manufacture, are of the shape shown in Fig. 17. These shells consist of thin sheet brass drawn up into cylindrical shape and corrugated to form a screw-threaded cylindrical portion and are provided with a curved inwardly projecting flange 2 at their lower ends.

The shells are supplied to the feed chute C from an inclined hopper C' arranged at the upper end of the inclined chute and provided around the lower edge of its periphery with a series of openings C^2 so shaped that the shells may pass through the openings, provided they register therewith in proper relation, that is to say with the curved lower end of the shell resting against the bottom of the hopper. The bottom of the hopper is stationary, while the cylindrical part of the hopper within which the recesses C^2 are formed is constantly rotated by means of a belt C^3 passing about the outer periphery of the hopper. As the hopper revolves the shells within the hopper are agitated and carried up to a greater or less extent by frictional engagement with the walls of the hopper and certain of the shells will properly register with the openings C^2 and pass through said openings as the hopper revolves. These shells will pass into the upper end of the feed chute and slide down said chute, forming a series of shells extending to the lower end of the chute, the end shell of the series resting against a fixed stop C^4 at the end of the chute.

The lower edge of the hopper is surrounded by an upwardly projecting flange C^5 which extends about the greater portion of the hopper and prevents the escape of the shells through the openings C^2. At that portion of the hopper which is adjacent to the upper end of the feed chute and which is traveling upward from the lower edge of the hopper, the flange C^5 is arranged at a distance from the periphery of the hopper sufficient to allow the passage of the shells through the openings C^2 as indicated in Fig. 12. As the openings C^2 in the lower edge of the hopper pass opposite this part of the flange C^5, any shells which may have entered the openings slide downward through the openings into the guideway C^6 formed between the flange C^5 and the outer periphery of the hopper, and slide down this guideway into the upper end of the feed chute C. In order to avoid injury to the shells in case they are carried up between the flange C^5 and the traveling periphery of the hopper, or in case they pass but partially through the opening C^2, the upper part of the flange C^5, which extends inward toward the periphery of the hopper at the upper end of the guideway C^6, is made yielding. In the form shown this portion C^7 of the flange C^5 is formed of spring metal which curves inward from the rigid part of the flange C^5 which forms the outer wall of the guideway C^6 and forms a yielding cam surface for forcing the shells which have passed but partially through the openings C^2 back into the openings as they pass upward toward the upper part of the hopper.

The feed chute C is so arranged that the shell which is in position against the fixed stop C^4 is directly above one of the molds A during the interval between the successive movements of the mold. When in this position the shell is supported by two spring fingers C^8 and is directly beneath a vertically reciprocating plunger C^9 the downward movement of which carries the shell from the end of the feed chute down into the mold, the spring fingers C^8 yielding to accommodate the downward movement of the shell and assisting in maintaining the shell in proper alinement with the mold. The lower end of the plunger C^9 is shaped to enter the shell and is also recessed to embrace the stem 4 of the center contact as the plunger completes its downward movement. The plunger is mounted in the head C^{10} carried by the bracket B^{19} and its upper end is bifurcated to receive a cam C^{11} secured to the shaft B^{20}. The plunger carries the roll C^{12} which is held in engagement with the cam by means of spring C^{13} and the plunger is slotted at C^{14} for the passage of the cam shaft. The plunger C^9 is operated in unison with the plunger B^7 and is advanced and retracted during the interval between successive movements of the mold carrier.

After the center contact and shell have been automatically introduced and positioned in the mold as above described, the mold is brought by the continued advance

movements of the mold carrier, into position below the discharge orifice E of the glass furnace E′ as indicated in Fig. 2, and the movements of the mold carrier are so timed with relation to the discharge of glass from the furnace that the proper amount of glass is delivered to the mold during the time that it remains beneath the discharge orifice. After the glass has thus been supplied to the mold, the mold is brought by the movement of the mold carrier, into position below the molding plunger F and stripping plate F′. The molding plunger and stripping plate are carried upon two reciprocating rods F^2 F^3 which are operated at proper intervals by suitable mechanism not shown.

After the molding has been performed and the stripping plate and molding plunger returned to normal position, the mold is advanced and is brought by the movement of the mold carrier into position above the ejector pins G, indicated in Fig. 1. These pins are reciprocated at proper intervals by mechanism not shown and as they rise they pass up on opposite sides of the bar a^7 and act against the flange a^4 to force the plunger a' of the mold upward against the tension of the spring a^5, thus forcing the completed base up out of the mold where it may be knocked off of the upper end of the plunger by an air blast or in any suitable manner.

By the combination of mechanism described the various operations involved in assembling the metallic parts of the base and uniting them by a web of molded insulating material, may be automatically and rapidly performed without manual manipulation or assembling of parts by the operator, and thus the rapidity of operation is increased and the cost of production reduced materially.

While I have shown and described a machine in which both the shells and the center contacts are automatically separated and introduced into the molds, it will be understood that mechanisms for introducing either of these parts into the molds automatically may be combined with advantage with the mechanisms for supplying the insulating material and the molding mechanism, the other part being introduced into the molds in the same manner as heretofore.

Without attempting to set forth in detail the various modifications and changes which may be made in the mechanisms without departing from my invention, what I claim and desire to secure by Letters Patent is:—

1. A machine for making lamp bases having in combination a receptacle for the base parts, a feed chute for center contacts having its delivery end arranged to register with the receptacles, means for separating and delivering center contacts to said feed chute, mechanism for separating individual contacts from the series in the feed chute and transferring them to the receptacle, means for feeding an insulating compound to unite the parts, and mechanism for shaping the compound.

2. A machine for making lamp bases having in combination a receptacle for the base parts, a feed chute for center contacts having its delivery end arranged to register with the receptacle, a hopper for supplying contacts to the feed chute, a stop for engaging the end contact in the feed chute, a separating device for feeding the end contact past the stop, a reciprocating plunger for carrying the contact into the receptacle, means for feeding an insulating compound to unite the parts, and mechanism for shaping the compound.

3. A machine for making lamp bases having in combination a receptacle for the base parts, a feed chute for the center contacts having its delivery end arranged to register with the receptacle, means for supplying contacts to the feed chute, a stop at the end of the feed chute, a carrier in advance of the stop, a separator for feeding the end contact in the chute past the stop and to the carrier, means for operating the carrier to carry the contact into the receptacle, means for feeding an insulating compound to unite the parts, and mechanism for shaping the compound.

4. A machine for making lamp bases having in combination a receptacle for the base parts, a feed chute for center contacts having its delivery end arranged to register with the receptacle, carrying jaws, mechanism for reciprocating the carrying jaws between the feed chute and the receptacle, and means for opening and closing the jaws.

5. A machine for making lamp bases having in combination a receptacle for the base parts, a feed chute for the center contacts having its delivery end arranged to register with the receptacle, a yielding stop at the delivery end of the feed chute, a reciprocating slide provided with an inclined cam surface arranged to pass behind the stem of the contact and force the contact past the yielding stop, a carrier for receiving the contact, means for operating the carrier to deliver the contact to the receptacle, means for feeding an insulating compound to the receptacle, and mechanism for shaping the compound.

6. A machine for making lamp bases having in combination a series of receptacles for the base parts, a feed chute for the center contacts, mechanism for separating individual contacts from the series in the feed chute and transferring them to a receptacle, a feed chute for the shells, mechanism for transferring individual shells from the chute to the receptacle, means for supplying insulating compound to a receptacle, mechanism for shaping the compound, and means for bringing the receptacles successively into register with the ends of the contact and shell chutes,

with the means for supplying insulating material and with the shaping mechanism.

7. A machine for making lamp bases having in combination a receptacle for the base parts, a feed chute for the center contacts, a carrier at the end of the feed chute, devices for transferring individual contacts from the chute to the carrier, a feed chute for the shells, a carrier at the end of the chute, means for supplying an insulating material, mechanism for shaping the material, mechanism for bringing the receptacle successively into register with the carriers, with the supplying means, and with shaping mechanism.

In witness whereof, I have hereunto set my hand, this 9th day of September 1905.

NORMAN MARSHALL.

In the presence of—

IRA L. FISH,

KATHARINE A. DUGAN.