

1,004,049.

C. DE LUKACSEVICS.
 ROTARY BRIQUET MACHINERY.
 APPLICATION FILED OCT. 25, 1905.

Patented Sept. 26, 1911.

6 SHEETS—SHEET 1.

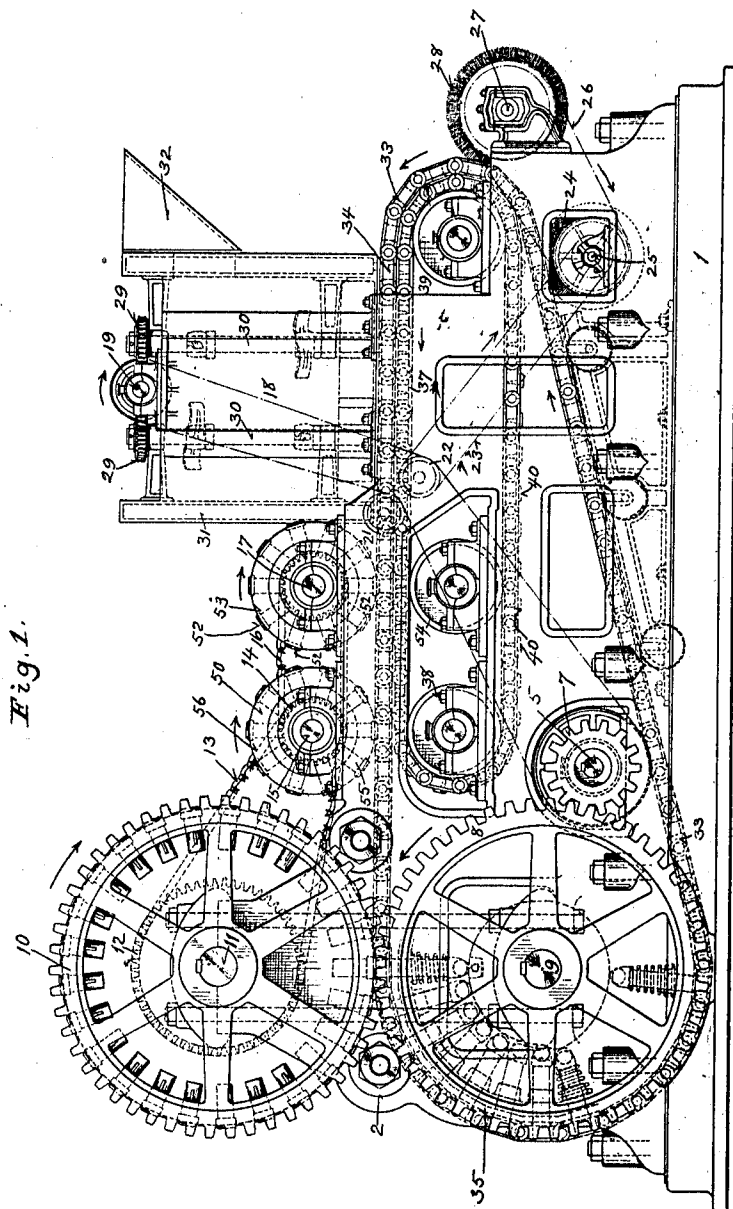


Fig. 1.

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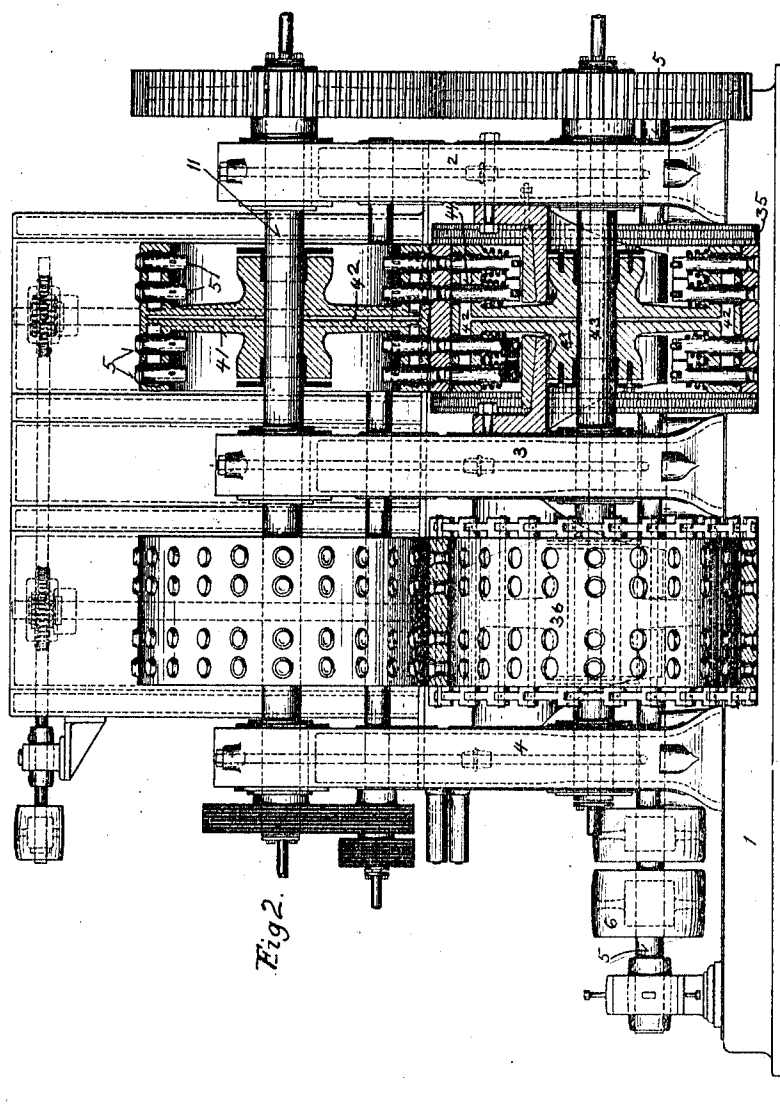
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6 SHEETS—SHEET 2.



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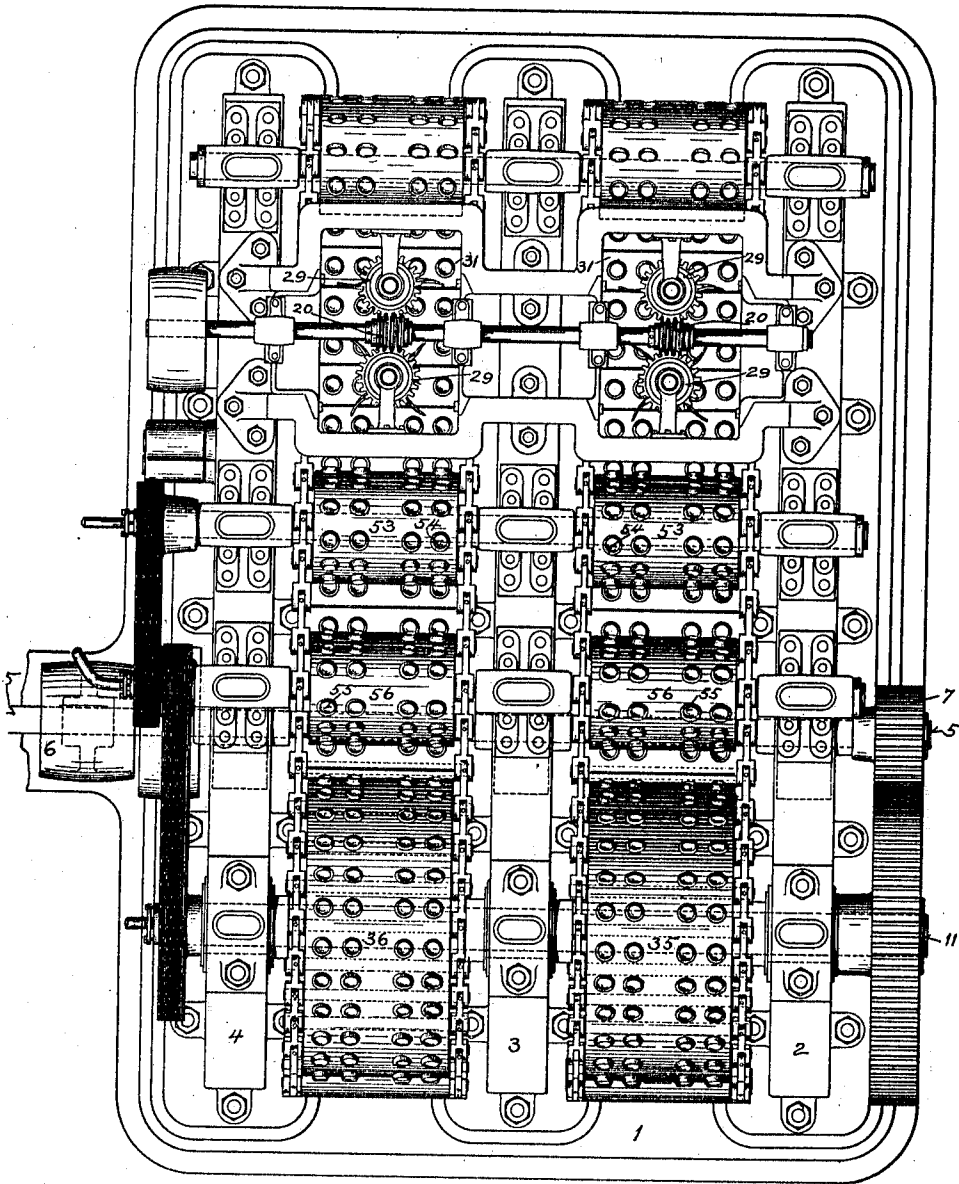
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5 SHEETS—SHEET 3.

Fig. 3.



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5 SHEETS-SHEET 4.

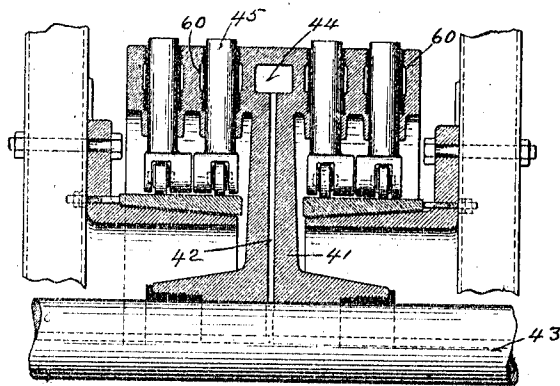


Fig. 4.

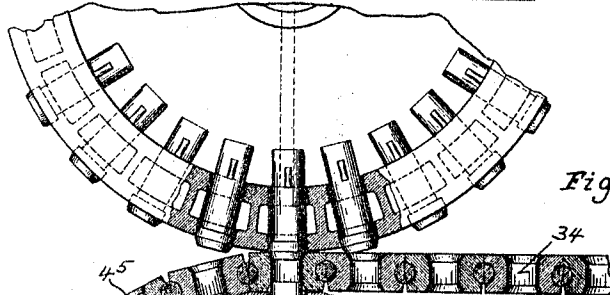
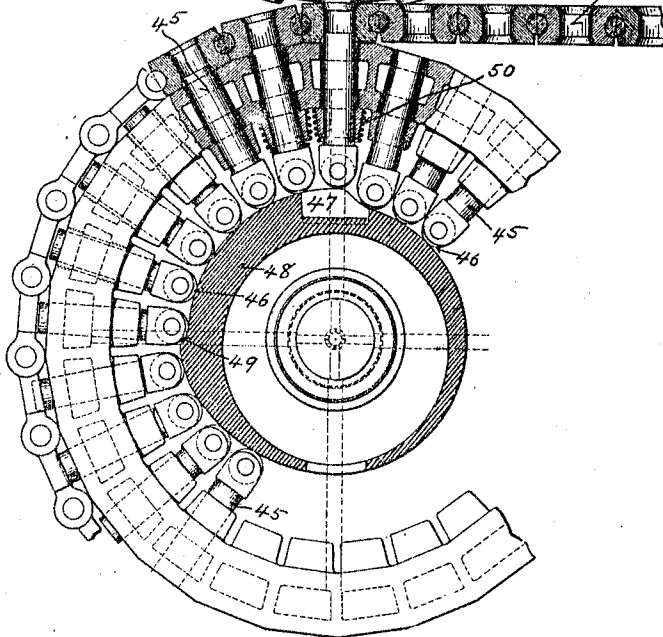


Fig. 5.



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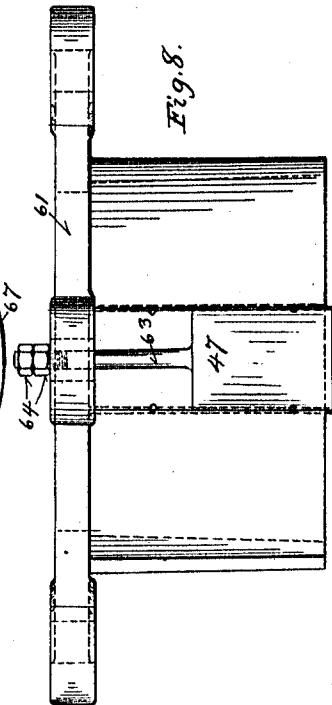
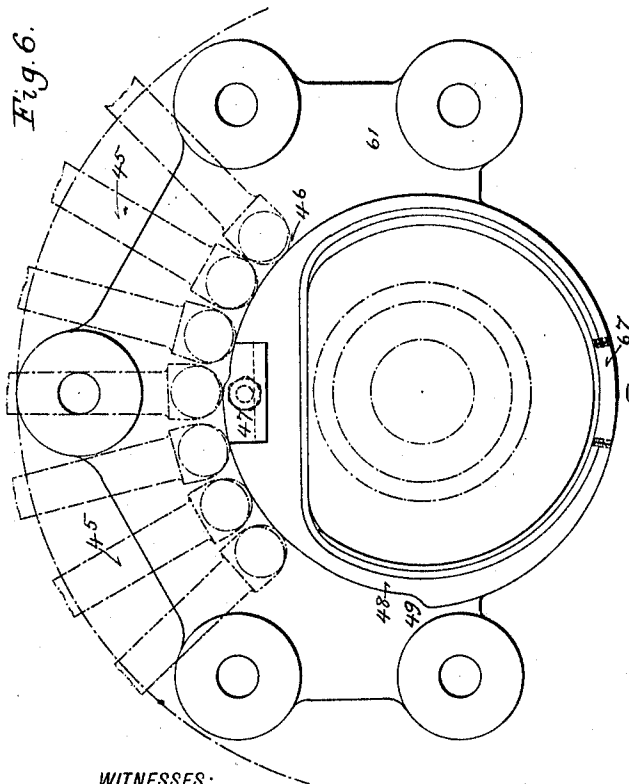
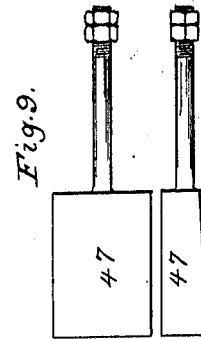
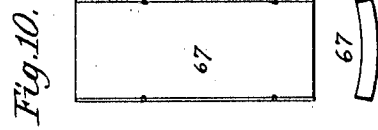
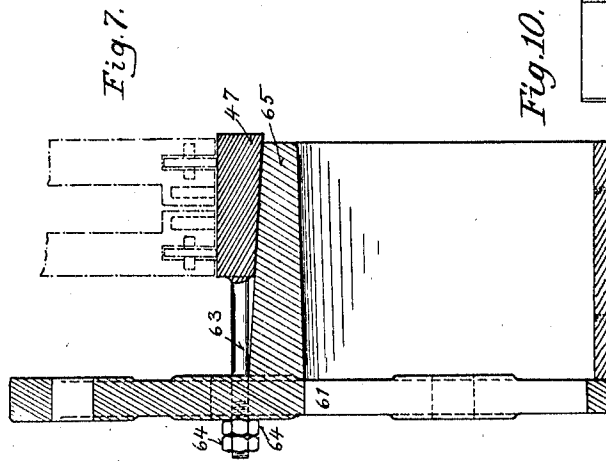
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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

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ROTARY BRIQUET MACHINERY.

1,004,049.

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Application filed October 25, 1905. Serial No. 284,302.

To all whom it may concern:

Be it known that I, CHARLES DE LUKACSEVICS, a citizen of the United States, and resident of New York, county of New York, State of New York, have invented certain new and useful Improvements in Rotary Briquet Machinery, of which the following is a specification.

The present invention relates to improvements in rotary briquet making machinery and is designed to provide a practical machine of this character in which the parts are duly combined in an operative mechanism and the moving elements are driven from a single source of power.

My invention will be understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a machine embodying my improvements; Fig. 2 is an end elevation thereof; Fig. 3 is a plan; Figs. 4 and 5 are enlarged views of different parts of the mechanism; and Figs. 6, 7, 8, 9 and 10 are detail views.

In the drawings, 1 is the base of the machine, and 2, 3 and 4 are upright plates or standards forming part of the frame of the machine.

The driving shaft is shown at 5, having a driving pulley, 6, mounted thereon. Near the end of the shaft 5, opposite the driving pulley, 6 is a pinion, 7, which engages with a gear-wheel, 8, keyed to a shaft, 9. The gear-wheel 8 engages with a corresponding gear-wheel, 10, keyed to a shaft 11, mounted in the uprights 2, 3 and 4. Near the opposite end of the shaft 11 is a sprocket wheel, 12, which is connected by a chain, 13, with a pinion, 14, on a shaft 15. The shaft 15 itself is connected by suitable pinions and a sprocket chain, 16, with a shaft, 17, mounted in the frame of the machine. Accordingly, when the driving shaft 5 rotates, motion is communicated to the several shafts, 9, 11, 15 and 17, causing a rotation thereof in the directions indicated by the several arrows. Moreover, the shaft 5 is connected by a suitable pulley on said shaft and a belt, 18, with a pulley on a shaft, 19, carrying worm gears, 20, 20. In passing between the pulleys, the belt 18 bears upon guide rollers, 21, 22, and communicates motion to the last named pulley whereby through a belt, 23, motion is also communicated to a rotary brush, 24, as shown. The

brush 24 is mounted on a shaft, 25, which is suitably connected by a belt, 26, with a shaft, 27, carrying a second brush or cleaner, 28. Besides giving motion to the shafts 9, 11, 15 and 17, as described above, the driving of the shaft 5 also gives motion to the shaft 19, the roller 22 and the brushes 24 and 28. That is to say, from a single driving shaft motion is given to all the parts mentioned.

Now the rotation of the shaft 19 in the direction of the arrow operates the worm screws 20, 20 and through them operates worm gears, 29, 29, 29, 29. These gears are connected with shafts, 30, 30, inside the hoppers, 31, 31, and through them operate the wipers by means of which the material entering the hopper through a spout, 32, is distributed to the dies, 34, in sprocket chains, 33, 33, about to be described. The said sprocket chains are mounted at one end upon sprocket wheels attached to the ends of drums, 35, 36, on the shaft 9, and at the other end they surround an internal sprocket chain, 37, mounted on the idlers, 38, 39. The chain 37 is provided with lugs or projections, 40, 40, which engage with the dies 34 in the chain 33 and cause the chain 37 to be moved along with the chain 33 in the direction of the arrows, the last named chain receiving its motion from the shaft 9 as already indicated.

It will be understood that the function of the chain 37 is to provide means whereby the material sifted or wiped into the dies in the chain 33 shall be prevented from dropping through until the first pressure has been exerted upon the material in order to compact it into a more or less hard cake or briquet.

The drums 35 and 36 partake of the rotary movement of the shaft 9 by reason of the fact that they are connected with spiders, 41, 41, on the said shaft, as clearly shown in Figs. 2 and 4. The arms of each spider 41 are provided with perforations, 42, 42, through which steam entering the shaft 9 by way of a perforation, 43, passes to an annular chamber, 44, whereby the formers, 45, which cooperate with the dies 34 are heated before doing their work. The drums 35 and 36 are hollow and in the interior thereof are cam devices fixed to the uprights 2, 3 and 4, outside of which cam devices the drums and the formers carried thereby are adapted to rotate. Each former 45 is provided with a roller, 46, at its inner

end, while at its outer end the former is shaped to enter a die 34 in the sprocket chain 33. By referring to Fig. 5 it will be seen that when the drum rotates, carrying the formers 45 with it, the said formers come successively into operative connection first with a cam, 47, on the cam device, 48, and then with a cam, 49, on the same device.

Each former is further provided with a spiral spring, 50, for automatically pressing the former into contact with the cam device whatever the position of the latter may be. In other words, the operation of the eccentric portions of the cam device is to cause an outward movement of each former against the force of a spring, which spring restores the former to its innermost position whenever the cam passes far enough to permit this to be done. The shaft 11 is similarly provided with spiders having hollow arms connected with chambers for heating the formers in the drums carried by the spiders. As shown in the drawings, however, the formers, indicated at 51, 51, in this instance, are either rigidly fixed in the drums or they may be actuated by springs in such a manner as to project slightly beyond the face of the drum, as indicated. If preferred, however, the shaft 11 may be provided with cam mechanism similar to that surrounding the shaft 9, although this in general is not found to be necessary.

It will be noted that the formers 51 project, as stated, slightly beyond the surface of the drums in which they are mounted, while the outer ends of the formers 45 normally stand flush with the surface of the drum and are projected outward by the action of the cam device. These are matters of detail which can be varied without departing from the principle of the invention. In any case, however, the formers are so related to the sprocket chain 33 and the dies 34 therein as to come into opposing relation to each other at the appropriate time for compressing the material within a certain set of the dies lying in the same horizontal plane.

The operation of the machine may now be described. Assuming that sufficient material has been poured into the hoppers 31 through the spouts 32 and that the driving shaft has been put into operation, the first effective action will be that of mixing and wiping the material in the hoppers and distributing it to the dies in the sprocket chain 33 which lie under the mouths of the hoppers. The chains being carried along in the direction of the arrow through the action of the driving shaft and the intermediate gearing, the dies filled with material to be compressed are fed forward, the material being prevented from falling out of the dies by the presence of the chain 37 and the projections, 40, thereon which enter and practically fill

the bottom of the dies. The first compression takes place when the first die having compressible material in it is brought into line with one of the formers, 52, 52, in a drum, 53, on the shaft 17. At this moment the compression takes place between the said former 52 and one of the lugs or projections 40 which at this time lies upon the surface of an idler wheel or drum, 54, as shown. The material in succeeding dies is similarly compressed until the chain is moved forward far enough so that one of the formers, 55, in a drum, 56, on the shaft 15 is brought into contact with the first cake or briquet of material which has been subjected to the action of the former 52. At this time the idler 38 supports the chain 37 and the briquet is still further hardened prior to the final operation of compression which takes place when the same cake or briquet comes into line with one of the formers 45 and one of the formers 51, already described. Here the action of the cam or eccentric 47 gives the final degree of compression and prepares the briquet for use. By still further feeding of the sprocket chain, the several briquets, formed as described, are thrown out by the action of the cam 49 upon the inner ends of the formers, after which the briquets can be collected in any suitable receptacle under the outer edge of the drums 35 and 36.

The construction of one of the spiders 41 is shown in an enlarged view in Fig. 4, the construction of the other spiders being identical to that shown in this figure. Here the perforation 42 is indicated as being connected with the perforation 43 in the shaft 9 and at its opposite end with the annular chamber 44 which is connected with by-passes (not shown) with chambers, 60, 60, surrounding the formers or plungers, 45. It is not thought necessary to show the source of steam or other heating fluid which may be utilized for heating the formers through the system of ducts described.

Fig. 6 is an enlarged view of the cam device 48 supported on a frame, 61, which is provided with means of attachment to the uprights or standards 2 and 3, or 3 and 4, as the case may be. One feature of the cam device is that of having an adjustable cam as shown at 47, the means of adjustment being a stem, 63, and one or more nuts, 64, the stem being screw-threaded and passing through the frame 61 and being adjustable lengthwise by means of the nut or nuts 64. By referring to Fig. 7 it will be seen that the part 47 is wedge shaped and rests upon an inclined plate, 65. When the part 47 is moved longitudinally in either direction it changes the effective height of the cam surface and, therefore, causes a greater or smaller effect upon the formers 45, 45, according to the requirements of the service.

On the same cam piece 48 is a second cam, 49, which, as already described has the effect of ejecting the finished products when the inner ends of the formers 43, 45, strike the cam and are urged over it in the rotation of the drum outside the cam.

One of the practical problems connected with the economical construction of the apparatus herein described is that of putting the formers into place without difficulty. To provide for this I mount a slide, 67, in the cam device 48, and preferably at the bottom thereof where the tension upon the formers is least, this slide being removable for the purpose indicated.

When the slide is removed a former may be pushed by hand into the opening thus left and may then be thrust outward until the roller 46 at the inner end of the former is brought to the exterior of the cam device, whereupon the drum may be slightly rotated so as to bring the inner end of the former against the outer surface of the cam device. It will be understood that this operation is so accomplished as to bring the outer end of each former opposite its appropriate opening in the drum. When the last formers have been put into position in this way, the slide 67 may be restored to place and its outer surface, which in Fig. 10 is shown to be curved, will then simply form a part of the surface of the cam device and will allow the inner ends of the formers to pass without obstruction.

It should be understood that the brush 24 is particularly adapted to cleaning out the dies while the brush 28 is intended more particularly to clean out the dust or other foreign matter from the joints of the sprocket chain 33.

I claim as my invention:

1. In a machine of the character described, a carrier in the form of a sprocket chain,

dies mounted in said carrier, means for charging the dies, formers adapted to cooperate with the dies to shape the charge, a second sprocket chain arranged along the opposite side of the carrier from the formers, means for causing the second sprocket chain to travel with the first one, such means consisting of lugs or projections on the second chain, extending into the dies of the first chain, whereby the material when first inserted in the dies is prevented from falling through.

2. In a machine of the character described, a carrier in the form of a sprocket chain, dies mounted in said carrier, means for charging the dies, formers adapted to cooperate with the dies to shape the charge, a second sprocket chain arranged on the opposite side of the carrier from the formers, means for causing the second sprocket chain to travel with the first one, such means consisting of lugs or projections on the second chain, extending into the dies of the first chain, in combination with one or more supports under the second sprocket chain for supporting the pressure induced by the formers.

3. In a machine of the character described, a revolving drum, formers mounted thereon, and a cam piece on which the inner ends of the formers rest, the said cam piece being provided with an opening through which the formers may be inserted and also being provided with a removable slide for closing the said opening.

Signed at New York, in the county of New York, and State of New York, this 23rd day of October, A. D. 1905.

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