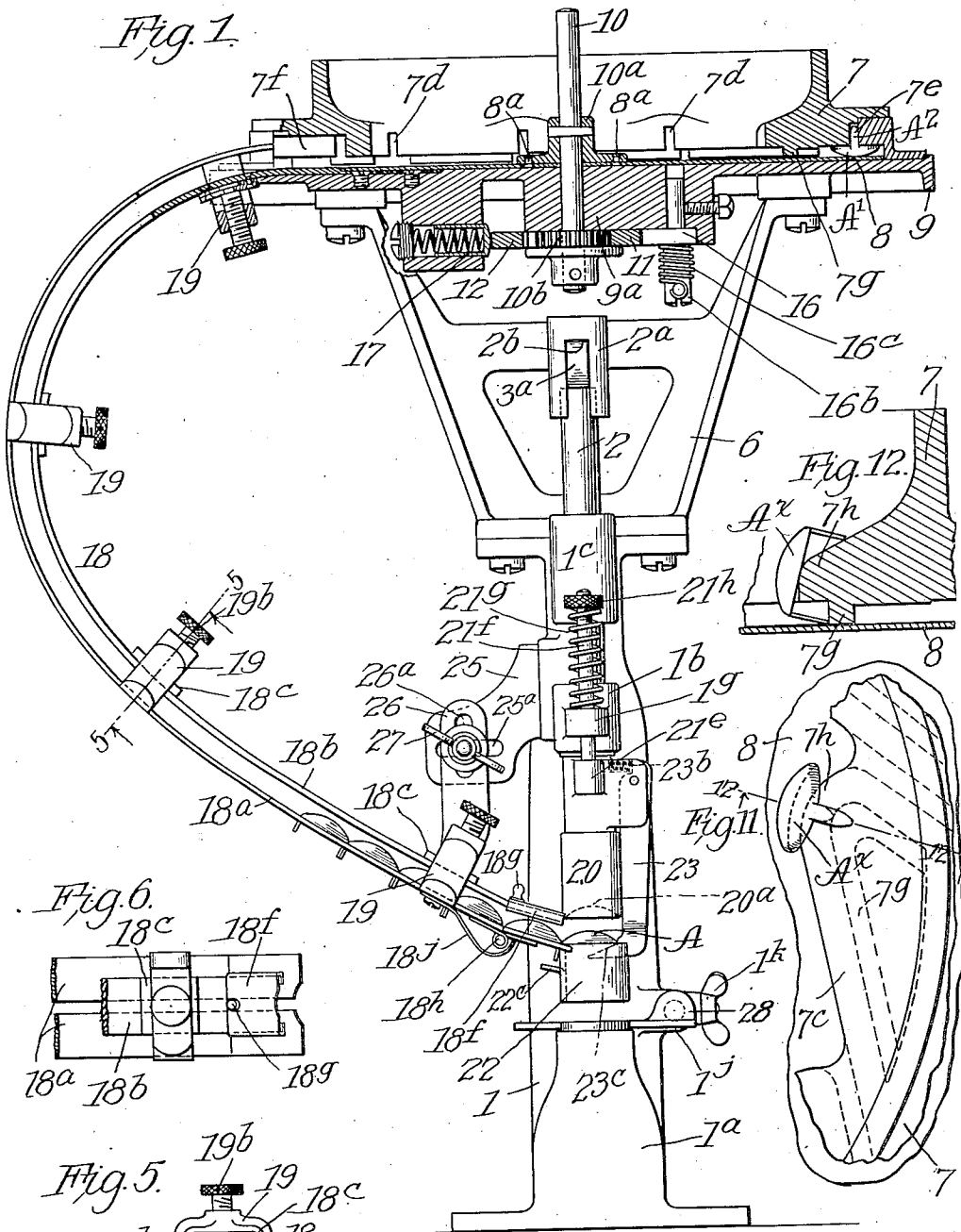


D. C. SASSEMAN.
SPOT SETTING MACHINE.
APPLICATION FILED JUNE 9, 1911.

Patented Oct. 22, 1912.

3 SHEETS—SHEET 1.

1,041,884.

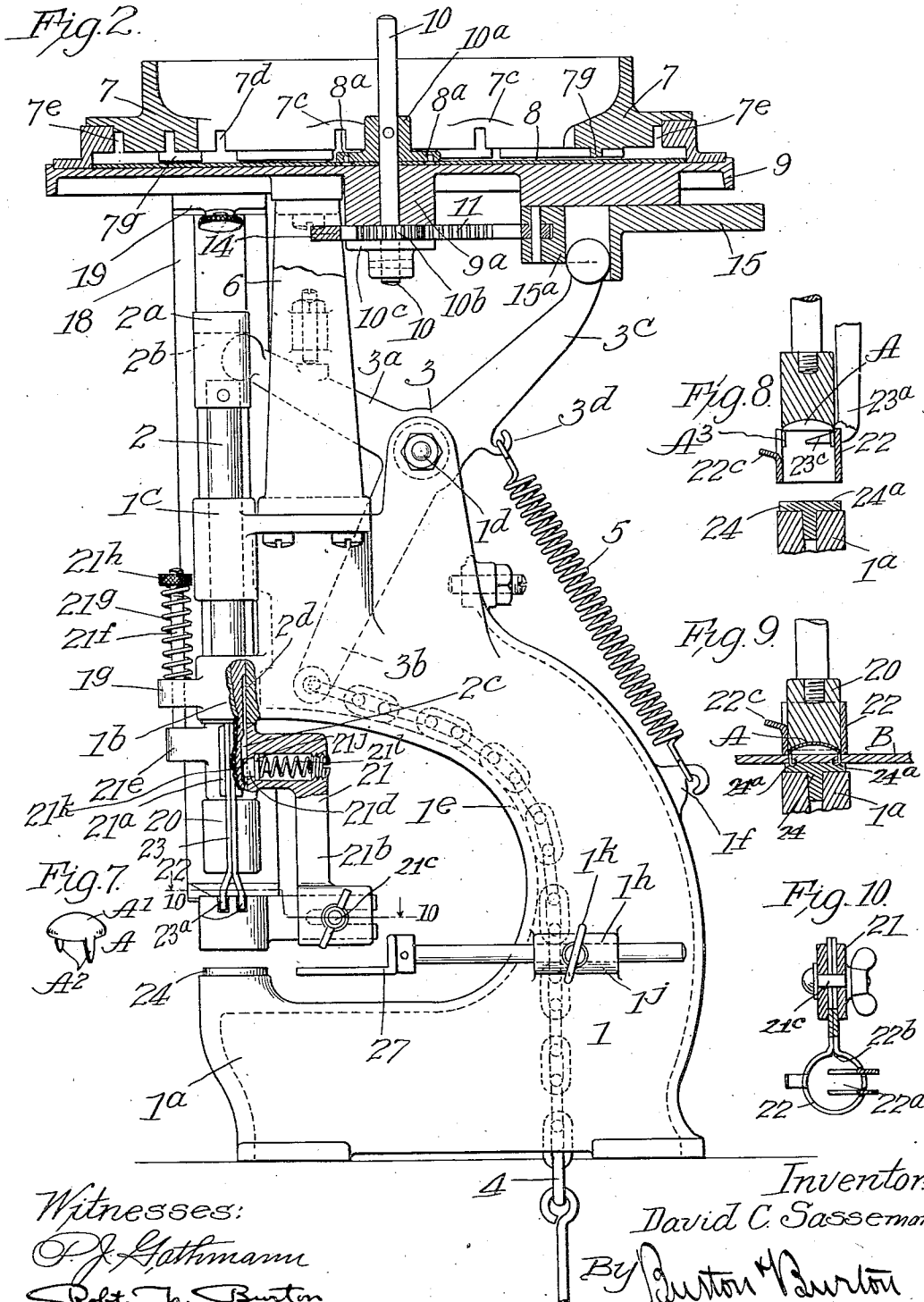


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Fig. 3.

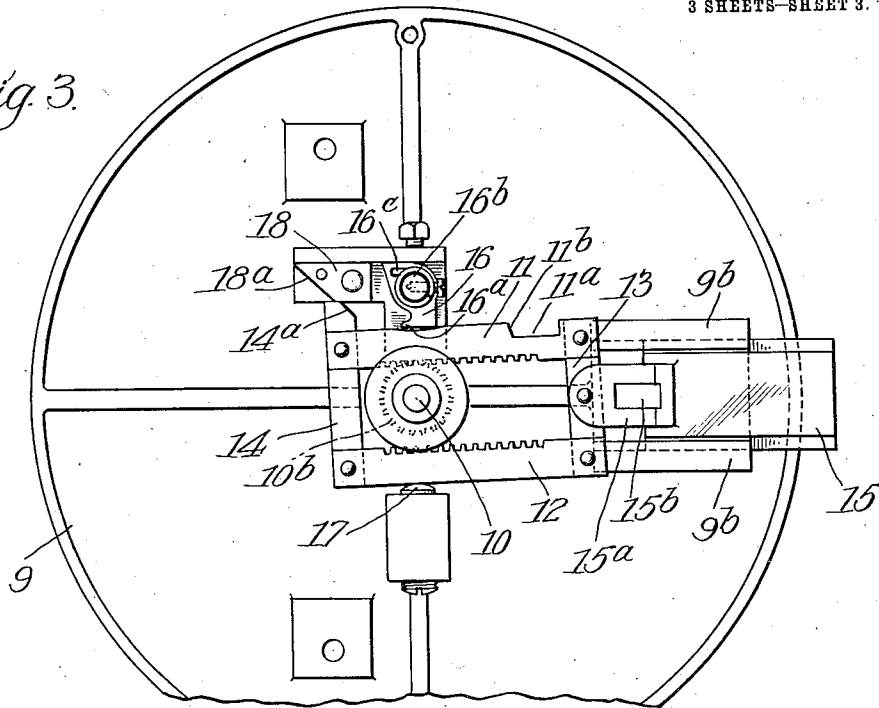
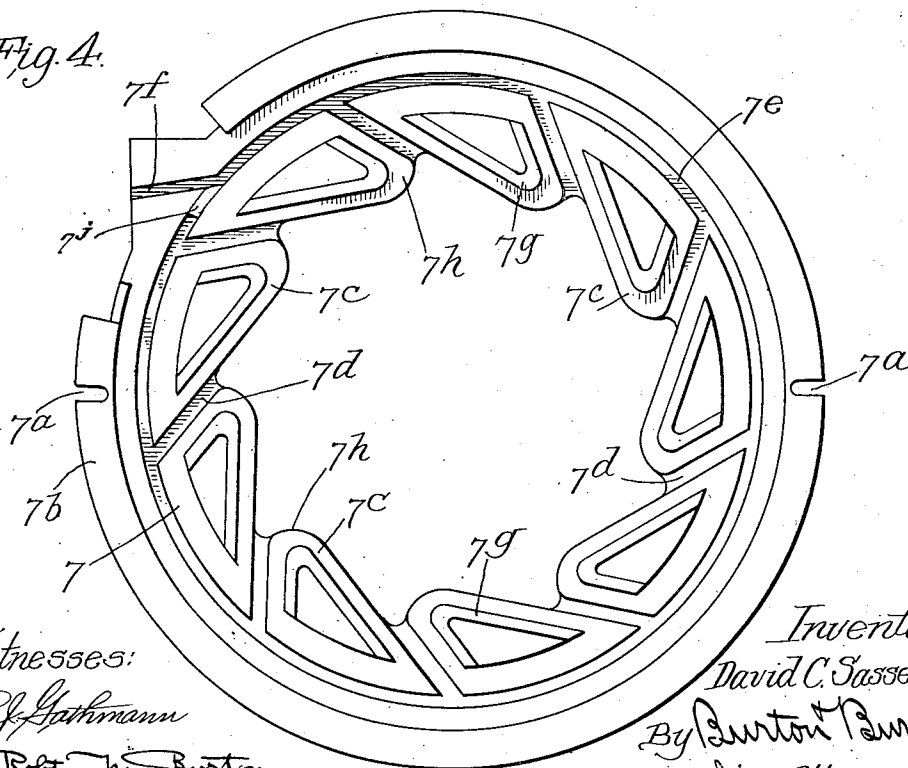


Fig. 4.



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UNITED STATES PATENT OFFICE.

DAVID C. SASSEMAN, OF RIVER FOREST, ILLINOIS, ASSIGNOR TO F. H. SMITH MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

SPOT-SETTING MACHINE.

1,041,884.

Specification of Letters Patent.

Patented Oct. 22, 1912.

Application filed June 9, 1911. Serial No. 832,256.

To all whom it may concern:

Be it known that I, DAVID C. SASSEMAN, a citizen of the United States, residing at River Forest, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Spot-Setting Machines, of which the following is a specification, reference being had to the drawings forming a part thereof.

The purpose of this invention is to provide a machine for attaching to harness leathers and the like, the particular form of rivets known as "spots", which are intended principally to serve the purpose of ornamentation.

It consists of the features of construction shown and described as indicated in the claims.

In the drawings:—Figure 1 is a front elevation of a machine embodying this invention, certain portions being shown in section. Fig. 2 is a side elevation of the same with certain parts shown in section. Fig. 3 is a bottom plan view of the hopper-actuating mechanism. Fig. 4 is a bottom plan view of the hopper body showing the guide grooves cut therein. Fig. 5 is a detail section of the race-way, taken as indicated at line 5—5 on Fig. 1. Fig. 6 is a detail plan view of the terminal portion of the race-way. Fig. 7 is a perspective view of a "spot" of the type intended to be used in this machine. Fig. 8 is a sectional detail showing the "spot" located in the holder, ready for driving. Fig. 9 is a sectional detail showing the "spot" driven home, with its tangs clenched in the leather. Fig. 10 is a detail section taken as indicated at line 10—10 on Fig. 2. Fig. 11 is a detail plan view of a portion of the hopper indicating the function of the guard-flange, 7^g. Fig. 12 is a section taken as indicated at line 12—12 of Fig. 11.

As illustrated in Figs. 7 and 8, the spot, A, which this machine is designed to attach to harness leathers or other fabrics upon which it is desired, is of the nature of a rivet comprising a head, A¹, and a pair of tangs, A², projecting from the head at the opposite ends respectively of a diameter thereof. As usually constructed, the head is cupped out, round and polished, while the tangs are well adapted to be readily bent and clenched in the leather, as indicated in Fig. 9.

It is desirable that the machine by which the spots are to be attached shall be capable not only of attaching and securing them upon the leather, but shall also be adapted for handling them and delivering them from a hopper or other receptacle to which they may be supplied in bulk, and finally for properly positioning them preparatory to the attaching operation. To accomplish these various functions, the machine embodying this invention comprises briefly an anvil and a driver coöperating therewith for attaching the spots, a hopper having an automatically rotated bottom which tends to eject the spots from the hopper through the operation of centrifugal force, and a chute or race-way connecting the exit opening of the hopper with a holder positioned between the driver and the anvil, so that the spots upon leaving the hopper are fed to the holder by which they are retained until attached by the driver to the leather and clenched thereto against the anvil.

Referring to Figs. 1 and 2, it may be noted that the main frame, 1, is C-shaped in outline, carrying at the end of its lower arm the anvil bed, 1^a, and at the end of its upper arm a pair of axially alined slide bearings, 1^b and 1^c, for the driver plunger, 2. This plunger projects from the upper bearing, 1^c, and is fitted with a slotted cap, 2^a, in whose slot, 2^b, there rests the rounded end of the arm, 3^a, of the actuating lever, 3, journaled at 1^a, upon the main frame, 1. Approximately at a right angle to the arm, 3^a, the arm 3^b, extends downward into the frame casting where it is linked with one end of the treadle chain, 4, which is threaded through the upright portion of the C-frame, 1, and extends through its base to a treadle not shown. Both the upper and lower portions of the frame are C-shaped in cross-section, the vertical neck alone being completely closed and of elliptical cross-section. This permits the frame, as just noted, to contain one arm of the actuating lever, 3, and allows the treadle chain to emerge from the lower portion of the frame, while the curved neck at 1^c serves as a guide or stationary pulley for the chain, 4. The actuating lever, 3, is provided also with a third arm, 3^c, intended to operate the feeding mechanism of the hopper, as hereinafter described; and this arm carries a lug, 3^d, from which the coil spring, 5, extends to a lug, 1^f, at the back of the frame, 1,

for the purpose of returning the parts to normal inoperative position.

From the top of the C-frame, 1, and in a plane transverse to its principal plane, there is mounted an inverted A-frame, 6, upon which the hopper body, 7, and its rotatable bottom plate, 8, are supported. A circular base plate, 9, is bolted to the legs of the A-frame, 6, and the hopper body, 7,—which consists merely of a side wall substantially annular in outline,—is secured to the base plate, 9, by bolts engaging the slots, 7^a, in its rim flange, 7^b. The bottom plate, 8, of the hopper consists of a circular disk centrally apertured to admit a shaft, 10, journaled in the boss, 9^a, of the base plate, 9, and connected with the bottom plate, 8, through studs, 8^a, secured in the plate, 8, and projecting upward into corresponding recesses in a collar, 10^a, pinned to the shaft, 10. Below the boss, 9^a, the shaft or spindle, 10, is fitted with a pinion, 10^b, and a guide flange, 10^c, both rigid with the shaft.

It may be understood that the tendency of the spots when placed in the hopper is to assume a position in which the heads lie flat upon the hopper bottom while the tangs project upward, the center of gravity of the spot being located practically within the head. Now if the hopper bottom upon which the spots stand in this position be rotated, the centrifugal force of such rotation will tend to drive the spots toward the rim of the hopper. To take advantage of this action, the hopper wall, 7, is provided with a series of inwardly projecting guide blocks, 7^c, cast integrally with the annular wall, but extending toward the center of the hopper and spaced above its bottom by a distance slightly greater than the thickness of the head, A¹, of a spot, and having guide grooves, 7^d, extending upward from this under surface, dimensioned to accommodate the upwardly projecting tangs of the spots. These grooves, 7^d, are disposed approximately in the resultant direction in which the spots tend to move under the combined influence of the tangential and centrifugal forces of rotation as imparted by the friction between their heads and the rotating bottom plate, 8; that is, the direction of the grooves is neither radial nor tangential, but somewhere between these positions, and leading outward and forward as respects the direction of rotation of the bottom plate, 8. The grooves, 7^d, open into an annular groove, 7^e, extending nearly around the wall of the hopper and having an outlet, 7^f. The bottom plate, 8, extends under the grooves, 7^d and 7^e, so that its rotation serves not only to cause the spots to enter the grooves, but also aids in afterward driving them along the grooves toward the exit opening, 7^f. Each of the guide blocks, 7^c, is provided with a guard flange, 7^g, extending down-

wardly to meet the bottom plate, 8, and parallel with the inner guide surfaces of the blocks which are presented to the interior and open portion of the hopper. The purpose of these guard flanges is indicated in Fig. 11, by the spot, A^x, which is shown as having been forced against the guide block, 7^c, with its head A¹, covering the rounded nose, 7^h, of the block and its tangs, A², extending sidewardly, one above and the other below the block. The encounter of the lower tang with the guard flange, 7^g, prevents the cup shaped head, A¹, from becoming wedged tightly upon the rounded nose, 7^h, of the block, and thus permits the spot to be readily jarred out of this undesirable position by a quick reverse movement of the bottom plate, 8, effected as hereinafter described; thus it is dislodged before other spots become wedged around it and before the entrance to the groove, 7^d, becomes seriously clogged, as it otherwise would be.

As already stated, the bottom plate, 8, is connected to the shaft, 10, for rotation with it by means of the studs, 8^a, engaging the collar, 10^a. For rotating the shaft there are provided a pair of racks, 11 and 12, respectively, mounted for reciprocation and designed to mesh one at a time with the pinion, 10^b, which is fast on the shaft, 10. The racks, 11 and 12, are connected together and spaced apart by a distance greater than the diameter of the pinion, 10^b, by means of a pair of cross bars, 13 and 14, notched, and pinned in the ends of the racks. The cross bar, 13, is pivoted at its mid-point to a cross head, 15, slidably mounted in guides, 9^b, cast on the under side of the base plate, 9, and designed to direct the reciprocation of the cross head, 15, along a radius of the base plate,—that is, toward and from the pinion, 10^b, journaled at the center of the plate, 9. The cross head, 15, is formed with a boss, 15^a, projecting downward, and provided with a slot, 15^b, proportioned to receive the rounded end of the arm, 3^e, of the actuating lever, 3; thus each complete operation of the treadle which moves the actuating lever, incidentally causes a complete reciprocation of the cross head, 15, and with it the racks, 11 and 12. During the advance stroke of the cross head toward the pinion, 10^b, the rack, 11, is held in mesh with the said pinion by the stop, 16, pivotally mounted upon the base plate, 9. Near the end of the advance stroke, however, a notch, 11^a, in the rack bar comes into registration with the stop, 16, and under the influence of a spring-pressed plunger, 17, operating against the rack bar, 12, the latter is caused to mesh with the pinion, 10^b, while the rack, 11, is thrown out of mesh, the notch, 11^a, receiving the stop, 16. By properly designing the parts, this action may be caused to occur just before the end of the stroke, so that the bot-

tom plate, 8, is given a quick reverse motion at the end of the stroke, which is effective for agitating the spots contained in the hopper and jarring them out of any undesirable positions of entanglement which they may have assumed. With the beginning of the return stroke, the shoulder, 11^b, of the notch, 11^a, acting against the point, 16^a, of the stop, 16, operates to swing the stop around its pivot, 16^b, and against the force of its spring, 16^c, out of engagement with the notch, 11^a, thus permitting the return stroke to take place with the rack, 12, meshing with the pinion, 10^b. Toward the end of the return stroke, the beveled corner, 14^a, of the extending end of the cross bar, 14, coming in contact with the correspondingly oblique edge, 18^a, of the cam block, 18, throws the rack, 12, out of mesh with the pinion, 10^b, and again brings the rack, 11, into mesh with the said pinion. This transverse movement of the rack bar, 11, permits the stop, 16, to swing back to its original position indicated in the full lines in Fig. 3, preparatory to maintaining the alinement of the rack, 11, during the next succeeding advanced stroke. It is also arranged that this shifting of the racks shall occur just previous to the finish of the return stroke so that the plate, 8, is again given a slight reverse twist for the purpose of agitating this box in the hopper. It will be noted, however, that the principal motion of the plate is always in the same direction, since during the advance stroke, the rack, 11, operates on one side of the pinion, 10^b, while during the return stroke, the rack, 12, operates upon the opposite side of the pinion; thus the spots are intermittently caused to travel always in the same direction around the hopper so as to be gradually worked out of the hopper to the grooves, 7^b and 7^c, into the exit opening, 7ⁱ. To insure that the spots shall enter the exit opening, 7ⁱ, and not travel continuously around the annular groove, 7^e, the latter is closed adjacent to the exit opening, 7ⁱ, by a block, 7^j. Emerging from the exit opening, 7ⁱ, the spots are received by a race-way, 18, shown in cross section in Fig. 5, by reference to which it may be seen that the race-way comprises a pair of flat strips, 18^a, spaced apart to form a longitudinally slotted track through which the tangs, A², of the spots may project outwardly from the machine. The strips, 18^a, are positioned with respect to each other by a series of yokes, 19, placed at intervals along the race-way, the two strips, 18^a, being secured to the respective arms, 19^a, of the yokes. Each yoke is provided with an adjusting screw, 19^b, by which there is carried a third strip or guide rail, 18^b, intended to contact with the heads of the spots for properly positioning them in the race way. The rail, 18^b, is secured to the end of

each of the adjusting screws, 19^b, by means of a washer, 18^c, riveted or otherwise rigidly attached to the rail, 18^b, and counter-bored at 18^d, to engage the terminal flange, 19^c, of the screw, the reduced portion, 19^d, of the screw, 19^b, extending through the opening, 18^e, of the washer. In this way the race way is made adjustable to fit the various sizes of spots which it may be desired to use in the machine.

In consequence of the shape of the race way, 18, which has the form of a letter C, the spots are reversed in position as they travel along it, entering at the top with their tangs projecting upward and arriving at the bottom with the tangs projecting downward, ready for insertion in the leather upon the anvil. It may be understood that for different diameters of spots, driver heads, 20, of different diameters will be employed and in order that the race way, 18, will at all times extend completely to the driver head, 20, the rail, 18^b, is provided with a slidably adjustable tip 18^f, having a knob, 18^g, which serves in setting it in proper position upon the end of the rail, 18^b. To prevent serious damage to the end of the race way, in case a spot should not be completely ejected therefrom before being engaged by the driver, 20, and carried down toward the anvil, the ends of the strips, 18^a, are hinged at 18^h for swinging downward out of the line of reciprocation of the driver, 20, being yieldingly upheld in proper position by a spring, 18ⁱ.

Directly above the driver head, 20, the plunger, 2, is provided with a bracket, 21, having a sidewardly extending lug, 21^a, and a downwardly projecting arm, 21^b, by which the spot holder, 22, is carried. This spot holder is formed of a strip of metal, bent into a hollow cylinder, as indicated at 22^a, in Fig. 10, and having its ends, 22^b, extending radially and side by side off from the cylindrical portion and into the slotted end of the arm, 21^b, into which they are secured by a bolt, 21^c. The inner diameter of the cylinder thus formed is slightly smaller than the standard diameter of the spot for which the holder is intended, so that, as the spot is forced into the cylinder, 22^a, its end portions, 22^b, will be slightly separated and the diameter of the cylinder thus slightly increased, while the elasticity of the material serves to maintain a frictional grip upon the spot, which grip, however, may be overcome by the driver, 20, as it descends at the proper instant to force the spot through the cylindrical throat of the holder, 22, and onto the material to which it is to be attached.

The lower end of the driver, 20, is cut or recessed at 20^a, to conform to the shape of the head, A¹, of the spot, and this feature will usually serve to accomplish the proper

alinement of the spot, preparatory to driving. To assist in such alinement, however, there is provided a downwardly-extending arm, 23, pivotally hung in the lug, 21^a, and provided with a pair of fingers, 23^a, projecting into the holder, 22, in position to embrace one of the tangs, A², of the spot, and to support its head, A¹, in horizontal position. A spring, 23^b, pocketed in the lug, 21^a, serves to return and hold the arm, 23, yieldingly in operative position, but since the arm is pivoted to one side of the axial line of operation of the driver, 20, the contact of the latter with the sloping faces, 23^c, of the fingers will serve to swing the fingers out of the path of the driver as it descends through the holder, 22. A still further assistance to the proper positioning of the spots within the throat of the holder, 20, is the lip, 22^c, bent down from one side of the cylindrical portion of the holder so as to leave an entrance opening for the tangs, A², of the spots, as they are delivered from the race way. If for any reason a spot should be delivered only part way into the holder the lip, 22^c, will serve to engage the rearward tang, A³, and prevent the tangs from straddling the wall of the holder, since from such a position the spot could not be re-alined and driven through the throat of the holder, 22.

While the holder, 22, is carried down against the leather, B, it is necessary that it be but yieldingly carried in order that the driver, 20, may move relatively to the holder, 22, for driving the spot through it and into the leather, B. For this reason the bracket, 21, is slidably carried upon the plunger, 2, being secured against rotation around it by means of a feather, 21^d. A lug, 21^e, projecting from the forward side of the bracket carries a stud, 21^f, extending upward through an apertured lug, 1^g, on the plunger bearings, 1^h, of the frame, and a coiled spring, 21^g, is retained between the upper surface of the lug, 1^g, and an adjusting nut, 21^h, on the stud, 21^f. It may be noted that as the plunger, 2, descends, the force of the spring, 21^g, is increased by compression, and this force may be so regulated by properly positioning the adjusting nut, 21^h, that the movement of the holder, 22, will be checked just as it reaches the upper surface of the leather, B, to which point it has been carried by the frictional grip between the holder, 22, and the spot, A, contained within it. At this point in the operation, the tangs, A², emerging from the under side of the leather, B, encounter the directing grooves, 24^a, of the anvil block, 24, and are clenched into form as illustrated in Fig. 9.

In addition to the above described features of construction which affect the operation of the machine, there may be mentioned

the bracket, 25, and hanger, 26, provided with oppositely directed slots, 25^a, and 26^a, respectively, through which they are connected by a bolt and wing nut, 27, for adjustably upholding the lower end of the race-way, 18. Preferably this hanger, 26, is formed integrally with the lowest one of the yokes, 19, which is otherwise constructed similarly to the remaining yokes already described. There is also shown a boss, 1ⁱ, projecting from one side of the frame, 1, just above the level of the anvil bed, 1^a, and provided with a socket, 1^j, and set screw, 1^k, adapting it to hold some form of adjustable stop gage, 28, which may assist in the proper positioning of the leather, B, or other stock to which the spots are to be applied.

As already stated, the cylindrical throat, 22^a, of the holder, 22, is made slightly smaller in diameter than the standard size of spot for which it is intended, but, it sometimes happens that the spots are made slightly under size so as to fit loosely in the holder. In this case the descent of the driver, 20, would tend to carry the spot through the holder without causing the latter to move down on to the leather for guiding the tangs of the spot, this movement being ordinarily accomplished by virtue of the friction between the spot and the holder. As a substitute for this friction, which is no longer present when the spot is under size, the feather, 21^d, may be made in the form of a spring-pressed dog pocketed in the bracket, 21, as shown in Fig. 2. The groove in the plunger rod, 2, may be made in two portions, 2^c and 2^d, the former being deeper than the latter, so that the driver, may descend for a limited distance without carrying with it the bracket, 21, and the holder, 22, since the flange, 21ⁱ, on the dog, 21^d, abuts the shoulder, 21^k, formed in the pocket of the bracket, 21, so as just to prevent the dog from engaging the bottom of the deeper portion of the groove at, 2^c. The descent of the plunger rod, 2, through the bracket, 21, will bring the dog 21^d, into registration with the shallower portion, 2^d, of the groove just at the instant when the driver head, 20, encounters the spot in the holder, 22. Here it will frictionally engage the bottom of the groove under the pressure of its spring, 21^l, and this induced friction between the dog, 21, and the plunger rod, 2, acts just as the friction between the spot and the holder normally would to cause the holder to be carried down with the driver, 20, against the leather to which the spot is to be attached.

I claim:—

1. In a spot-setting machine, a hopper for the spots, a rotatably mounted bottom plate, and a fixedly mounted body overhanging said bottom plate, the body being provided with an exit opening for the spots, its over-

hanging surface having a system of guide grooves leading outwardly to said exit opening, and the inner vertical edge of the overhanging portion of the body being formed with inwardly projecting guide blocks arranged to compose enlarged or flared entrances to the said guide grooves.

2. In a spot-setting machine, a hopper for the spots, comprising a rotatably mounted bottom plate, and a fixedly mounted body overhanging said bottom plate, the overhanging surface of said body being provided with a guide groove in the form of an incomplete annulus, feeder grooves leading outward from the central portion of the hopper into said annular groove, and an exit groove leading out of the body from one end of the annular groove together with means for rotating the bottom plate.

3. In a spot-setting machine, a hopper for the spots, comprising a rotatably mounted bottom plate, and a fixedly mounted body overhanging the peripheral portion of the bottom plate, the overhanging surface of said body being spaced above the bottom plate, and being provided with outwardly leading guide grooves, the inner vertical edge of said overhanging body being formed with guide blocks flanking the entrances to the respective guide grooves, and the aforesaid overhanging surface being formed with downwardly extending guard flanges, respectively parallel to the out-leading guide grooves and to the edges of the blocks, which constitute the entrances to said grooves, and means for rotating the bottom plate.

4. In a spot-setting machine, a hopper for the spots, comprising a rotatably mounted bottom plate, and a fixedly mounted body having an exit opening for the spots, together with a driving gear for the bottom plate, comprising a pinion rigidly connected therewith, a pair of racks, means connecting said racks and spacing them apart by a distance greater than the diameter of the pinion, a cross head connected to the racks and mounted for reciprocation toward and from the pinion, means for holding one of the racks in mesh with the pinion during the advance of the cross head, and for holding the other rack in mesh with the pinion during the return of the cross head, and means for reciprocating the cross head.

5. In a spot-setting machine, a hopper for the spots, comprising a rotatably mounted bottom plate, and a fixedly mounted body having an exit opening for the spots, together with means for rotating the bottom plate, comprising a pinion rigidly connected therewith, a pair of racks, means laterally connecting said racks and spacing them apart by a distance greater than the diameter of the pinion, a cross head connected to the racks and mounted for reciprocation toward and from the pinion, means adapted

for holding one of the racks in mesh with the pinion during the advance of the cross head, means for holding the other rack in mesh with the pinion during the return of the cross head, means for disengaging one of the racks and engaging the other rack with the pinion prior to the completion of the stroke of the cross head in either direction, and means for reciprocating the cross head.

6. In a spot-setting machine, a clenching anvil, a driver mounted for reciprocation toward and from said anvil, a hopper for the spots, a race-way leading therefrom to a point between the driver and the anvil and comprising a slotted track, a guard rail spaced away from said path by a distance sufficient to accommodate the heads of the spots, and an adjustable terminal for said guard rail slidably carried by it for movement toward and from the driver.

7. In a spot setting machine, a frame, an anvil thereon, a driver-plunger mounted for reciprocation toward and from the anvil, a spot holder connected to the driver plunger for movement therewith toward and from the anvil, and a spot-supporting detent also connected to the plunger for movement with the holder and projecting into the throat of the said holder, the connections between the spot holder and the driver plunger being adapted to permit additional movement of said driver through the holder toward the anvil, and the detent being mounted to permit its withdrawal from the holder during such additional travel of the driver.

8. In a spot-setting machine, a frame, an anvil thereon, a driver plunger mounted for reciprocation toward and from the anvil, a bracket slidably carried upon the driver plunger, a spot holder secured in said bracket and extending between the driver and the anvil, the plunger having a longitudinal groove, a portion of which is deeper than the remainder, a spring-pressed dog carried in the bracket and projecting into said groove, the dog and the bracket having cooperating stop shoulders which prevent the dog from engaging the bottom of the groove in its deeper portion, and means operating between the frame and the bracket for yieldingly resisting movement of the latter toward the anvil.

9. In a spot setting machine, a frame, an anvil thereon, a driver-plunger mounted for reciprocation toward and from the anvil, a bracket slidably carried upon the driver-plunger, a spot holder secured in said bracket and extending between the driver and the anvil, and means yieldingly opposing movement of the holder toward the anvil, the bracket being sufficiently loose upon the plunger to permit movement of the latter toward the anvil into contact with the spot in the holder without moving said

holder, but said plunger and bracket being provided, respectively, with means adapted for frictional engagement with each other when the driver is positioned for contact
5 with a spot carried in the spot holder.

10 10. In a spot-setting machine, a clenching anvil, a driver plunger mounted for reciprocation toward and from said anvil, a spot holder mounted between the driver and the anvil, and a race-way for the spots leading
to the holder and comprising a track longitudinally slotted for accommodating the
tangs of the spots, the holder having the

form of a hollow cylinder, and having a portion of its wall, which registers with the
slot of the race-way bent downwardly into
a lip extending under said slot and leaving
an opening in the holder adapted to receive
the tangs of the spots. 15

In testimony whereof I have hereunto set
my hand at Chicago, Illinois, this 6th day
of June, 1911. 20

DAVID C. SASSEMAN.

Witnesses:

CHAS. S. BURTON,
M. GERTRUDE ADY.