

No. 878,295.

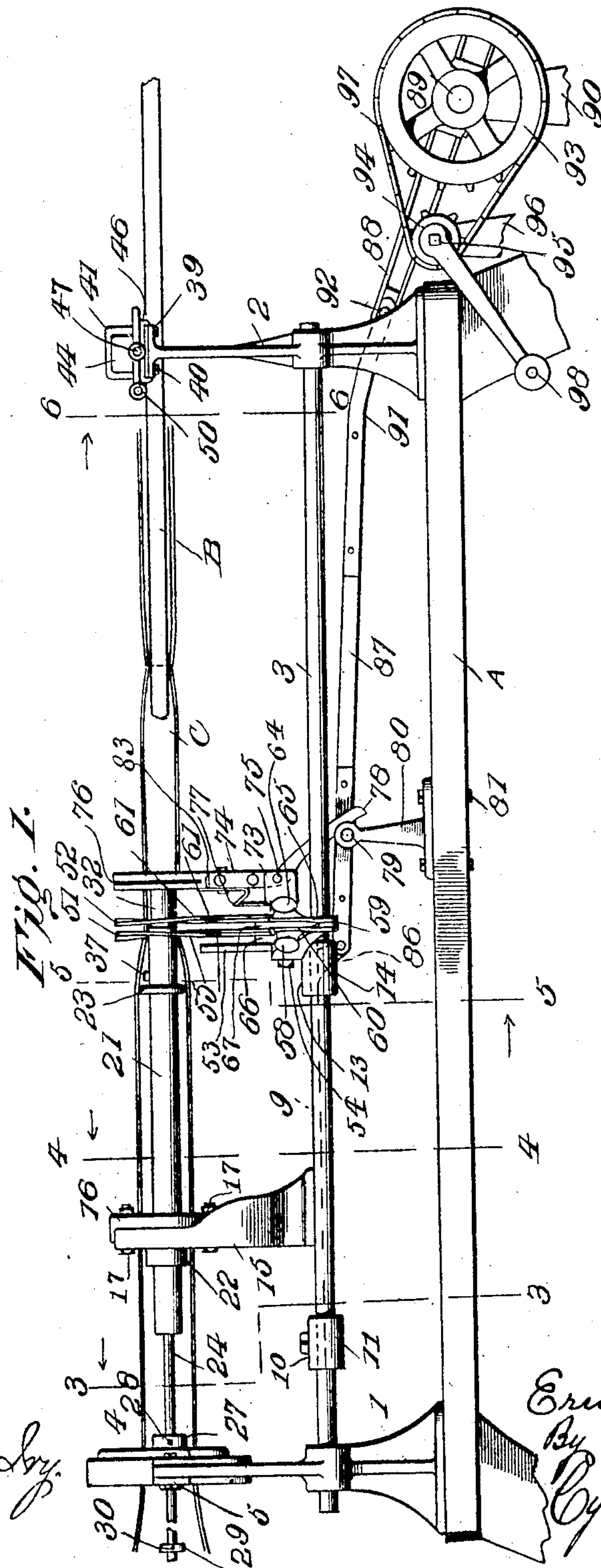
PATENTED FEB. 4, 1908.

E. KOELLA.

MOP AND BRUSH MAKING MACHINE.

APPLICATION FILED JAN. 12, 1905. RENEWED JUNE 26, 1907.

5 SHEETS—SHEET 1.



Witnesses
Leanne R. Lry.
Samuel Duffet.

Inventor
Ernest Koella
By
Cyrus Kehr
Attorney

No. 878,295.

PATENTED FEB. 4, 1908.

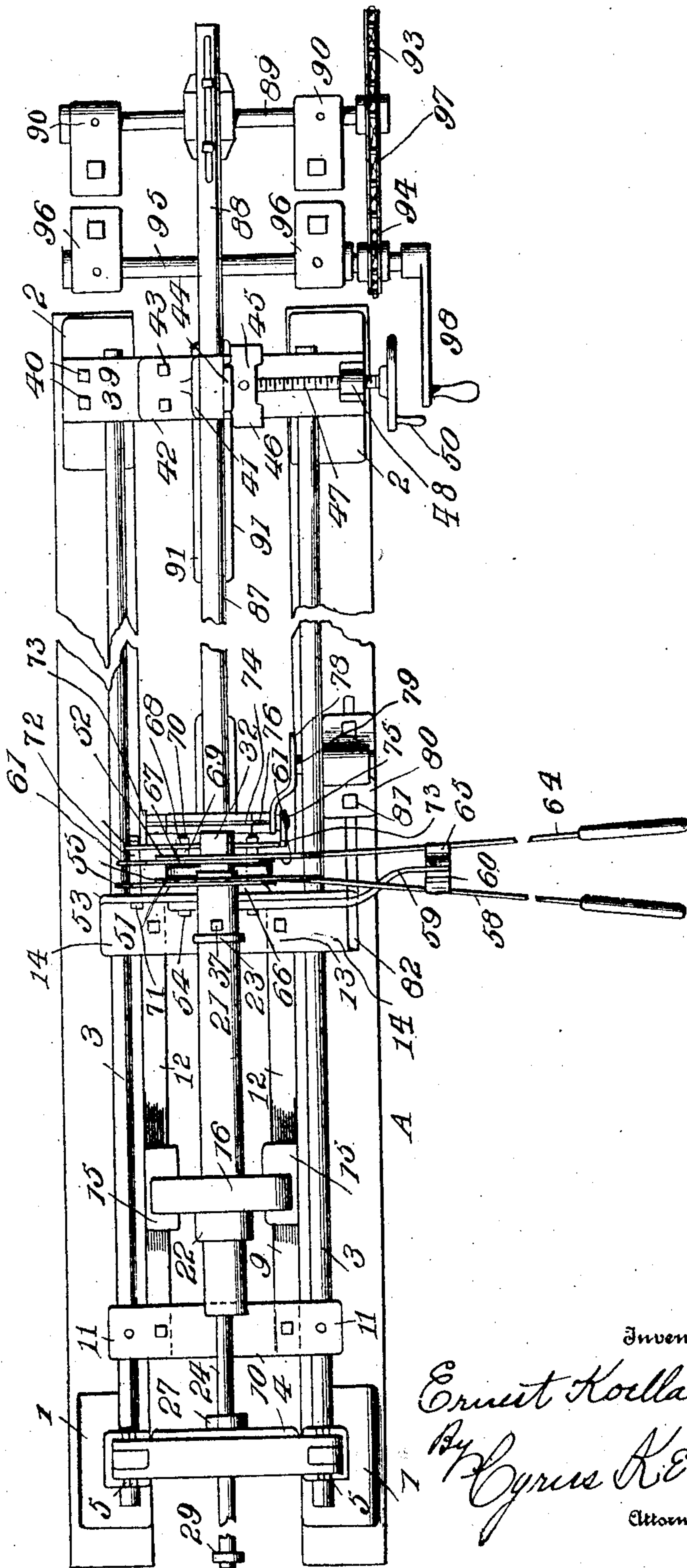
E. KOELLA.

MOP AND BRUSH MAKING MACHINE.

APPLICATION FILED JAN. 12, 1905. RENEWED JUNE 26, 1907.

5 SHEETS—SHEET 2.

Fig. 2.



Witnesses
Carrie R. Lory
Samuel Puffer

Inventor
Ernest Koella
By Cyrus K. Eber
Attorney

No. 878,295.

PATENTED FEB. 4, 1908.

E. KOELLA.

MOP AND BRUSH MAKING MACHINE.

APPLICATION FILED JAN. 12, 1905. RENEWED JUNE 26, 1907.

5 SHEETS—SHEET 3.

Fig. 3.

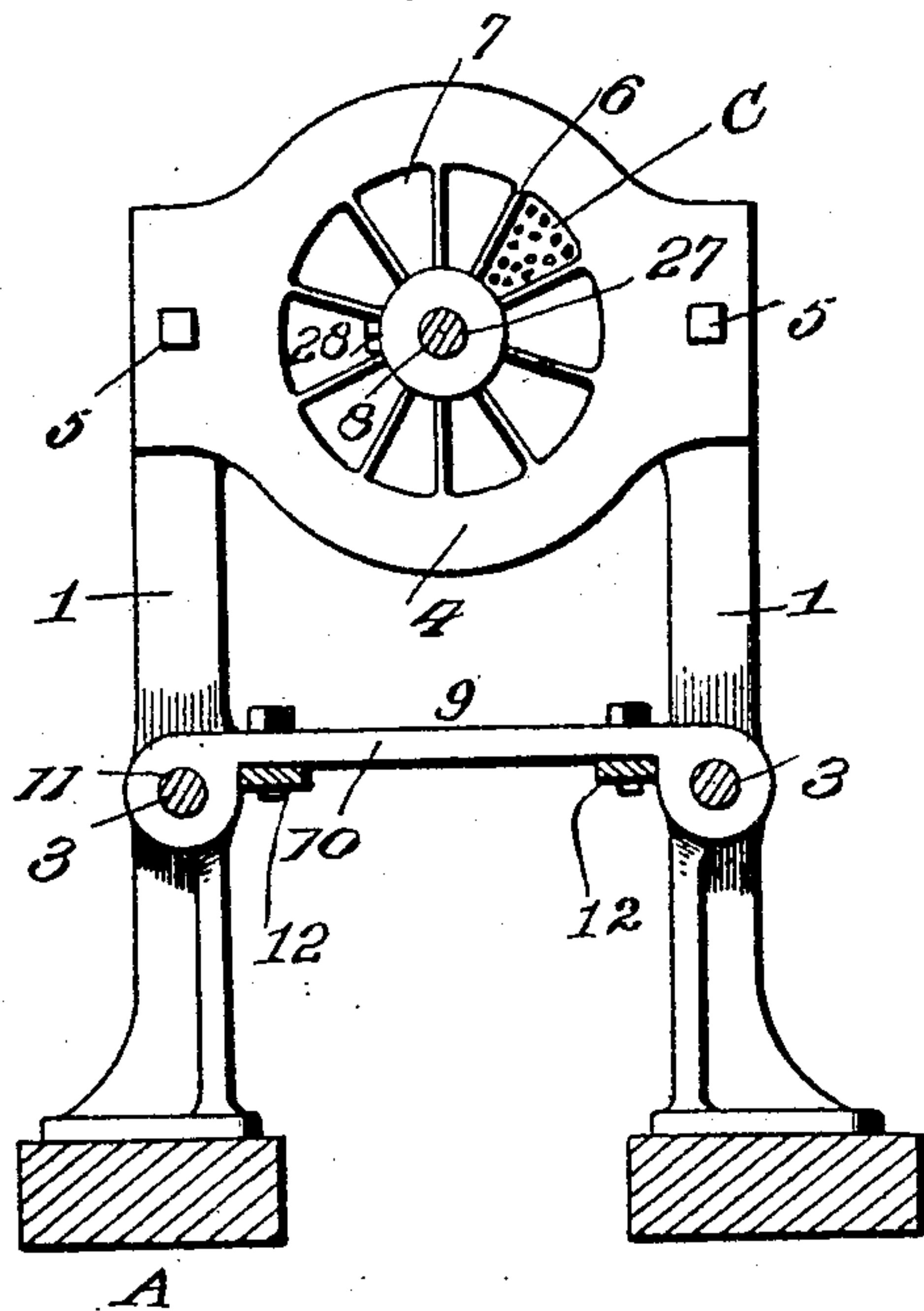


Fig. 4.

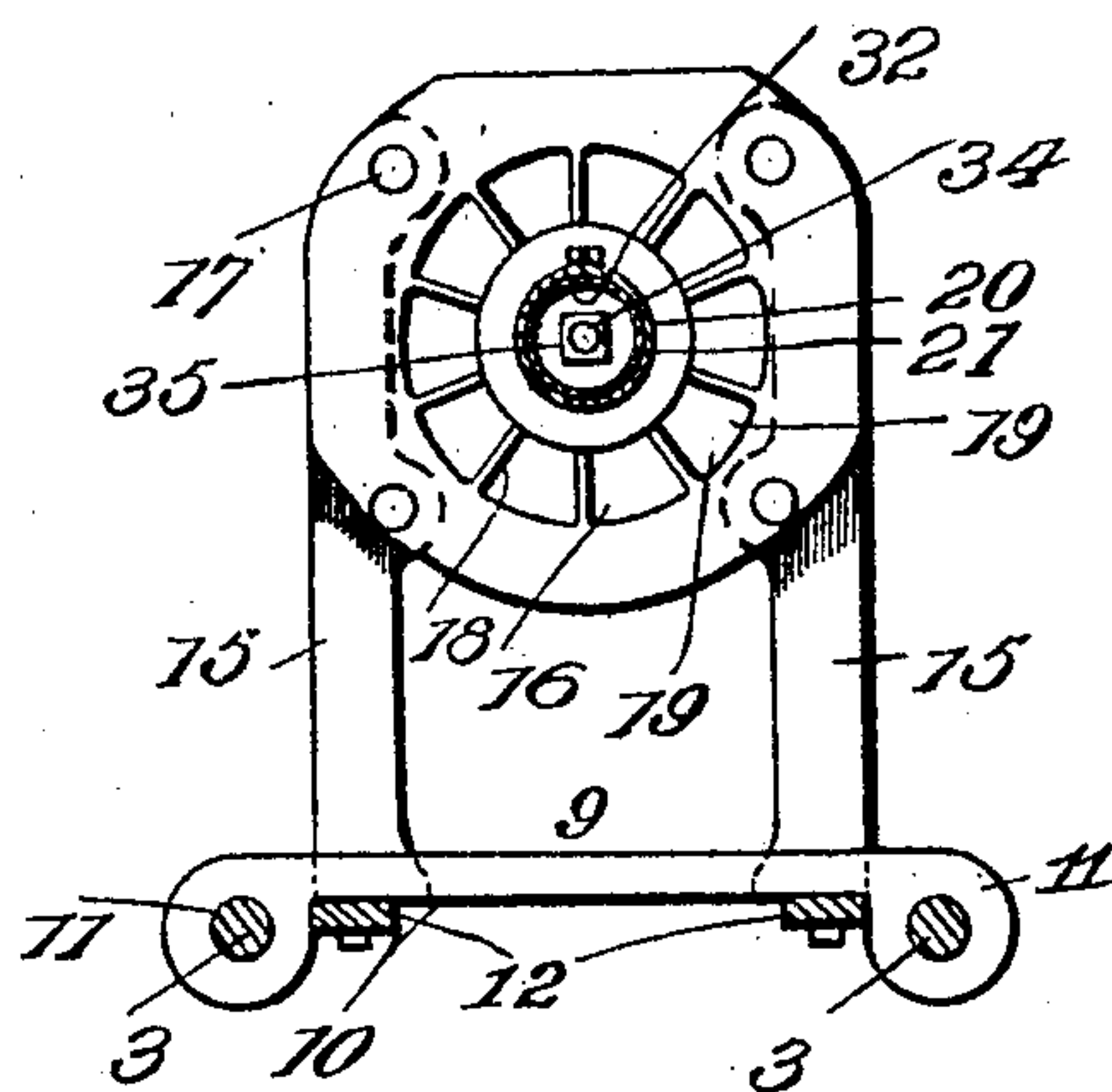


Fig. 8.

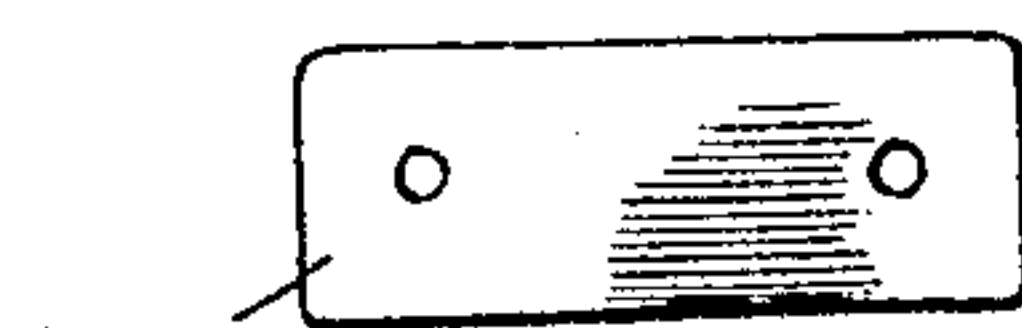


Fig. 9.

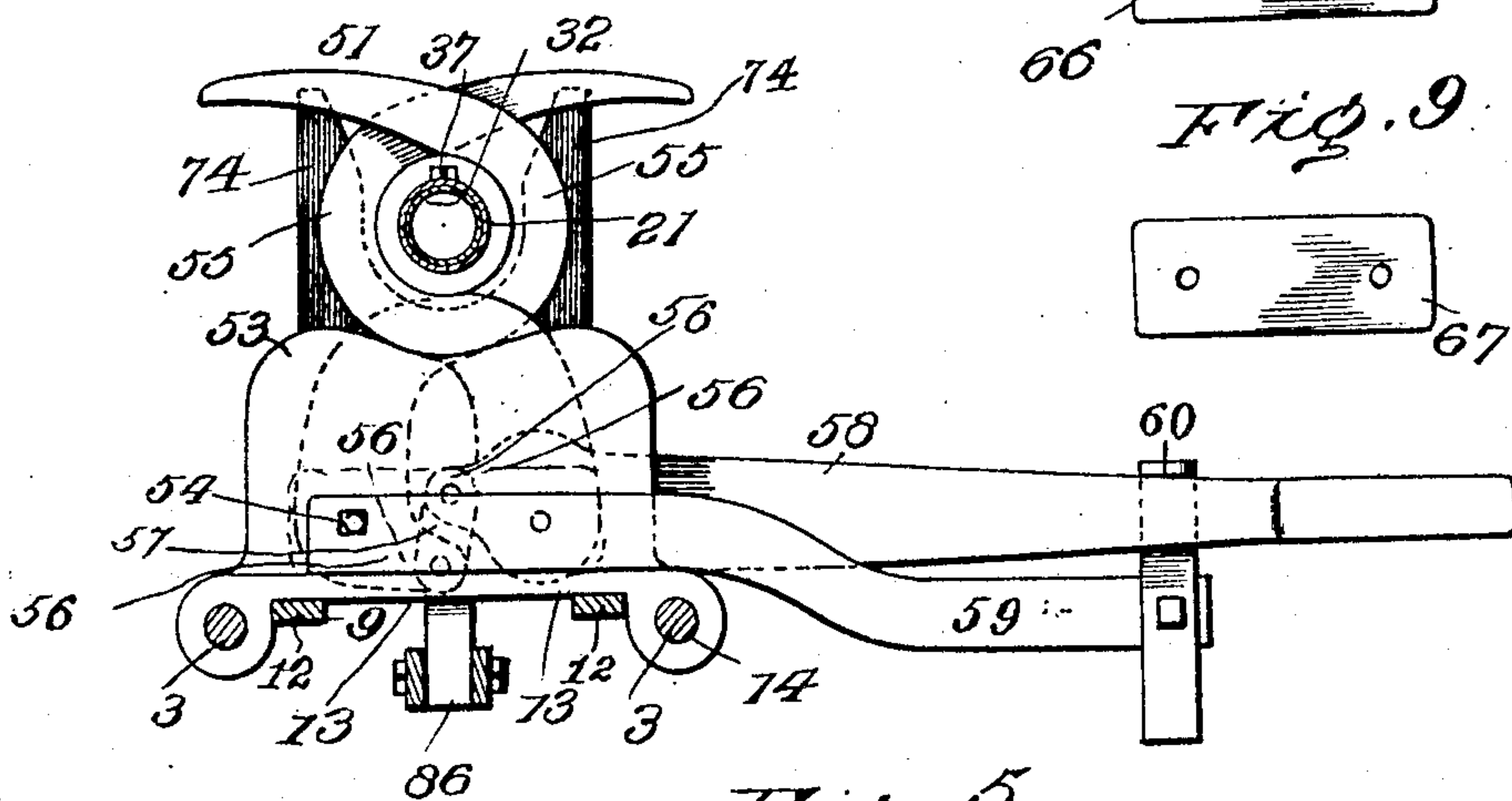
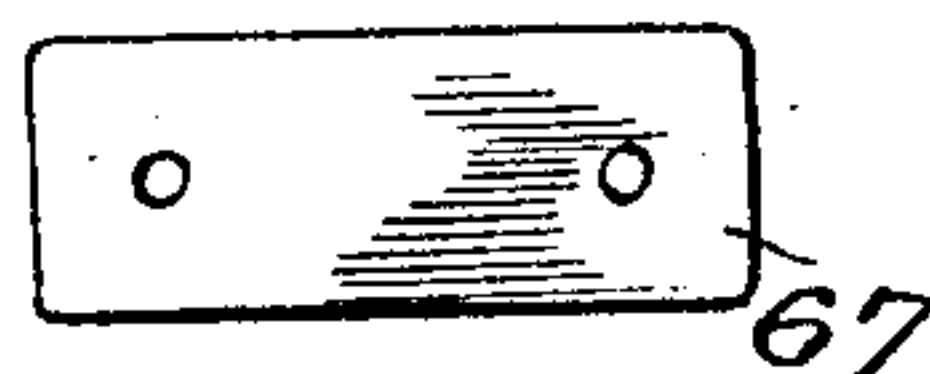


Fig. 5.

Inventor

Ernest Koella

By

Cyrus Kehr

Attorney

Witnesses

Carrie R. Lry.

Samuel Buffat.

No. 878,295.

PATENTED FEB. 4, 1908.

E. KOELLA.

MOP AND BRUSH MAKING MACHINE.

APPLICATION FILED JAN. 12, 1905. RENEWED JUNE 26, 1907.

5 SHEETS-SHEET 4.

FIG. 6.

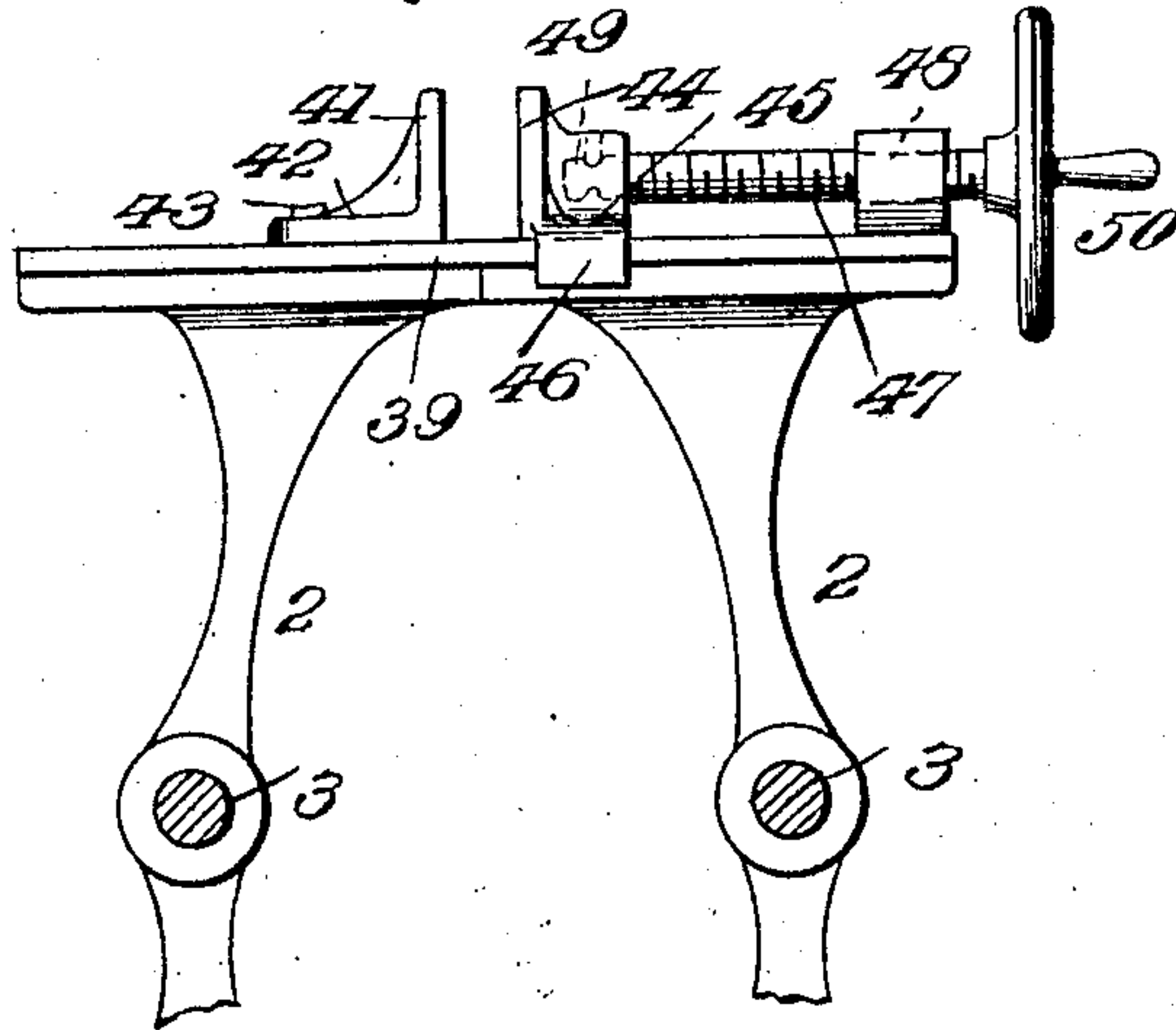


FIG. 12.

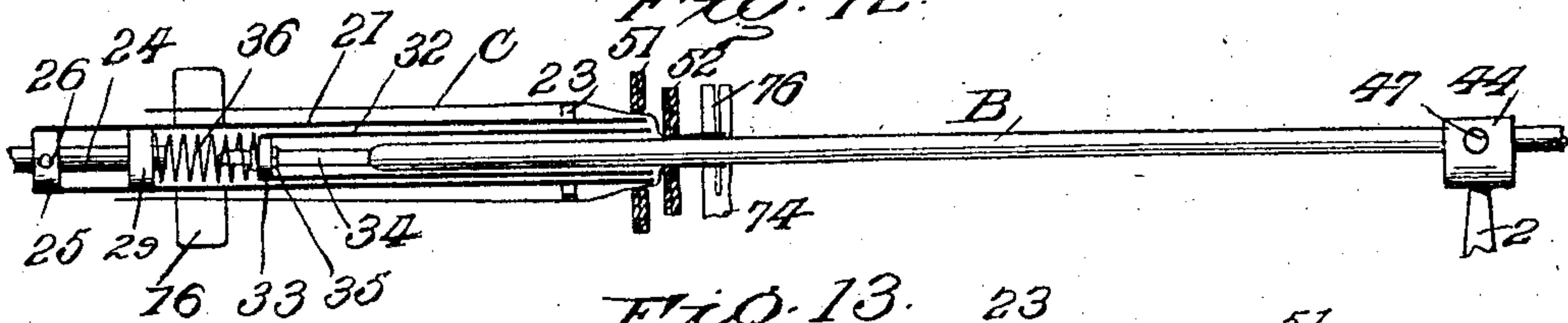


FIG. 13.

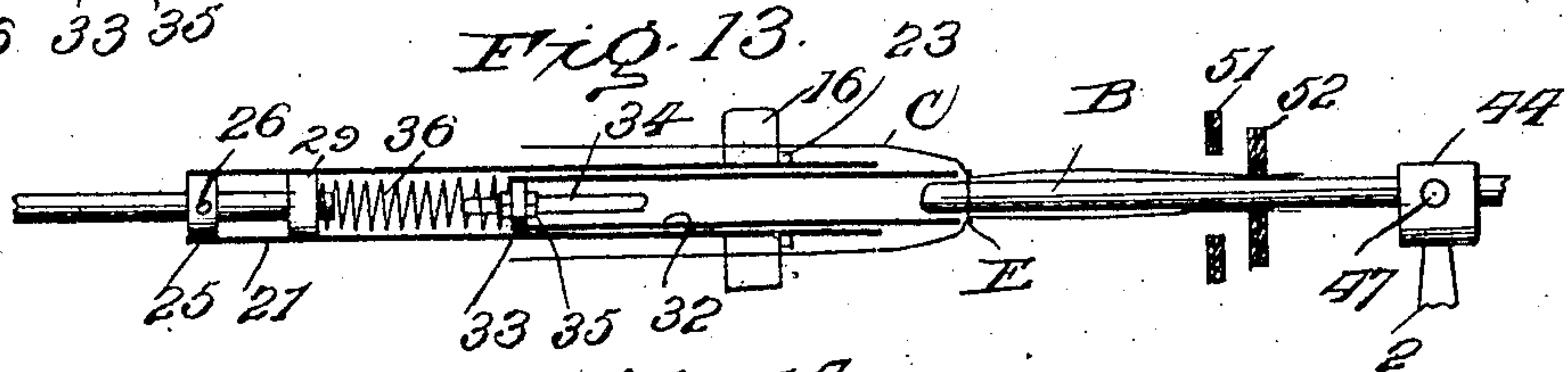


FIG. 14.

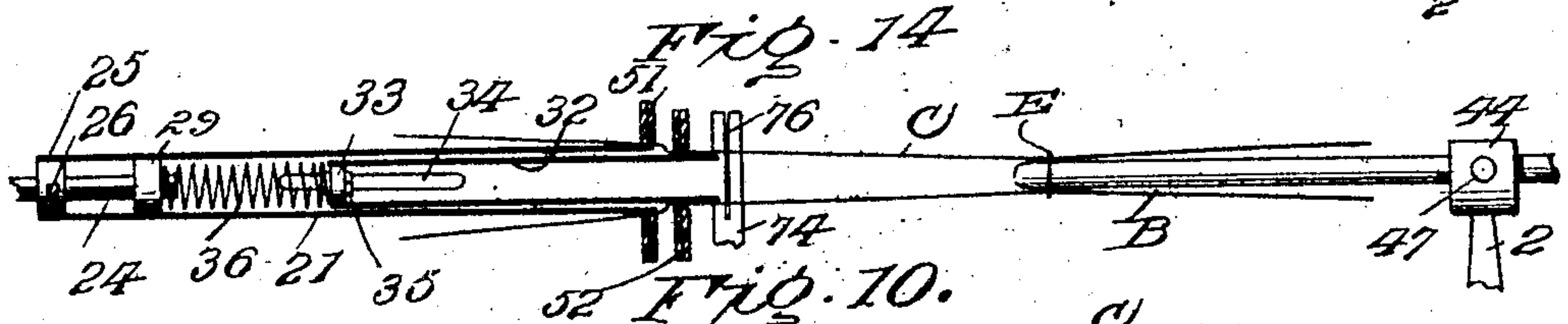


FIG. 10.

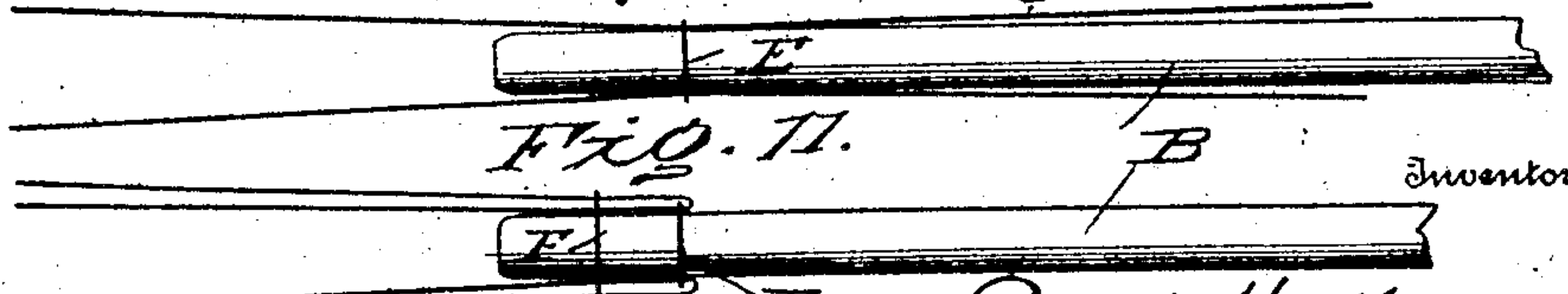


FIG. 11.

Witnesses
Carrie R. Lry.
Sam. T. Puffat.

Inventor
Ernest Koella
Cyrus Kehr
Attorney

No. 878,295

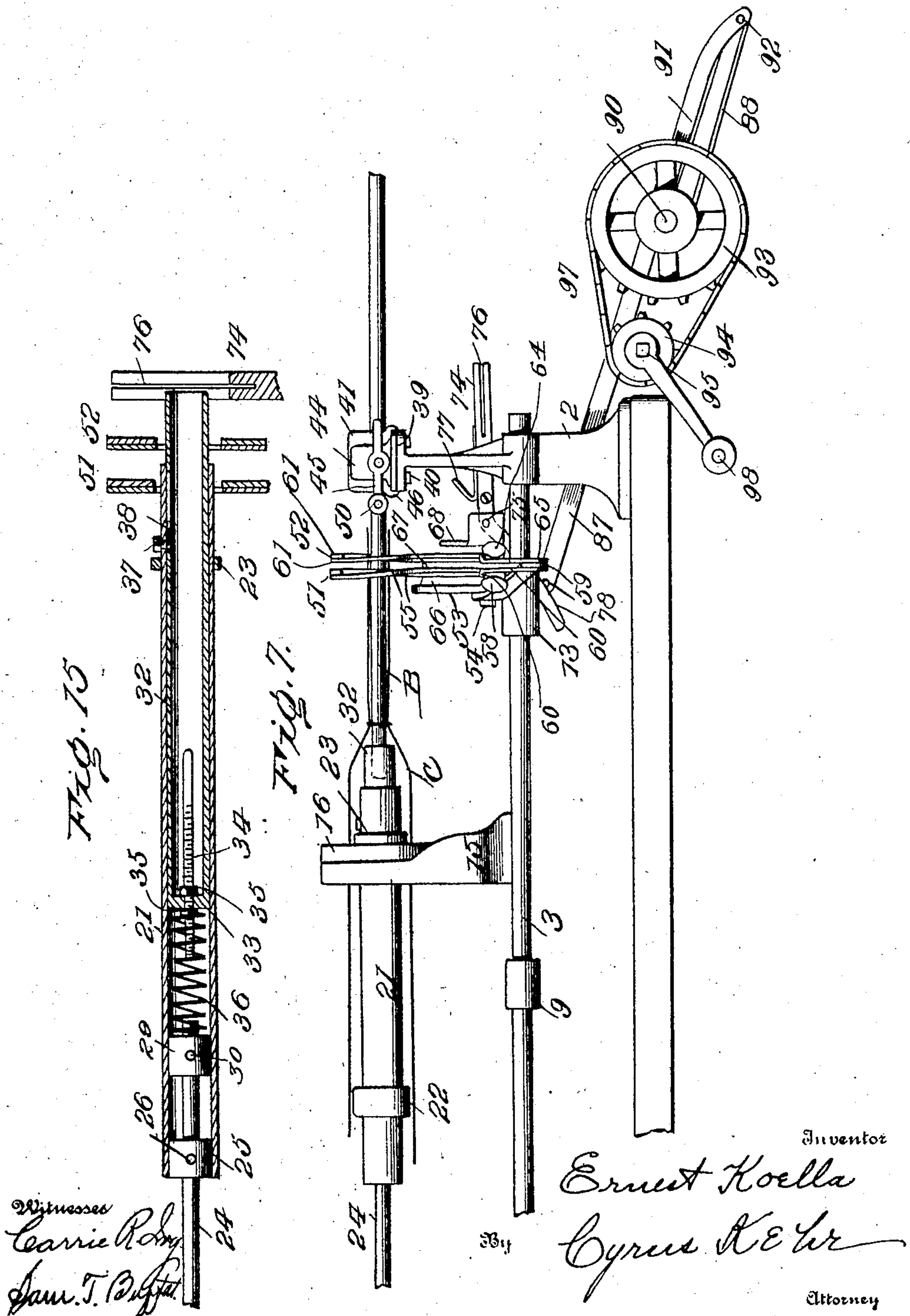
PATENTED FEB. 4, 1908.

E. KOELLA.

MOP AND BRUSH MAKING MACHINE.

APPLICATION FILED JAN. 12, 1905. RENEWED JUNE 26, 1907.

6 SHEETS—SHEET 5.



UNITED STATES PATENT OFFICE.

ERNEST KOELLA, OF ROCKFORD, TENNESSEE, ASSIGNOR TO MYER BRIDGES COMPANY, OF LOUISVILLE, KENTUCKY, A CORPORATION.

MOP AND BRUSH MAKING MACHINE.

No. 878,295.

Specification of Letters Patent.

Patented Feb. 4, 1908.

Application filed January 12, 1905, Serial No. 240,794. Renewed June 26, 1907. Serial No. 380,944.

To all whom it may concern:

Be it known that I, ERNEST KOELLA, a citizen of the United States, residing at Rockford, in the county of Blount and State of Tennessee, have invented a new and useful Improvement in Mop and Brush Making Machines, of which the following is a specification, reference being had to the accompanying drawing.

My invention relates to machines for making mops and brushes and similar articles, the heads of which are composed of cords, or devices resembling cords; and the invention relates particularly to machines for making such mops or brushes of such cords of indefinite length, a plurality of sections of said cords of approximately even length being applied parallel to each other to a handle.

In the following description, the term cord or cords will be applied to cords, strings, yarns, wires, straps, and any similar devices or materials suitable for forming the head of a mop or brush.

The object of my invention is to produce a machine which shall facilitate the making of such mops or brushes, it being obvious that economy will result from performing a considerable portion of the operation mechanically instead of manually.

In the accompanying drawings, Figure 1 is a side elevation of a machine embodying my improvement; Fig. 2 is a plan of the machine shown in Fig. 1; Fig. 3 is a section on the line, 3—3, of Fig. 1, looking toward the left; Fig. 4 is a section on the line, 4—4, of Fig. 1, looking toward the left; Fig. 5 is a section on the line, 5—5, of Fig. 1, looking toward the right; Fig. 6 is a section on the line, 6—6, of Fig. 1, looking toward the right; Fig. 7 is a side elevation of the right hand portion of the machine shown in Fig. 1, the tubular receiver having been shifted to its limit toward the right; Figs. 8 and 9 are detail views of washer plates; Fig. 10 is a diagrammatic detail of a mop with only the inner band applied thereto; Fig. 11 is a similar detail of a completed mop; Figs. 12, 13, and 14 are sectional details illustrating different stages of the operation of the machine; Fig. 15 is a longitudinal, upright section of the handle receiver.

By way of general description, it may be stated that said machine comprises a stationary base or frame, A, which may be of any desired form and material. Upon said frame are

mounted the operative devices. The functions performed by said operative devices are as follows: Temporarily gripping the cords or strands and holding them while the mop or brush handle is being placed into position on the machine; temporarily gripping the cords or strands to said handle; supporting said handle; drawing said cords a distance equal to the length of the cord sections which are to be taken from the continuous cords to constitute a mop-head; binding the cords to the lower or base end of the mop-handle by what is to be herein termed the inner band; severing cords at the proper distance from the base of the mop-handle.

Usually the handles of such mops or brushes are cylindrical, and the cords or strands are arranged concentrically and symmetrically around said handle. But the handle may be of any other desired cross sectional form, and the strands may be arranged otherwise than concentrically and symmetrically.

If the cords are arranged approximately symmetrically and concentrically to the handle axis, the continuous cords must be so guided as to become arranged approximately evenly in an annular or tubular space around the handle axis.

For convenience in description, the portion of the machine at the left in Figs. 1, 2, and 7 will be herein termed the left hand end of the machine while the opposite end will be termed the right hand end of the machine; and the portions of the machine at the front and rear in Fig. 2 will be termed, respectively, the front and rear of the machine; and a line coinciding with the mop or brush handle axis, when the latter is in position in the machine, will be termed the axis or axial line of the machine.

The cords or strands, C, are brought into the machine from the left hand end, and the mop handle, D, is brought into the machine from or at the right hand end of the machine. Said handle is first placed shiftably into the machine, and after having been shifted lengthwise in connection with a portion of the operation of applying the cords, the handle is immovably secured and so held until the cords have been severed. The cords are drawn into the machine in a direction substantially parallel to the axial line of said handle, or the machine axis, by means of gripping mechanism mounted upon a car-

riage shiftable in a direction parallel to the machine axis.

The details of construction and operation of the particular form of my machine illustrated by the accompanying drawings are as follows:

At the left hand end of the frame, A, two standards, 1, 1, rise to a suitable height for supporting mechanism to be hereinafter described. At the opposite end of said frame, rise two similar standards, 2, 2. At a short distance above the frame, said standards, 1, 1 and 2, 2, support two fixed rails, 3, 3, said rails being parallel and in the same horizontal plane and one being supported by the front standards, 1 and 2, and the other by the rear standards, 1 and 2. Said rails constitute a track for the reciprocatory carriage to be hereinafter described. A spider, 4, is supported by the upper ends of the standards, 1, 1, bolts, 5, extending through opposite edge portions of said spider and said standards. (See Figs. 1, 2, and 3.) Said spider is concentric with the machine axis. It has radial arms, 6, apertures, 7, between the arms, and a central aperture, 8.

It is to be observed that the standards, 1, are stationary and that the spider, 4, is bolted immovably to said standards. In other words, said spider is a stationary member of the machine. Its prime function is to guide the cords, C, which are led to the machine from the left and extended through the apertures, 7, of said spider, an approximately equal number of said cords going through all said spaces. The second function of said spider is to guide a longitudinal reciprocatory shaft to be hereinafter described, said shaft extending through the aperture, 8, of the spider. Having pointed out that said spider is stationary, the reciprocatory carriage, 9, will be next described. This consists of the bridge-plate, 10, extending across the rails, 3, 3, and having eyes, 11, penetrated by said rails, a similar bridge-plate, 13, having eyes, 14, penetrated by said rails, and horizontal bars, 12, parallel to the rails, 3, and rigidly joined to said bridge-plates. The rails, 3, 3, extend loosely through said eyes, 11 and 14, and the carriage is, therefore, free to slide upon said shafts between the standards, 1, 1 and 2, 2. Near the left hand portion of the carriage rise two standards, 15, 15, to approximately the height of the standards, 1, 1 and 2, 2. The upper ends of said standards support between them a spider, 16, said spider being joined to said standards by means of bolts, 17, and being concentric with the machine axis. The spider has radial arms, 18, and apertures, 19, between said arms and a cylindric central opening, 20, similar to the aperture, 8, of the spider, 4, but larger. Extending through said aperture, 20, is a tube, 21, which is fitted loosely within said aper-

ture, so that it is slidable longitudinally therein. The sliding or reciprocation of said tube is limited by a fixed collar, 22, surrounding said tube at the left of the spider, 16, and another fixed collar, 23, surrounding said tube at the right of said spider. The distance between said collars is suited to the distance said tube is to be reciprocated during the operation of the machine, as will be hereinafter described. A shaft, 24, extends slidably through the aperture, 8, of the stationary spider, 4, and immovably through collars, 25, fixed within the left hand end of the tube, 21. Pins, 26, extend through the tube, 21, collars, 25, and said shaft, to secure said members to each other. At the right of the spider, 4, said shaft, 24, is surrounded by a collar, 27, which is secured in any suitable manner, as by a set-bolt, 28. At the left of the spider, 4, said shaft is surrounded by another collar, 29, secured by any suitable means, as by a set-bolt, 30. The function of said collar, 27, is to limit the movement of said shaft toward the left; and the function of said collar, 29, is to limit the movement of said shaft toward the right. By means of said set-bolts, said collars may be adjusted toward the right or left to vary the limits of reciprocation of said shaft with reference to said stationary spider, 4. As already described, said tube, 21, is reciprocable horizontally through the spider, 16, and such reciprocation is limited by the collars, 22 and 23. And, as already described, the carriage, 9, is reciprocable with reference to the standards, 1, and the spider, 4. From the foregoing it will be seen that said carriage and the tube, 21, may reciprocate to a limited extent, independently of each other. As to said tube and said shaft, it may be here observed that the latter is a passive element, power being applied to the tube to cause it to reciprocate, and said shaft being moved by the tube. And it is also well to state at this point that said shaft has no direct function of its own; that it is an auxiliary to said tube, its function being to support the left hand end of the tube. In other words, by means of said shaft the tube is, in effect, extended and given a second bearing, namely the bearing in the aperture, 8.

Telescoping within the right hand portion of the tube, 21, is another tube, 32, fitting the tube, 21, loosely and having in its left hand end a fixed head, 33, penetrated centrally by a screw-threaded shaft, 34, to which are applied two nuts, 35, one at each side of the head, 33. By adjusting said nuts, said shaft may be shifted longitudinally so as to extend a shorter or a longer distance from the right hand end of the tube, 32. Between the head, 33, and the adjacent collar, 25, an expanding coiled spring, 36, surrounds the adjacent ends of the shafts, 34, and 24. Said expanding spring presses said tube, 32, yield-

ingly toward the right. The longitudinal reciprocation of said tube, 32, is limited by a set-screw, 37, seated in the left hand portion of the tube, 21, and extending into a longitudinal slot, 38, in the tube, 32, said slot being of proper length and location to cause engagement between said screw and the wall of said tube at the end of said slot when said tube has moved the desired distance to the right or left with reference to the outer tube, 21. While the movement of said tube, 32, toward the left may be farther, for practical results, it need be only sufficient to bring all of said tube within the outer tube, 21, in order that the right hand end of said tube, 32, may, at the proper times, be moved out of the way of the mechanism gripping the cords to the handle.

At the right of the tube, 21, at a distance depending somewhat upon the length of the mop-handle, D, is located mechanism for supporting said handle with its axis coincident with the machine axis—in other words, axially in line with said tube. In the form shown in the drawings, such mechanism is as follows: Across the upper ends of the standards, 2, 2, is placed a bridge-plate, 39, which is secured to said standards by bolts, 40. Upon said bridge-plate, at the rear of the axial line of said tube is placed a jaw, 41, rising from a base, 42, secured to said bridge-plate by bolts, 43. At the opposite side of said axial line is located a similar jaw, 44, rising from a base, 45, having feet, 46, loosely embracing the lateral edges of said bridge-plate. In an interiorly-threaded bearing, 48, located upon the front end of the bridge-plate, 39, and having an axis transverse to the length of the machine, is a screw-threaded shaft, 47, having its rear end joined by a swivel-head, 49, to the base, 45. To the front end of said shaft is applied a hand crank, 50. By the rotation of said crank, said shaft, 47, may be driven forward whereby the jaw, 44, is driven toward the jaw, 41, and the mop-handle, D, located between said jaws is firmly engaged.

Upon the carriage, 9, are mounted two cord-gripping devices, 51 and 52. The function of the first of these is to periodically grip the cords, C, to the tube, 21, and the function of the other is to periodically grip the cords, C, to the handle. Said gripping devices are substantially duplicates. From the left hand edge of the bridge-plate, 13, rises a standard plate, 53, to which both of said devices are secured. At opposite sides of the upright plane of the machine axis are rigid, horizontal, bolt-form wrists, 54, extending through said plate toward the right hand end of the machine, and upon said arms are hinged a pair of gripping arms, 55, each of said arms rising almost to the tube, 21, and curving thence beneath and around the opposite side and across the top of said tube, said

arms crossing each other shear-fashion above and below the tube. Thus the tube is completely surrounded by the inner, curved edges of said two arms. Adjacent to said horizontal wrists, 54, each of the arms, 55, has a bell-crank arm, 56, extending toward said plane, one of said bell-crank arms extending above and over-lapping the other. A link, 57, joins said bell-crank arms, so that said gripping arms must move from and toward each other in unison. A hand lever, 58, is joined to the front gripping arm in any suitable manner, as by riveting or bolting. By pressing said hand lever downward, said gripping arms are drawn toward each other shear-fashion. By raising said hand lever, said arms are separated shear-fashion. The projecting ends of said gripping arms are long enough to keep said arms crossed over each other even when the hand lever is raised far enough to completely free the gripping edges of said arms from the cords surrounding the tube, 21. From said carriage, a rigid locking arm, 59, extends forward approximately parallel to said hand lever and almost to the front end of the latter, and there supports a lateral bracket, 60, beneath which said hand lever may be sprung when the latter has been depressed to its lower limit. Said arm and bracket constitute a means for locking said gripping device in engagement. Said arm, 59, is shown secured to the carriage by placing it against the left hand face of the standard plate, 53, and extending the horizontal wrists, 54, transversely through the arm, 59, as well as through said standard plate. The gripping device, 52, is similarly applied to said horizontal wrists, 54, and is composed of curved gripping arms, 61, and bell-crank arms, 62, and a link, 63, and a hand lever, 64, corresponding, respectively, to the gripping arms, 55, bell-crank arms, 56, link, 57, and hand lever, 58, in the gripping device, 51; but the gripping arms of the gripping device, 52, are adapted to approach each other more closely than are the corresponding arms in the gripping device, 51, in order that the device, 52, may grip the cords, C, around the mop-handle, D, which is of smaller diameter than is the diameter of the tube, 21. The locking arm, 59, has another bracket, 65, beneath which the hand-lever, 64, may be sprung when said lever has been depressed to its lower limit.

A washer plate, 66, may be placed between the standard plate, 53, and the gripping arms, 55; and a washer plate, 67, may be placed between the pairs of gripping arms, 55 and 61.

At the right of the gripping arms, 61, an upright yoke-plate, 68, is applied to the wrists, 54, said wrists penetrating said yoke. Washers, 69, surround said wrists between said yoke-plate and said gripping arms. At the right of said yoke-plate, nuts, 70, surround the threaded ends of said wrists.

To impart additional stability to said yoke-plate, the upper portion of its rear end is penetrated by a bolt, 71, which bolt also penetrates the adjacent portion of the standard-plate, 53. A spacing sleeve, 72, surrounds said bolt between said plates. The lower portion of the rear end and a corresponding portion of the front end of said yoke-plate are bent to the right in upright planes parallel to the machine axis. Between the ears, 73, thus formed is pivoted a knife guide, 74, a bolt, 75, extending horizontally through said ears and said guide. The front and the rear portions of said knife guide extend above the mass of cords to be cut; and between said portions, said guide is, preferably, of semi-circular form, so as to extend closely to the mass of cords and form an abutment for the latter when the knife presses downward. From its upper edge downward, in a plane to which the machine axis is perpendicular, said guide is provided with a slot, 76, of proper depth and width to receive a suitable cutting tool, as, for example, a long thin knife adapted to cut all the cords when the latter have been secured to the mop-handle. To impart stability to said guide when it is to be used, a short arm, 77, is applied to the left hand face of said guide in proper position to bear against the upper middle portion of said yoke-plate, and at the front of said guide an arm, 78, extends obliquely downward and toward the right and bears upon a wrist, 79, extending rearward from a standard, 80, rising from the front portion of the frame, A. Said standard is preferably secured to said frame by upright bolts, 81, extending through a longitudinal, upright slot, 82, in order that said standard and said wrist may be shifted to the right or the left for adjusting the engagement of said guide. The arm, 77, may be a continuation of a plate, 83, adapted to lie against the left hand face of the knife-guide, 74, and having a bolt, 84, extending through said plate, 83, and the guide.

When the carriage is moved toward the right, so that the arm, 78, is no longer in engagement with said wrist, 79, said knife-guide falls to the right, into the position shown in Fig. 7, the preponderance of weight of said guide being at the right of its hinge. In this position the arm, 78, rests against the lower edge of the yoke-plate, whereby the downward movement of the guide is limited.

For the reciprocation of the carriage and the parts supported thereby, any one of several means may be used. For this purpose, I have shown a crank and pitman mechanism.

From the lower face of the bridge-plate, 13, a lug, 86, extends downward. To said lug is hinged a pitman, 87, and said pitman

is hinged to the outer end of a crank-arm, 88, and said crank-arm is rigidly secured to a shaft, 89, resting transversely to the length of the machine in bearings, 90. By the partial rotation of said shaft clock-wise, said crank-arm is moved to the right and the right hand end of said pitman is moved upward and to the right, and said pitman as a whole, as well as the carriage, drawn to the right. And by partially rotating said shaft in the reverse direction, the crank-arm, pitman, and carriage are moved to the left. Said crank-arm and said pitman are preferably so constructed as to allow said members to become substantially parallel to each other when the crank-arm is turned to its full limit to the right. This is accomplished by terminating the right hand end of said pitman with a plate, 91, applied to each lateral side of the pitman and extending over each lateral side of the adjacent end of the crank-arm, and forming the hinge between said crank-arm and the pitman by extending a bolt, 92, horizontally through said plates and said crank-arm, the plates being curved downward, so as to bring said hinge below the lower face of said pitman a distance equal to one half the thickness of the crank-arm in an upright plane and in a direction perpendicular to said crank-arm. This construction permits the "folding" of said crank-arm and said pitman upon each other, and the angle of said plates, 91, to the body of said pitman may be sufficient to bring said hinge below a line extending from the axis of the shaft, 89, to the hinge at the left hand end of said pitman, in order that strain upon said pitman toward the left will tend to move the outer end of the crank arm downward instead of upward—in other words, throwing said pitman "over the center". By this construction, the carriage; when it reaches its limit to the right, is automatically locked against reverse movement from the strain of the cords, C.

For the purpose of reducing power required for operating the carriage, a sprocket wheel, 93, is mounted upon said shaft, and a relatively smaller sprocket wheel, 94, is mounted upon a shaft, 95, resting in bearings, 96, parallel to said shaft, 89, a sprocket chain, 97, is applied to said sprocket wheels, and a hand crank, 98, is applied to said shaft, 95.

The entire operation is as follows: The carriage being at its left hand limit, the desired number of cords or strands, C, of indefinite length are led by hand from large spools or other source through the spider, 4, thence through the spider, 16, and thence along the exterior of the tube, 21, and the inner tube, 32, and beyond the end of the latter to the plane of the knife slot in the knife guide. Then the grip, 51, is closed so as to press all the cords against the tube, 21.

Then a mop-handle, D, is put into position, the base end being inserted into the tube, 32, and made to bear against the screw shaft, 34, until the tube, 32, has been pressed to the left as far as it will go, the handle clamp being left open. Then the grip, 52, is closed, whereby the cords are all immovably pressed against the mop-handle. This gripping, it will be observed, is at a distance from the base of the handle equal, approximately, to what is to be the length of the mop head, or approximately equal to one half the length of the cord sections which are to be severed to form said head. Next, the grip, 51, is released from the tube, 21. The hand crank, 98, is then turned to move the carriage to the right. At the beginning of this movement the tube, 21, (the collar, 23, being not yet engaged) remains stationary. The mop-handle, which is, as above stated, now gripped by the gripping device, 52, and not engaged by the handle clamp, is carried with the carriage toward the right and thus made to slide through said clamp. While the carriage thus moves, the cords are all drawn toward the right, sliding through the spider, 4, and, during a portion of the movement, also through the spider, 16, namely, during the portion of said movement preceding the engagement of the collar, 23, by the spider, 16, whereby said tube is carried with the carriage. When the right hand limit of the movement of said carriage and said handle has been reached, said handle clamp is closed upon said handle. The cords are then tied to the mop-handle, close to the base end of the latter, by means of any suitable band, E, extending around said cords and handle. In this connection it is to be again observed that the gripping device, 52, gripped the ends of the cords at a distance above the base of the mop-handle equal to the length of the finished mop head. Thus the cords around the base of the handle are accessible for tying. Then the gripping device, 52, is opened and the carriage moved to its limit to the left, the spider, 16, and the gripping devices, 51 and 52 sliding along the cords, and the knife guide again assuming its upright position. Next the gripping device, 51, is again closed around the cords and the tube, 21, whereby said cords will be held after the partially completed mop has been detached. Now a knife is placed into the slot, 76, of the knife guide, 74, and drawn across the cords extending through said guide, whereby said cords are cut. Then the mop-handle clamp is opened and the mop-handle and the cord sections thereto attached are removed from the machine. The portions of the cord sections above the point of binding to the handle by the inner band, E, are then turned downward and the entire mass of cord sections tied by an outer band, F, adjacent to the inner band. Another mop handle is

then put into position in the machine, as before, and the operation repeated.

The function of the collar, 27, on the shaft, 24, at the right of the spider, 4, is to prevent movement of said shaft and the tube, 21, toward the left farther than said tube and shaft are drawn to the left by the spider, 16, when the latter is carried to the left by the movement of the carriage, 9, to the left. In the absence of said collar, 27, or some equivalent device, momentum of said shaft and tube, or the strain of the continuous cords, or the operations of gripping the cords to the tube, 21, or to the mop handle, D, or the insertion of the mop handle (whereby the inner tube is pressed to the left against the resistance of the spring, 36), or the cutting of the cords at the knife guide, might shift said tube, 21, and shaft, 24, to the left. The collar, 29, on the shaft, 24, at the left of the spider, 4, prevents said shaft and tube from moving to the right farther than they are positively drawn by the spider, 16, by reason of the engagement of the latter with the collar, 23, on the right hand portion of said tube. It will be observed that, in the absence of said collar, 29, said tube and shaft would be free to move to the right after the carriage has reached its right hand limit. Inasmuch as it is desirable that the ends of the cord sections in the finished mop be even with each other, it is important that the positions of said tube and shaft (at the right and at the left) be accurately maintained.

The tube, 21, constitutes an open or tubular receiver for the mop handle, into which receiver said handle may extend any distance adapted for the insertion of the handle within the tubular group of cords. Obviously, said receiver may be varied in form and dimensions. The telescoping or replaceable inner tube, 32, makes said receiver a lengthwise contractible receiver.

The purpose of the longitudinal movement of the handle receiver in the spider, 16, is to extricate the handle completely from the receiver after the ends of the cords, C, have been gripped to the mop handle, such extrication being necessary to make the left hand or base end of the handle and the surrounding portions of the cords accessible for applying the inner band, E. And such extrication must occur while the gripping device, 52, remains in engagement with the cords around the mop handle. Hence there must be a separation between the receiver and said gripping device, and inasmuch as the latter is relatively fixed upon the carriage, the receiver must move relative to the carriage and the spider, 16, which latter is fixed upon the carriage.

It will be understood that the mop or brush handles may be of any desired length relative to the length of the mop or brush head.

The tubular group of cords passing along the exterior of the space into which the handle is to be inserted may be guided more or less by the mechanical means described, said means being the spider, 4, the spider, 16, the exterior of the tube, 21, and the arms of the gripping device, 51. That is to say, portions of said guiding means may be omitted.

10 I claim as my invention:

1. In a machine for making mops and brushes, mechanism for holding the end portions of a plurality of continuous cords parallel to each other and surrounding a space of proper size and form to receive the end of a handle, substantially as described.

2. In a machine for making mops and brushes, mechanism for holding the end portions of a plurality of continuous cords parallel to each other and surrounding a space of proper size and form to receive the end of a handle, and a support for said handle, substantially as described.

3. In a machine for making mops and brushes, mechanism for holding the end portions of a plurality of continuous cords parallel to each other and surrounding a space of proper size and form to receive the end of a handle, a support for said handle, said support and said holding mechanism being relatively reciprocable in a path parallel to said cylindrical space, substantially as described.

4. In a machine for making mops and brushes, mechanism for holding the end portions of a plurality of continuous cords parallel to each other and surrounding a space of proper size and form to receive the end of a handle, and a knife guide adjacent said holding mechanism, substantially as described.

5. In a machine for making mops and brushes, mechanism for guiding and mechanism for periodically gripping the end portions of continuous cords in a tubular group, said mechanism being open for the introduction of a handle within, and approximately parallel to the axis of, said group of cords, substantially as described.

6. In a machine for making mops and brushes, mechanism for guiding and mechanism for periodically gripping the end portions of continuous cords in a tubular group, said mechanism being open for the introduction of a handle within, and approximately parallel to the axis of, said group of cords, and a knife guide adjacent said gripping mechanism, substantially as described.

7. In a machine for making mops and brushes, the combination of an open handle receiver and mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group to the exterior of said receiver, substantially as described.

8. In a machine for making mops and

brushes, mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group, said mechanism being open for the introduction of a handle within and approximately in line with said group of cords, and mechanism for gripping said cords to said handle, substantially as described.

9. In a machine for making mops and brushes, mechanism for supporting and guiding continuous cords in a tubular group and mechanism for gripping said cords, said mechanism being open along the axis of said tubular group for the insertion of a handle, and mechanism for gripping said cords to said handle, substantially as described.

10. In a machine for making mops and brushes, the combination of an open handle receiver and mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group to the exterior of said receiver, and mechanism for gripping said cords to said handle, substantially as described.

11. In a machine for making mops and brushes, mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group, said mechanism being open along the axis of said group, and mechanism for gripping said cords to a handle, said last mentioned mechanism and said first mentioned mechanism being relatively shiftable, substantially as described.

12. In a machine for making mops and brushes, the combination of an open handle receiver and mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group to the exterior of said receiver, and mechanism for gripping said cords to said handle, said last mentioned mechanism and said first mentioned mechanism being relatively shiftable, substantially as described.

13. In a machine for making mops and brushes, mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group, said mechanism being open along the axis of said group for the introduction of a handle, and a clamp for supporting said handle while said gripping mechanism is disengaged from said cords, substantially as described.

14. In a machine for making mops and brushes, the combination of an open handle receiver and mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group to the exterior of said receiver, and a clamp for supporting said handle while said gripping mechanism is disengaged from said cords, substantially as described.

15. In a machine for making mops and brushes, mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group, said mechanism

ism being open along the axis of said group for the introduction of a handle, mechanism for gripping said cords to said handle, said guiding and said gripping mechanisms being relatively shiftable, and a handle clamp for supporting said handle during the disengagement of said gripping mechanisms from said cords, substantially as described.

16. In a machine for making mops and brushes, the combination of an open handle receiver and mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group to the exterior of said receiver, mechanism for gripping said cords to said handle, said guiding and said gripping mechanisms being relatively shiftable, and a handle clamp for supporting said handle during the disengagement of said gripping mechanisms from said cords, substantially as described.

17. In a machine for making mops and brushes, mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group, said mechanism being open along the axis of said group for the introduction of a handle, and a handle clamp, said clamp and said gripping mechanism being relatively shiftable, substantially as described.

18. In a machine for making mops and brushes, mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group, said mechanism being open along the axis of said group for the introduction of a handle, and a knife guide, substantially as described.

19. In a machine for making mops and brushes, the combination of an open handle receiver, mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group to the exterior of said receiver, and a knife guide, substantially as described.

20. In a machine for making mops and brushes, the combination of an open contractible handle receiver, mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group concentric to said receiver, substantially as described.

21. In a machine for making mops and brushes, the combination of an open contractible handle receiver, mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group to the exterior of said receiver, substantially as described.

22. In a machine for making mops and brushes, the combination of an open contractible handle receiver, mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group concentric to said receiver, and mechanism for gripping said cords to said handle, substantially as described.

23. In a machine for making mops and brushes, the combination of an open contractible handle receiver, mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group to the exterior of said receiver, and mechanism for gripping said cords to said handle, substantially as described.

24. In a machine for making mops and brushes, the combination of an open contractible handle receiver, mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group concentric to said receiver, mechanism for gripping said cords to said handle, said last mentioned gripping mechanism and said receiver being relatively shiftable, substantially as described.

25. In a machine for making mops and brushes, the combination of a tubular handle receiver comprising two telescoping tubes relatively yielding longitudinally, mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group concentric to said receiver, substantially as described.

26. In a machine for making mops and brushes, the combination of an open handle receiver, comprising two telescoping tubes relatively yielding longitudinally, mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group to the exterior of one of said tubes, substantially as described.

27. In a machine for making mops and brushes, the combination of a tubular handle receiver comprising two telescoping tubes relatively yielding longitudinally, mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group concentric to said receiver, and mechanism for gripping said cords to the handle, substantially as described.

28. In a machine for making mops and brushes, the combination of an open handle receiver, comprising two telescoping tubes relatively yielding longitudinally, mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group to the exterior of one of said tubes, and mechanism for gripping said cords to the handle, substantially as described.

29. In a machine for making mops and brushes, the combination with mechanism for supporting and guiding continuous cords in a tubular group and mechanism for gripping the end portions of said cords, said mechanism being open along the axis of said tubular group for the insertion of a handle, and mechanism for limiting the insertion of said handle, substantially as described.

30. In a machine for making mops and brushes, the combination with mechanism for supporting and guiding continuous cords in a tubular group and mechanism for grip-

ping the end portions of said cords, said mechanism being open along the axis of said tubular group for the insertion of a handle, and adjustable mechanism for limiting the
5 insertion of said handle, substantially as described.

31. In a machine for making mops and brushes, the combination of a handle receiver comprising an outer tube and an inner longitudinally yielding tube having mechanism
10 for engaging the end of a handle, substantially as described.

32. In a machine for making mops and brushes, the combination of a handle receiver
15 comprising an outer tube and an inner longitudinally yielding tube having adjustable mechanism for engaging the end of a handle, substantially as described.

33. In a machine for making mops and
20 brushes, the combination of an open handle receiver and mechanism for guiding and mechanism for gripping the end portions of continuous cords in a tubular group concentric to said receiver, and mechanism for gripping
25 said cords to said handle, said last mentioned gripping mechanism and said receiver being reciprocable through courses differing in length, substantially as described.

34. In a machine for making mops and brushes, the combination with a frame, of a
30 carriage reciprocable upon said frame, a stationary receiver-guide mounted upon said frame, a tubular handle receiver mounted slidably upon said carriage and said stationary guide, and stops for limiting the reciprocation of said receiver with reference to said
35 carriage and stops for limiting the reciprocation of said receiver in said stationary support, substantially as described.

35. In a machine for making mops and
40 brushes, the combination of an open handle receiver and mechanism for gripping continuous cords in a tubular group concentric to said receiver, mechanism for gripping said cords to the handle, and mechanism for shifting
45 said last mentioned gripping mechanism, substantially as described.

In testimony whereof I have signed my name, in presence of two witnesses, this ninth day of January, in the year one thousand
50 nine hundred and five.

ERNEST KOELLA.

Witnesses:

J. C. HARRIS,
CYRUS KEHR.