B. M. W. HANSON & F. W. POST.

FEED MECHANISM.

APPLICATION FILED APR. 12, 1907.

905,520.

Patented Dec. 1, 1908.

2 SHEETS—SHEET 1.

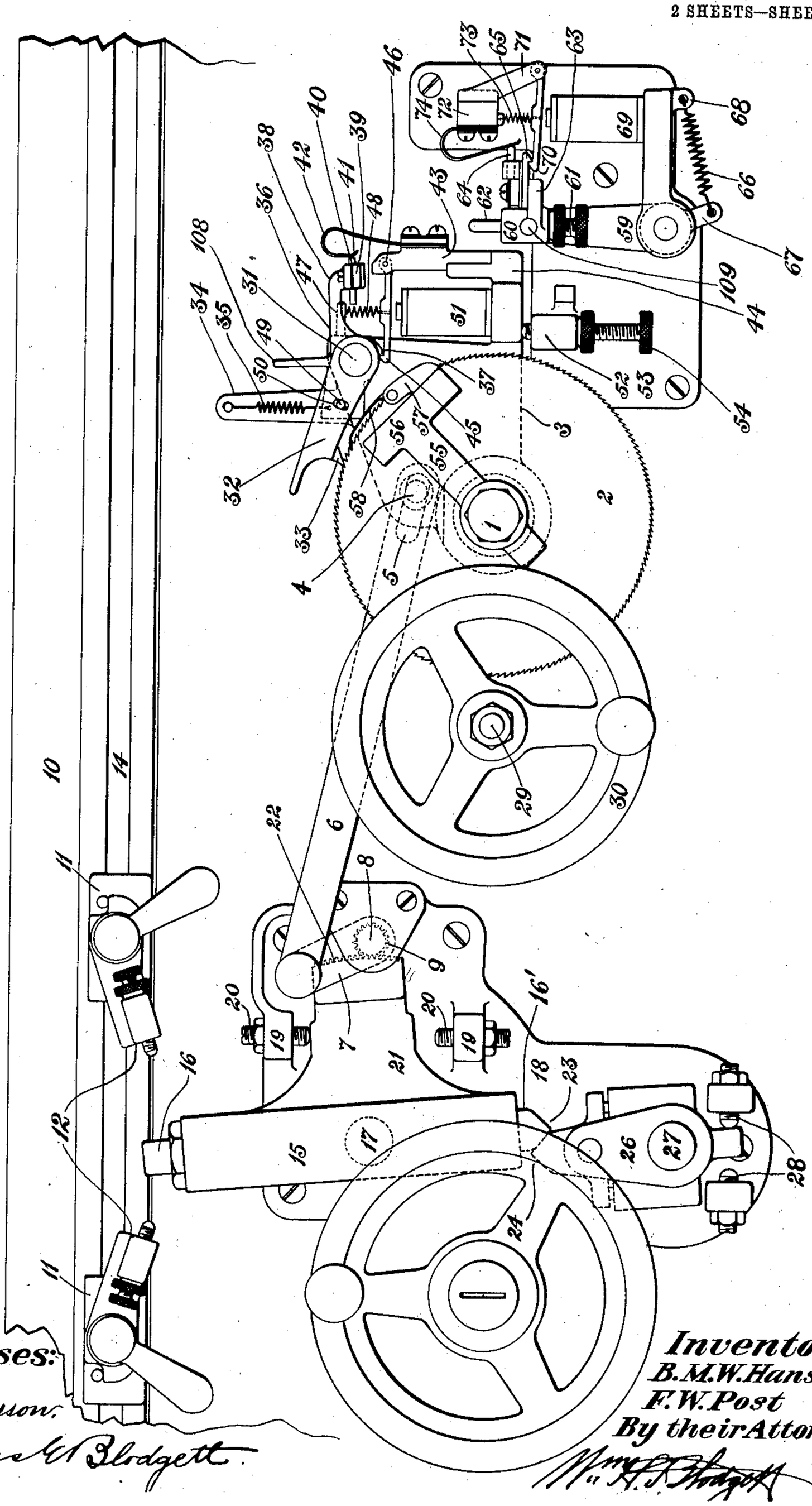

Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 2.

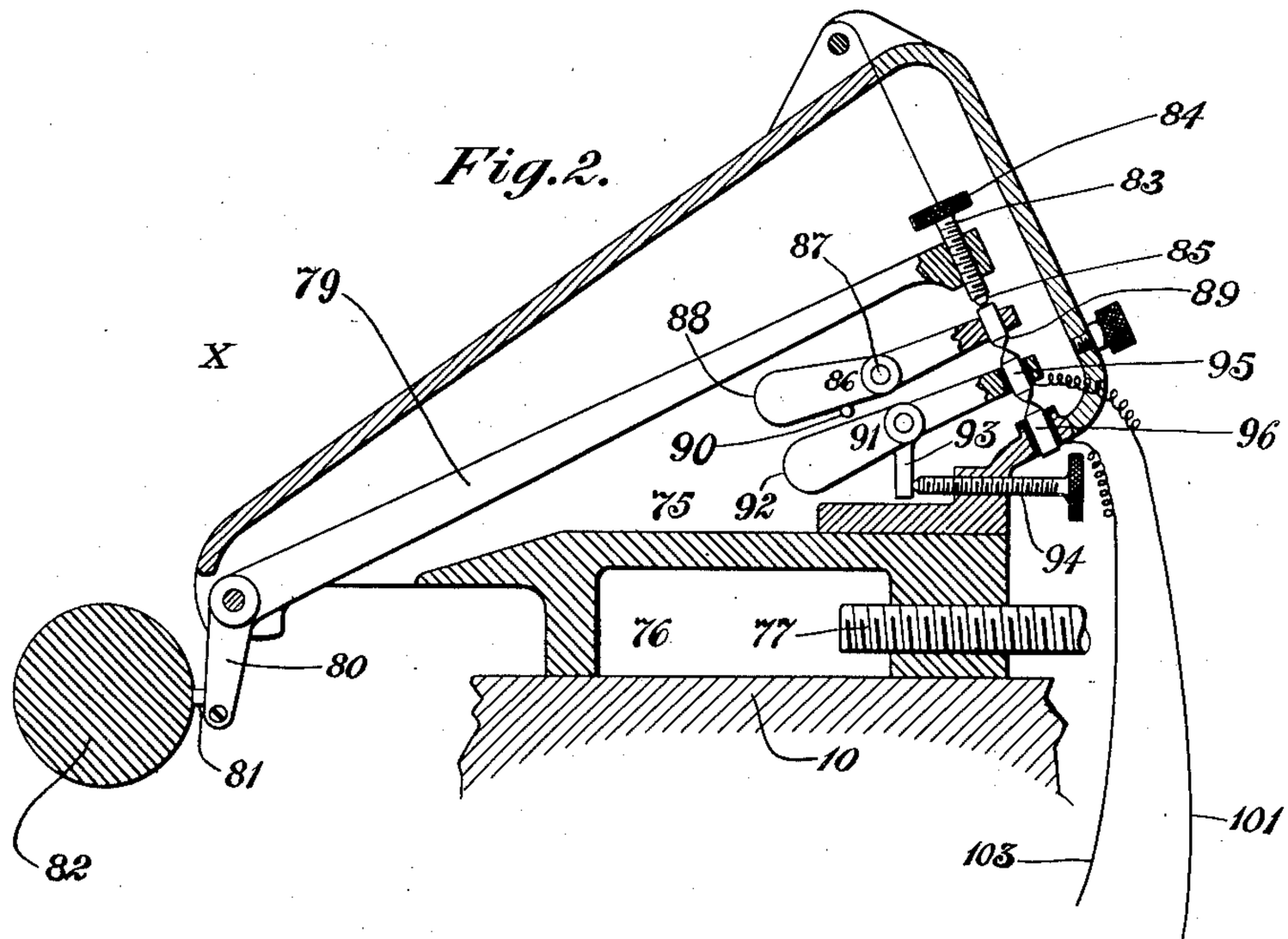
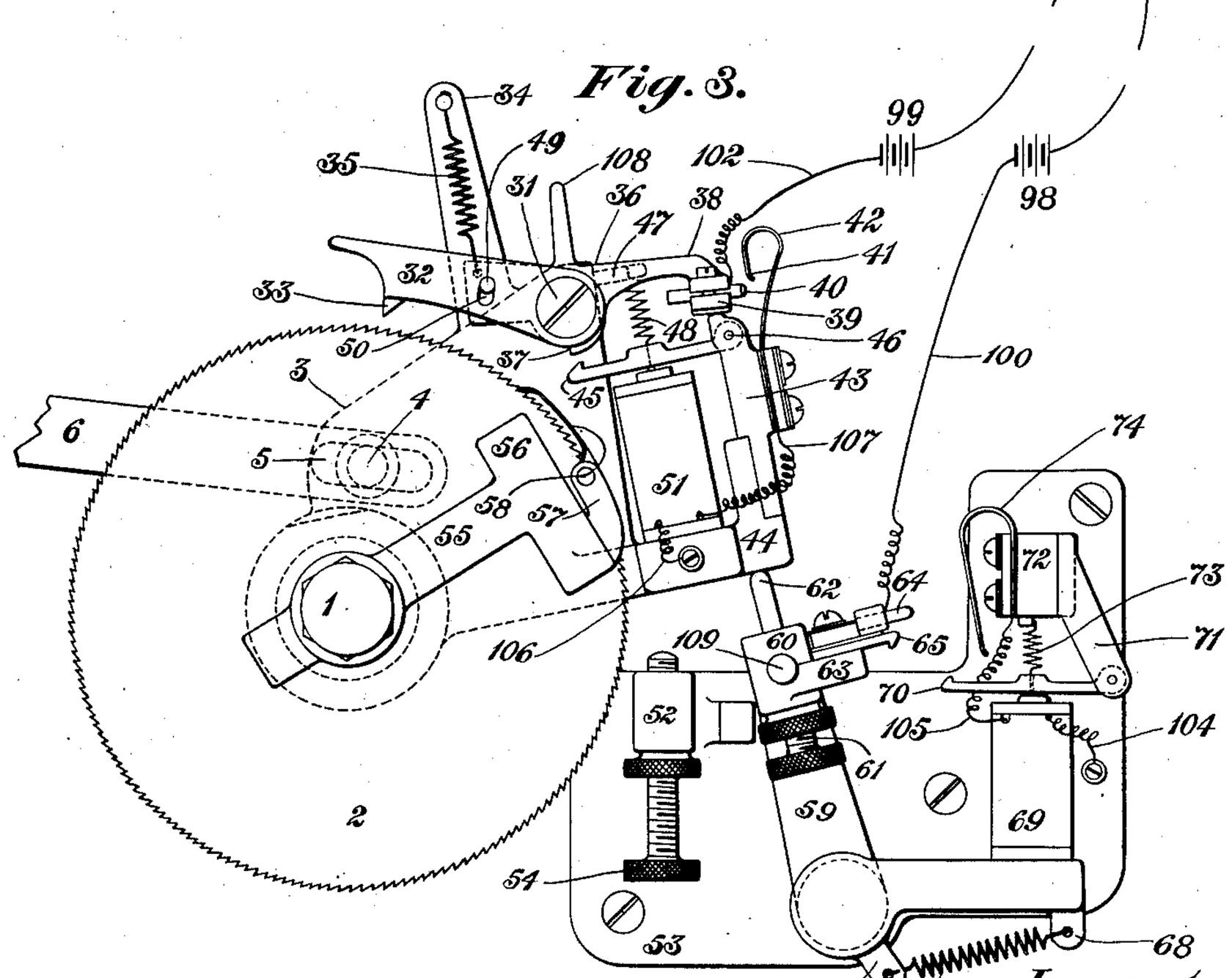


Fig. 3.



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UNITED STATES PATENT OFFICE.

BENGT M. W. HANSON AND FREDERICK W. POST, OF HARTFORD, CONNECTICUT, ASSIGNORS TO PRATT & WHITNEY CO., OF HARTFORD, CONNECTICUT, A CORPORATION OF NEW JERSEY.

FEED MECHANISM.

No. 905,520. Specification of Letters Patent. Patented Dec. 1, 1908.

Application filed April 12, 1907. Serial No. 367,848.

To all whom it may concern:

Be it known that we, BENGT M. W. HANSON and FREDERICK W. POST, citizens of Sweden and the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Feed Mechanism, of which the following is a specification.

This invention relates to feed-mechanism for metal-grinding and other reducing-machines, and is shown applied to a machine in which a cylinder is submitted to a grinding-operation, but is, in some of its details, applicable for use in other relations and in various arts.

In machines for the purpose stated heretofore in use objectionable sparking occurs between the contact-points controlled by the "feeler" in engagement with the work, thereby causing corrosion of the same, and consequently such deterioration in working, that the required precisionized accuracy of the mechanism may be more or less affected.

Our invention is intended to obviate the objectionable results heretofore accruing to a greater or less extent, and due to the vibration of the levers carrying the contact-points in the circuit controlled by the "feeler", as will presently be described.

In the accompanying drawings, Figure 1 is a side elevation of part of a grinding-machine, showing part of the platen-reversing mechanism in connection with elements of the cross-feed mechanism for advancing the tool-carriage toward the work. Fig. 2 is a view partially in section of mechanism for controlling contact-points which are adapted to complete an electric-circuit, thereby operating parts of the feed-mechanism. Fig. 3 is a view of the feed-mechanism showing the electrical connections with the contact-mechanism shown in Fig. 2, and also showing the parts thereof in their tripped position.

Like numerals designate similar parts, throughout the several views.

Referring to the drawings, the numeral 1 designates a shaft of mechanism (not illustrated) which may operate a device for feeding a carrier for a reducing-tool, and rigid with said shaft is a ratchet-wheel 2. At one side of said ratchet-wheel and preferably loosely mounted on the hub thereof, is a plate 3, in which is fixed a stud 4 entering a slot 5 in the inner end of a link 6, connected at its opposite extremity with an arm 7 rigid with a shaft 8 carrying a pinion 9.

Designated by 10 in Fig. 1 is a table or platen, and by 11 are separated slides carrying dogs 12, said slides being adjustable in a groove 14 of the platen.

Referring to Fig. 1 the numeral 15 designates a barrel in which is mounted a stud 16, said barrel being pivoted at 17 on a plate 18 provided with lugs 19, in which are threaded screws 20. Projecting from the barrel is an extension 21 provided with a segmental rack 22 in mesh with the pinion 9 before described. At its lower end a rod 16′ is double beveled at 23, and said end engages as the barrel is rocked in either direction the oppositely-beveled end 24 of an arm 26 which is pivoted at 27, and limited in its movements by screw-studs 28.

On the feed-shaft 29 of the machine is a hand-wheel 30, by which said shaft may be manipulated.

As thus far described the mechanism is not of our joint invention, it being fully set forth in the application of B. M. W. Hanson, filed October 13, 1906, Serial No. 338,864.

Pivoted on a stud 31 of swinging plate 3 is a pawl 32 having a tooth 33 adapted to engage the ratchet-wheel 2. To a standard 34 of plate 3 is attached one end of a spiral-spring 35, while the opposite extremity of said spring is connected to a lever 36 which is pivoted on stud 31 back of pawl 32. At the under side of the hub of lever 36 is formed a catch 37, and projecting from said hub is an arm 38 having a split clamp 39 in which is adjustably mounted a contact-pin or point 40 shown in Fig. 1 in engagement with a contact-stop 41 having a loop or crook-shaped top 42 at its upper end, the shank of said strip being clamped to a standard 43 rising from an arm 44 of the swinging plate 3.

In engagement with catch 37 of lever 36 is a latch 45 pivoted at 46 to the standard 43. Connected at one end to said latch and at the other to a pin 47 is a spring 48 the stress of which tends to hold the latch in engagement with the catch, as shown in Fig. 1.

A pin 49 projects from lever 36 into a slot 50 in pawl 32 so that when latch 45 is tripped, and said lever is acted upon by

spring 35, said pawl 32 will be disengaged from ratchet-wheel 2, as shown in Fig. 3.

Mounted on the arm 44 of plate 3 is an electro-magnet 51, and below said arm, and working in a lug 52 of a frame-plate 53 is a screw 54 for limiting the descent of the swinging-arm 3.

An arm 55 is adjustable around the hub of the ratchet-wheel 2, and is provided with a head 56, having on its top a fixture 57 to which is pivoted a shield 58.

Pivoted on the plate 53 is a lever 59 having a head 60 in which is secured for vertical adjustment a screw 61, having a stop 62 at its upper end, and on a horizontal arm 63 of said lever is secured a contact-pin 64, and a catch 65.

A spring 66 is secured at one end to an arm 67 of the lever, and at the other extremity to a lug 68 of the frame-plate 53.

An electro-magnet 69 is mounted on a seat of the frame-plate, and latch 70 is pivoted to an arm 71 projected from a head 72 of said plate, while a spring 73 normally tends to lift the latch 70 and to hold it in engagement with the catch 65, as shown in Fig. 1.

A curved or bowed contact-strip 74 is secured to the inner side of the head 72, and when the feed is in operation, is in engagement with the contact-pin 64, but when the magnet 69 is energized in a manner soon to be described the spring 66 will throw arm 59 to the position shown in Fig. 3, and the circuit will be broken.

Adjustably secured to the table or platen 10 is a sizing-device designated in a general way by X and involving a casing 75 having a base 76 adjustable transversely of the carriage by a screw 77. In this casing is pivoted an angle-lever constituting a feeler member or movable dimensioning device, having a long arm 79, and a short arm 80, the latter carrying a feeler 81, shown in Fig. 2 in contact with the work 82. In the free end of the long arm 79 of the angle-lever is threaded a screw 83 having a knurled head 84 and a contact-point 85. A lever 86 is pivoted at 87 in the casing, is weighted at one end at 88, carries at the opposite end a contact-point 89, and is limited in movement by a stop-pin 90. Below this lever is a second lever 91 having a weighted end 92, and a depending arm 93, adapted to engage a stop-screw 94, said lever 91 carrying an insulated contact-point 95. A third contact-point 96 is inserted in a bushing 97 composed of insulating-material and located in the lower part of the casing X.

Electric batteries 98 and 99 are illustrated in Figs. 2 and 3, and from one pole of battery 98 extends a wire 100 to the contact-pin 64, while from the other pole of said battery a wire 101 leads to the contact-point 95 of lever 91. From battery 99 a wire 102 leads to contact-point 40, and another wire 103 to point 96 of the casing X, while a wire 104 leads from the machine-frame to magnet 69, and a wire 105 leads from said magnet to strip 74. In a similar manner a wire 106 leads from the machine-frame to magnet 51, and a wire 107 leads from said magnet to strip 42.

The operation of the sizing device is as follows: As the diameter of the stock 82 is decreased by the reducing-tool, the contact-points 89 and 95 carried by the levers 86, 91 which are properly adjusted by screws 83 and 94, gradually approach each other until the stock is sufficiently reduced to require a finer or finishing "cut", then the points meet and complete a circuit from battery 98 through wire 101 the machine frame, wire 104, magnet 69, wire 105, strip 74, contact-pin 64 and wire 100, thereby energizing magnet 69 and causing latch 70 to be drawn downward so as to release the catch 65, which allows the arm 59 to be thrown to the position shown in Fig. 3 by action of spring 66. As soon as arm 59 is tripped the contact between point 64 and strip 74 is released, and consequently, the circuit above mentioned is broken, thereby preventing objectionable sparking between points 89 and 95.

In the tripped position of arm 59 the end 62 of the screw 61 falls within the path of the oscillating arm or plate 3, and acts as a stop to reduce the arc of travel of said arm when it returns to normal position.

It is obvious that with the reduced throw of pawl 32 the action of the feed mechanism is limited and hence a finer feed will now be imparted. This fine feed continues until the stock is reduced to the desired precisionized diameter when the points 95 and 96 will come in contact with each other and establish a circuit from battery 99, wire 103, points 96, 95, the machine-frame, wire 106, magnet 51, wire 107, strip 42, contact-point 40, and wire 102, thereby energizing magnet 51 which trips latch 45 and releases lever 36, whereupon contact between point 40 and strip 42 is immediately broken and the pawl 32 is thrown out of engagement with ratchet-wheel 2 by spring 35 thereby further and finally limiting the feed mechanism in such manner that no further movement of said ratchet-wheel can take place.

The function of the contact-point 40 and strip 42 is identical with that of point 64 and strip 74, that is to prevent continual current through the electrical connections.

The lever 36 and arm 59 may be readily re-set to the normal position shown in Fig. 1 by means of the handles 108, and 109, respectively.

Changes may be made in various details of the mechanism without departure from the spirit of the invention.

Having thus described our invention, what we claim is:

1. The combination of an automatically-operative feeler member, feed-mechanism, an electric circuit having a member provided with means for limiting the action of the feed mechanism, means operative with the feeler member for closing said circuit to thereby cause said limiting action, and automatically-operative means for opening said circuit substantially at the time the feed mechanism is thus limited, whereby sparking in said circuit will be prevented.

2. The combination of an automatically-operative feeler member, feed mechanism, an electric circuit having a member provided with means for limiting the action of the feed mechanism and also having two contacts one of which is movable into engagement with the other by said feeler member to thereby close the circuit and cause said limiting action, and automatically-operative means for opening said circuit immediately following the closing thereof to prevent sparking between or at said contacts.

3. In feed-mechanism, the combination, with a reciprocatory table and with reversing-mechanism, of strips for operating said reversing mechanism; a pitman; a ratchet-wheel actuated by said pitman; a shaft to which the ratchet-wheel is secured; an arm or plate movable around the shaft; a pawl carried by the arm; a latch for engaging the pawl; means for tripping the latch; and means for reëngaging the latch with the pawl.

4. In feed-mechanism the combination, with a reciprocatory table and with reversing-mechanism, of strips for operating said reversing-mechanism; a pitman; a ratchet-wheel actuated by said pitman; a shaft to which the ratchet-wheel is secured; an arm or plate movable around the shaft; a pawl carried by the arm; a latch for engaging the pawl; means for tripping the latch; means for reëngaging the latch with the pawl; and electrically controlled devices for operating the latch, and for preventing sparking between the electric connections.

5. The combination, with a shaft, of a ratchet-wheel rigid therewith; an arm or plate movable around the shaft; a pawl carried by the arm, and in engagement with said ratchet-wheel; a latch for said pawl; means for tripping the latch; an electric-circuit connected with the latch; and means for preventing sparking between the electrical connections.

6. The combination, with a shaft, of a ratchet-wheel rigid therewith; an arm or plate movable around the shaft; a pawl carried by the arm, and in engagement with said ratchet-wheel; a latch for said pawl; means for tripping the latch; an electric-circuit connected with the latch; means for preventing sparking between the electrical connections; electrically-controlled means for limiting the operation of the arm.

7. The combination, with a shaft, of a ratchet-wheel rigid therewith; an arm or plate movable around the shaft; a pawl carried by the arm, and in engagement with said ratchet-wheel; a latch for said pawl; means for tripping the latch; an electric-circuit connected with the latch; means for preventing sparking between the electrical connections; electrically-controlled means for limiting the operation of the arm; and a latch for said electrically-controlled means.

8. The combination, with a shaft, and a ratchet-wheel rigid therewith; an arm or plate movable around said shaft; a pawl carried by the arm, and in engagement with the ratchet-wheel; means for latching said pawl; means for tripping the latch; means for withdrawing the pawl after the latch has been tripped; electrically-controlled devices for actuating the latch-tripping means; a circuit; and means for preventing sparking between contact-points in said circuit.

9. The combination of an automatically-operative member governed by the work, a feed device, an electric-circuit having a member provided with means for controlling said feed-device, said automatically-operative member having means for closing the circuit at a predetermined point, and means operative with the feed-device for opening the circuit and preventing sparking therein.

10. The combination of an automatically-operable member governed by the work, feed-mechanism, an electric circuit having means in connection therewith for controlling the feed-mechanism, said automatically-operable member controlling the circuit, and automatically-operative means for also controlling said circuit and preventing sparking therein.

11. The combination of an automatically-operative member governed by the work, feed mechanism, an electric circuit having means in connection therewith for controlling the feed mechanism, the automatically-operative member serving to close the circuit at a predetermined point, and automatically-operative means for subsequently breaking said circuit and also preventing sparking therein.

12. The combination, with a shaft, and with a ratchet-wheel rigid therewith, of an arm movable around the shaft; a pawl carried by the arm, and in engagement with the ratchet-wheel; a latch for said pawl; a shoe movable with the ratchet-wheel, and adapted to raise the pawl; and means for tripping the latch; electric devices for actuating said means; and means for preventing sparking between the contact-points of said electric-devices.

13. The combination, with a dimensioning apparatus, of movable contact-points, constituting a part thereof, a device carrying one of said contact-points, and having a "feeler" in engagement with the work; a circuit; a shaft; an arm movable around said shaft; a pawl on said arm; a ratchet-wheel carried by the shaft, and with which the pawl engages; a latch engaging a part of the pawl; an electro-magnet for tripping the latch; and means for preventing sparking between the contact-points of the electric-circuit.

14. The combination, with a dimensioning apparatus, of movable contact-points, constituting a part thereof, a device carrying one of said contact-points, and having a "feeler" in engagement with the work; a circuit; a shaft; an arm movable around said shaft; a pawl on said arm; a ratchet-wheel carried by the shaft, and with which the pawl engages; a latch engaging a part of the pawl; an electro-magnet for tripping the latch; means for preventing sparking between the contact-points of the electric circuit; and means for reducing the movement of the movable arm.

15. The combination, with a carriage, and with a sizing-device carried thereby, of a "feeler" carried by an element of said sizing-device; electrical-connections operated by the "feeler"; a circuit; feed-mechanism controlled by said circuit; and means for preventing sparking between the contact-points of the electrical connections operated by the "feeler".

16. The combination of a movable dimensioning-device, an electric circuit comprising a magnet and a pair of contacts one of which latter is operable by said dimensioning-device, feed-mechanism, an automatically-operative controlling member for governing the action of the feed-mechanism, a latch for holding the said automatically-operative controlling member against action and adapted to be operated by the magnet to release said controlling-member, and means for opening the circuit automatically when the controlling member is released to prevent sparking at said contacts.

17. The combination of a movable dimensioning-device, a ratchet-wheel, a pawl for operating said ratchet-wheel, an oscillatory carrier for said pawl, an automatically-operable member movable to limit the movement of said carrier, a latch for normally holding said automatically-operable member against movement, a latch for normally holding the pawl against movement; separate electric circuits including contact points operable by said dimensioning-device and magnets for operating said latches, and means for opening the circuits automatically on the operation of the latches.

18. The combination of a movable dimensioning-device, an electric-circuit comprising a magnet and contacts operable by said dimensioning-device, feed-mechanism, an automatically-operable controlling-member for the feed-mechanism, means controlled by the magnet for holding said controlling-member against movement and for releasing the same on the energization of said magnet, and automatically-operable means for opening the circuit substantially simultaneously with the energization of said magnet to prevent sparking at said contacts.

In testimony whereof we affix our signatures in presence of two witnesses.

BENGT M. W. HANSON.
FREDERICK W. POST.

Witnesses:
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W. M. BUSHNELL.