

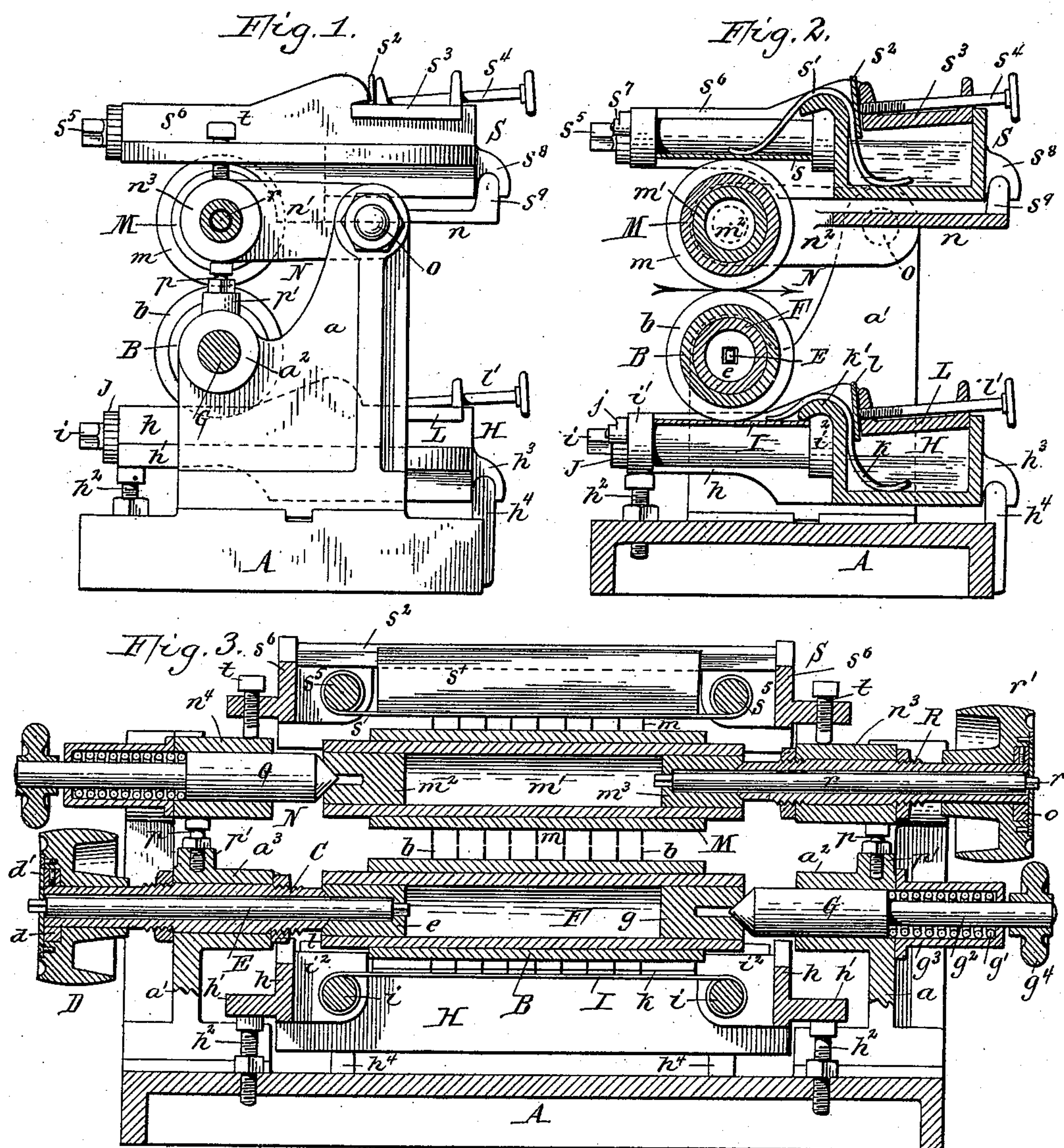
(No Model.)

3 Sheets—Sheet 1.

F. HART.
RULING MACHINE.

No. 497,472.

Patented May 16, 1893.



Witnesses:
Theo. L. Popp.
C. F. Seyer

Frederick Hart, Inventor.
By Edward Wilhelm
Attorney.

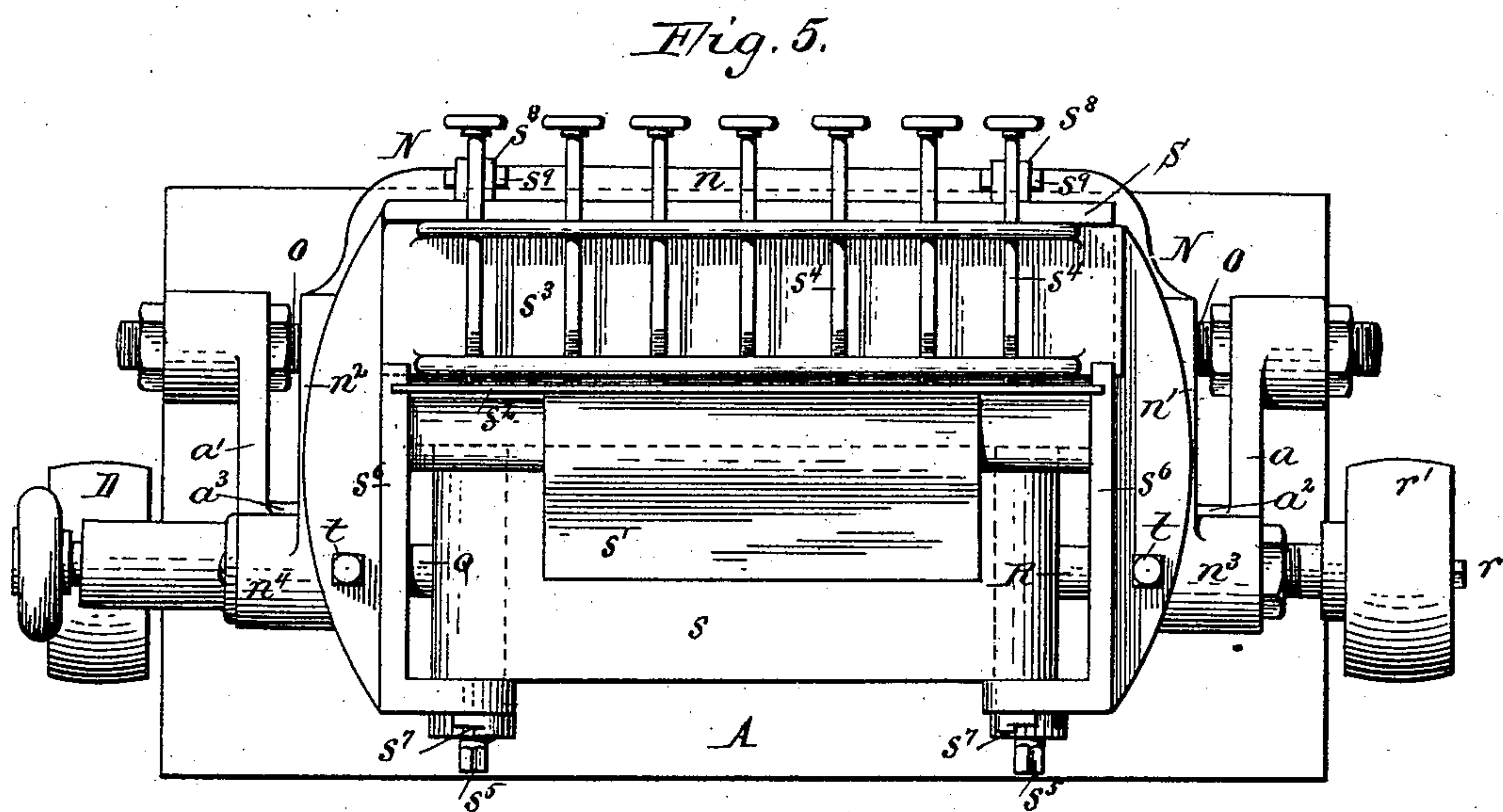
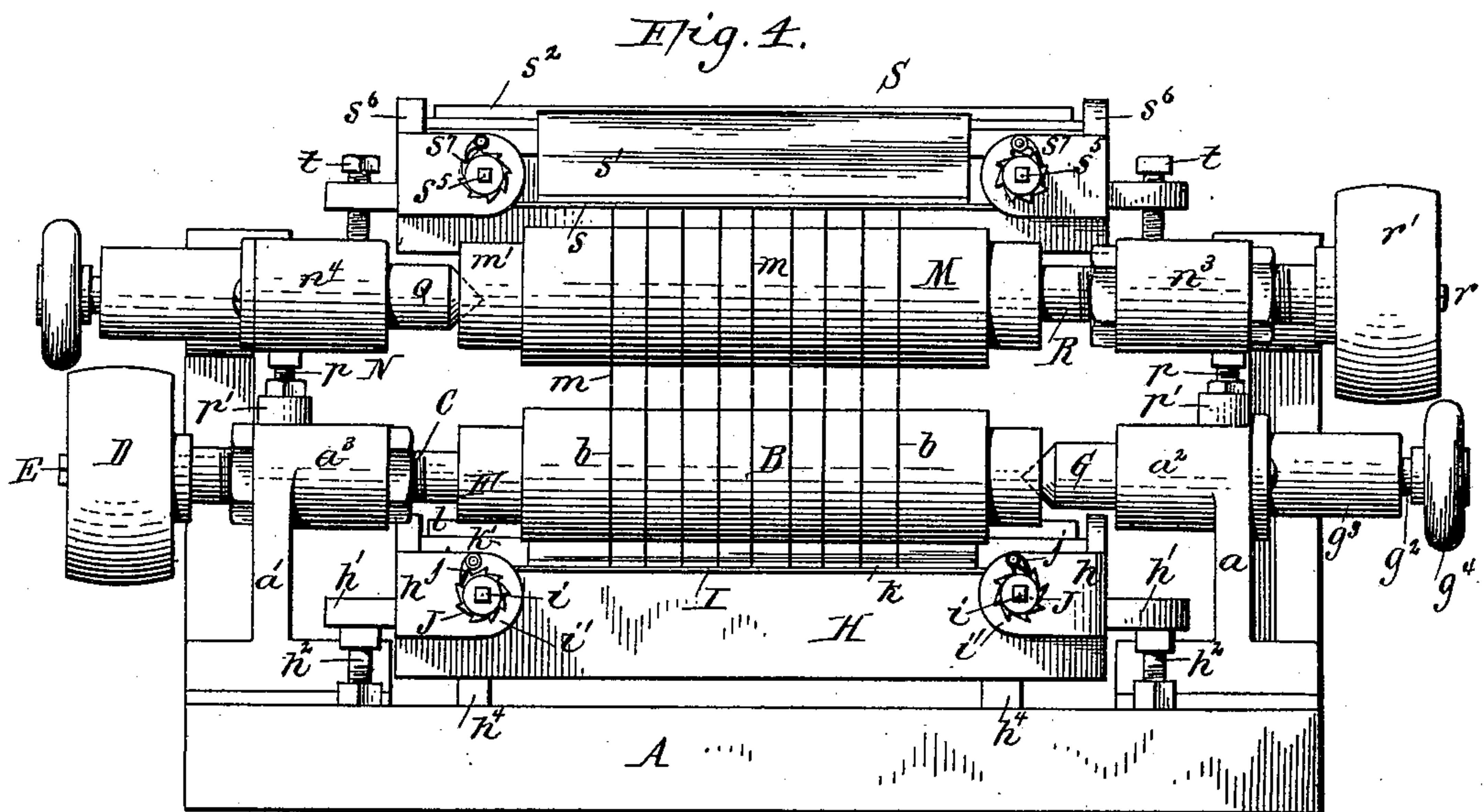
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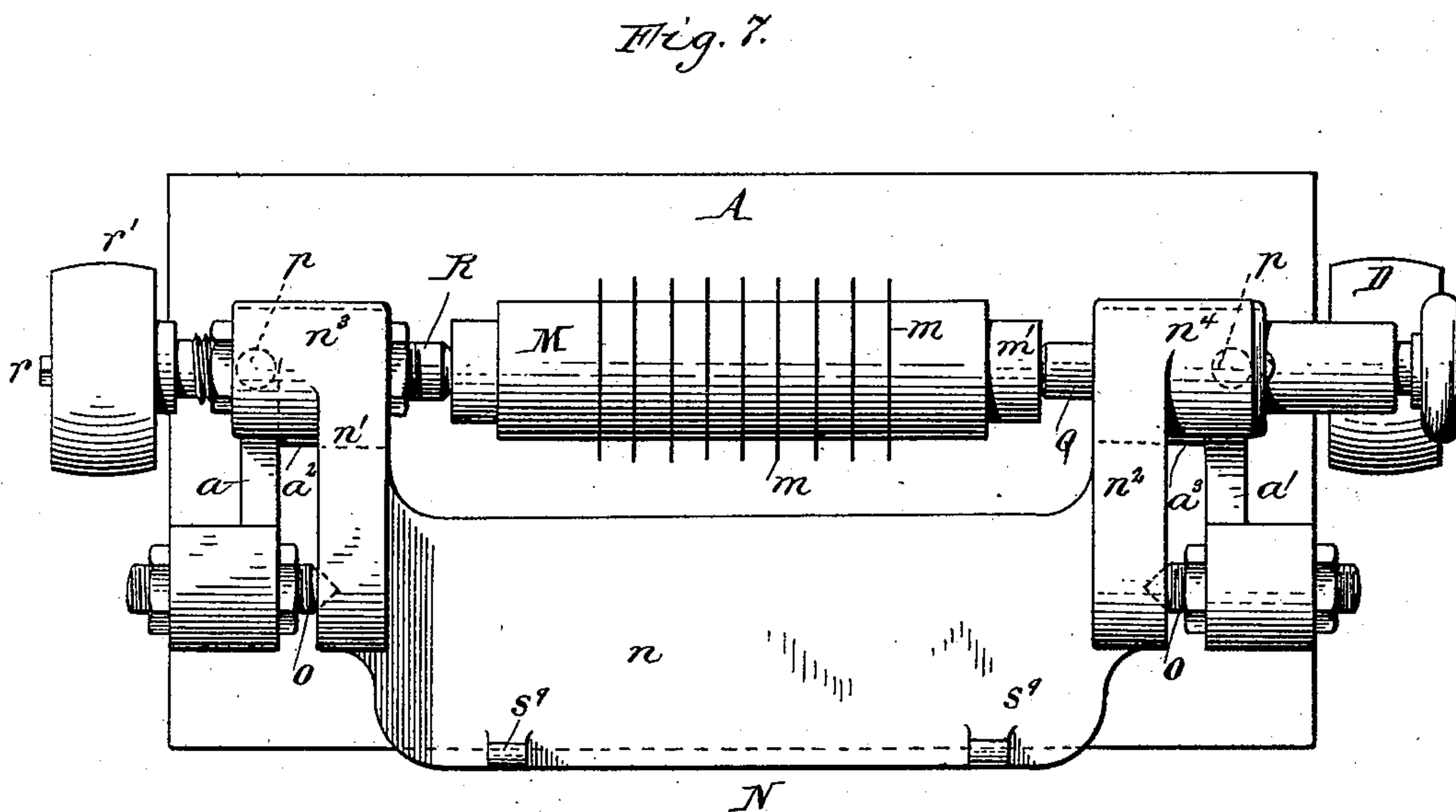
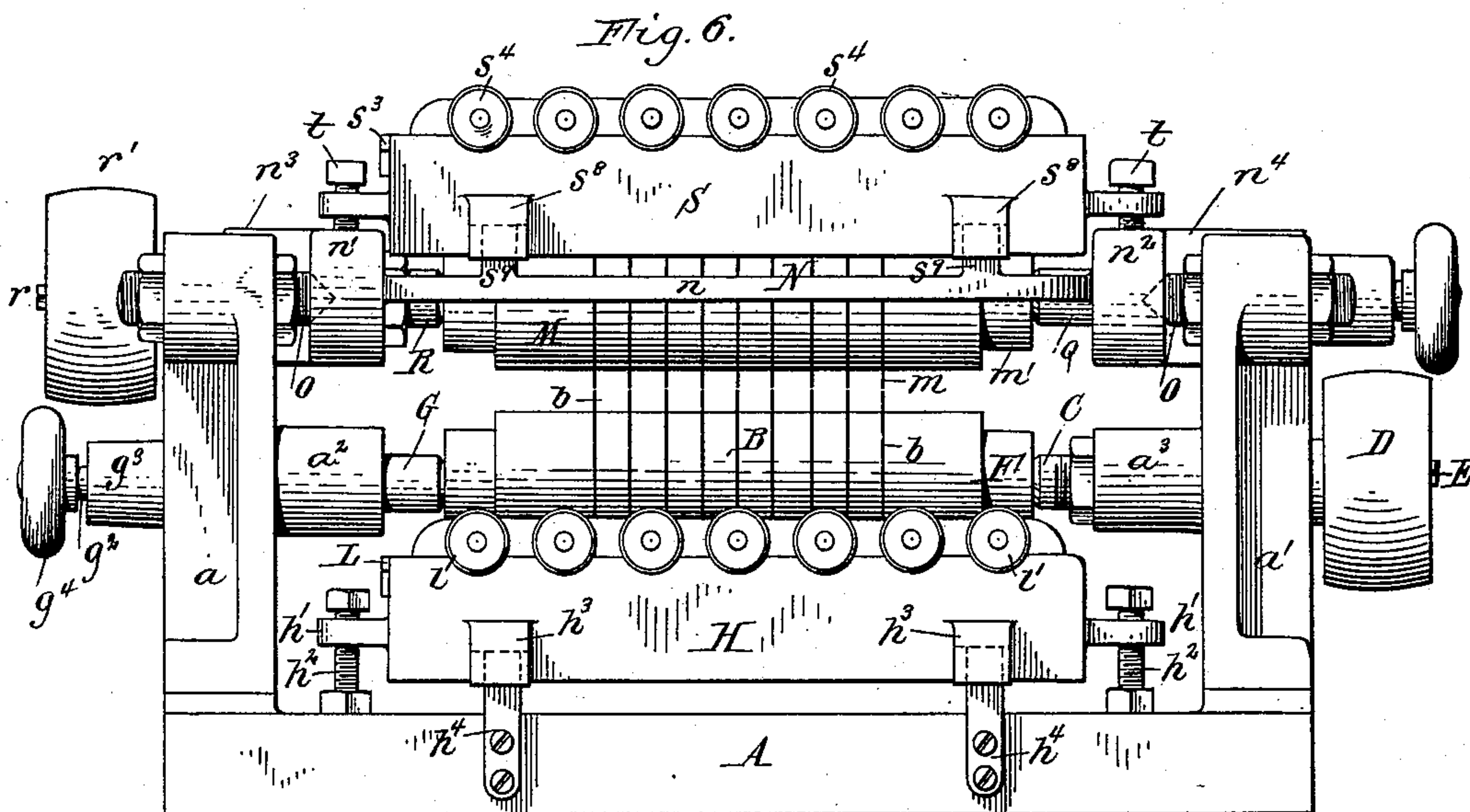
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Attorney.

UNITED STATES PATENT OFFICE.

FREDERICK HART, OF POUGHKEEPSIE, ASSIGNOR TO D. H. BURRELL & CO., OF LITTLE FALLS, NEW YORK.

RULING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 497,472, dated May 16, 1893.

Application filed June 17, 1889. Serial No. 314,640. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK HART, a subject of the Queen of England, residing at Poughkeepsie, in the county of Dutchess and State of New York, United States of America, have invented new and useful Improvements in Ruling-Machines, of which the following is a specification.

This invention relates to that class of ruling machines in which rotating ruling rings or disks are employed, and has for its object to produce a simple, compact and efficient machine of this character.

In the accompanying drawings consisting of three sheets:—Figure 1 is an end elevation of my improved ruling machine partly in section. Fig. 2 is a vertical cross section thereof. Fig. 3 is a vertical longitudinal section thereof. Fig. 4 is a front elevation of the machine. Fig. 5 is a top plan view thereof. Fig. 6 is a rear elevation of the machine. Fig. 7 is a top plan view of the upper ruling cylinder and its supporting frame.

Like letters of reference refer to like parts in the several figures.

A represents the base plate of the machine, and a a' vertical frames secured to the base plate at both ends thereof. These end frames are provided respectively with horizontal bearings a^2 a^3 formed at the front sides of the end frames, and supporting the devices by which the lower ruling cylinder B is supported and centered.

C represents a sleeve which is secured in the bearing a^3 by screw nuts applied to the sleeve on opposite sides of the bearing, and which projects inwardly and outwardly from said bearing. The outwardly projecting portion of this sleeve forms a hollow stud on which is mounted the pulley D by which the lower ruling cylinder is rotated. This pulley is held against lateral movement on the sleeve by a collar d which is secured to the outer end of the sleeve and projects into an annular recess in the outer side of the pulley, the outer side of which recess is closed by a detachable plate d' . This plate is provided at its center with a square opening in which engages the square outer end of the driving shaft E of the lower ruling cylinder. This driving shaft passes loosely through the sleeve

C and extends beyond the inner end of the sleeve. The square inner end of the driving shaft enters a correspondingly shaped opening in the inner end of a bushing e , which is secured in one end of a tube or hollow cylinder F to which the lower ruling cylinder B is firmly secured. The inner end of the sleeve C is made conical and projects into a conical cavity formed in the outer end of the bushing e , so that the latter can readily center itself upon the sleeve.

In the bearing a^2 is arranged a horizontal sliding bolt G which projects inwardly from the bearing and enters with its conical inner end a correspondingly shaped cavity formed in a bushing g which is secured in the adjacent end of the sleeve F. This sliding bolt is pressed inwardly against the cylinder by a spring g' which surrounds the stem g^2 of the sliding bolt and is arranged in a casing g^3 secured to the outer side of the bearing a^2 . The stem g^2 of the sliding bolt is provided on the outer side of the casing with a thumb piece g^4 by which the sliding bolt can be pulled outwardly when it is desired to remove the lower ruling cylinder.

H represents the ink fountain from which the lower ruling cylinder is supplied with ink, and which is arranged in rear of and below the ruling cylinder, and above the base plate A. This ink fountain is provided at both ends with arms h which project forwardly between the side frames a a' , and which are provided at their front ends with outwardly projecting lugs h' resting upon set screws h^2 by means of which the front ends of the arms can be raised and lowered. The frame formed by the ink fountain H and the arms h is supported at its rear end by hooks h^3 formed on the ink fountain, and resting upon upwardly projecting lugs h^4 secured to the rear side of the base plate A.

I represents an ink ribbon or apron which is arranged lengthwise underneath the lower ruling cylinder B so as to bear against the lower portions of the ruling rings b of the same and supply ink thereto. This ink ribbon is arranged lengthwise in front of the ink fountain H and its end portions are wound upon rollers i which are journaled in lugs i' i^2 formed respectively at the outer ends of the

arms h and the front wall of the ink fountain. These rollers are provided at their outer ends with ratchet wheels J and pawls j so that the ribbon can be moved in the direction of the axis of the ruling cylinder and new portions of the ribbon be brought in contact with the ruling rings when required. The ink is elevated from the ink fountain to the ink ribbon by means of a broad wick k which is immersed with its lower end in the ink in the fountain and rests with its upper end upon the ribbon. The front wall of the ink fountain is provided with a curved lip k' for supporting the upper portion of the wick. This wick is preferably constructed of flannel, but it may be constructed of any other material which has the necessary capillary action.

L represents the cover of the ink fountain which rests in notches formed in the end wall of the fountain, and is separated at its front edge from the front wall of the fountain by a space sufficient to accommodate the wick k and a clamping plate l which bears against the rear side of the wick in front of the cover. This clamping plate is pressed against the wick and the latter against the front wall of the ink fountain by means of set screws l' , so that the ink feeding capacity of the wick can be increased or reduced by decreasing or increasing the pressure of the clamping plate against the wick by adjusting the set screws l' .

M represents the upper ruling cylinder provided with ruling rings m and secured to a tube m' which is provided in its ends with bushings $m^2 m^3$. The supporting devices of the upper ruling cylinder are mounted in a horizontal U-shaped or bifurcated frame N which is composed of a plate n and forwardly projecting arms $n' n^2$ formed on said plate and carrying at their front ends bearings $n^3 n^4$. The frame N is pivoted near its rear end between the side frames $a a'$ by horizontal pivots O which are secured in openings formed in the elevated rear portions of the side frames. These pivots are formed with external screw threads and are secured in the side frames by screw nuts applied to opposite sides of the latter. The inner conical ends of the pivots O enter conical recesses in the frame N . The front ends of the arms $n' n^2$ rest upon set screws p which are arranged in lugs p' formed upon the bearings $a^2 a^3$ of the side frames $a a'$. By adjusting these set screws the front portions of the arms $n' n^2$ can be raised and lowered to regulate the distance between the ruling rings which are arranged face to face or edge to edge so as to operate simultaneously upon opposite sides of the sheet of paper which is fed between the two ruling cylinders by suitable feed tapes or other devices which are not shown in the drawings. The operating and supporting devices of the upper ruling cylinder are identical in construction with those of the lower ruling cylinder, but are reversed in their arrangement, the driving pulleys of the two cylinders

being placed on opposite sides of the machine for the purpose of compactness in construction. The upper ruling cylinder is supported at one end by the sliding spring bolt Q arranged in the bearing n^4 , and at its opposite end by the sleeve R in the bearing n^3 .

r represents the driving shaft of the upper ruling cylinder, and r' the driving pulley thereof.

The inking mechanism of the upper ruling cylinder is constructed like that of the lower ruling cylinder, and consists of an ink fountain S , ink ribbon s , wick s' , clamping plate s^2 , cover s^3 , adjusting screws s^4 , and rollers s^5 , upon which the ribbon is wound, and which are journaled in arms s^6 and provided with ratchet mechanism s^7 . The upper ink fountain S is arranged above the frame N , and its ink ribbon s is arranged above the upper ruling cylinder, so as to bear against the upper portions of the ruling rings thereof. The rear portion of the frame composed of the ink fountain S and arms s^6 is supported by hooks s^8 , formed on the ink fountain, upon lugs s^9 formed on the plate n , and the front portions of this frame of the inking mechanism are supported upon the arms $n' n^2$ by set screws t which are secured in the arms s^6 , and rest upon the arms $n' n^2$.

The connection of the driving shafts with the ruling cylinder is to a certain extent flexible, so that the shaft can spring or change its position within certain limits, without causing a change of position in the ruling cylinder. The ruling cylinders are thereby enabled to remain in proper register or alignment although the driving mechanism of one or both of them may have been sprung out of alignment.

The frame in which the upper ruling cylinder is mounted rests loosely upon the lower stationary frame, and is free to rise when two or more sheets enter accidentally between the ruling disks, thereby avoiding injury to the disks by an excessive feed of paper, and preventing the paper from being cut by the ruling disks.

The fountain, ribbon, and all other supporting and operative parts of each inking mechanism are so connected together that each inking mechanism can be removed completely from the machine for the purpose of cleaning or other purposes, without interfering with or changing the adjustment of either the inking mechanism or the ruling mechanism to which it belongs. The cone bearings of the ruling cylinders enable these cylinders to readily center themselves upon their supports, and the yielding support at one end of each cylinder permits the support to adjust itself to cylinders differing somewhat in length and also permits of ready removal and insertion of the cylinder. The adjusting screws by which the clamping plate is pressed against the wick being all attached to the sliding cover, the latter can be removed together with the adjusting screws and clamp-

ing plate when access is required to the ink fountain. The contact of the ink ribbons with the ruling rings can be increased or diminished by adjusting the set screws upon which the inking frames rest and by increasing or diminishing this contact the amount of ink which is supplied to the rings is correspondingly increased or diminished.

I claim as my invention—

10 1. The combination with two ruling cylinders arranged one above the other, of a lower stationary frame in which the lower cylinder is mounted, and an upper vertically movable frame provided with bearings in which the
15 upper cylinder is journaled, whereby both journals of the upper cylinder are carried in a rigid movable frame, substantially as set forth.

20 2. The combination with two ruling cylinders arranged one above the other, of a lower stationary frame in which the lower cylinder is mounted, and an upper frame pivoted to the stationary frame and provided with bearings in which the journals of the upper cylinder
25 der are supported, substantially as set forth.

30 3. The combination with two ruling cylinders having their ruling disks arranged edge to edge, of a lower stationary frame in which the lower ruling cylinder is mounted, an upper movable frame in which the upper ruling cylinder is mounted, and adjustable supports on which the upper movable frame rests and by which the distance between the faces of the ruling cylinders can be regulated, substantially as set forth.
35

40 4. The combination with the lower ruling cylinder and its stationary frame, of an upper ruling cylinder, a movable frame in which the upper cylinder is mounted and which is attached to the stationary frame, and an inking mechanism mounted on the upper movable frame, substantially as set forth.

45 5. The combination with the lower ruling cylinder and its stationary supporting frame, of an upper frame pivoted to the stationary frame, a ruling cylinder supported in said pivoted frame, and an ink mechanism detachably mounted in said pivoted frame, substantially as set forth.

50 6. The combination with a ruling cylinder

and its supporting frame, of an ink fountain, an ink ribbon supported on said fountain, and adjustable supports by which the ribbon can be adjusted toward and from the ruling cylinder, substantially as set forth. 55

7. The combination with a ruling cylinder and its supporting frame, of a frame containing an ink fountain and an ink ribbon, lugs formed on the supporting frame of the ruling cylinder, hooks formed on the ink fountain
60 and resting on said lugs, and adjusting screws by which the frame of the ink mechanism is supported on the frame of the ruling cylinder, substantially as set forth.

8. The combination with a ruling cylinder, 65 of a supporting frame provided with a bearing, a sleeve secured in said bearing, and supporting one end of the cylinder, a driving shaft passing loosely through said sleeve and connected at its inner end with the ruling
70 cylinder, and a driving pulley mounted upon the sleeve and connected with the driving shaft, substantially as set forth.

9. The combination with a ruling cylinder, of a supporting frame provided with a bearing, 75 of a sleeve secured in said bearing and having an inner conical end, a pulley mounted on said sleeve, a driving shaft passing loosely through said sleeve, connected at its outer end with the pulley and having an angular
80 inner end, and a bushing secured in the ruling cylinder and having an angular socket for connection with the driving shaft and a conical socket for connection with the sleeve, substantially as set forth. 85

10. The combination with a ruling cylinder and its supporting frame, of a spring bolt supporting one end of the cylinder, a fixed sleeve supporting the other end of the cylinder, a driving shaft passing loosely through the
90 sleeve and connected at its inner end with the cylinder, and a driving pulley mounted upon the sleeve and connected with the driving shaft, substantially as set forth.

Witness my hand this 11th day of June, 95 1889.

FREDERICK HART.

Witnesses:

J. S. VAN CLEEF,
MARY CROUSE.