

No. 860,602.

PATENTED JULY 16, 1907.

H. HOPKINS.
FULL STROKE MECHANISM.
APPLICATION FILED JUNE 2, 1906.

Fig. 1.

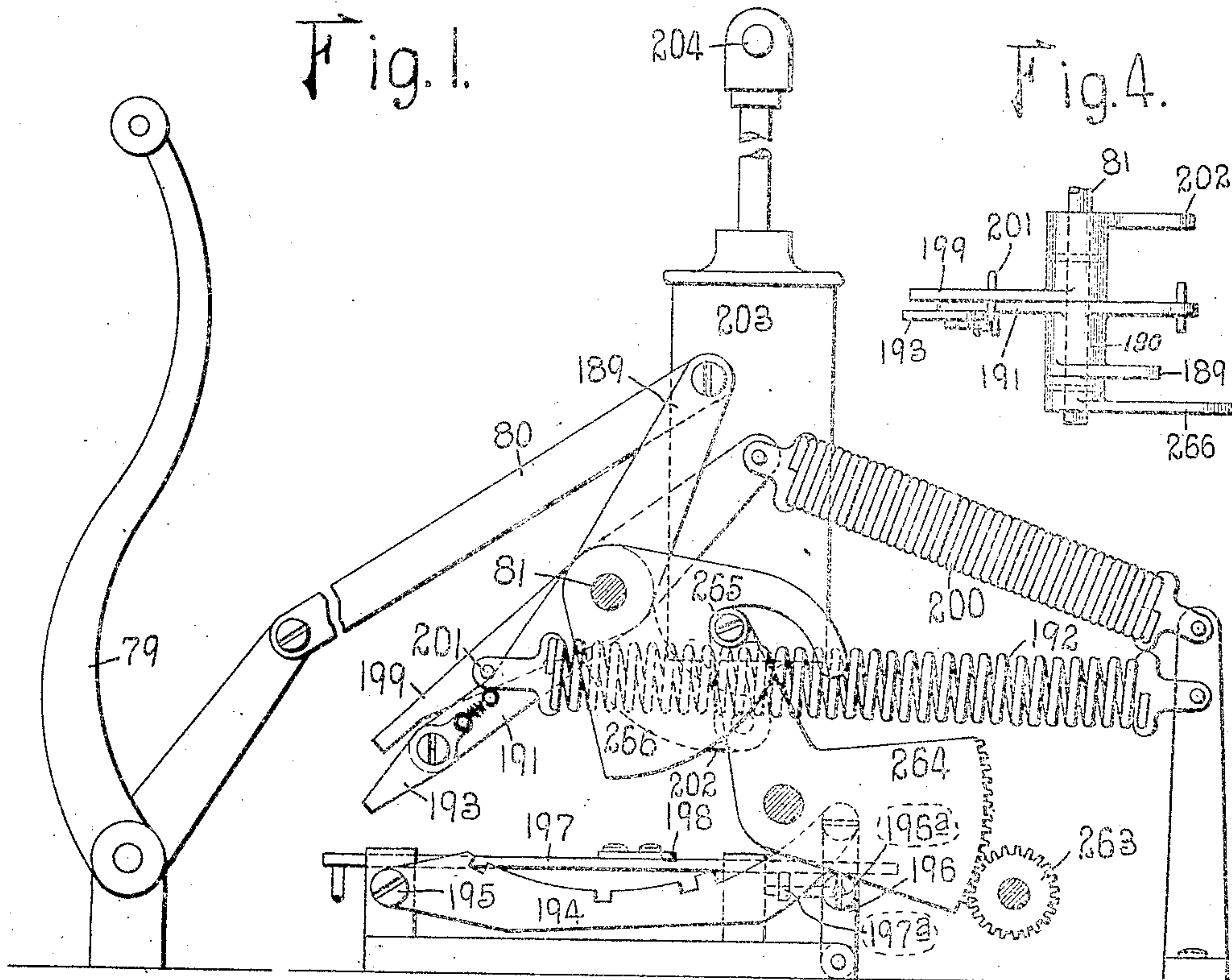


Fig. 4.

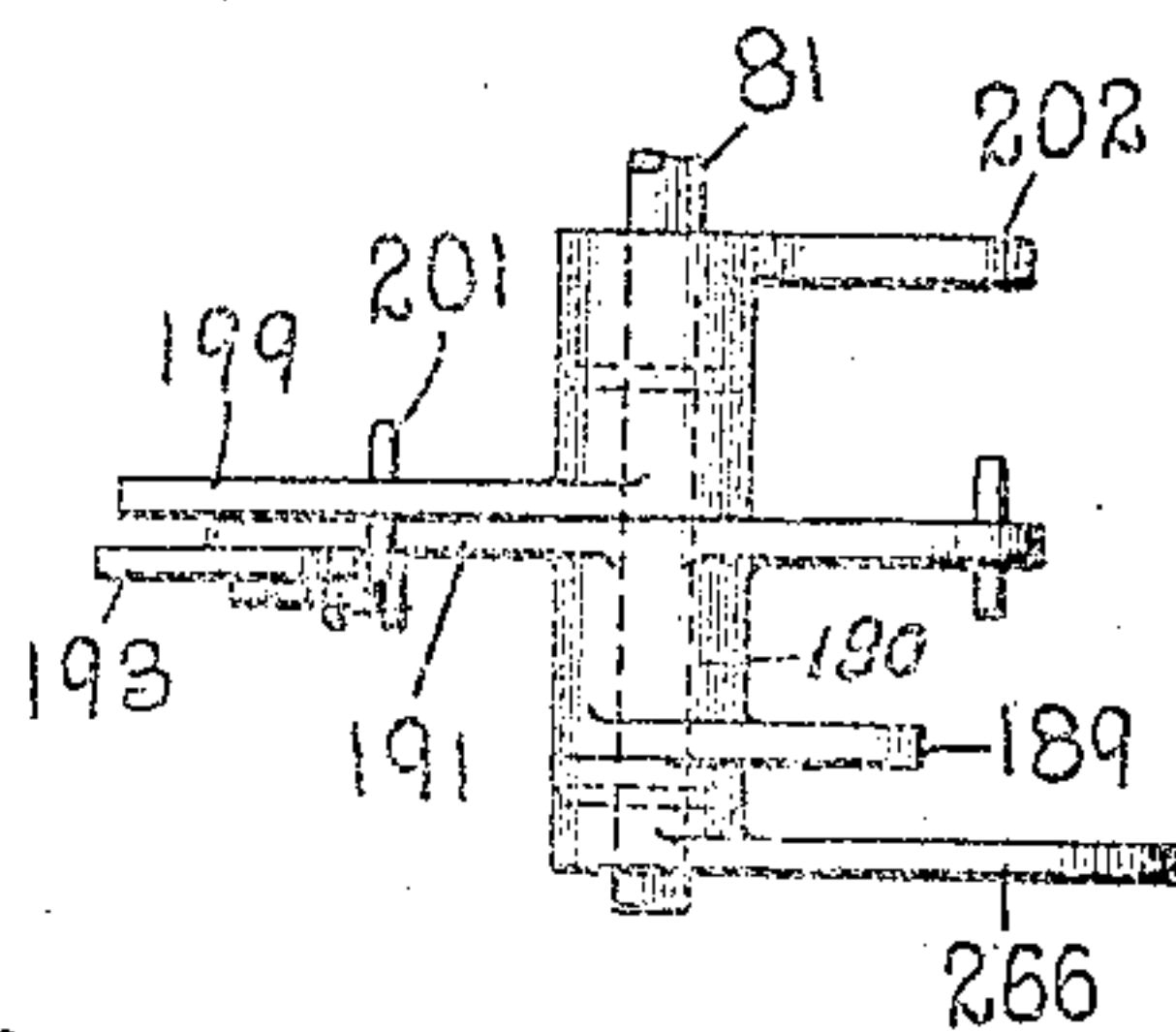


Fig. 2.

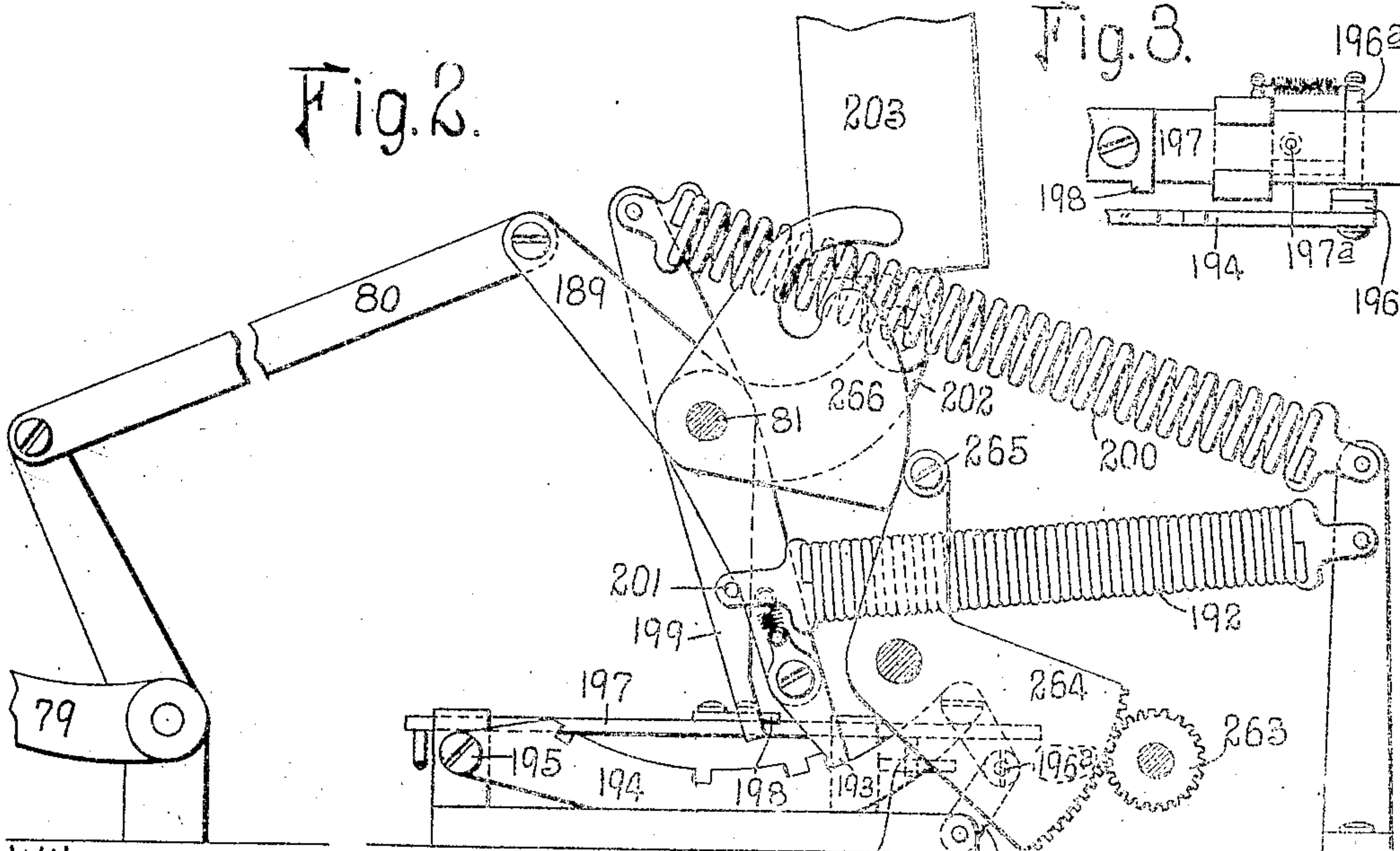
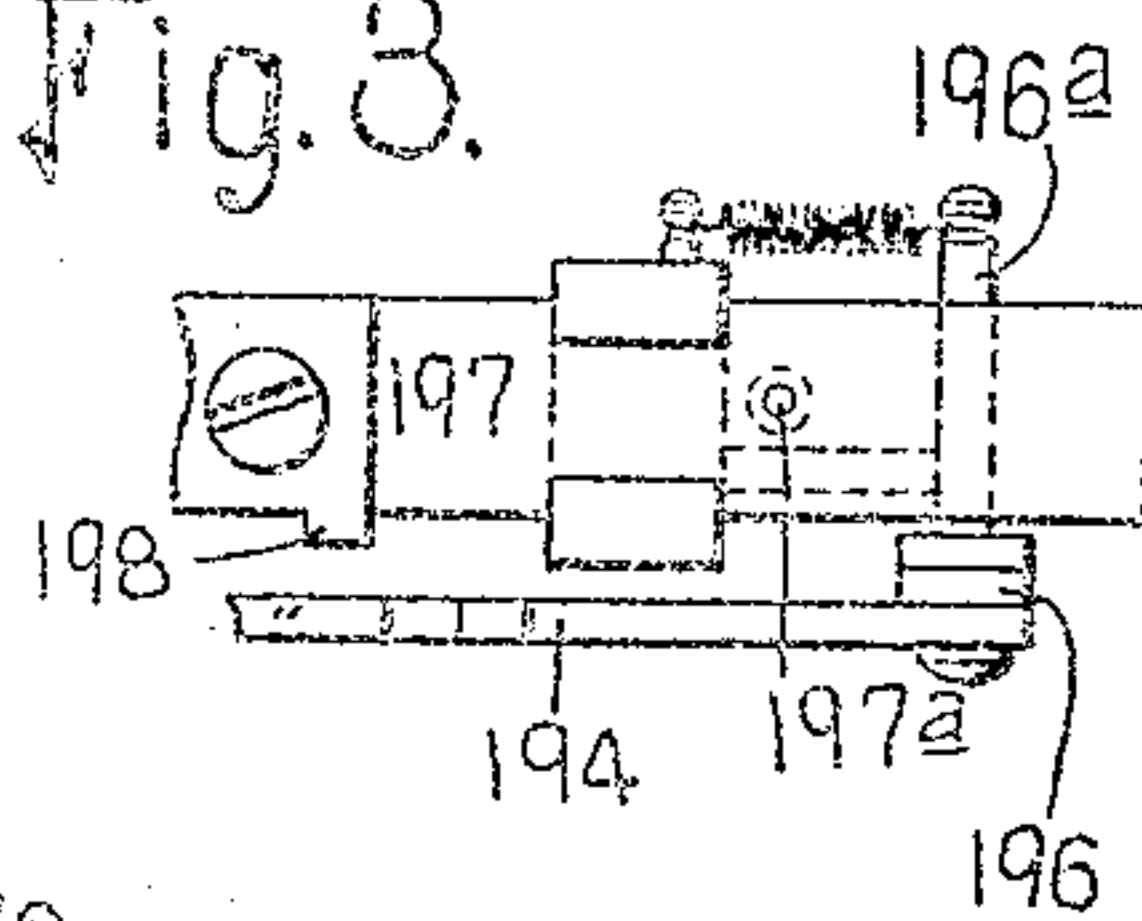


Fig. 3.



Witnesses
Edgar T. Farmer
O. J. McCauley.

Inventor:
Hubert Hopkins
by *Dakney Cornwall* Attys.

UNITED STATES PATENT OFFICE.

HUBERT HOPKINS, OF ST. LOUIS, MISSOURI, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE MOON-HOPKINS BILLING MACHINE COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

FULL-STROKE MECHANISM.

No. 860,602.

Specification of Letters Patent.

Patented July 16, 1907.

Original application filed April 9, 1906, Serial No. 310,739. Divided and this application filed June 2, 1906, Serial No. 319,945.

To all whom it may concern:

Be it known that I, HUBERT HOPKINS, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Full-

5 Stroke Mechanism, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—
10 Figure 1 is a side elevational view of my improved full-stroke mechanism illustrating the dash pot in connection therewith for cushioning the movement of the parts; Fig. 2 is a similar view showing the parts in a changed position; Fig. 3 is a detail top plan view of the
15 bar which carries means for breaking the toggle to permit the notched track to be depressed; and Fig. 4 is a top plan view of the several rock arms, showing the manner of mounting the same on the shaft.

This invention relates to a new and useful improvement in full-stroke mechanism adapted for use in connection with the operating handle of a calculating machine, and with which mechanism is combined a dash
20 pot for cushioning the movement of the parts.

The subject-matter of this present application is divided from a pending application for improvements in calculating machines filed by me April 9, 1906, Serial No. 310,739.

An operating handle 79 is connected by a link 80 to a rock arm 189, which rock arm has a sleeved hub portion 190 (see Fig. 4) mounted loosely on the shaft 81.
30 The opposite end of this sleeve carries a lever 191 to the upper end of which are connected springs 200 whose energies are constantly exerted to return the handle 79 to normal position. The lower end of lever
35 191 carries a tappet 193 which rides over the notched upper edge of a plate 194 pivoted at 195. The rear or free end of this plate is supported in position by toggle links 196 which, when their pivotal points are in line support the plate 194 in an elevated position. When
40 this toggle joint is broken so as to depress the rear end of plate 194 the tappet may be reversed so as to permit the handle to return home. If, however, the toggle mechanism supports the plate, the handle will be locked in its forward position. The means for breaking the
45 toggle joint consists of a rack bar 197 mounted in suitable guide ways so as to slide longitudinally the machine. This rack bar has a projection 198 in the path of the lower end of a rock arm 199, which rock arm is fixed to the shaft 81 and has springs 192 connected to
50 its lower end so as to force arm 199 on shaft 81 to follow the lower end of lever 191, thus causing the pin 201 on rock arm 199, to which the springs 192 are connected, to follow the lever 191 when the handle is pulled for-

ward. Springs 200 are the master springs, that is, they are of such strength that when the handle is released when in its forward position the tension of
55 springs 192 will be overcome and the handle returned home.

202 indicates a rock arm fixed to the shaft 81, which rock arm supports a dash pot 203, said dash pot containing oil so as to regulate the movement of shaft 81
60 by means of a ported piston therein as is well understood. The piston rod from this dash pot is pivotally mounted upon a shaft 204 extending across the machine.

From the above description it will be obvious that should the handle 79 be pulled suddenly forward the lever 191 will leave the pin 201 and, under the action of springs 192, the shaft 81 will be rocked against the flow of liquid through the perforations of the piston in
70 the dash pot. On the backward movement of the handle the lever 191 engages the pin 201, and must not only overcome the spring 192 and store power therein, but must operate against the liquid in the dash pot whose flow through the openings in the piston regu-
75 lates the speed of movement of the machine. In this manner it may be said that the speed of movement of the shaft 81 is regulated and cushioned in both directions. When the handle is pulled forward the lower end of rock arm 199 engages the pin 198 on the rack
80 bar 197 and forces said rack bar rearwardly so as to break the toggle joint and permit the plate 194 to be depressed in order that the tappet may reverse and allow the handle to return home.

The means for breaking the toggle joint consist of a
85 pin 197^a on the underside of the rack bar 197, which pin engages an inwardly projecting stud 196^a on the toggle pintle. It is only necessary for pin 197^a to move the pintle stud 196^a slightly to the rear in breaking the toggle because as soon as the toggle links are moved
90 out of their positions of dead center the tappet 193 will, when the handle starts rearwardly, engage the plate 194 and depress it as shown in the drawings. A spring is connected to the pintle lug 196^a for the purpose of straightening the toggle and raising the plate 194.
95 There is a stop for limiting the movement of the links under the action of said spring and holding the links with their centers in alignment. In returning home the tappet is forced to pass over the notches, and when started it cannot be again pulled forward before it
100 reaches its home position and is freed from the plate 194 and allowed to assume its normal position in readiness for another stroke of the handle.

Shaft 81 carries a cam 266 which coöperates with a roller 265 mounted on an extension of a segmental
105 gear 264 which meshes with a pinion 263. These ele-

ments form no part of my present invention and are illustrated merely because they are present in the machine shown in my said application.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a mechanism of the character described, the combination with a rock shaft, a rock arm fixed to said shaft, a spring connected to said rock arm, a lever loosely mounted on said shaft and engaging said rock arm, a master spring connected to said lever and exerting an energy in opposition to the energy of the spring connected to said rock arm, an operating handle connected to said lever for rocking the same against the energy of its connected spring, and a dash pot connected to the rock shaft for enshrouding the movements thereof; substantially as described.

2. In a mechanism of the character described, the combination with a handle-operated rock arm, a tappet on said rock arm, a notched plate cooperating with said tappet, toggle links for supporting said plate in position, whereby when the handle starts to move in one direction the tappet will engage said notches and prevent the return movement of the handle, and means for breaking said toggle connection to enable said tappet to reverse its position; substantially as described.

3. In a mechanism of the character described, the combination with a rock shaft, a rock arm fixed to said shaft, a spring connected to said rock arm, a lever loosely mounted on said shaft and engaging said rock arm, a master spring connected to said lever and exerting an energy in opposition to the energy of the spring connected to said rock arm, and an operating handle connected to said lever for rocking the same against the energy of its connected spring; substantially as described.

4. In a mechanism of the character described, the combination with a vibrating member, of means for vibrating said member, a tappet carried by said vibrating member, a notched plate cooperating with said tappet, toggle links for supporting said plate in position, and means under control of said vibrating member for breaking the toggle joint and permitting the tappet to reverse its position with respect to said notched plate; substantially as described.

5. In a mechanism of the character described, the combination with a vibrating member, of a tappet carried by

said member, a hinged notched plate cooperating with said tappet, a toggle link for supporting the free ends of said plate, means under control of the vibrating member for breaking the toggle joint to permit the tappet to reverse its position with respect to said notched plate, and an error key for breaking the said toggle joint independently of said vibrating member; substantially as described.

6. In a mechanism of the character described, the combination with a rock shaft, of an operating spring, a restoring spring, a dash pot regulating the speed of contraction of both of said springs, and a reversible tappet operating in connection with the rock shaft; substantially as described.

7. In a mechanism of the character described, the combination with a rock shaft and an operating handle, of two opposing springs of different tensile strength, a reversible tappet in connection with the rock shaft, and a lock piece for the tappet; substantially as described.

8. In a mechanism of the character described, the combination with a rock shaft, and a dash pot connected thereto by an arm, of two springs of different tensile strength for actuating said rock shaft in contrary directions, and a lock mechanism arranged to cooperate with the rock shaft; substantially as described.

9. In a mechanism of the character described, the combination with a rock shaft, a rock arm rigid therewith, a spring for actuating the arm to rock the shaft, an arm loose on the shaft and separably connected to said first mentioned rock arm, a spring actuating said loose arm in opposition to said first mentioned spring, and a lock device; substantially as described.

10. In a mechanism of the character described, the combination of a rock shaft, an operating arm rigid therewith, a spring for actuating the arm to rock the shaft, an arm loose on the shaft and separably connected to said fixed arm, a spring of less tensile strength than the first mentioned spring, connected to said loose arm, a lock device, and a dash pot; substantially as described.

In testimony whereof, I hereunto affix my signature, in the presence of two witnesses this 29th day of May, 1906.

HUBERT HOPKINS.

Witnesses:

F. R. CORNWALL,
GEORGE BAKWELL.