

No. 762,719.

PATENTED JUNE 14, 1904.

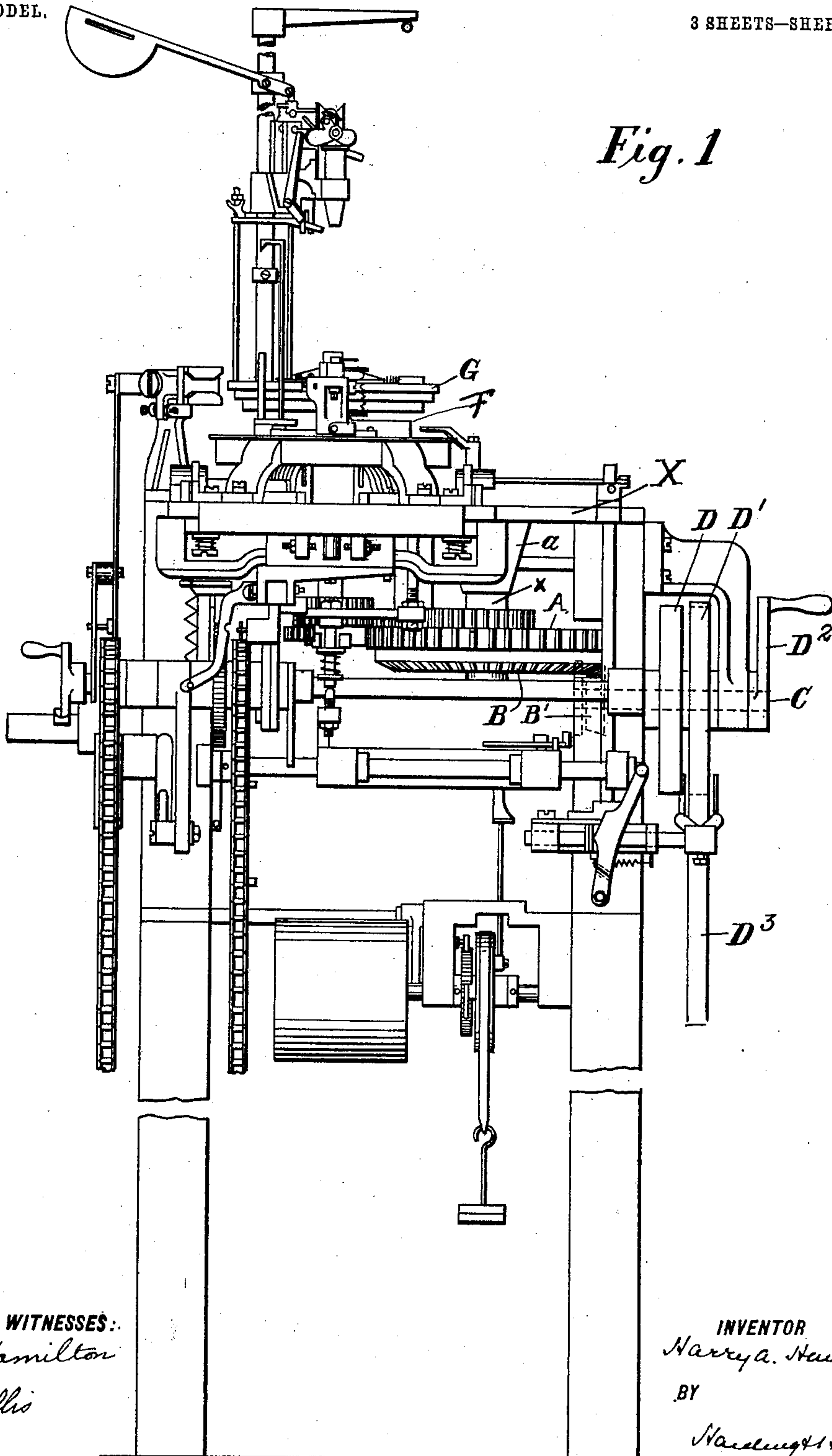
H. A. HOUSEMAN.
MECHANISM FOR PROVIDING ROTATION AND RECIPROCATION FROM
SINGLE DRIVING GEAR.

APPLICATION FILED JULY 17, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1



WITNESSES:

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M. F. Ellis

INVENTOR

Harry A. Houseman

BY

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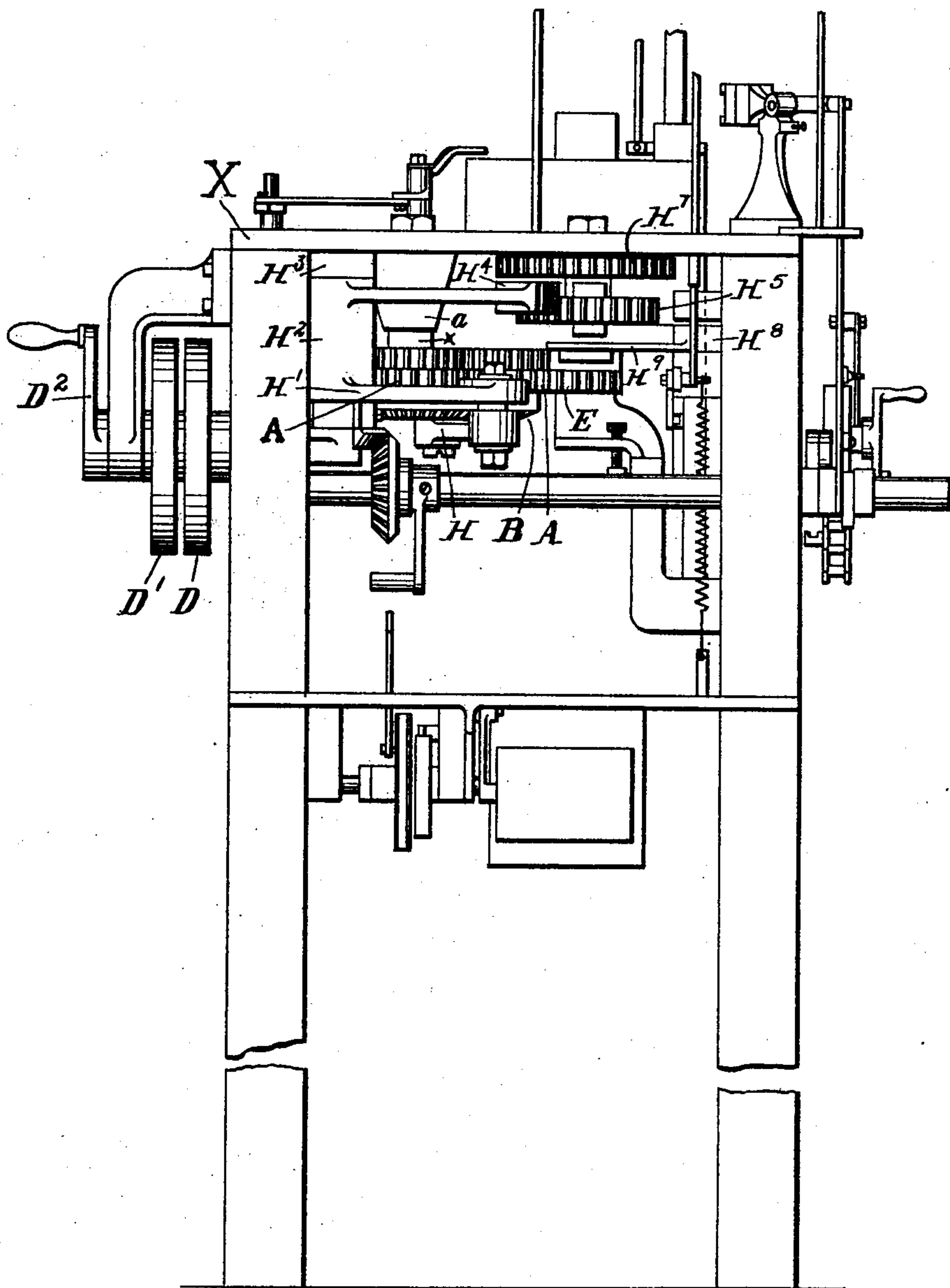
MECHANISM FOR PROVIDING ROTATION AND RECIPROCATION FROM
SINGLE DRIVING GEAR.

APPLICATION FILED JULY 17, 1903.

NO MODEL.

3 SHEETS—SHEET 2.

Fig. 2



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MECHANISM FOR PROVIDING ROTATION AND RECIPROCATION FROM SINGLE DRIVING GEAR

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3 SHEETS—SHEET 3.

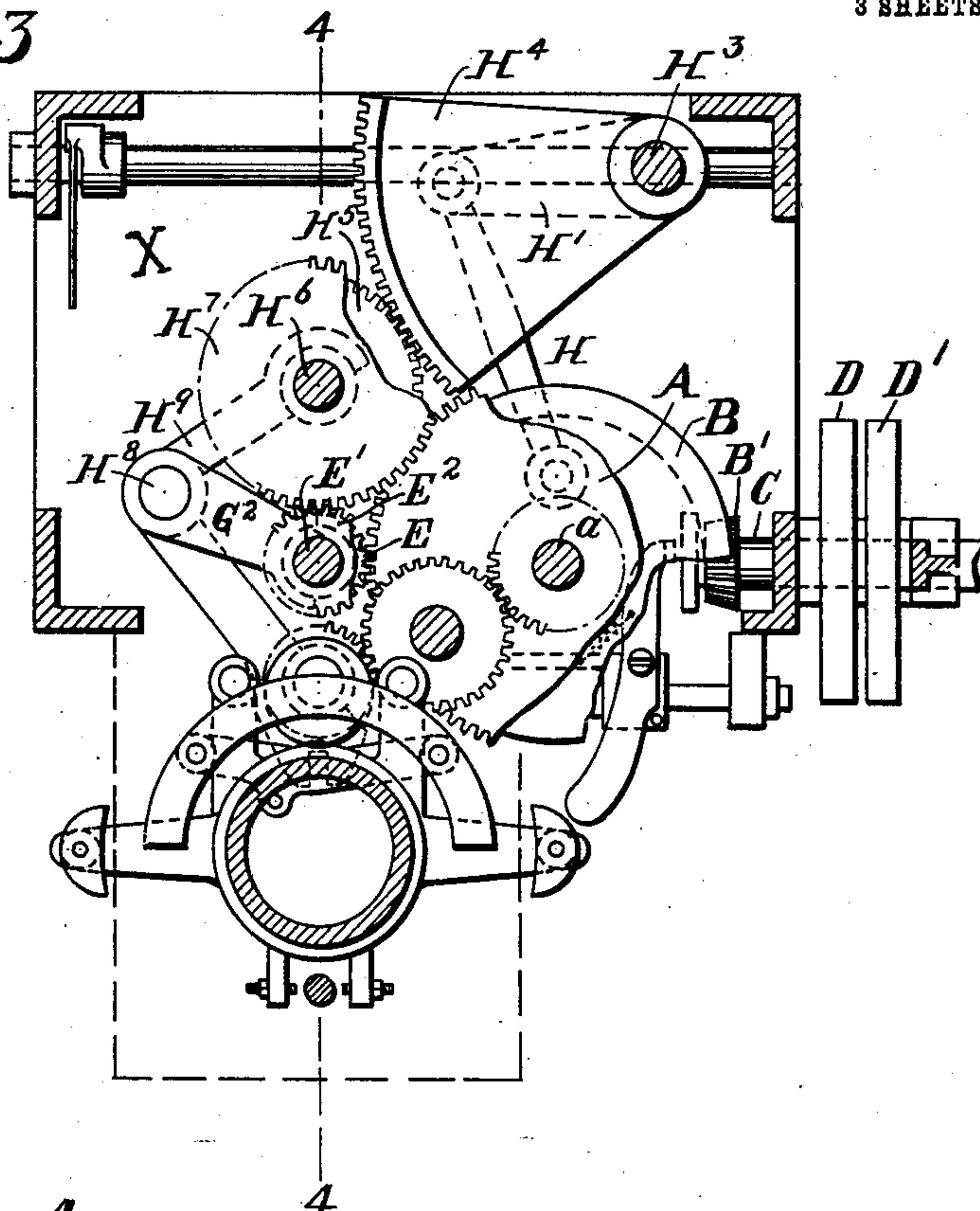
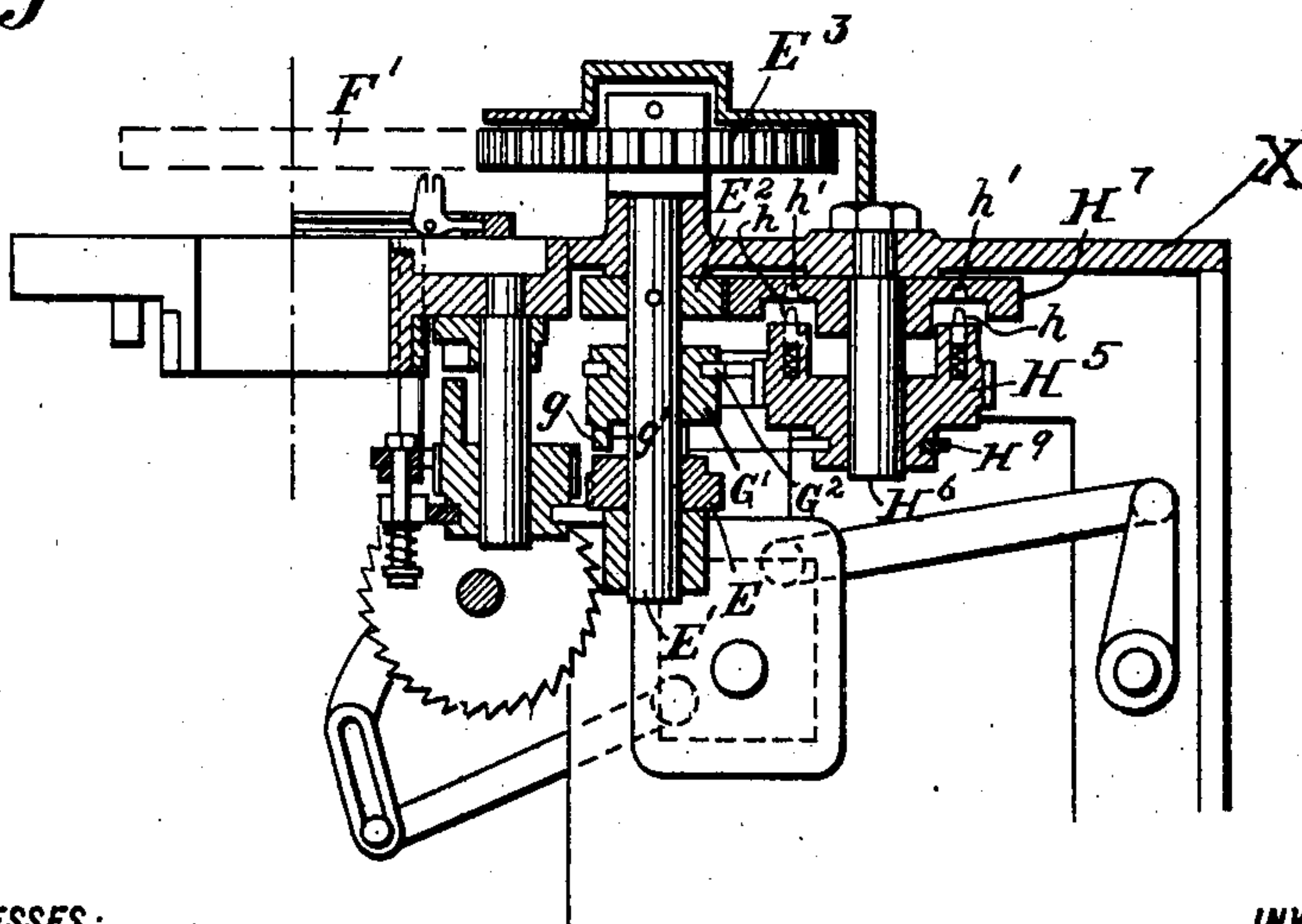


Fig. 4



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UNITED STATES PATENT OFFICE.

HARRY A. HOUSEMAN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
STANDARD MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA,
A CORPORATION OF PENNSYLVANIA.

MECHANISM FOR PROVIDING ROTATION AND RECIPROCATION FROM A SINGLE DRIVING-GEAR.

SPECIFICATION forming part of Letters Patent No. 762,719, dated June 14, 1904.

Application filed July 17, 1903. Serial No. 165,973. (No model.)

To all whom it may concern:

Be it known that I, HARRY A. HOUSEMAN, a citizen of the United States, residing at Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Mechanism for Providing Rotation and Reciprocation from a Single Driving-Gear, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

I will first describe the embodiment of my invention as illustrated in the accompanying drawings and then point out the invention in the claims.

In the drawings, Figure 1 is a front elevation of a circular-knitting machine embodying my invention. Fig. 2 is a rear elevation of same with the top structure broken away. Fig. 3 is a sectional plan. Fig. 4 is a sectional elevation on line 4 4, Fig. 3.

X is the bed-plate of the machine.

A is the main driving-gear of the machine. This gear is supported on the vertical stud α , supported by the bed-plate X. As shown in the drawings, this gear A is driven in the following manner: Connected with or formed upon one face of the gear A is the bevel-gear B, meshing with the bevel-gear B' upon the shaft C. Upon this shaft is the fixed pulley D and the idle pulley D' and the crank D². D³ is the driving-belt. The gear A is supported upon the stud α . The gear A meshes with the gear E, loose upon the shaft E'. This shaft E' projects vertically above and below from the bed-plate X, having its upper bearing on the bed-plate X. Fixed upon this shaft E' is the gear E² and the gear E³, the gear E³ meshing with the gear F' upon the cam-cylinder F.

G is the needle-cylinder.

G' is a clutch feathered upon the shaft E'.

H is a crank-rod secured to one face of the gear A and connected to a crank H', connected to one end of the sleeve H² upon the stud H³, the segmental gear H⁴ being connected to the other end of said sleeve. The stud H³ projects vertically from the bed-plate X and

is supported at one end by said bed-plate. This segmental gear meshes with the gear H⁵, loose upon the stud H⁶. The stud H⁶ projects vertically from and is supported by the bed-plate X. Loose upon this stud H⁶ is the gear H⁷, which meshes with the gear E².

The clutch G' is provided with the lug g , which when the clutch is shifted into engagement with gear E aligns with projection g' upon the gear E, and thus the gear E is brought into engagement with shaft E', and through the medium of gear E³ the cam-cylinder is rotated. The gear H⁵ is provided on its face with the spring-pins h h , and when moved into engagement with the gear H⁷ the pins enter orifices h' h' in the face of gear H⁷, the length of the teeth of segmental gear H⁴ being sufficient to allow for such throw. When the clutch-pins h h enter the orifices h' h' , the gear H⁷ is reciprocated, and through its connection with the gear E³ the cam-cylinder is reciprocated. The movement of the clutch G' and clutch-pins h h for engagement and disengagement with their respective gears are with respect to each other in opposite directions, so that the gear E³ cannot at any time be in engagement both with the rotary gear E' and the reciprocating gear H⁵.

G² is a clutch-lever connected to clutch G', and H⁹ is a clutch-lever connected to the gear H⁵. These two clutch-levers are connected to a common clutch-rod H⁸. The mechanism for operating this clutch-rod so as to shift the clutches to bring the gear E³ under the influence of the rotary and reciprocatory motion at the proper times which I use is that shown and described in Letters Patent issued to me April 30, 1895, No. 538,518, and therefore need not here be described in detail.

This mechanism for providing rotation and reciprocation from a single driving-gear I have shown and described as applied to drive the cam-cylinder of a knitting-machine; but it is clear that it can be applied to drive other mechanism, and unless specifically claimed in connection with a knitting-machine I do not intend it to be so limited.

Having now fully described my invention,

what I claim, and desire to protect by Letters Patent, is—

1. In combination, a rotary gear, a reciprocating gear and a main gear-wheel, each being
5 mounted on independent vertical bearings, and connection between said main driving-wheel and the rotary gear and reciprocating gear.

2. In combination, a rotary gear, a reciprocating gear, a main gear-wheel, each being
10 mounted on independent vertical bearings, and connection between said main gear-wheel and rotary gear and reciprocating gear, the bed-plate forming a support for all of said bearings.

3. In combination, a rotary gear, a reciprocating gear, a main gear-wheel, each being
15 mounted on independent bearings, and connection between said main gear-wheel and rotary gear and reciprocating gear, a driving-gear, and independent clutches for connecting the reciprocating and rotary gears with said driving-gear.
20

4. In combination, a rotary gear, a reciprocating gear, a main gear-wheel, each being
25 mounted on independent vertical bearings, a bed-plate forming a support for all of said bearings, connection between said main gear-wheel and rotary and reciprocating gears, a driving-gear, and independent clutches for connecting the reciprocating and rotary gears with said driving-gear.
30

5. In combination, a rotary gear, a reciprocating gear, a main gear-wheel, each being
35 mounted on independent vertical bearings, and connection between said main gear-wheel and rotary gear and reciprocating gear, a driving-wheel, and independent clutches for connecting the reciprocating and rotary gears with said driving-wheel, said clutches being interconnected.
40

6. The combination, with the bed-plate and a rotary and reciprocating gear, of a main gear-wheel having a vertical bearing supported from the bed-plate of the machine, and driving connection between said main gear-wheel and said reciprocating and rotary gears.
45

7. In combination, a vertical shaft, a rotary gear, loosely mounted on said shaft, a gear fixed on said shaft, a reciprocating gear mounted
50 on a vertical bearing, a gear on said vertical bearing, meshing with the fixed gear on the vertical shaft, a clutch adapted to connect said gear and the reciprocating gear and a clutch adapted to connect the rotary gear and the fixed gear on the vertical shaft.
55

8. In combination, a vertical shaft, a rotary gear loosely mounted on said shaft, a gear fixed on said shaft, a reciprocating gear mounted on a vertical bearing, a gear on said vertical
60 bearing, meshing with the fixed gear on the vertical shaft, a clutch adapted to connect said gear and the reciprocating gear and a clutch adapted to connect the rotary gear and the fixed gear on the vertical shaft, a main gear-wheel, a vertical bearing for said gear-wheel
65

and connection from said main gear-wheel to the rotary and reciprocating gears.

9. In combination, a vertical shaft, a rotary gear loosely mounted on said shaft, a gear fixed on said shaft, a reciprocating gear mounted
70 on a vertical bearing, a gear on said vertical bearing, meshing with the fixed gear on the vertical shaft, a clutch adapted to connect said gear and the reciprocating gear and a clutch adapted to connect the rotary gear and the fixed gear on the vertical shaft, a main gear-wheel, a vertical bearing for said gear-wheel and connection from said main gear-wheel to the rotary and reciprocating gears, the bed-plate of the machine forming a support for
80 said bearings and shafts.

10. In combination, a vertical shaft, a rotary gear loosely mounted on said shaft, a gear fixed on said shaft, a reciprocating gear mounted on a vertical bearing, a gear on said vertical bearing, meshing with the fixed gear on the vertical shaft, a clutch adapted to connect
85 said gear and the reciprocating gear and a clutch adapted to connect the rotary gear and the fixed gear on the vertical shaft, said clutches being interconnected.
90

11. In combination, a rotary gear, a reciprocating gear, independent supports for said gears, a driving-shaft, driving connections, including an independent clutch mechanism for
95 each gear, between said shaft and the rotary and reciprocating gear, the clutch mechanisms of the respective driving connections being oppositely placed and interconnected, and means to move said clutch mechanisms.
100

12. In combination, a rotary gear, a reciprocating gear, independent supports for said gears, a driving-shaft, driving connections, including an independent clutch mechanism for
105 each gear, between said shaft and the rotary and reciprocating gear, the clutch mechanisms of the respective driving connections being oppositely placed, and a clutch-shifter for each clutch mechanism, said clutch-shifters being interconnected.
110

13. In combination, a rotary gear, a reciprocating gear, a driving-shaft, driving connections, including independent clutches, between said shaft and the rotary and reciprocating gears, the clutches of the respective
115 driving connections being oppositely placed and interconnected, and means to give said clutches a movement in the same direction.

14. In combination, with a main gear-wheel, a rotary gear and a reciprocating gear, both
120 driven directly from said main gear-wheel, a driving-shaft upon which the rotary gear is loosely mounted, a clutch for engaging and disengaging said rotary gear and shaft, a gear fixed upon said shaft, a stud, a gear upon the stud meshing with the last-mentioned gear, and means to bring the last-mentioned gear into and out of connection with the reciprocating gear.
125

15. In combination, with a main gear-wheel, 130

a rotary gear and a reciprocating gear, both driven directly from said main gear-wheel, a driving-shaft upon which the rotary gear is loosely mounted, a clutch for engaging and
 5 disengaging said rotary gear and shaft, a gear fixed upon said shaft, a stud, a gear upon the stud meshing with the last-mentioned gear, and a gear upon the stud meshing with the reciprocating gear and means to bring the last-
 10 mentioned gear on the stud into driving connection with the other gear on said stud and to disengage it from said driving connection.

16. In combination with a main gear-wheel, a rotary gear and a reciprocating gear both
 15 driven directly from said main gear, a driving-shaft upon which the rotary gear is loosely mounted, a clutch for engaging said rotary gear and shaft, a gear fixed upon said shaft, a stud, a gear upon said stud meshing with
 20 the last-mentioned gear and a gear upon said stud meshing with the reciprocating gear and means to bring the last-mentioned gear on the stud into driving connection with the other gear on said stud and to disengage it from
 25 said connection, a common operating mechanism for said clutch and said means, the connection being such that the operating mechanism acts oppositely upon the respective shifting members.

30 17. In combination, with a main gear-wheel, a rotary gear and a reciprocating gear, both driven directly from said main gear-wheel, a driving-shaft upon which the rotary gear is loosely mounted, a clutch for engaging and
 35 disengaging said rotary gear and shaft, a gear fixed upon said shaft, a stud, a gear upon the stud meshing with the last-mentioned gear, and a gear upon the stud meshing with the reciprocating gear and means to bring the last-
 40 mentioned gear on the stud into driving connection with the other gear on said stud and to disengage it from said driving connection, the movement of the clutch to bring the rotary gear and shaft into engagement being in
 45 a direction opposite to the movement of the engaging and disengaging means for the reciprocating gear on the stud.

18. In combination, a main gear-wheel, a rotary gear meshing with said main gear-wheel,
 50 a driving-shaft upon which the rotary gear is loosely mounted, a device for engaging and disengaging said gear and shaft, a reciprocating gear, a crank connected to the main gear and driving said reciprocating gear, a stud, a
 55 gear upon said stud meshing with the reciprocating gear, a second gear on said stud and a gear on the driving-shaft meshing with said last-mentioned gear and mechanism to bring said stud-reciprocating gear into driving con-
 60 nection and out of driving connection with the other gear on said stud.

19. In combination, a main gear-wheel, a rotary gear meshing with said main gear-wheel,
 65 a driving-shaft upon which the rotary gear is loosely mounted, a device for engaging and

disengaging said gear and shaft, a reciprocating gear, a crank connected to the main gear and driving said reciprocating gear, a stud, a gear upon said stud meshing with the reciprocating gear, a second gear on said stud and
 70 a gear on the driving-shaft meshing with said last-mentioned gear and mechanism to bring said stud-reciprocating gear into driving connection and out of driving connection with the other gear on said stud, rotary gear engaging
 75 and disengaging devices moving in a direction opposite to that of the reciprocating gear engaging and disengaging devices to cause and release driving connection.

20. In combination, a main gear-wheel, a rotary gear meshing with said main gear-wheel,
 80 a driving-shaft upon which the rotary gear is loosely mounted, a device for engaging and disengaging said gear and shaft, a reciprocating gear, a crank connected to the main gear
 85 and driving said reciprocating gear, a stud, a gear upon said stud meshing with the reciprocating gear, a second gear on said stud and a gear on the driving-shaft meshing with said last-mentioned gear and mechanism to bring
 90 said stud-reciprocating gear into driving connection and out of driving connection with the other gear on said stud, rotary gear engaging and disengaging devices to engage and disengage in a direction opposite to that of the re-
 95 ciprocating gear engaging and disengaging device to cause and release driving connection, and an operating mechanism common to both the rotary and reciprocating engaging and disengaging devices.
 100

21. In combination, a main gear-wheel, a rotary gear meshing with said main gear-wheel,
 a driving-shaft upon which the rotary gear is loosely mounted, a clutch feathered upon said shaft and adapted to engage with and disen-
 105 gage from said rotary gear, a reciprocating gear, a crank connected to the main gear and driving said reciprocating gear, a stud, a gear upon said stud meshing with the reciprocating gear, a second gear upon said stud, a clutch
 110 carried by the reciprocating gear, said clutch being adapted to move into and out of engagement with the other gear on the stud, and a gear on the driving-shaft meshing with the last-named gear.
 115

22. In combination, a main gear-wheel, a rotary gear meshing with said main gear-wheel,
 a driving-shaft upon which the rotary gear is loosely mounted, a clutch feathered upon said shaft and adapted to engage with and disen-
 120 gage from said rotary gear, a reciprocating gear, a crank connected to the main gear and driving said reciprocating gear, a stud, a gear upon said stud meshing with the reciprocating gear, a second gear upon said stud, a clutch
 125 carried by the reciprocating gear, said clutch being adapted to move into and out of engagement with the other gear on the stud, a gear on the driving-shaft meshing with the last-named gear, the movements to engage and dis-
 130

engage with the rotary gear-clutch being respectively in opposite directions to the corresponding movements of the reciprocating gear-clutch.

5 23. In combination, a main gear-wheel, a rotary gear meshing with said main gear-wheel, a driving-shaft upon which the rotary gear is loosely mounted, a clutch feathered upon said shaft and adapted to engage with and disengage from said rotary gear, a reciprocating
10 gear, a crank connected to the main gear and driving said reciprocating gear, a stud, a gear upon said stud meshing with the reciprocating gear, a second gear upon said stud, a clutch
15 carried by the reciprocating gear, said clutch being adapted to move into and out of engage-

ment with the other gear on the stud, and a gear on the driving-shaft meshing with the last-named gear, the movements to engage and disengage with the rotary gear-clutch being
20 respectively in opposite directions to the corresponding movements of the reciprocating gear-clutch, and a clutch-shifting rod common to both clutches.

In testimony of which invention I have here-
25 unto set my hand, at Philadelphia, on this 15th day of July, 1903.

HARRY A. HOUSEMAN.

Witnesses:

M. F. ELLIS,

M. M. HAMILTON.