

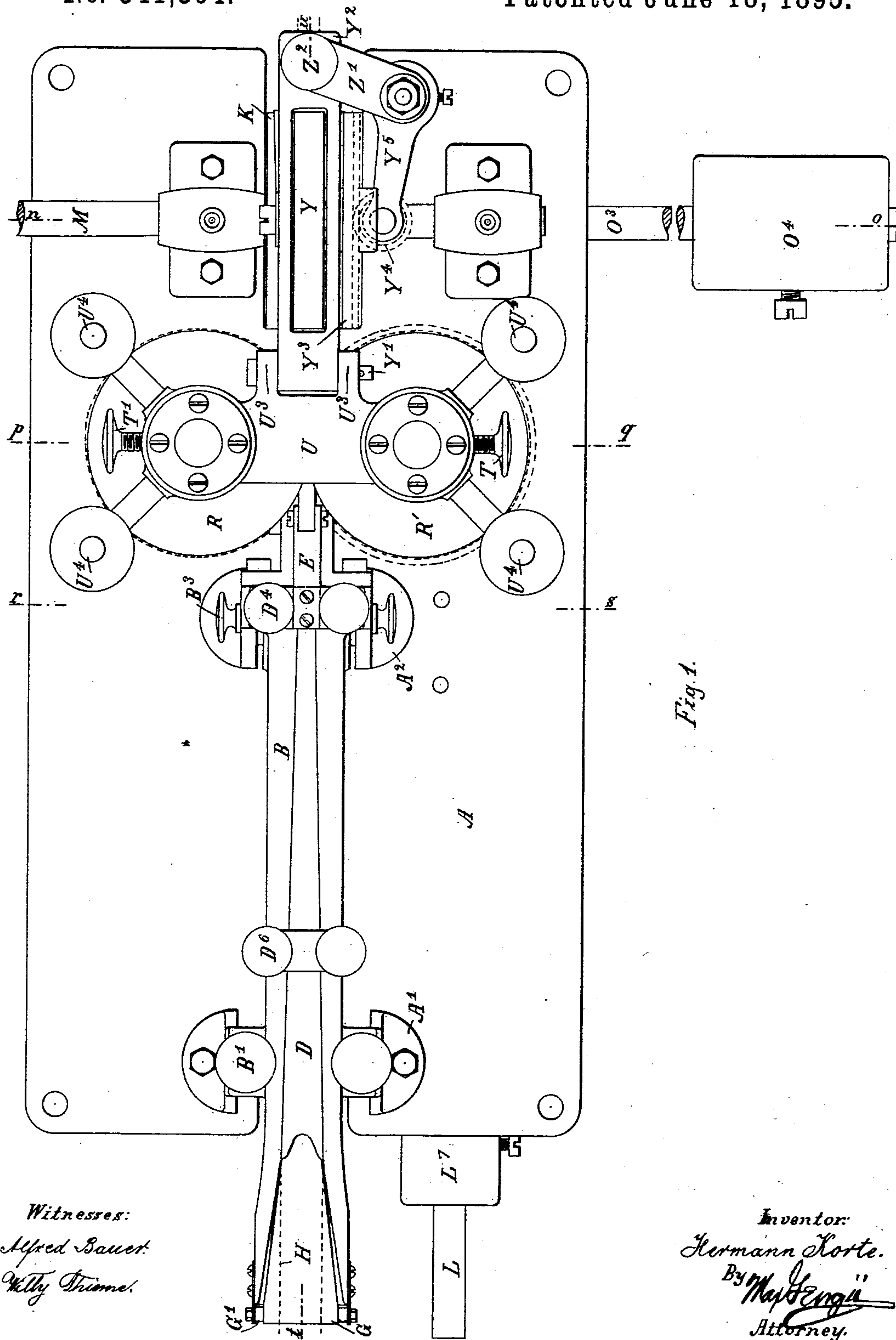
(No Model.)

7 Sheets—Sheet 1.

H. KORTE.
CONTINUOUS CIGARETTE MACHINE.

No. 541,364.

Patented June 18, 1895.



Witnesses:
Alfred Bauer.
Ketty Thome.

Inventor:
Hermann Korte.
By *Max Engle*
Attorney.

(No Model.)

7 Sheets—Sheet 2.

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No. 541,364.

Patented June 18, 1895.

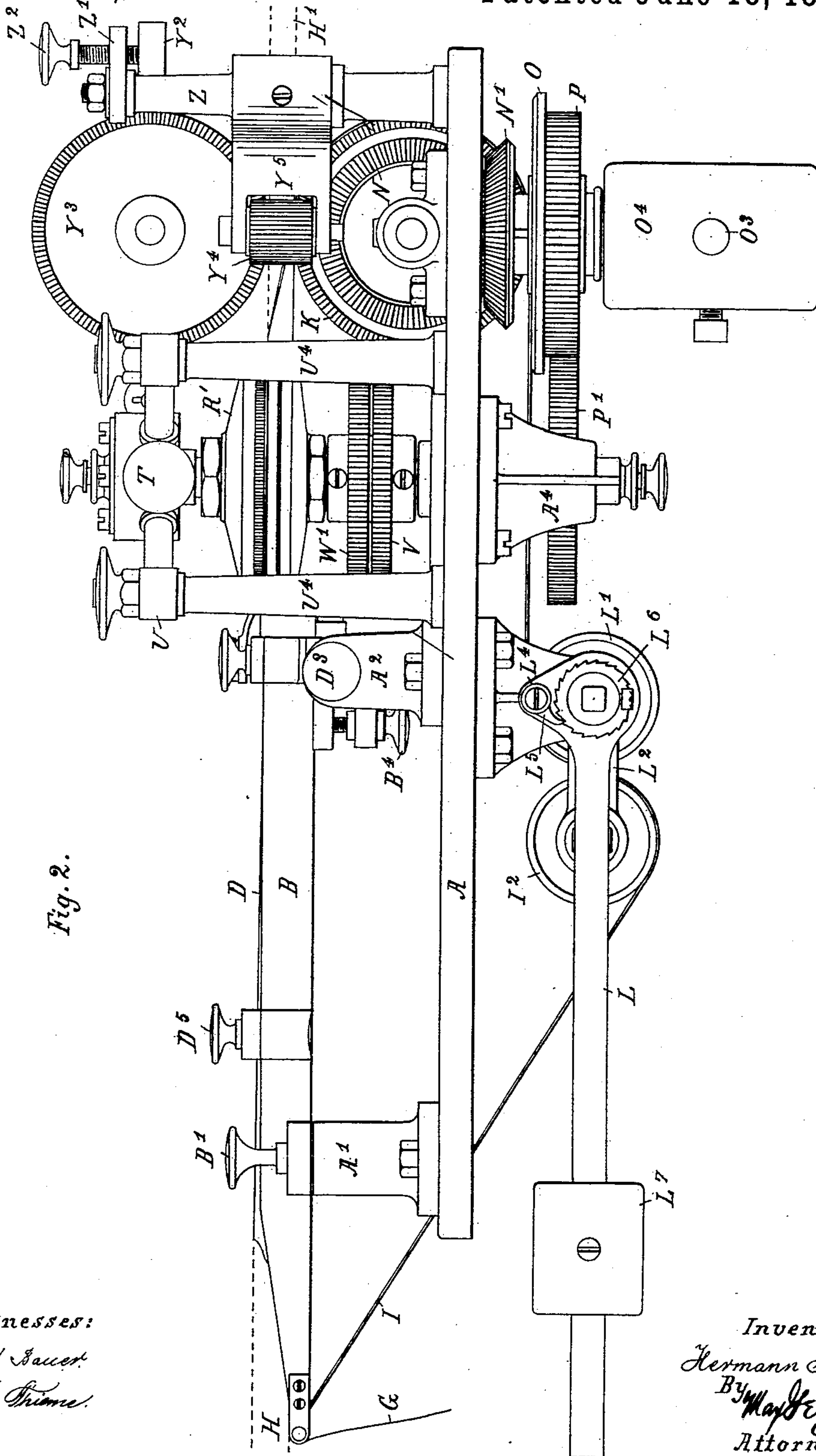


Fig. 2.

Witnesses:
Alfred Sauer.
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7 Sheets—Sheet 3.

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Fig. 3.

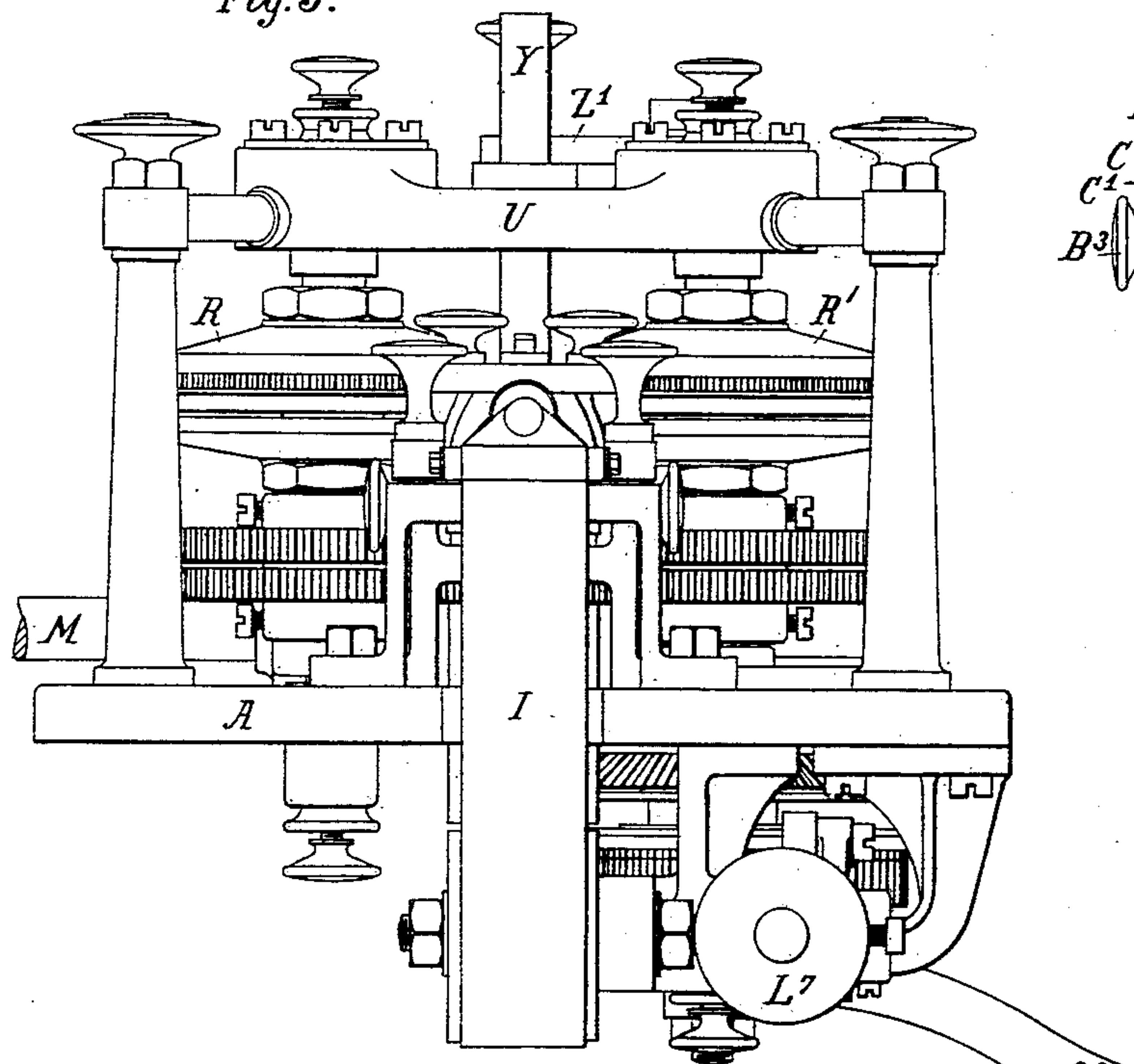
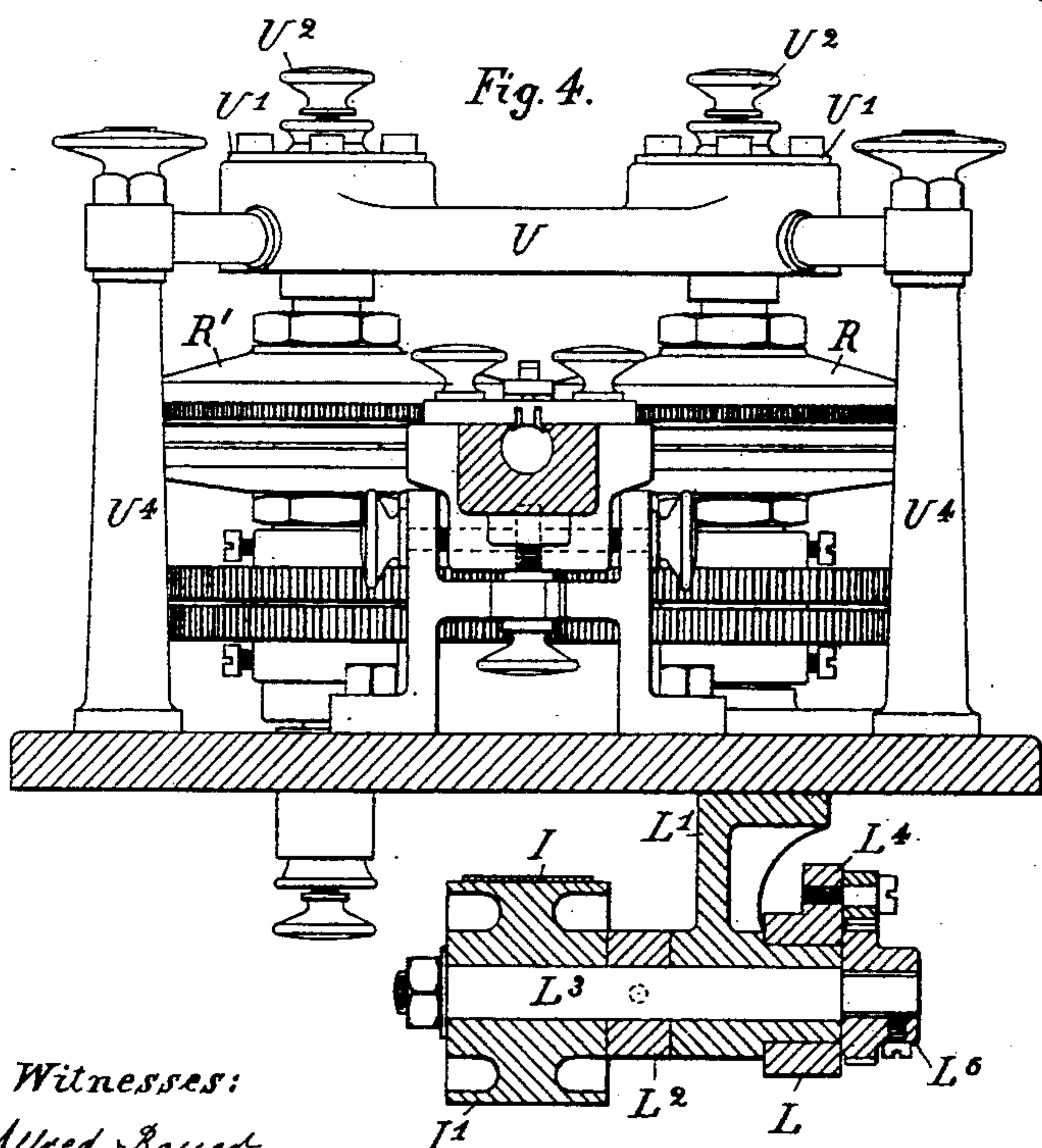


Fig. 4.



Witnesses:
Alfred Bauer.
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Fig. 5.

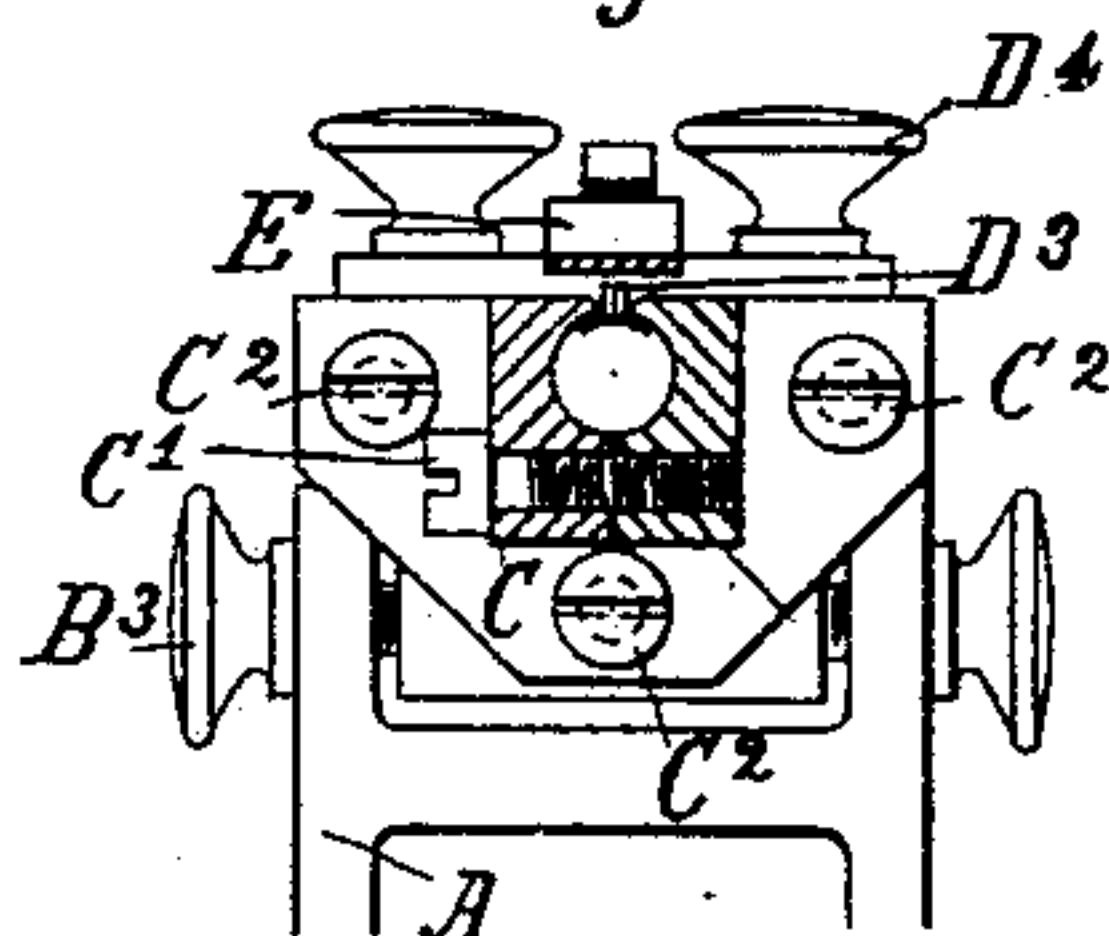


Fig. 6.

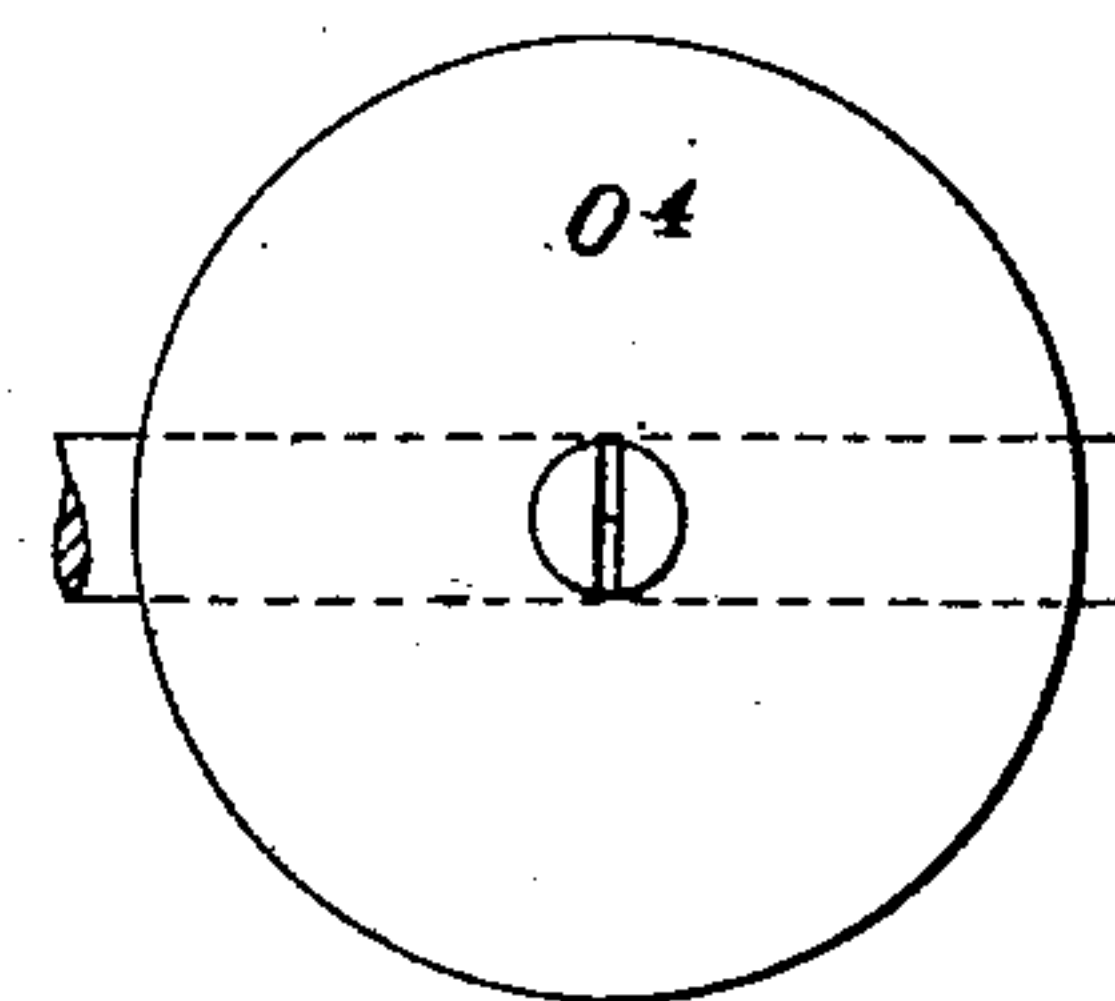
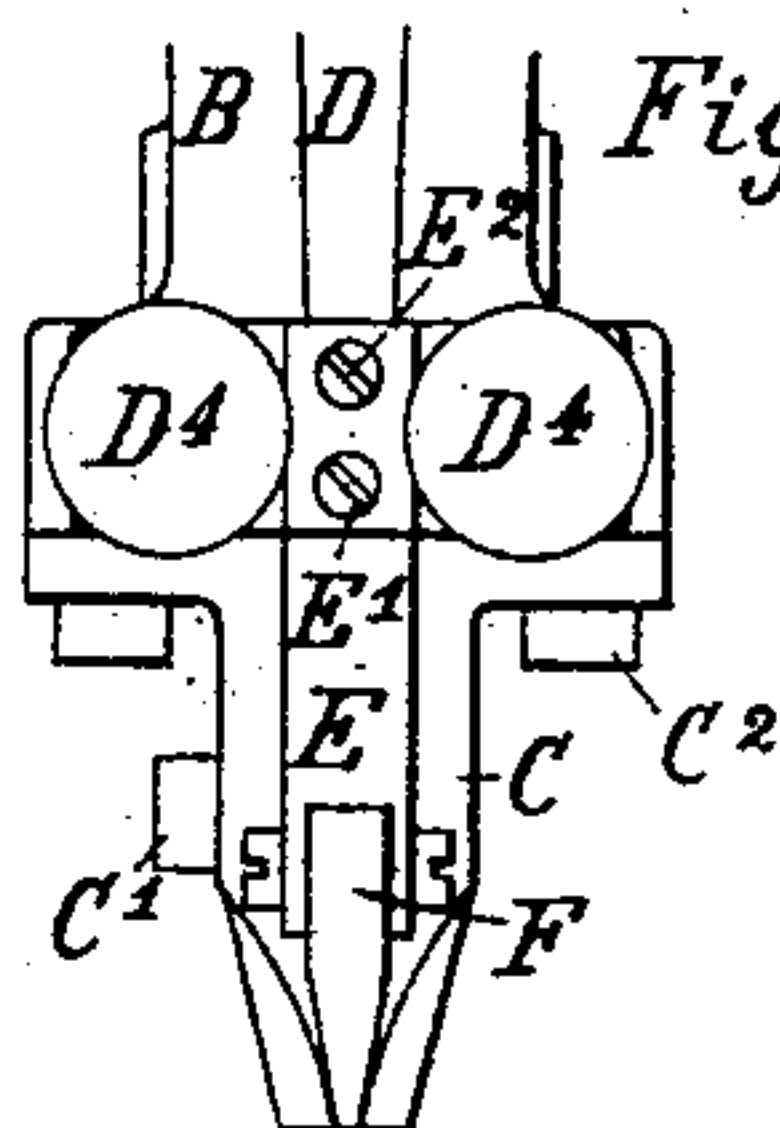


Fig. 7.

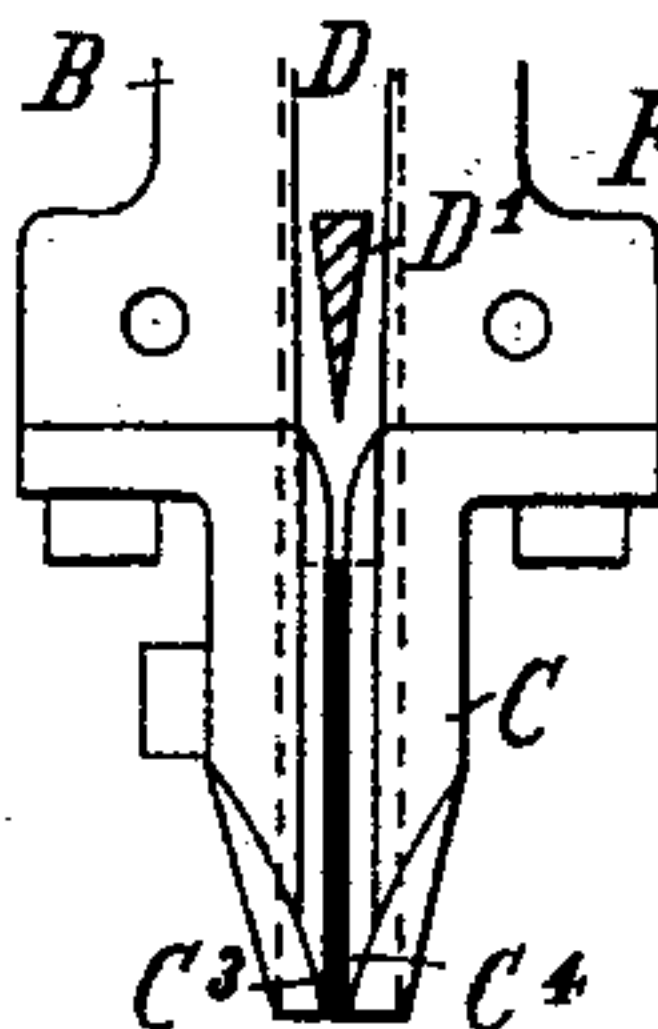
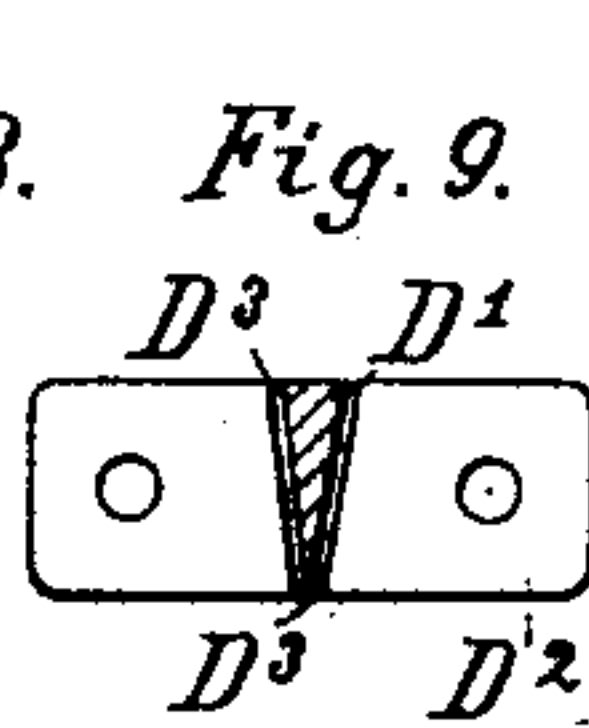
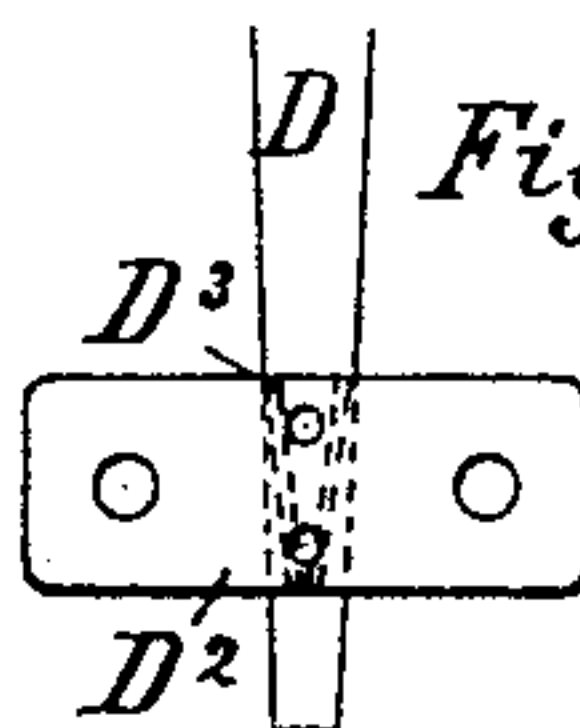


Fig. 8. Fig. 9.

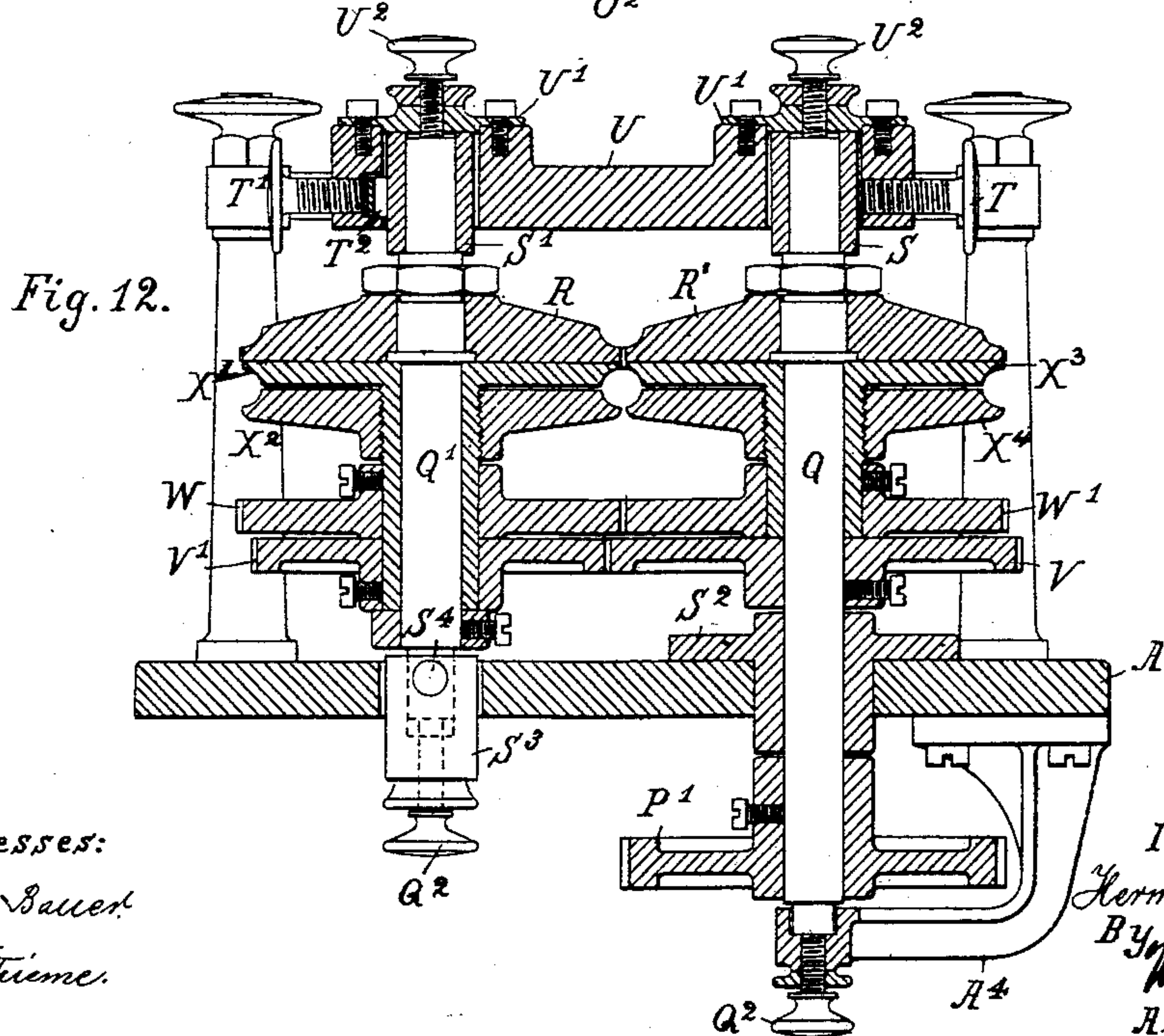
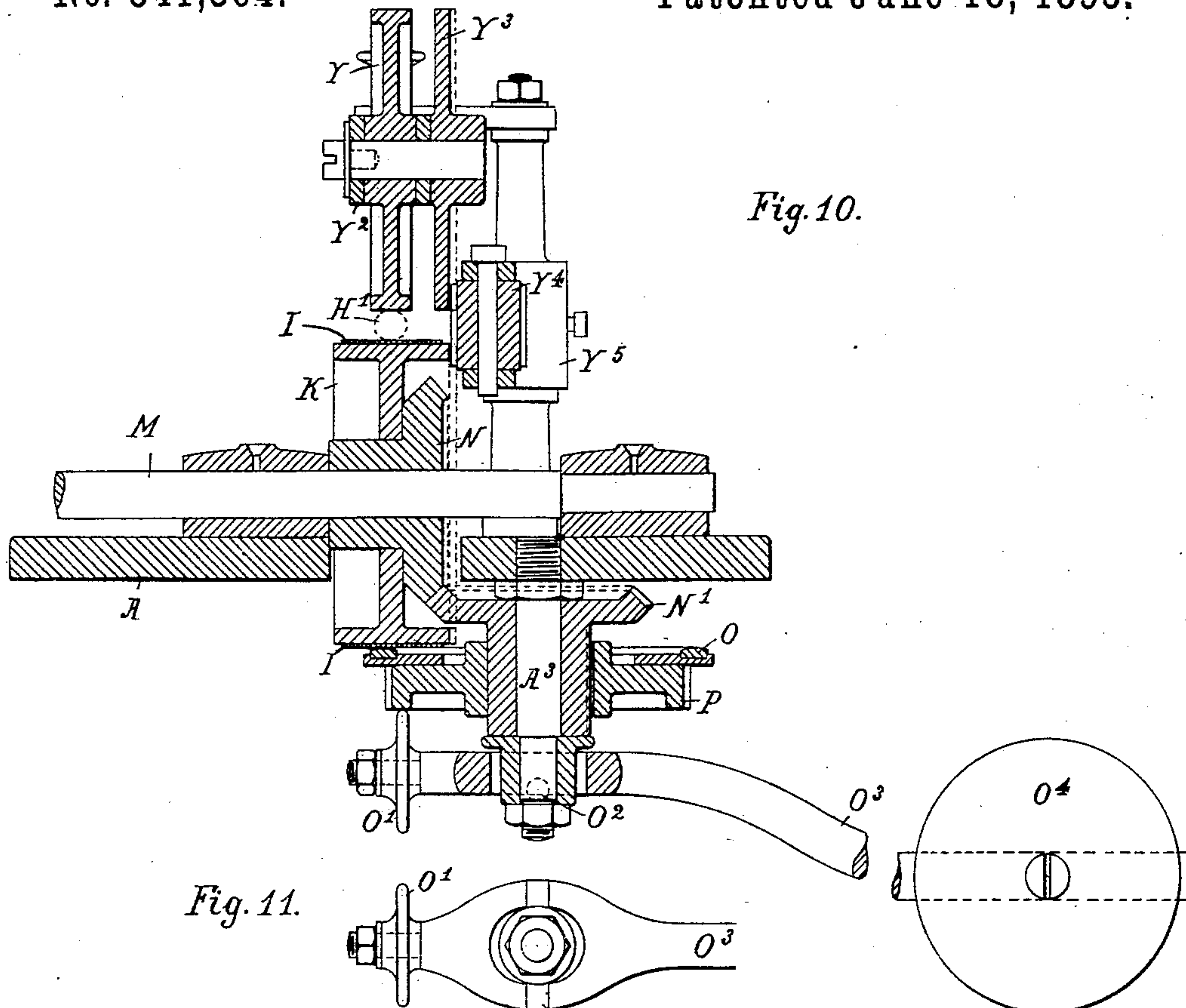


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H. KORTE.
CONTINUOUS CIGARETTE MACHINE.

No. 541,364.

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7 Sheets—Sheet 5.

H. KORTE.
CONTINUOUS CIGARETTE MACHINE.

No. 541,364.

Patented June 18, 1895.

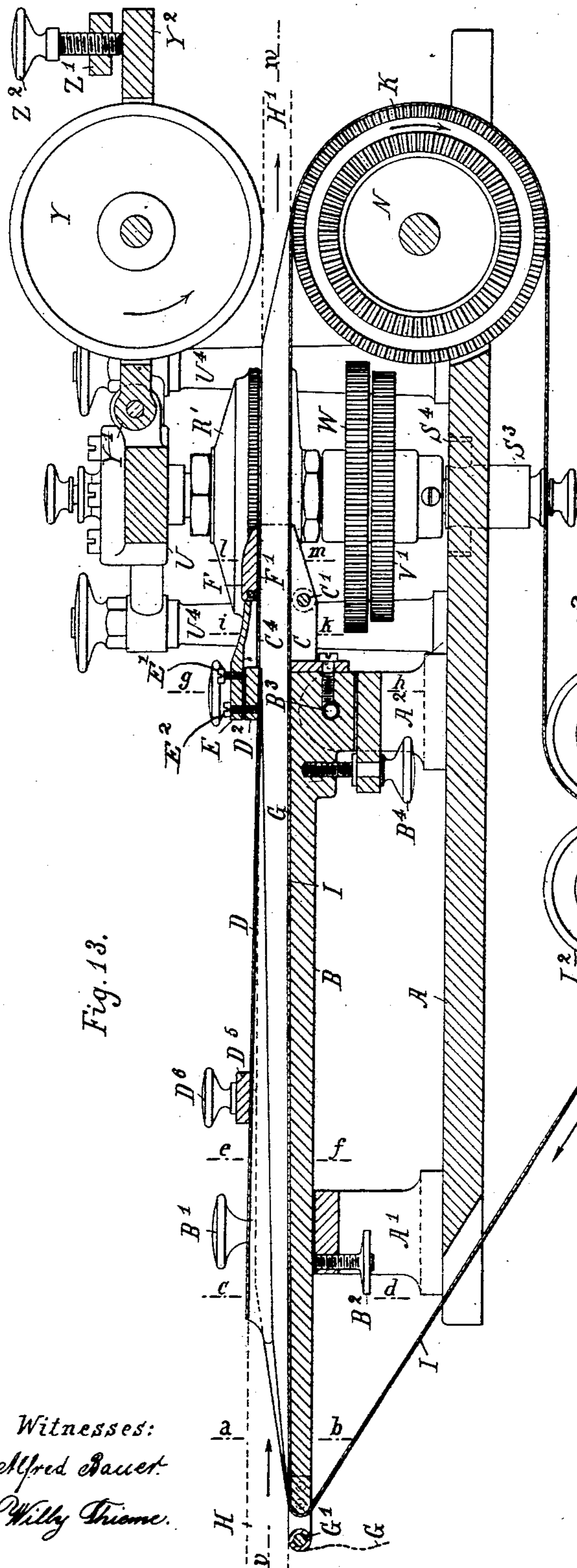


Fig. 13.

Witnesses:
Alfred Bauer.
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Fig. 19.

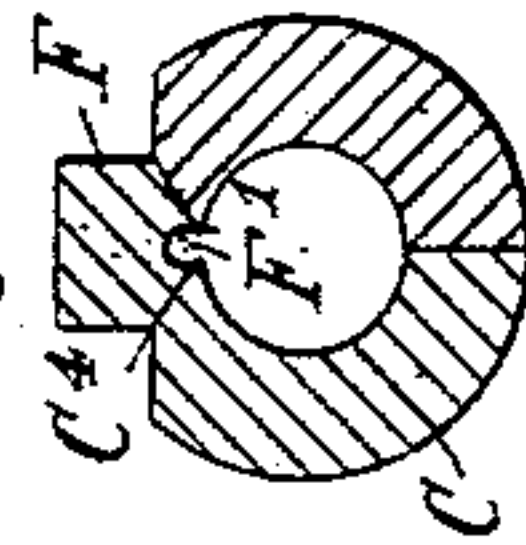


Fig. 18.

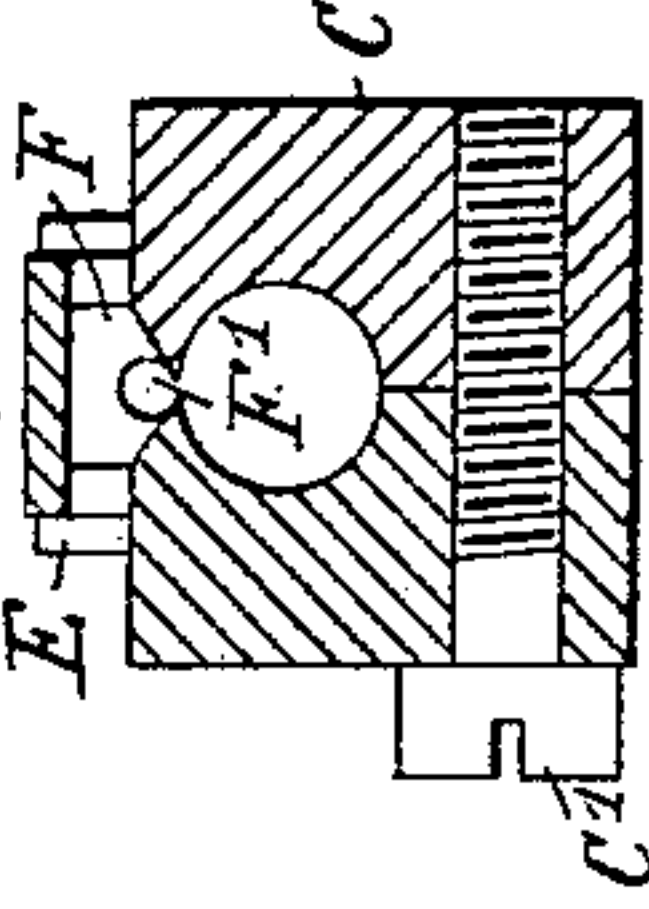


Fig. 17.

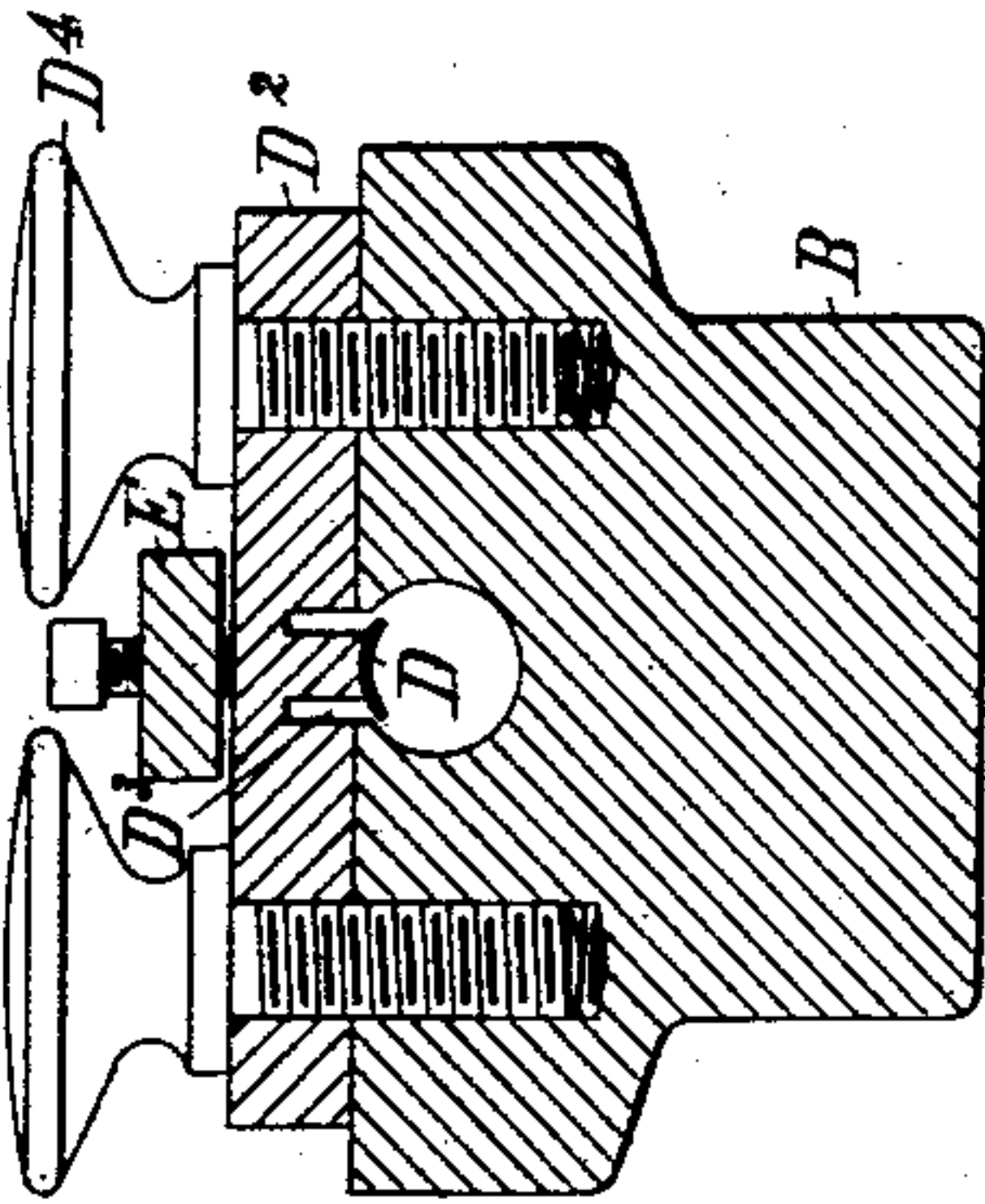


Fig. 16.

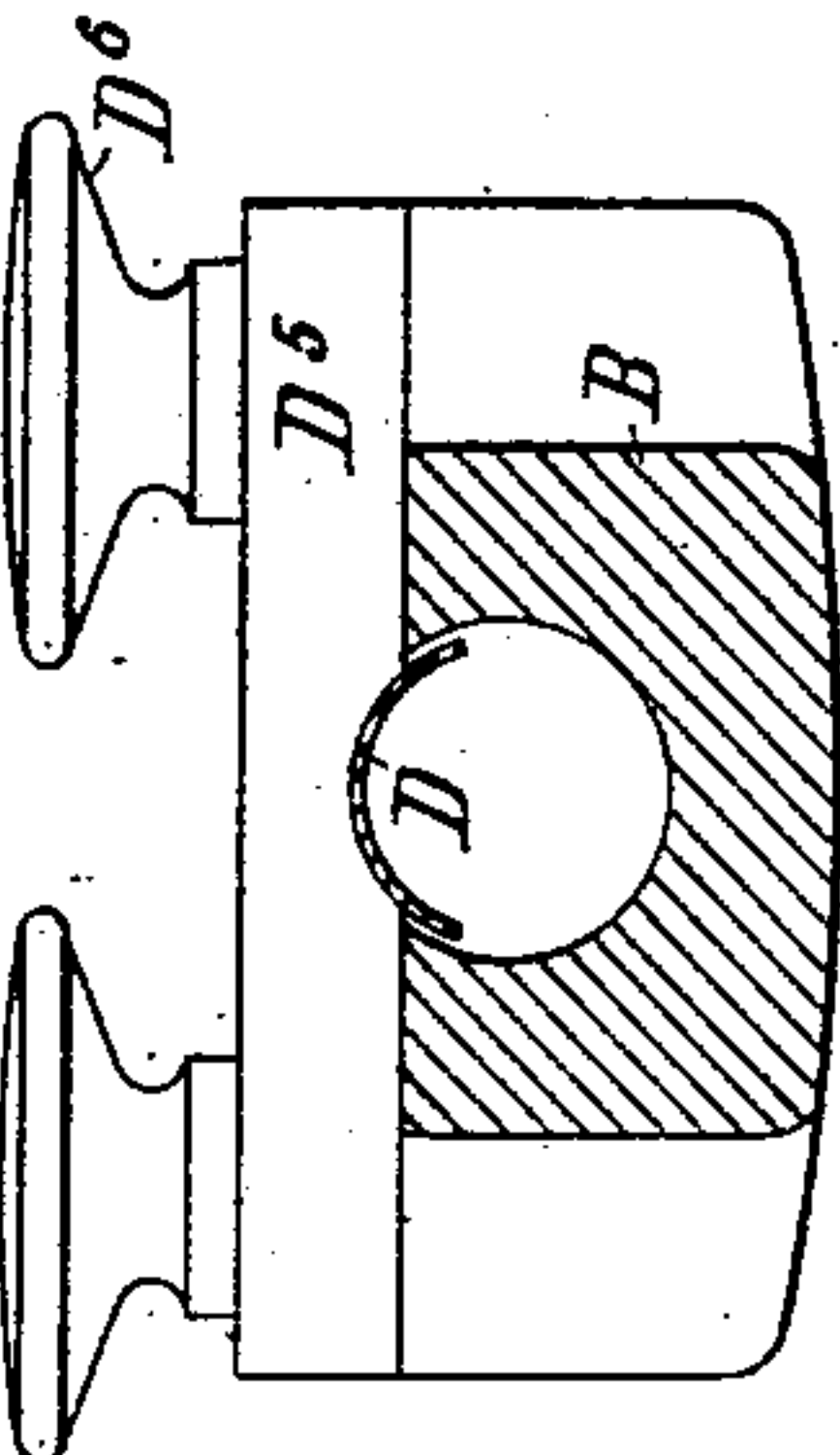


Fig. 14.

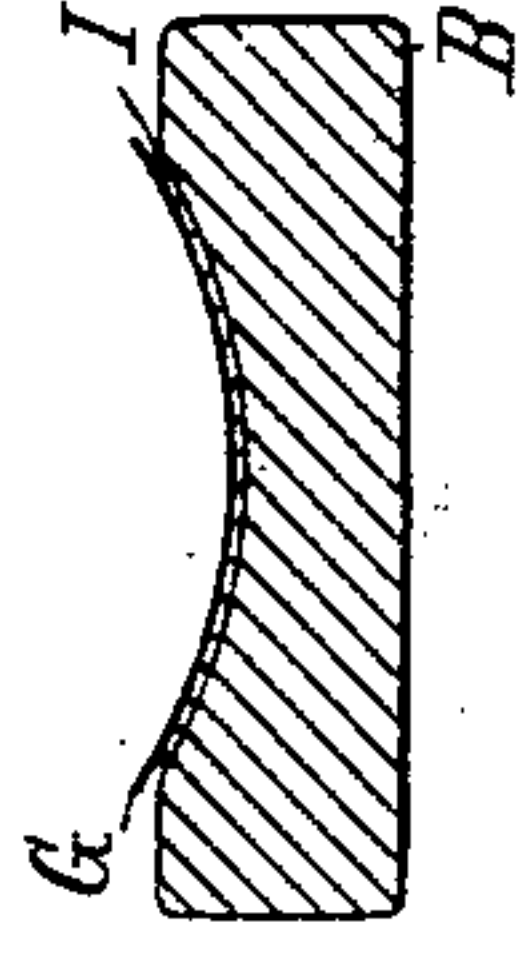
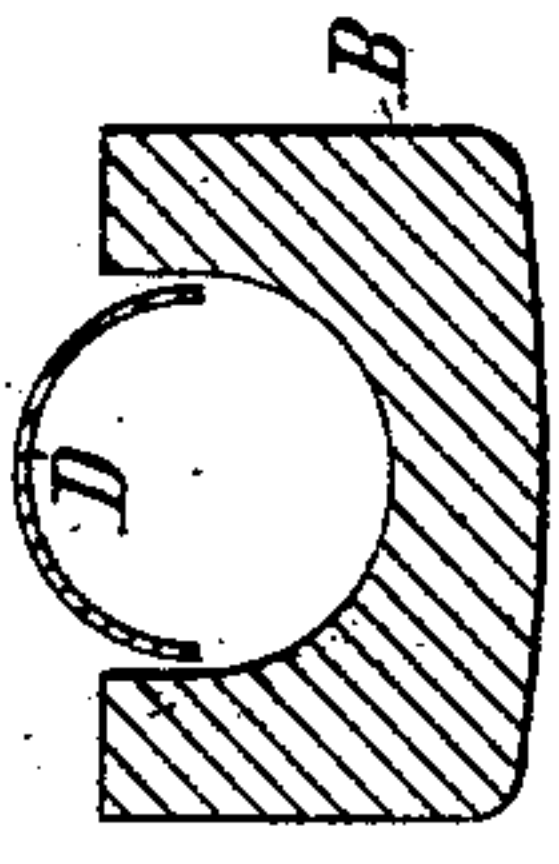


Fig. 15.



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(No Model.)

7 Sheets—Sheet 6.

H. KORTE.
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No. 541,364.

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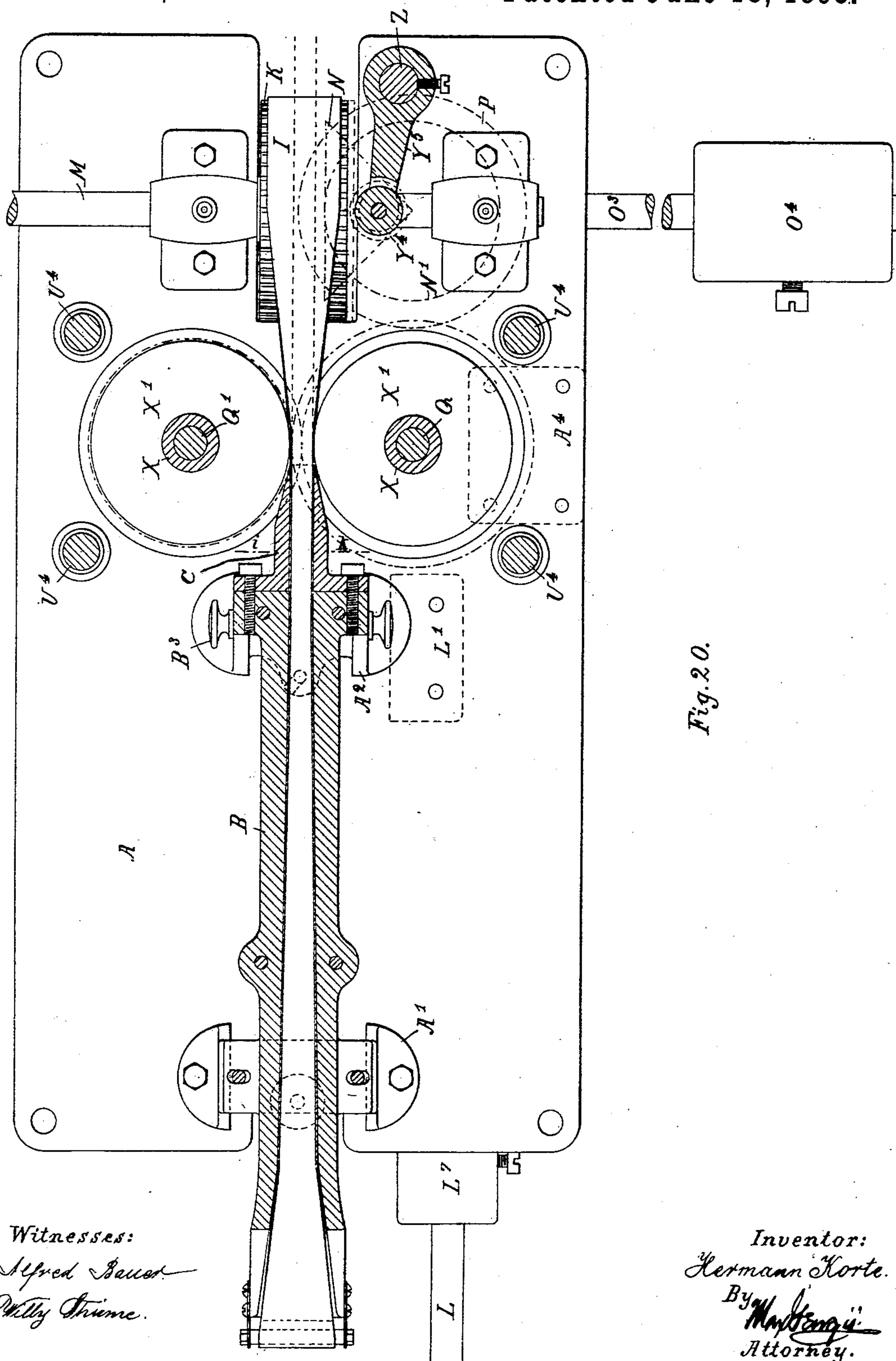


Fig. 20.

Witnesses:
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(No Model.)

7 Sheets—Sheet 7.

H. KORTE.
CONTINUOUS CIGARETTE MACHINE.

No. 541,364.

Patented June 18, 1895.

Fig. 21.

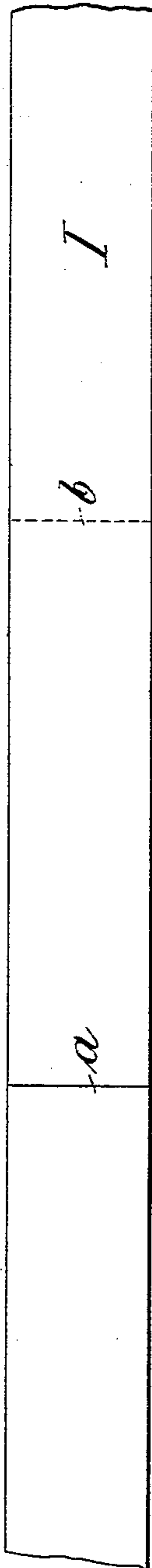


Fig. 22.

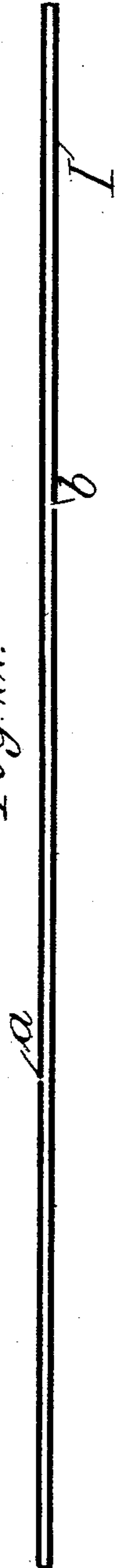


Fig. 23.

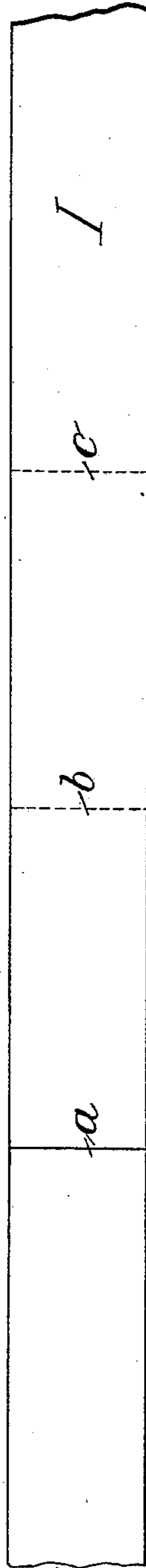


Fig. 24.



Witnesses:
Alfred Bauer.
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Inventor:
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Attorney.

UNITED STATES PATENT OFFICE.

HERMANN KORTE, OF WAHLERSHAUSEN, GERMANY.

CONTINUOUS-CIGARETTE MACHINE.

SPECIFICATION forming part of Letters Patent No. 541,364, dated June 18, 1895.

Application filed September 28, 1894. Serial No. 524,376. (No model.)

To all whom it may concern:

Be it known that I, HERMANN KORTE, of Wahlershausen, near Cassel, in the Empire of Germany, have invented certain new and useful Improvements in Continuous-Cigarette Machines, of which the following is a specification.

This invention relates to improvements in such cigarette-machines, in which an endless rod of loose tobacco or fillings is continually compressed and enveloped in an endless paper band or wrapper and the seam of the latter is closed by a folding arrangement; and the objects of my improvement are, first, to make the forming channel and the forming wheels adjustable; second, to better fold and roll the wrapper seam; third, to provide a mechanism, whereby the circumferential velocity of the crimping wheels is made like the velocity of the continuous cigarette; fourth, to afford facilities for the proper indenting of the folded and rolled wrapper seam; fifth, to provide a press roller for leveling the indented folded wrapper seam, also for making the cigarette oval in section, if so preferred; sixth, to make the apron reliable and adjustable. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a ground plan of my improved continuous-cigarette machine; Fig. 2, a side elevation thereof; Fig. 3, an end view thereof; Fig. 4, a cross-sectional view taken on the plane of the line *rs*, Fig. 1; Fig. 5, a cross-section taken in the plane of the line *ik*, Fig. 20; Figs. 6, 7, 8, and 9, various views of certain parts to be described later on; Fig. 10, a cross-sectional view of the machine, taken in the plane of the line *no*, Fig. 1; Fig. 11, a view from below at the lever *O*³ shown in Fig. 10; Fig. 12, a cross-sectional view of the machine, taken in the plane of the line *pq*, Fig. 1; Fig. 13, a vertical longitudinal section taken in the plane of the line *tu*, Fig. 1; Fig. 14, a cross-section on enlarged scale through the line *ab* of Fig. 13; Fig. 15, a cross-section through the line *cd*; Fig. 16, a cross-section through the line *ef*; Fig. 17, a cross-section through the line *gh*; Fig. 18, a cross-section through the line *ik*; Fig. 19, a cross-section through the line *lm* of Fig. 13; and Fig. 20 a horizontal sectional view of the machine, taken in the

plane of the line *vw*, Fig. 13. Figs. 21 to 24 show parts of the feed-apron, and will be referred to later on.

Similar letters of reference indicate corresponding parts.

On the table *A* (Figs. 1, 2 and 13) are trestles *A'* and *A*², upon which the forming channel *B* is made vertically and sideward adjustable by means of the set-screws *B'* *B*² *B*³ *B*⁴.

On the four columns *U*⁴ *U*⁴ erected on the table *A* a head plate *U* is fastened for the purpose of holding the two axles *Q* *Q'* (Fig. 12). The one axle *Q*, pivoted in the bearing *S*² on the table *A* and in the bearing *S* in the head plate *U*, is made adjustable by means of the screws *Q*² in the bracket *A*⁴ and *U*² in the plate *U'* on the head plate *U*. In a similar manner the other axle *Q'*, pivoted in the box *S*³ and in the bearing *S'*, is made adjustable by means of the screws *Q*² and *U*². On the axles *Q* *Q'* two crimping wheels *R* *R'* are fastened, which are finely toothed at the circumference and work together.

Immediately under the crimping wheels *R* *R'* are two adjustable forming wheels, which revolve on the axles *Q* *Q'* and consist in the upper halves *X'* *X*³ and in the lower halves *X*² *X*⁴. The latter are threaded in the borings to fit to the equally threaded bosses of the upper halves *X'* *X*³, so that they can be moved up and down, their lower parts being outside formed like nuts (Fig. 13). In this manner the furrows at the circumference of the forming wheels can be regulated according to the diameter of the continuous cigarette *H'*.

The machine is driven by means of the shaft *M* (Fig. 1), which may be turned either by hand or through some suitable means from a machine making the continuous rod of loose tobacco or fillings. The motion of the shaft *M* is transmitted through the bevel wheels *N* and *N'* (Fig. 10) and the gear wheels *P* and *P'* (Fig. 2) to the axles *Q* *Q'*. When the machine is driven, not only the crimping wheels *R* *R'* revolve, but also the forming wheels *X'* *X*³, *X*² *X*⁴, to which motion is imparted through the gear wheel *V* fastened on the axle *Q* and through the gear wheels *V'* *W* *W'* sitting on the bosses of the forming wheel halves *X'* *X*³. The two gear wheels *W* *W'* are alike, while the gear wheel *V* is a little larger than the other *V'*. For this reason the forming wheels

$X' X^2$, $X^3 X^4$ run a little quicker than the crimping wheels $R R'$, and in such a manner, that the velocity at the periphery of the crimping wheels $R R'$ is like that of the mean circumference of the forming wheels $X' X^2$ $X^3 X^4$ and also like that of the continuous cigarette H' .

The forming channel B is best shown in Figs. 13 to 19. It is open at the top (see Fig. 1) and is covered with a steel tongue D . At the front end it is flat as shown by the cross section Fig. 14 to facilitate the entrance of the wrapper G , which is introduced over the guide pulley G' . The channel B is hollowed out conically about from trestle A' to trestle A^2 to properly compress the tobacco fillings and to gradually envelop the same with the wrapper G . The end piece C is, however, bored cylindrically, slit at the top (Figs. 7, 18 and 19) and fastened to the channel B by means of the screws $C^2 C^2 C^2$ (Fig. 5). To introduce the rod of fillings II (Fig. 13) and the endless wrapper G into the forming channel B an endless feed apron I is employed, which goes over the flat front end of the channel B into the latter and round the pulley K . The two cross bars $D^2 D^5$, fastened on the channel B by means of the screws $D^4 D^6$, serve to hold the steel tongue D . The one cross bar D^2 is on its under side provided with two deep cuts $D^3 D^3$ (Figs. 9 and 17), which converge in the direction to the end piece C . To the cross bar D^2 the steel tongue D is fastened only in the face shown hatched in Fig. 9. The steel tongue D is kept at a certain distance from the inside of the channel B , so as to leave on both sides narrow slits for the passage of the borders of the wrapper G and of the apron I . See Figs. 15 to 17. Thus the steel tongue D not only compresses the fillings H , as they proceed in the channel B , but it also enables the two edges of the wrapper G to rise continually and to approach each other over its upper surface. On arriving before the cross bar D^2 the edges of the wrapper G are obliged to bend upward in order to travel through the deep cuts $D^3 D^3$ (Fig. 17). Here they are drawn nearer and nearer until on the exit they touch each other.

As said above, the end piece C has at the top a slit C^3 , which is shown in Fig. 7 exaggeratedly wide for the sake of clearness, while in reality it is so narrow as to allow only of the two wrapper edges passing through. The top face of the end piece C is a little above that of the channel B and is provided with two inclines C^4 sloping to the slit C^3 . Into the furrow thus formed a die F (Figs. 13, 18 and 19) is fitted. It is fastened to the spring E by means of screws (Fig. 6) and is provided on its under side with a conical furrow F' converging toward the exit. The spring E is connected with the cross bar D^2 and made adjustable by means of the set-screws $E' E^2$. It is capable of being bent a little upward, so as to clean the furrow F' of the die F . The spring E may also be fastened to the cross bar

D^2 , if so preferred, in which case the set-screw E' is omitted and the other screw E^2 inserted in its place. The steel tongue D reaches a little beyond the cross bar D^2 and into the end piece C . The end piece C is sharpened as shown in Figs. 6, 7, and 20, in order to bring the compressed and enveloped tobacco quite near to the forming wheels $X' X^3$, $X^2 X^4$.

As already mentioned the edges of the endless wrapper G touch each other on leaving the cuts $D^3 D^3$ of the cross bar D^2 . When farther proceeding, they enter the narrow slit C^3 and are thereby folded, so that they stand quite vertically. On reaching the die F , they are obliged by its furrow F' to bend and to roll more and more. On leaving the die F the rolled seam of the wrapper G is caught by the fine teeth of the crimping wheels $R R'$ and indented or crimped, so that the seam is now prevented from opening again. To insure this purpose, the lower end of the axle Q' (Fig. 12) is fitted in a box S^3 which can turn on the two pins S^4 sidewise, while the upper end is in a bearing S' which is pressed with the spring T^2 by means of the screw T' . Thus the two crimping wheels $R R'$ are pressed together so that their teeth crimp the wrapper seam tightly.

Above the pulley K a press roller Y (Fig. 13) is arranged in a frame Y^2 , which is connected at U^3 (Fig. 1) to the head plate U by the pin Y' and is made adjustable by the set-screw Z^2 . The latter is in an arm Z' which can be swung about on the column Z . On the axle of the press roller Y a gear wheel Y^3 is fixed, which gears into the long pinion Y^4 . The pulley K is also toothed at one side and gears into the pinion Y^4 , so that its motion is thereby imparted to the press roller Y . To insure a good working of the machine the pulley K , the press roller Y and the gear wheel Y^3 are made of an equal diameter. The pinion Y^4 is pivoted in an arm Y^5 , which is adjustable on the column Z and may be put aside if desired.

The press roller Y serves for leveling the folded and crimped seam of the continuous cigarette H' and also, where wanted, for flattening the cigarette, *i. e.*, giving it an oval section. (See Fig. 10.)

When a continuous cigarette of another diameter is to be made, the forming channel B will have to be replaced by another one and the forming wheels $X' X^2$, $X^3 X^4$ are readjusted to fit to the diameter of the cigarette.

The apron I is kept in tension by means of the two pulleys I' and I^2 . The one pulley I' (Fig. 13) revolves on the shaft L^3 (Fig. 4), which is pivoted in the bearing L' and carries at the one side the short lever L^2 (Fig. 2) and at the other side the ratchet wheel L^6 . On the boss of the bearing L' a lever L is turnable, which carries a weight L^7 and is provided with a pawl L^5 at the short arm L^4 . Thus the pressure of the weight L^7 is transmitted through the lever L , the pawl L^5 , the ratchet wheel L^6 , the shaft L^3 , the lever L^2

and the pulley I² to the feed apron I. To prevent the feed apron I from slipping on the pulley K, the latter is finely serrated and moreover the apron is in the following manner pressed against the pulley K. The bevel wheel N' turning round the bolt A³ (Fig. 10) has a long boss, on which the gear wheel P slides up and down, while it is obliged by a feather to partake in the revolution of the bevel wheel N'. On the gear wheel P an india rubber ring O is fastened in a suitable manner, while on pins O² below the gear wheel P a lever O³ is turnable, which carries at the longer arm a weight O⁴ and at the shorter arm a friction wheel O' bearing against the gear wheel P. It will now be seen, that the pressure of the weight O⁴ is transmitted through the lever O³, the wheel O', the gear wheel P and the ring O to the feed apron I.

The feed apron I is made of two or several layers of tracing cloth pasted together in the manner indicated by Figs. 21 to 24. The ends of the tracing cloth strips in every layer butt at each other and the butts in one layer do not coincide with those in the next layer. Thus the butts *a* and *b* in a twofold apron shown in Figs. 21 and 22 are interposed. The same refers to the butts *a*, *b* and *c* in a threefold apron. Shown in Figs. 23 and 24. In Figs. 22 and 24 the layers of the tracing cloth in the apron I are shown exaggeratedly thick for the sake of clearness. Thus an endless apron is obtained, which is throughout of the same thickness and lasts much longer than an apron with seven joints would, because the joints of the latter are not only thicker, but are also liable to wear and tear. Owing to this construction of the feed apron I the latter cannot be inserted in the channel B through the fine slit C³ (Fig. 7). Therefore the end piece C is made in two halves united together by means of the screw C' (Figs. 5 to 7). To insert the feed apron I in the channel B, one half of the end piece C is taken off, then the apron I is introduced and afterward closed in by putting the half on again.

The forming wheels X' X², X³ X⁴ serve to draw the feed apron I with the continuous cigarette H' out of the forming channel B. To insure this, they may also be covered at the circumferences with india rubber.

Having described my invention, I declare that what I claim as new and of my own original invention is—

1. In a cigarette machine, the combination, with a forming channel, and an end piece forming an extension of said channel, said end piece having a longitudinal opening, a depression in its top, and a slit connecting said depression and opening, of a die yieldingly held in said depression, substantially as set forth.

2. In a cigarette machine, the combination, with a forming channel, and an end piece forming an extension of said channel, said end piece having a longitudinal opening, a

depression in its top, and a slit connecting the depression and opening, of a die yieldingly held in said depression and provided with a folding groove in its under surface, substantially as set forth.

3. In a cigarette machine, the combination, with a pair of shafts, a crimping wheel on each shaft and opposite each other, of a forming wheel mounted on each shaft, each forming wheel comprising a pair of forming-wheel sections adjustable with relation to each other, and means for driving the crimping wheels and forming wheels, substantially as set forth.

4. In a cigarette machine, the combination, with a pair of shafts, a crimping wheel on each shaft and opposite each other, of a forming wheel loose on each shaft, each forming wheel comprising a forming-wheel section having a hub, and a second forming-wheel section adjustably mounted on said hub, and means for driving the crimping and forming wheels, substantially as set forth.

5. In a cigarette machine, the combination, with a pair of shafts, a crimping wheel fixed on each shaft and opposite each other, of a forming wheel loose on each shaft, each forming wheel comprising a pair of forming-wheel sections, one of which has a hub onto which the other section is threaded, means for driving the shafts, and means for driving the forming wheels, substantially as set forth.

6. In a cigarette machine, the combination, with a pair of shafts, a crimping wheel on each shaft, opposite each other and a swiveled bearing at one end of one shaft, of a spring device normally tending to force the other end of said shaft toward the other shaft, substantially as set forth.

7. In a cigarette machine, the combination, with a pair of shafts, a crimping wheel fixed on each shaft opposite each other, and a forming wheel loosely mounted on each shaft, each forming wheel having a part provided with a hub, of a pair of gear wheels fixed on said hubs and meshing into each other, a second pair of gear wheels meshing into each other, one of said wheels being fixed on one of the hubs of the forming wheels, and the other being fixed on the shaft on which the opposite forming wheel is mounted, and means for driving the last-mentioned shaft, substantially as set forth.

8. In a cigarette machine, the combination, with a pair of shafts, a crimping wheel fixed on each shaft, and a forming wheel loosely mounted on each shaft, each forming wheel having a hub, of a pair of gear wheels of equal diameters fixed on said hubs and meshing into each other, a second pair of gear wheels of different diameters meshing into each other, one of said wheels being fixed on one of the hubs of the forming wheels, and the other being fixed on the shaft on which the opposite forming wheel is mounted, and means for driving the last-mentioned shaft, substantially as set forth.

9. In a cigarette machine, the combination, with a pair of shafts, a crimping wheel fixed on each shaft, a forming wheel loosely mounted on each shaft, each forming wheel having a hub, one of the hubs being longer than the other, a pair of gear wheels of equal diameters fixed on the hubs and meshing into each other, a second pair of gear wheels of unequal diameters meshing into each other, one being fixed on the long hub, and the other fixed on the shaft of the opposite forming wheel, and means for rotating the latter shaft, substantially as set forth.

10. In a cigarette machine, the combination, with a band wheel, and an apron passing over said wheel, of a pressure wheel having an annular surface on its side, said annular surface normally pressing the apron against the band wheel, substantially as set forth.

11. In a cigarette machine, the combination, with a band wheel, and an apron passing around the band wheel, of a pressure wheel provided with an elastic annular ring on its side, said annular ring normally pressing the apron against the band wheel, substantially as set forth.

12. In a cigarette machine, the combination, with a band wheel, of an apron passing around said band wheel, a pressure wheel provided with an annular surface on its side, and a roller normally pressing the annular surface against the apron, substantially as set forth.

13. In a cigarette machine, the combination, with a band wheel, of an apron passing around said band wheel, and a pressure wheel having an annular ring on one of its sides contacting with the apron, substantially as set forth.

14. In a cigarette machine, the combination, with a band wheel having a crown gear, an apron passing over said band wheel and a swinging pressing roller, of a crown wheel driving said pressing roller, and a gear wheel meshing into the crown gear on the band wheel and into the crown wheel, substantially as set forth.

15. In a cigarette machine, the combination, with a driving shaft, a band wheel fixed on the shaft and provided with a crown gear, an apron passing over said band wheel a movable frame, a shaft journaled in said frame, a pressing roller, and a crown wheel fixed on said shaft, of a swinging arm, a screw mounted in the swinging arm and bearing against the movable frame, and a gear wheel meshing into the crown surface on the band wheel and into the crown wheel, substantially as set forth.

16. In a cigarette machine, the combination, with a shaft, a pulley mounted on said shaft, a swinging frame fixed on said shaft, and a pulley mounted in said frame, of a ratchet wheel fixed to the shaft, a pawl engaging said ratchet wheel, and an apron passing over one pulley and under the other pulley, substantially as set forth.

17. In a cigarette machine, the combination, with a shaft, a pulley mounted on said shaft, a swinging frame fixed on said shaft, and a

pulley mounted in said frame, of a ratchet wheel fixed to the shaft, a lever mounted on the shaft and provided with a pawl engaging the ratchet teeth, and an apron passing over one pulley and under the other pulley, substantially as set forth.

18. In a continuous cigarette-machine the combination of a forming channel B made adjustable vertically and sidewise by means of set-screws $B^1 B^2 B^3 B^4$ in trestles $A^1 A^2$ adapted for said forming channel B, with a tongue D held in the opening of said forming channel B and leaving free passage for the wrapper edges, a cross bar D^2 holding said tongue D at the smaller end and having two deep converging cuts $D^3 D^3$ for guiding the wrapper edges, a sharpened and bored end piece C secured to the back end of said forming channel, made in two halves and leaving a narrow slit C^3 for folding the wrapper edges, a die F above said slit C^3 and connected to said cross bar D^2 , the said die F having a conical furrow F' for bending and rolling the folded wrapper edges, and an apron passing through said channel and end piece substantially as shown and described.

19. In a continuous cigarette-machine the combination of an adjustable forming channel B, with a pair of forming wheels for drawing the continuous cigarette out of said forming channel, each forming wheel being made in two halves, threaded one into the other to adjust the width at the circumference according to the diameter of the cigarette, axles carrying said forming wheels and made adjustable endwise by means of screws, an apron passing through the channel and between the forming wheels, and means for pressing the cigarette in the channel, substantially as set forth.

20. In a continuous cigarette-machine the combination of a first crimping wheel on an axle pivoted at both ends in fixed bearings, with a second crimping wheel on a second axle, a box carrying one end of said second axle and pivoted on two pins so as to allow the axle to swing sidewise, a bearing for holding the other end of said second axle, a spring and a screw for pressing said bearing toward said first axle, so as to press the two crimping wheels tightly together, and means for imparting motion to said two axles, substantially as set forth.

21. In a continuous cigarette-machine the combination of a pulley K having teeth at one border, a feed apron I, driven by said pulley with a press roller Y above said pulley K, a pivoted frame Y^2 carrying said press roller Y and connected with the machine frame, a set-screw Z^2 in a swinging arm Z' for pressing said frame Y^2 down, a gear wheel Y^3 fixed on the shaft of said press roller Y, and a long pinion Y^4 pivoted in a swinging arm Y^5 and gearing with said gear wheel Y^3 and with the teeth of said pulley K, substantially as set forth.

22. In a continuous cigarette-machine the

combination of a pulley K serrated on the rim
 a feed apron, I, driven by said pulley, with a
 first bevel wheel N mounted with said pulley
 K on the driving shaft M, a second bevel
 5 wheel N' with a long boss revolving on a bolt
 A³ and gearing with said first bevel wheel N,
 a gear wheel P adapted to slide on the boss of
 said second bevel wheel N' and to partake in
 its revolution and transmit its motion to cer-
 10 tain parts of the machine, an india rubber
 ring O secured to said gear wheel P and ca-
 pable of pressing the feed apron I against said
 pulley K, a lever O³ pivoted on said bolt A³,
 a friction wheel O' on the shorter arm of said
 15 lever O³ and bearing against said gear wheel
 P, and a weight O⁴ on the longer arm of said
 lever O³ and pressing by means of said fric-
 tion wheel O', said gear wheel P and said in-
 dia rubber ring O the feed apron I against
 20 said pulley K, substantially as set forth.

23. In a continuous cigarette-machine the
 combination of the forming channel B, the
 endless feed apron I going through same, a

tongue, D, over said channel the serrated
 driving pulley K, with two tension pulleys I' 25
 and I², a shaft L³ pivoted in a bearing L' at
 the machine table and carrying the one I' of
 said tension pulleys revolving on it at one
 side, a ratchet wheel L⁶ fastened at the other
 side of said shaft L³, a short lever L² fastened 30
 on said shaft L³ and carrying the other I² of
 said tension pulleys, a long lever L turning
 on the boss of said bearing L' and having a
 pawl L⁵ engaging with said ratchet wheel L⁶,
 and a weight L⁷ on said lever L to give the 35
 feed apron I the required tension by means
 of the said various parts, substantially as set
 forth.

In testimony that I claim the foregoing as
 my invention I have signed my name in pres- 40
 ence of two subscribing witnesses.

HERMANN KORTE.

Witnesses:

ADOLF KOCH,
 RUDOLPH FRICKE.