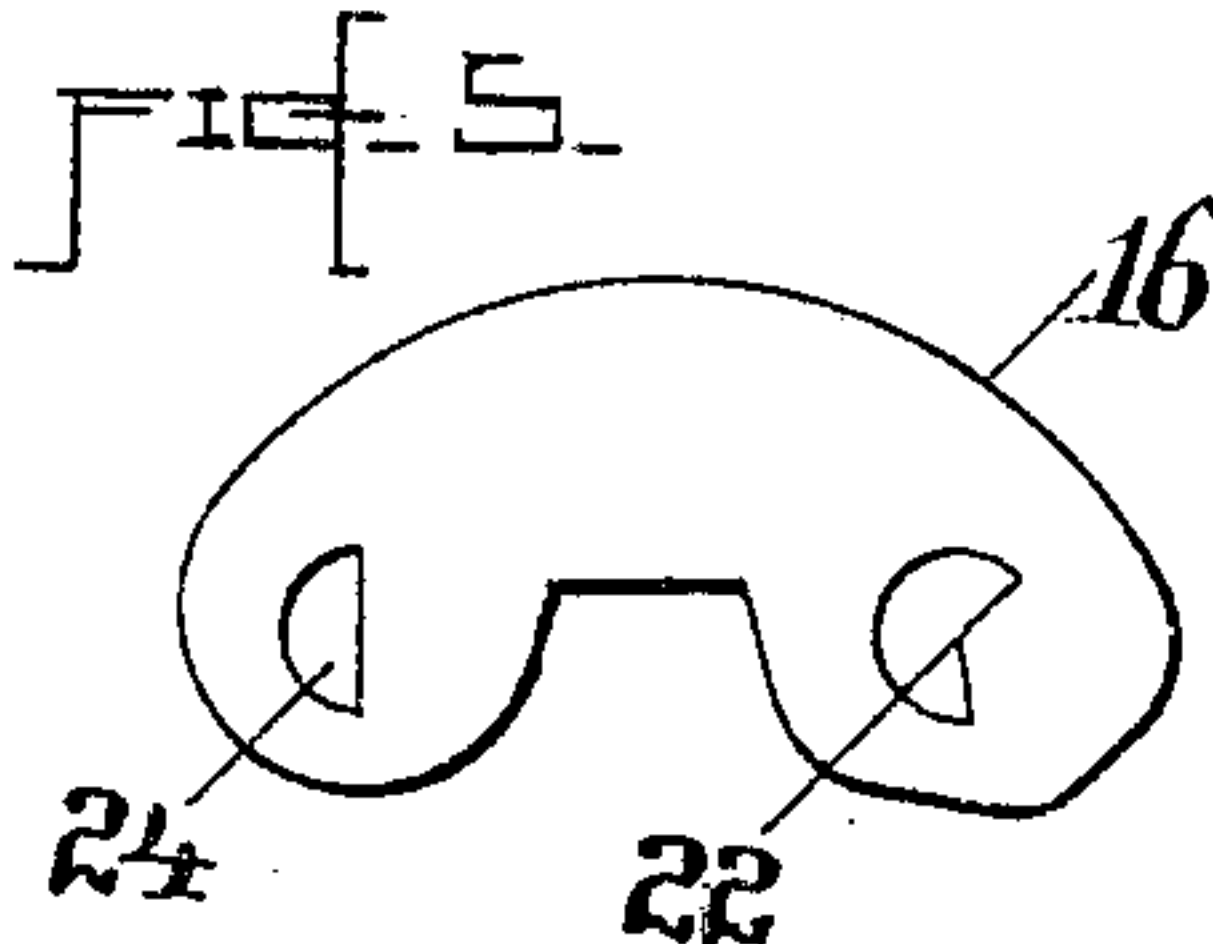
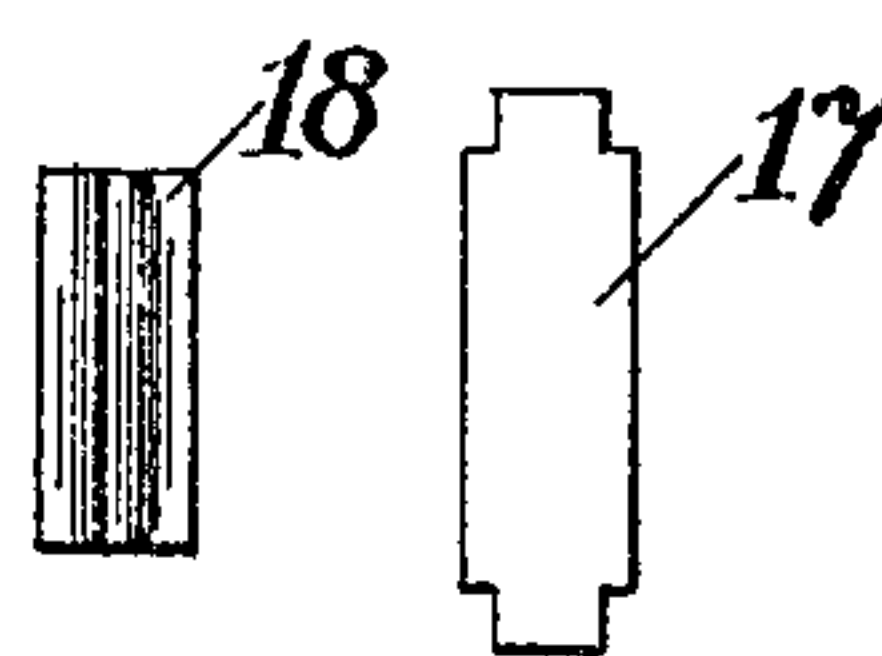
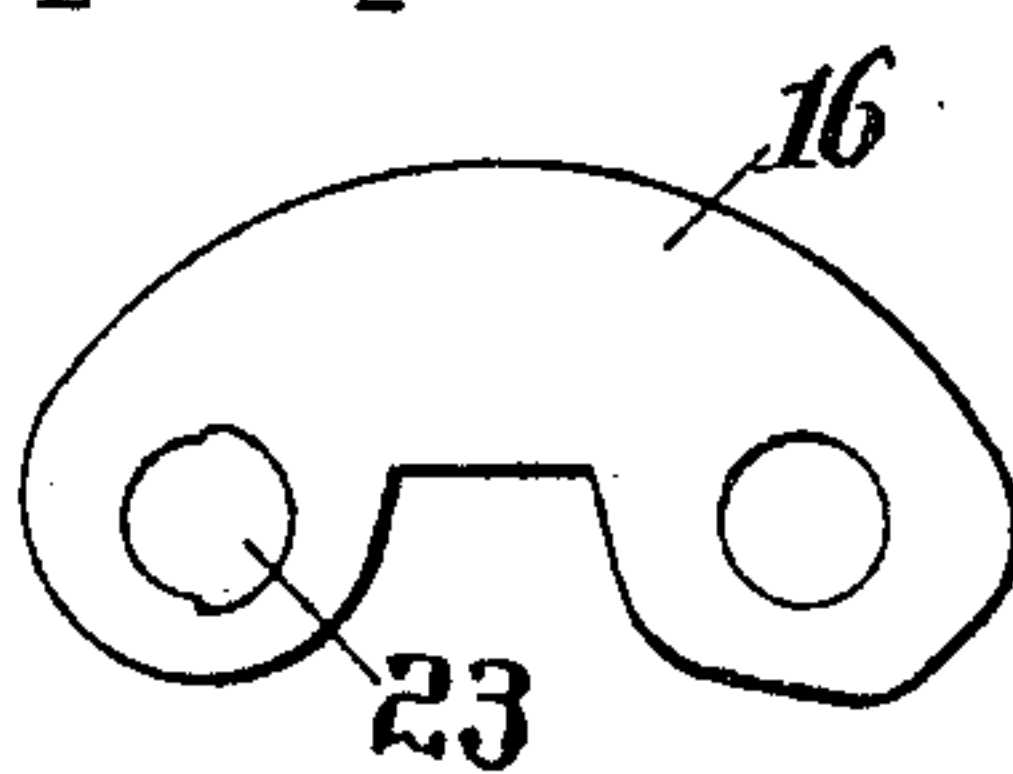
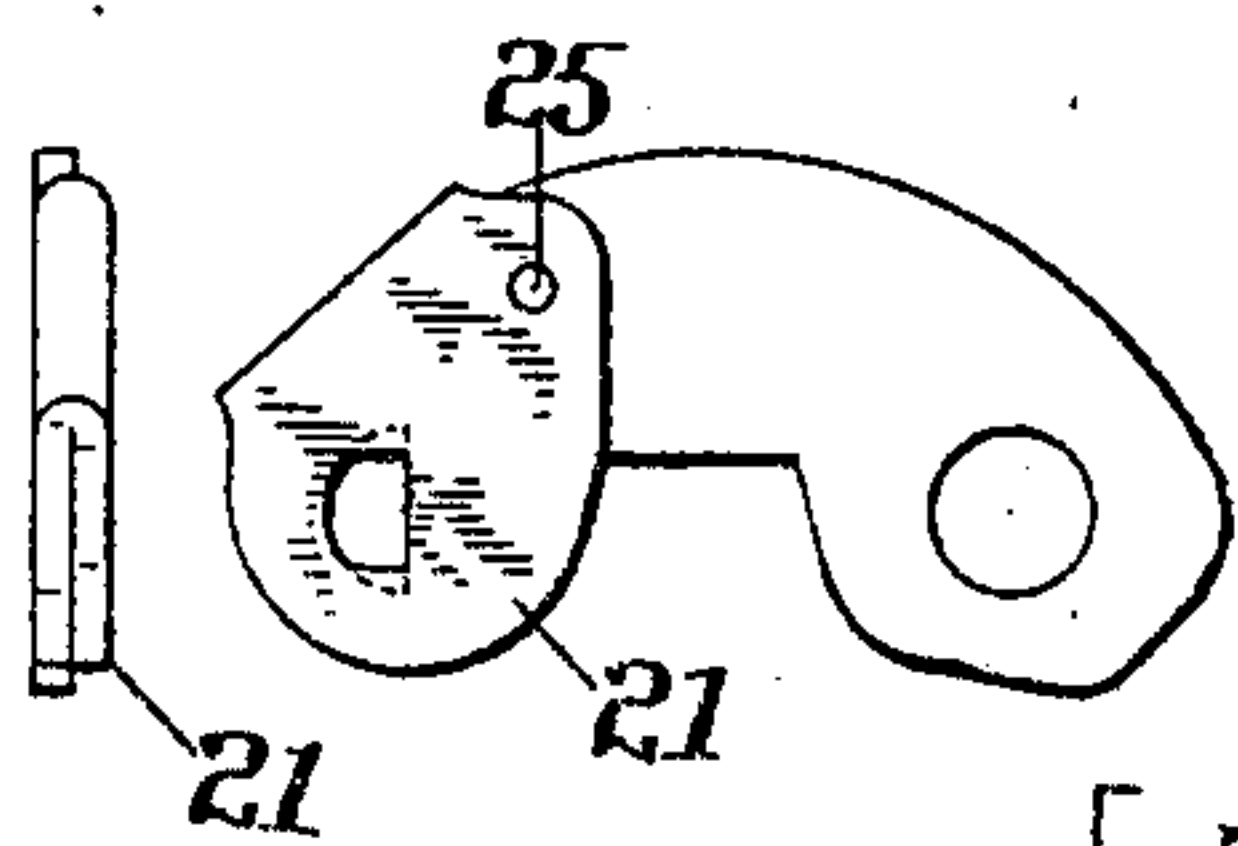
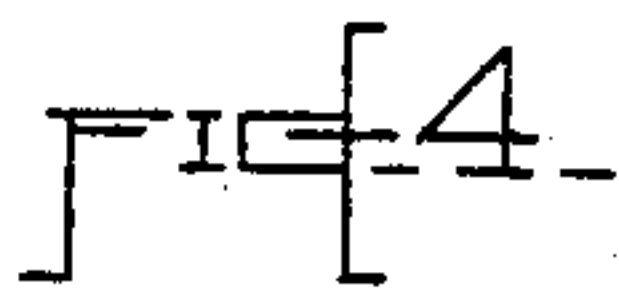
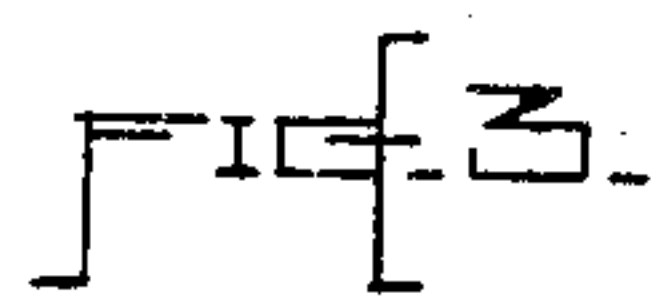
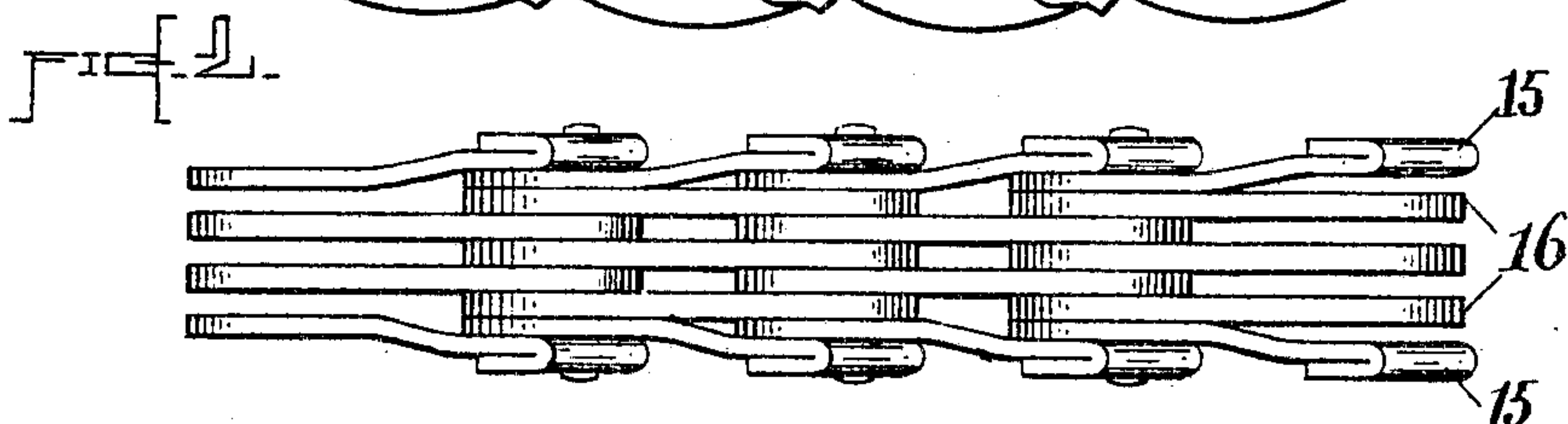
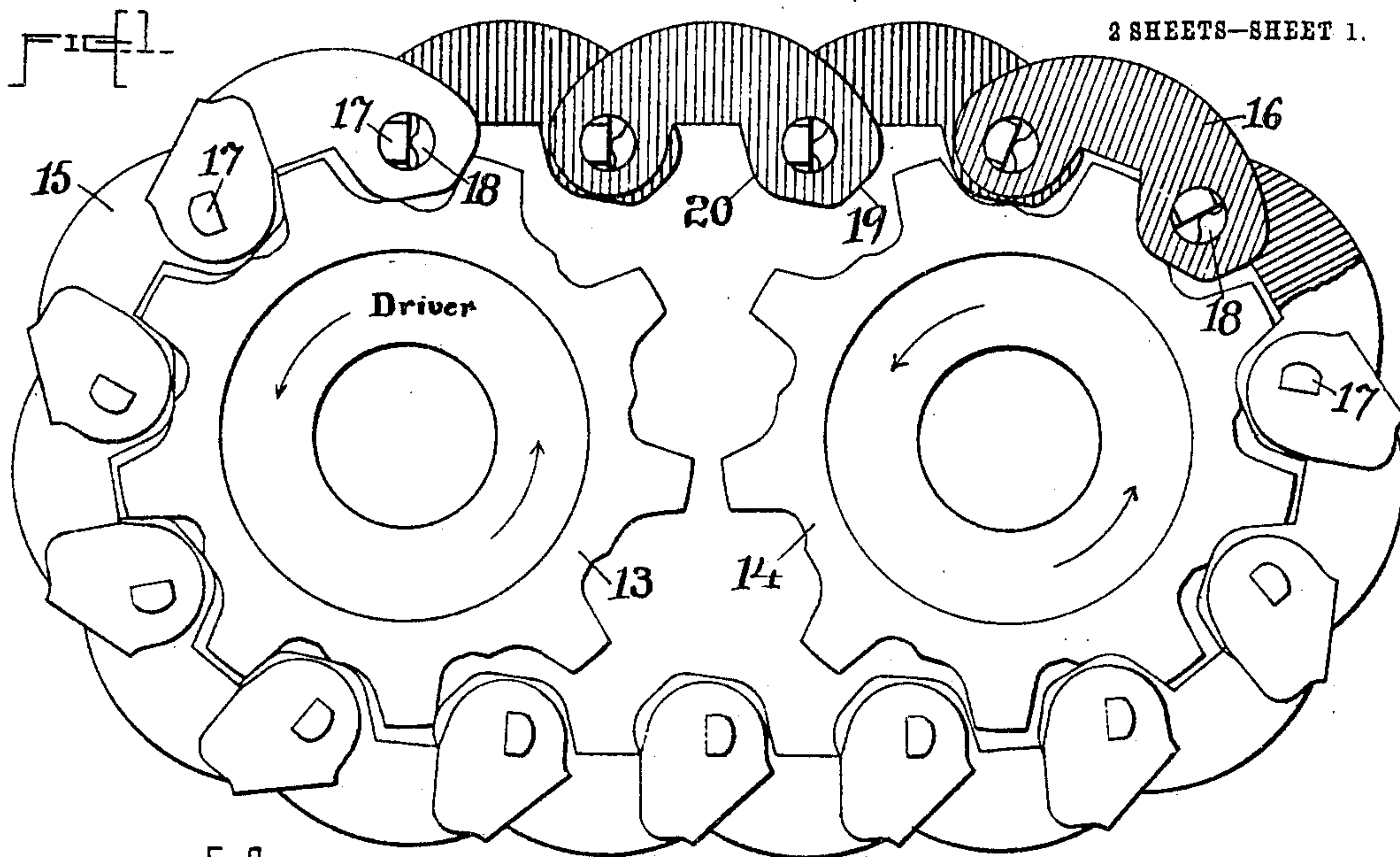


F. L. MORSE.
POWER CHAIN.

APPLICATION FILED APR. 13, 1901.

2 SHEETS—SHEET 1.



Witnesses:

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Frank L. Morse

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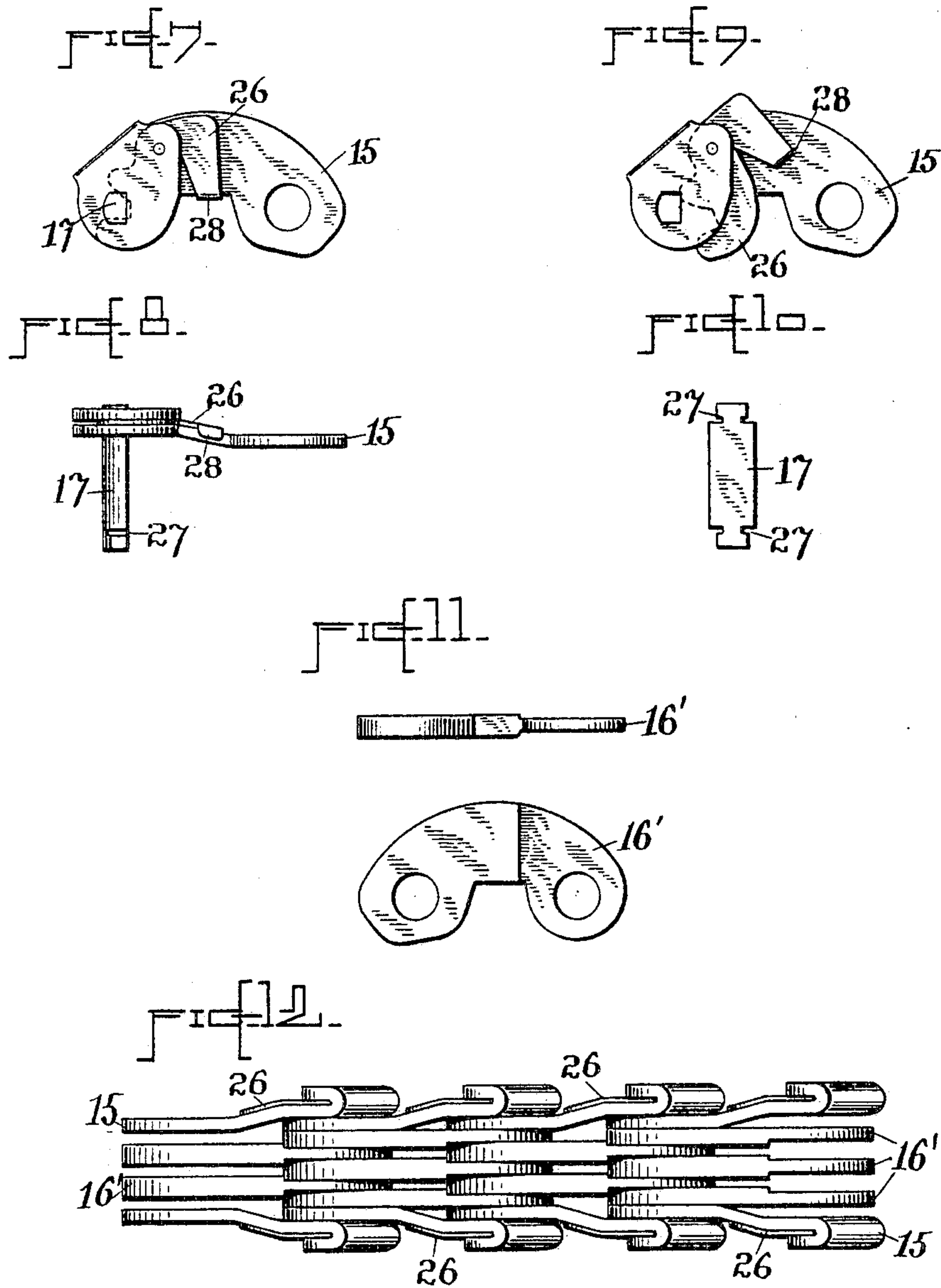
No. 799,072.

PATENTED SEPT. 12, 1905.

F. L. MORSE.
POWER CHAIN.

APPLIOATION FILED APR. 13, 1901.

2 SHEETS—SHEET 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

FRANK L. MORSE, OF TRUMANSBURG, NEW YORK, ASSIGNOR TO MORSE
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POWER-CHAIN.

No. 799,072.

Specification of Letters Patent.

Patented Sept. 12, 1905.

Application filed April 13, 1901. Serial No. 55,696.

To all whom it may concern:

Be it known that I, FRANK L. MORSE, a citizen of the United States, and a resident of Trumansburg, in the county of Tompkins and State of New York, have invented a certain new and useful Improvement in Power-Chains, of which the following is a specification.

This invention relates to improvements in chains for transmission of power, and has for its object the construction of a power-chain in a simple and durable form and on an economical basis.

The invention is especially directed to improvements in that class of power-chains wherein the links are made up of plates and are held together by two-part pintles formed of hardened tool-steel and between which parts there is a rocking motion as the chain goes on and off the sprocket-wheels, thereby reducing to the minimum the wear at the pintle and the consequent lengthening of the chain.

The invention consists in the formation and construction of parts and their combination, substantially as hereinafter described and claimed.

In the accompanying drawings, which form a part of this specification, Figure 1 represents in side elevation a pair of sprocket-wheels and my improved drive-chain applied thereto, parts of said chain being broken away. Fig. 2 represents in plan a portion of the chain seen in Fig. 1. Fig. 3 shows in end and side view one of the outside links of said chain. Figs. 4 and 5 show modifications in the form of the intermediate links. Fig. 6 represents in elevation and end view the parts of the pivots or pintles of the chain. Fig. 7 represents in side elevation an outside link provided with a latch for removably securing it to the pivot. Fig. 8 is an edge view of said link with pivot secured therein. Fig. 9 is a side view of the link seen in Fig. 7, the latch being withdrawn from the position of engagement with the pivot. Fig. 10 is a face view of the part of the pivot to which the outside links are secured by said latch. Fig. 11 represents an edge and side view of a modified form of link. Fig. 12 represents in plan a portion of a chain embodying the modifications shown in Figs. 7 to 11.

Referring to Figs. 1, 2, and 3, the driving sprocket-wheel is indicated at 13 and the driven sprocket-wheel at 14. The chain is

made up of the outside links 15 and the intermediate links 16, together with the pintles, each consisting of the seat-pin 17 and the rocker 18. The proper working of the pintle requires that the parts thereof shall rock freely on each other. Therefore the seat-pin 17 has a hardened plane steel surface, which is engaged by a hardened cylindrical steel surface on the rocker 18. The proper working of these surfaces upon one another also requires that the plane bearing-surface of the seat-pin shall be substantially perpendicular to the direction of force in the joint, and therefore said pins are fixed in position in their respective links so that said surfaces will all face in the same direction and so that they will be substantially perpendicular to the length of their respective links. A still further requisite for a perfect and free operation of this joint is that the links shall engage the sprockets by one end only, and for this purpose each link has one end thicker than the other and the thicker end provided with an outside or end engaging surface 19 and an inside engaging surface 20, which surfaces project beyond the periphery of the smaller end of the adjacent links. This provides for the smaller ends of the links working entirely free of the sprockets, and as it is in these free ends of the outside links that the seat-pins 17 are fixed said pins are free from lateral pressure. Each outside link 15 is bent laterally, so as to rest at the inside of the next outside link, as seen in Fig. 2, and to receive and support at this its engaging end the rocker 18. The parts 17 of the pintles serve to join together the links of the chain, and in order to take advantage of the full strength of these parts it is preferable that they extend at their full size into the outside plates or links 15. It is also desirable that in a properly-constructed chain shoulders should be formed upon the connecting-pintle in order that in securing the pintle to the outside plates they may not be made to encroach upon the spaces of the intermediate plates. To accomplish this in a simple and reliable manner, the ends of the links 15 are folded over upon themselves, such fold being clearly shown at 21, Fig. 3, and through the fold 21 an opening is formed of a size to admit the reduced end of the pintle, the shoulders of the pintle resting against the under side of the fold 21, whereby the pintle at full

size is confined in the main portion of the link 15. The reduced portion of the pintle is preferably projected sufficiently beyond the fold 21 to allow of its being riveted down upon said fold. Although the pintle 17 is made of the best hardened tool-steel, the application of an electric arc to the end will sufficiently soften the same for riveting without softening the pin for an objectionable distance from the end. Within the apertures of the engaging ends of the outside links and the ends of the intermediate links are located the rockers 18, as seen in Fig. 1, they being confined within said openings by the folded or free ends of the adjacent outside links, the openings through said free ends being preferably made to receive the ends of pintle 17 only.

If desired, the rocker may be replaced by projections into the apertures of the intermediate links formed from the metal of said links, as seen at 22 in Fig. 5. Also in the smaller ends of the intermediate links 16 the aperture may be enlarged at the side of the rocker so that the latter will not touch said links, but will rest simply against the walls of the openings in the larger ends of the adjacent links. Such construction is seen at 23 in Fig. 4.

The shape of the opening in the smaller end of the outside links under the fold 21 is indicated in full lines at 24 in Fig. 5. Usually the outside links are made of sufficiently heavy metal to provide for the fold 21 remaining tightly against the outer face of the link 16; but, if desired, its retention in this position may be insured by placing a small rivet through the fold and main part of the link, as seen at 25 in Fig. 3.

In a chain of the structure just described a coupling may be readily formed by inserting between the fold 21 and the main portion of the link 16 a latch, as seen at 26, Figs. 7, 8, and 9, which shall engage with a groove or grooves in the ends of the pintle 17, as seen at 27, Fig. 10. This latch may be of any desired shape and held in place in any suitable manner. It is, however, preferably pivoted, as upon the rivet 25, and provided with a catch, as 28, which when the latch is in place shall engage with the edge of the link and hold the latch against accidental displacement. Said latch being of thin spring-steel, the catch may be readily sprung up and the latch swung on its pivot to disengage it from the end of the pintle. In Figs. 7 and 8 the latch is shown in engagement with the pintle, while in Fig. 9 it is shown withdrawn therefrom.

Instead of riveting the pintle 17, as above described, a chain may be made by using the latches 26 on both ends of all the pintles, as indicated in Fig. 12.

Since but one end of each link engages the sprocket-teeth, it is desirable in chains transmitting a considerable power to broaden the engaging surfaces of the links, thereby giving

an extended-wearing surface on the sprockets. This may be done as indicated in Figs. 11 and 12, wherein the intermediate plates are made thicker at the engaging end, as by swaging or otherwise reducing the smaller ends thereof.

In the power-chain in question, wherein the links arch over the sprocket-teeth, the engagement with the teeth by but one end of each link is readily accomplished. This gives an advantage in the manufacture of the sprocket-wheels, since it enables the inner engaging faces of the links to be made on the same angle to the line of pull, thereby enabling the same cutter to be used in cutting sprocket-wheels of different sizes, and it likewise enables the non-engaging ends of the links to turn on their pivots free of the sprocket-wheel by making them smaller than the engaging ends of the links.

Other changes and modifications in the formation of my power-chain aside from those above mentioned may be made without departing from the invention.

I claim as my invention—

1. A drive-chain, having links composed of a plurality of plates adapted to arch over the sprocket-teeth, the plates of each link being larger at one end than at the other, whereby only one end of each link engages the sprocket-teeth.

2. In a drive-chain wherein the links arch over the sprocket-teeth, links of greater thickness at one end than at the other, the thicker ends of the links extending beyond the periphery of the smaller ends of adjacent links both in front and in rear of the pivot whereby one end only of the links engages the sprocket-teeth.

3. A drive-chain wherein the links consist of arched plates pivoted together, the plates of each link alternating with those of adjacent links and the plates of each link having an external and an internal engaging surface at one end which extend beyond the corresponding portions of the ends of the interposed plates of the adjacent link.

4. A drive-chain wherein the links consist of arched plates pivoted together, the plates of each link alternating with those of adjacent links and the plates of each link having an external and an internal engaging surface at one end which extend beyond the corresponding portions of the interposed plates of the adjacent link the ends of the plates having the engaging surfaces being thicker than the other ends thereof interposed between the thicker ends of the adjacent link, whereby the bearing of each link is extended.

5. A drive-chain wherein the links consist of arched plates pivoted together, the plates of each link alternating with those of adjacent links and the plates of each link having an internal and an external engaging surface at one end which extend beyond the corresponding

portions of the interposed plates of the adjacent link the outside plates of each link being bent laterally inward so as to come within the end of the outside plates of the adjacent link thereby providing for an equal width of engaging surface for each link and for each plate of each link doing duty.

6. In a drive-chain, an outside plate having one end folded back upon itself and an opening for the pivot formed through the part of the plate thus reinforced, the opening being irregular in outline to prevent the pivot from turning therein and the opening through the fold being smaller than that through the body portion of the plate, as and for the purpose set forth.

7. In a drive-chain having shouldered pivot-pins, outside plates each having an end folded over upon itself, the portion folded over having an opening to receive the reduced portion of the pin and forming an abutment for the shoulders on the pin while the opening in the main part of the plate receives the pin at its full cross-section.

8. In a drive-chain, the combination with pivot-pins provided with grooves near their ends, of outside links or plates having an end folded over upon itself and perforated to receive the end of a pivot-pin, and a latch located under the fold to engage in the groove of the pin to hold the plate upon the pin.

9. In a drive-chain, the combination with pivot-pins provided with grooves near their ends, of outside links or plates having an end folded over upon itself and perforated to receive the end of a pivot-pin, and a latch pivoted to the plate and movable under the fold to enter the groove of the pin and having a catch whereby to maintain the latch in the groove of the pin for holding the plate upon the pin.

10. A drive-chain consisting of links made up of plates overlapping and alternating, and pintles having grooves at their ends and joining said plates together, the outside plates having an end folded over upon itself and perforated to receive the pintles, and a pivoted latch under each fold for removably securing the outside links to the pintles and the links to one another.

11. In a drive-chain wherein the links consist of arched plates engaging the sprocket-teeth and wherein the links are joined by two-part pintles, the seat-pins of said pintles fixed

in the outside plates with their bearing-faces substantially at right angles to the line of pull and all facing in the same direction and the rocking members of said pintles confined between said outside plates or links in the openings through the intermediate plates, substantially as set forth.

12. In a drive-chain wherein one end only of the driving-links engages the sprockets, two-part pintles of which one part has a substantially plane bearing-surface for the other part, said plane bearing-surfaces all facing in the same direction, as and for the purpose set forth.

13. In a drive-chain wherein one end only of the driving-links engages the sprockets, two-part pintles of which one part has a substantially plane bearing-surface and is fixed in that end of the link which does not engage the sprockets and faces toward the other end thereof and the other part of the pintle has a rocking engagement upon the plane bearing-surface, as and for the purpose set forth.

14. In a drive-chain, two-part pintles of which one part has a substantially plane bearing-surface for the other part, said plane bearing-surfaces all facing in the same direction, as and for the purpose set forth.

15. A drive-chain having links composed of a plurality of plates adapted to arch over the sprocket-teeth, the outside plates of each link being bent laterally and placed with one end outside and the other end inside the corresponding plates of the respective adjacent links.

16. A drive-chain having links composed of a plurality of plates, and pintles formed in two parts comprising a seat-pin and rocker, the seat-pins having their bearing-surfaces substantially at right angles to the line of pull and all facing in the same direction.

17. A drive-chain having links composed of a plurality of plates, and pintles formed in two parts comprising a seat-pin and rocker, the side plates of each link being bent laterally and having one end engaging the seat-pin and the other end engaging the rocker.

Signed at Trumansburg, in the county of Tompkins and State of New York, this 9th day of April, A. D. 1901.

FRANK L. MORSE.

Witnesses:

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JULIA L. SEELYE.