

No. 817,604.

PATENTED APR. 10, 1906.

R. WILLIAMS.
POWER TRANSMISSION SYSTEM.
APPLICATION FILED JAN. 11, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

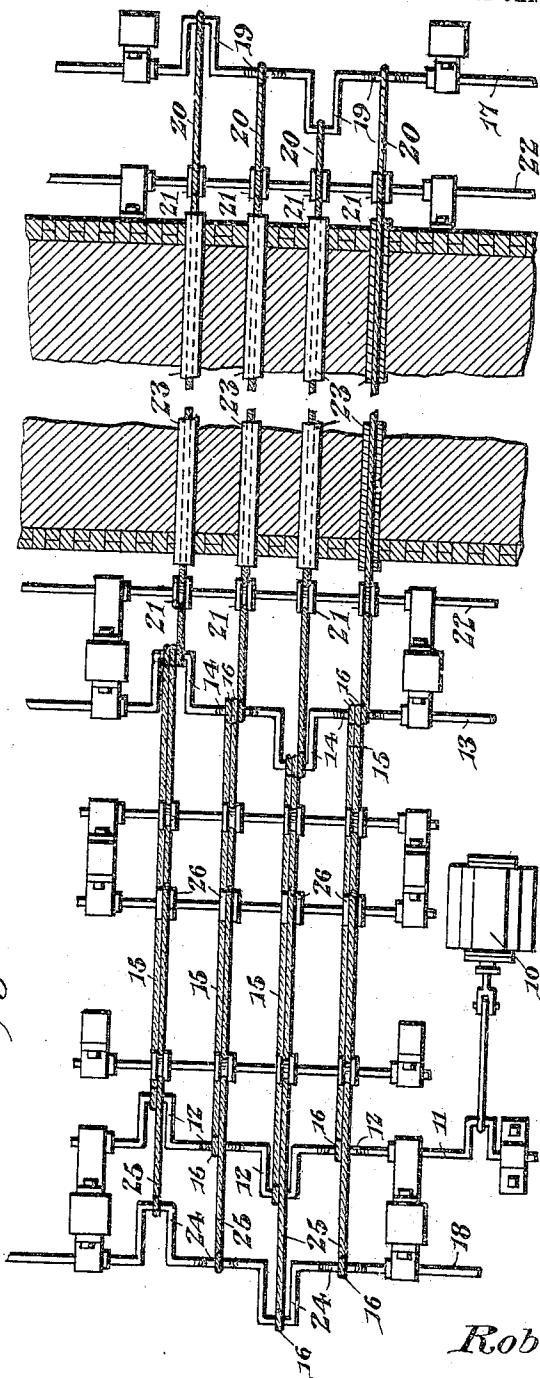


Fig. 5.

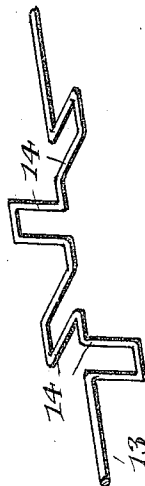
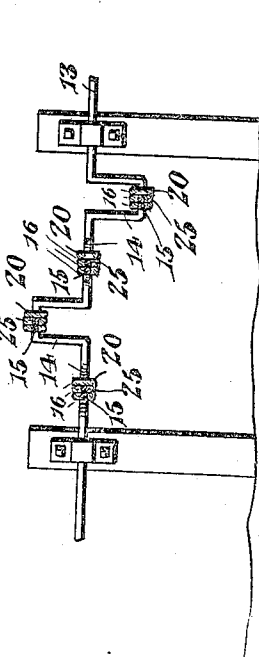


Fig. 4.



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2 SHEETS—SHEET 2.

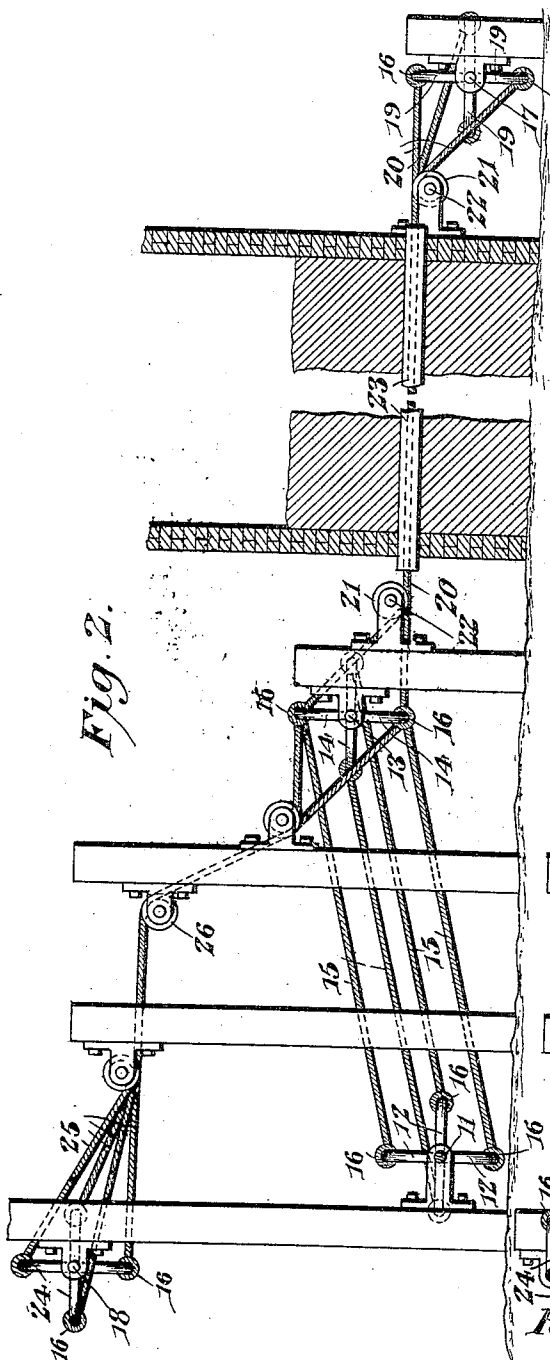


Fig. 2.

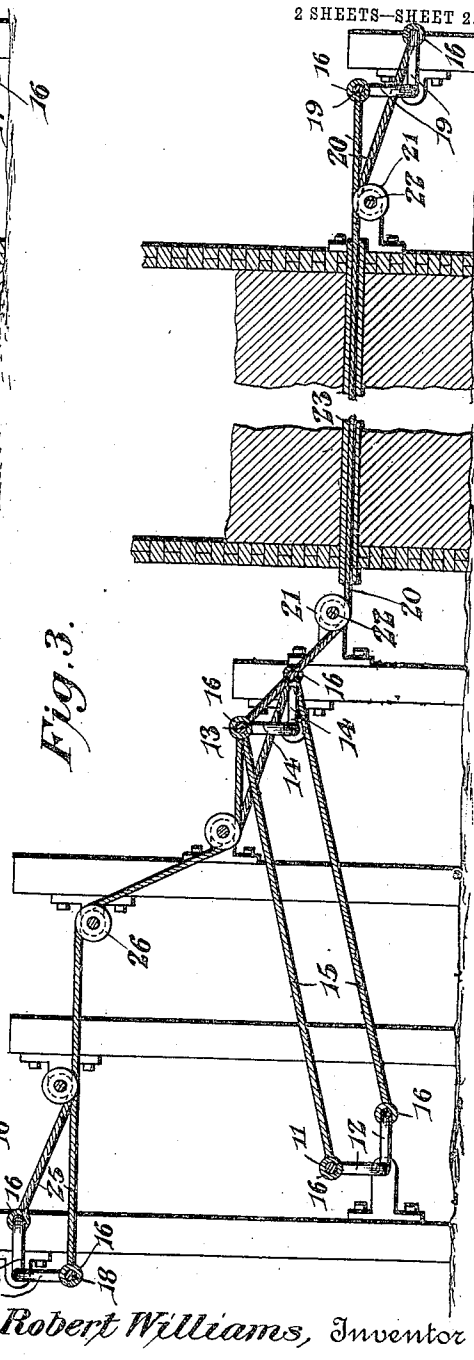


Fig. 3.

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UNITED STATES PATENT OFFICE.

ROBERT WILLIAMS, OF COALDALE, PENNSYLVANIA.

POWER-TRANSMISSION SYSTEM.

No. 817,604.

Specification of Letters Patent.

Patented April 10, 1906.

Application filed January 11, 1905. Serial No. 240,583.

To all whom it may concern:

Be it known that I, ROBERT WILLIAMS, a citizen of the United States, residing at Coal-dale, in the county of Schuylkill and State of Pennsylvania, have invented a new and useful Power-Transmission System, of which the following is a specification.

This invention relates to improvements in the means for transmitting power from one point to another, and particularly between comparatively distant stations.

One of the principal objects is to provide novel mechanism of a simple nature whereby power may be readily transmitted to great distances in indirect lines and at comparatively small cost and loss.

Another object is to provide means that will occupy but little space and will permit the ready connection thereto of practically any number of mechanisms to be driven.

A still further object is to provide mechanism of a simple nature that will secure the reversal of motion whenever the same may be found desirable or expedient.

An embodiment of the invention that is considered preferable is illustrated in the accompanying drawings and is described in the following specification.

An inspection of the claims hereto appended will clearly indicate that the said invention is not limited to the exact construction and detailed arrangement shown, but is open to various changes and modifications.

In the drawings, Figure 1 is a plan view of the system. Fig. 2 is a side elevation of the same. Fig. 3 is a longitudinal sectional view. Fig. 4 is a cross-sectional view. Fig. 5 is a detail perspective view of the line-shaft.

Similar reference-numerals designate corresponding parts in all the figures of the drawings.

In the embodiment illustrated a motor-shaft 11 is shown, which may be driven from any suitable source of power, an engine 10 being illustrated in this particular instance. This motor-shaft is provided with a plurality of angularly-disposed cranks 12, four being shown, though any number desired may be employed. A line-shaft 13 is illustrated, said line-shaft having a plurality of angularly-disposed cranks 14, corresponding to the cranks 12 of the motor-shaft. Con-

nections 15, preferably in the form of cables, are made between the corresponding cranks 12 and 14, said cables being secured by suitable journal-links 16 to their respective cranks. In view of the fact that the connected cranks are at all times disposed in substantially parallel relation it will be apparent that when the motor-shaft 10 is rotated in one direction or the other the line-shaft 13 will be similarly rotated because of the cranks and connections.

Counter-shafts 17 and 18 are illustrated as being driven from the line-shaft 13. The counter-shaft 17 is shown as being located in a separate building and at some distance from the power plant. This counter-shaft 17 is provided with a plurality of angularly-disposed cranks 18, corresponding to the cranks 14 of the line-shaft. The corresponding cranks 14 and 19 are connected by cables 20, and said cranks are so related that the shaft 17 will revolve in the same direction as the shaft 13. In this particular instance, as it is desired to transmit power from the line-shaft to a considerable distance, it is very desirable to prevent the lateral play of the connections 20, said connections being illustrated as passing underground. To this end idler rollers or pulleys 21, suitably journaled on shafts 22, are located between the line-shaft 13 and the counter-shaft 17 and on opposite sides of the cables 20, said cables operating upon the pulleys during the rotation of the shafts and said pulleys being located contiguous to said shafts.

As shown particularly in Fig. 2, the idler-pulleys contiguous to the line-shaft 13 are disposed in line with the lowermost portion of the paths of revolution of the cranks 14, while the idler-pulleys contiguous to the shaft 17 are located substantially in line with the uppermost portion of the paths of revolution of the cranks 19. By this arrangement, therefore, it will be seen that the portions of the cables between the pulleys 21 are held against lateral play and that said cables have comparatively slight longitudinal movement only. Thus said portions can be passed through comparatively small guide-tubes 23 and will need but little space for their movements.

The counter-shaft 18 is provided with a plu-

5 rality of crank-arms 24, and particular atten-
 tion is invited to the disposition of these arms
 with respect to the cranks 14 of the line-shaft,
 in that the arrangement, together with the
 10 cable connections 25 between the correspond-
 ing cranks, effects a reverse movement on the
 part of the shaft 18 to that of the shaft 13.
 It will be observed that the crank 24, which
 is being drawn toward the shaft 13 by the
 15 crank 14, connected thereto, is always dis-
 posed oppositely to said connected crank 14,
 and consequently while two of said sets of
 connected cranks are disposed in substan-
 tially the same relation the other two are
 20 oppositely disposed. The result is that the
 shaft 18 will be rotated in a direction oppo-
 site to that of the driving or line shaft 13. In
 order to show how the cables may be dis-
 posed in indirect paths, the cable connec-
 25 tions 25 are shown as passing over rollers 26,
 located in different positions and constitut-
 ing supports which permit the free longitu-
 dinal movements of the cables, but prohibit
 their lateral play.

25 From the above it will be seen that mech-
 anism is provided for transmitting motion
 which is simple and powerful and may be
 made to occupy comparatively little space.
 Furthermore, the motion may be readily re-
 30 versed without in any manner altering the
 type of the structure and without the neces-
 sity of crossed belts or other analogous ar-
 rangements. A still further important fea-
 ture resides in the arrangement whereby the
 35 same cranks of the line-shaft which are em-
 ployed for receiving power from the motor-
 shaft may in turn transmit power to one or
 any number of counter-shafts, said cranks
 being employed even where the motion is re-
 40 versed, as shown in the connections with the
 counter-shaft 18. This, it will be clear, is a
 distinct advantage over belting, wherein a
 separate pulley must be employed for each
 connection. Moreover, the system is par-
 45 ticularly adapted for transmitting power
 over indirect routes, as the cables can be
 passed over hills, buildings, or other obstruc-
 tions or through valleys or depressed places by
 merely supporting said cables upon rollers,
 50 the cables having merely longitudinal move-
 ment and no lateral play. This will be clear
 by reference to the connections shown be-
 tween the line-shaft 13 and counter-shaft 18.

55 From the foregoing it is thought that the
 construction, operation, and many advan-
 tages of the herein-described invention will
 be clear to those skilled in the art, and it will
 be understood that various changes in the
 size, shape, proportion, and minor details of
 60 construction may be resorted to without de-
 parting from the spirit or sacrificing any of
 the advantages of the invention. This is
 particularly true with respect to the arrange-

65 ment and disposition of the shafts, which
 may be placed in a variety of positions and
 relations with respect to the driving or motor
 shaft and the line-shaft.

Having thus described my invention, what
 I claim as new, and desire to secure by Let-
 70 ters Patent, is—

1. In a power - transmission system, the
 combination with spaced shafts, each having
 a plurality of cranks, of connections between
 the cranks, and idlers located between the
 shafts, said connections operating against
 75 the idlers during the rotation of the cranks
 and preventing the lateral play of said con-
 nections.

2. In a power - transmission system, the
 combination with spaced shafts, each having
 80 a plurality of cranks, of flexible connections
 between the cranks, and idlers located be-
 tween the shafts on opposite sides of the con-
 nections, said connections operating against
 the idlers during the rotation of the cranks
 85 and said idlers preventing the lateral play of
 said connections.

3. In a power - transmission system, the
 combination with spaced shafts, each having
 a plurality of cranks, of connections between
 90 the cranks of the shafts, idler-rollers located
 between and contiguous to the shafts on op-
 posite sides of the connections, said connec-
 tions operating over the rollers and said roll-
 ers preventing the lateral play of the connec-
 95 tions.

4. In a power - transmission system, the
 combination with spaced shafts, each having
 a plurality of angularly-disposed cranks, of
 cables connecting the corresponding cranks
 100 of the shafts, and idler-rollers located on op-
 posite sides of the cables contiguous to the
 shafts, said cables operating over the rollers.

5. In a power - transmission system, the
 combination with spaced shafts, each having
 105 a plurality of cranks, of connections between
 the cranks, and rollers about which said con-
 nections operate.

6. In a power - transmission system, the
 combination with spaced shafts, each having
 110 a plurality of cranks, of sets of spaced rollers,
 and connections between the cranks oper-
 ating over said rollers.

7. In a power - transmission system, the
 combination with a shaft having a plurality
 115 of cranks, of another shaft having a plurality
 of cranks, and connections between the cor-
 responding cranks of said shafts, the connect-
 ed cranks of said shafts being disposed in op-
 posite relations at certain points in their
 120 paths of revolution and said shafts revolving
 in opposite directions.

8. In a power - transmission system, the
 combination with a shaft having a plurality
 of cranks, of another shaft having a plurality
 125 of cranks corresponding to those of the first-

mentioned shaft, certain of said correspond-
ing cranks being disposed in opposite rela-
tion, and connections between the corre-
sponding cranks whereby upon the rotation
5 of one shaft in one direction the other will be
rotated in a reverse direction.

In testimony that I claim the foregoing as

my own I have hereto affixed my signature
in the presence of two witnesses.

ROBERT WILLIAMS.

Witnesses:

JOHN H. SIGGERS,
B. G. FOSTER.