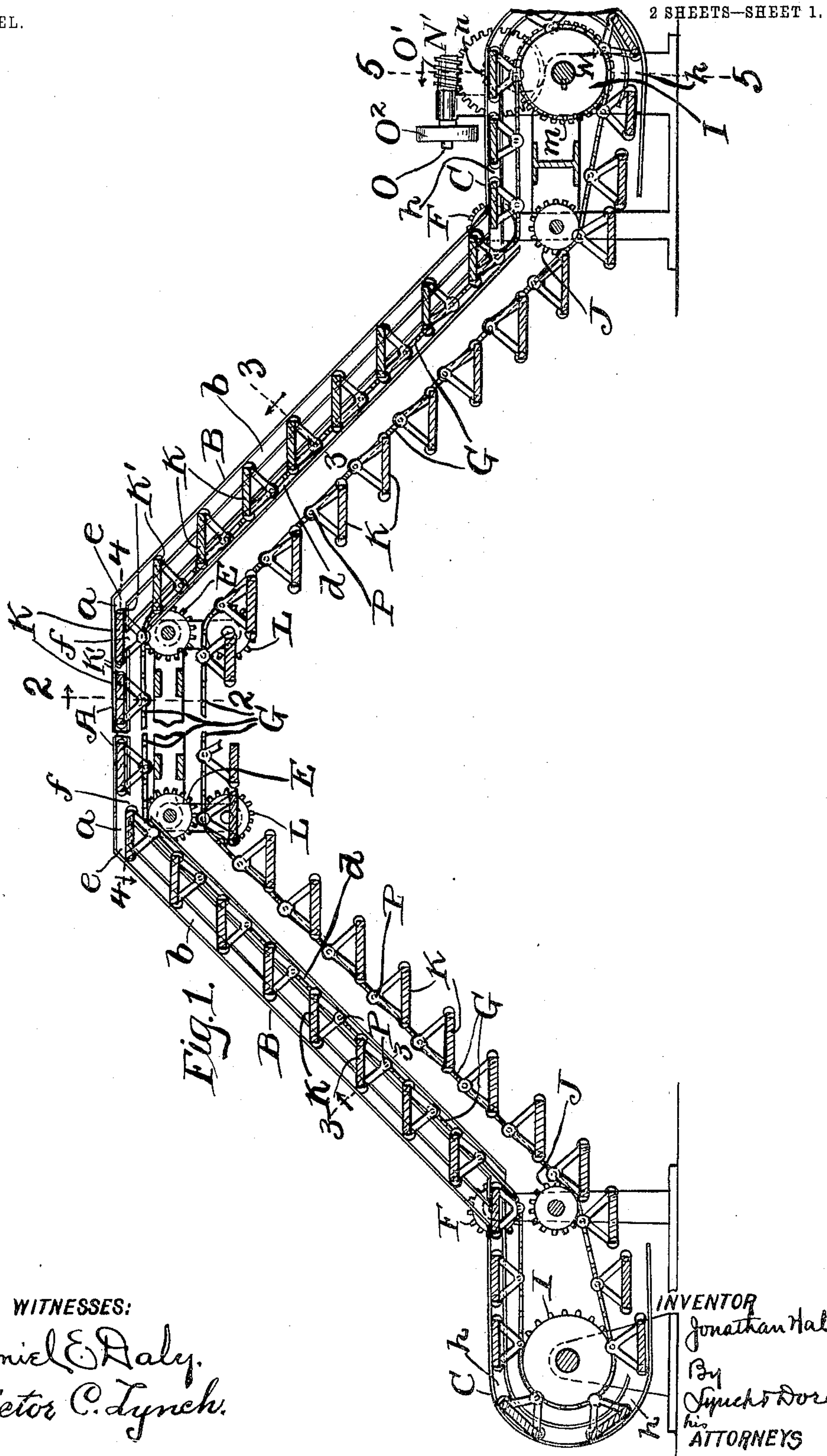


No. 770,523.

PATENTED SEPT. 20, 1904.

J. HALEY.
CONVEYING APPARATUS.
APPLICATION FILED NOV. 7, 1903.

NO MODEL.



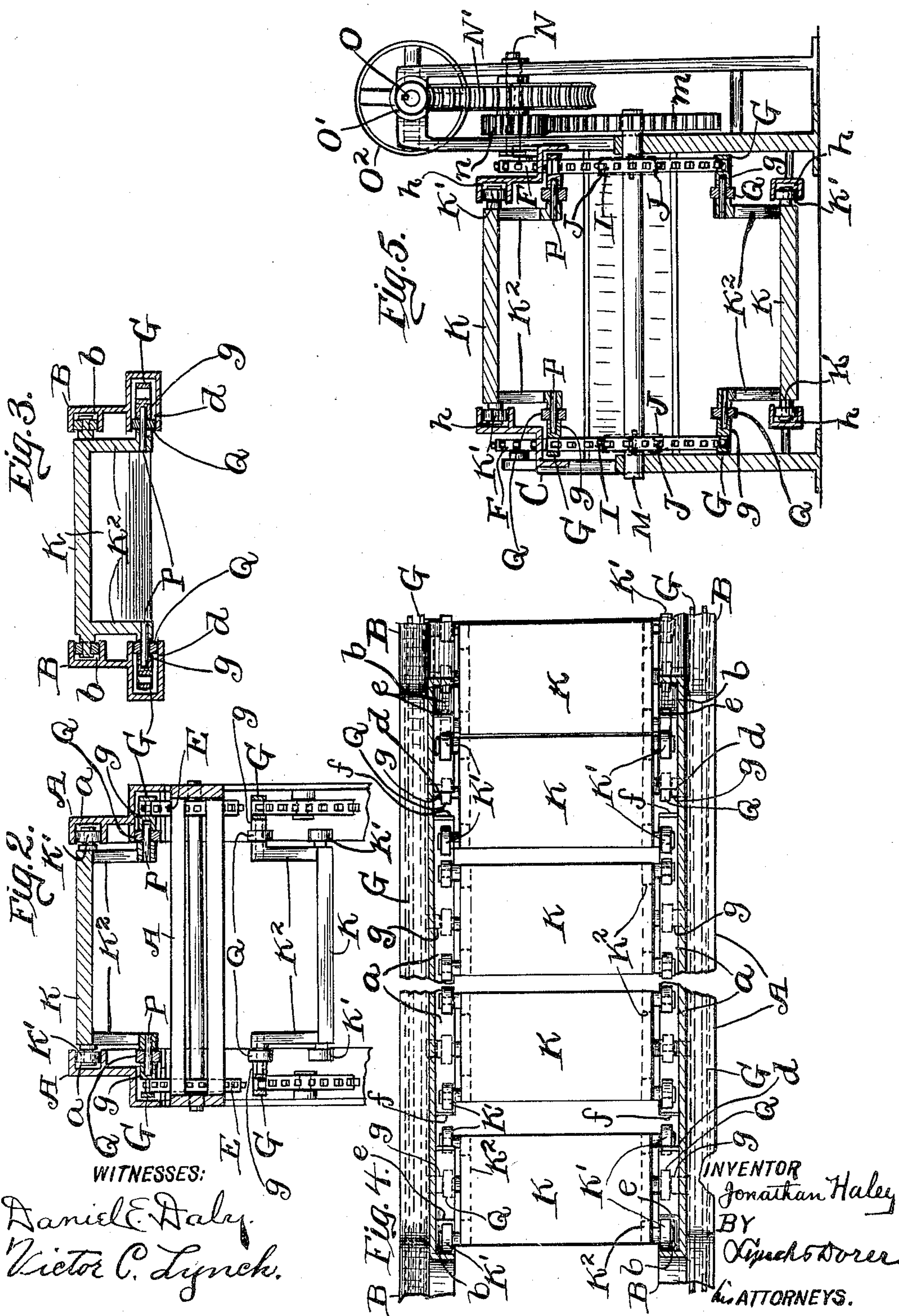
No. 770,523.

PATENTED SEPT. 20, 1904.

J. HALEY.
CONVEYING APPARATUS.
APPLICATION FILED NOV. 7, 1903.

NO MODEL.

2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

JONATHAN HALEY, OF AKRON, OHIO, ASSIGNOR TO THE AKRON GLASS AND MACHINERY COMPANY, OF AKRON, OHIO, A CORPORATION OF OHIO.

CONVEYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 770,523, dated September 20, 1904.

Application filed November 7, 1903. Serial No. 180,164. (No model.)

To all whom it may concern:

Be it known that I, JONATHAN HALEY, a citizen of the United States of America, residing at Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Conveying Apparatus; and I hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

This invention relates to improvements in conveying apparatus more especially designed for use in carrying ware or articles overhead between a machine or operative in one part of a shop and a machine or operative in another part of the shop.

One object of this invention is to provide apparatus whereby ware or articles can be elevated and conveyed with facility from one part of a shop to another part of the said shop without materially obstructing the working space over which the said articles or ware are to be carried.

Another object of this invention is to convey ware or articles up or down an incline by means of an endless carrier extending longitudinally of the said incline and a procession of platforms extending crosswise of the path of the carrier and arranged at suitable intervals longitudinally of the carrier, which platforms are pivotally connected to the carrier, with the pivotal connection between each platform and the carrier arranged crosswise of and at a right angle to the path of the carrier, and means whereby the platforms are arranged and maintained in a horizontal position preparatory and during their passage along the incline.

With these objects in view, and to the end of realizing other advantages hereinafter appearing, this invention consists in certain features of construction and combinations of parts hereinafter described, and pointed out in the claims.

My improved conveying apparatus is illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation in central section of the same, and portions are broken

away in this figure to reduce the size of the drawing. Fig. 2 is a transverse vertical section on line 2 2, Fig. 1. Fig. 3 is a section on either one of lines 3 3, Fig. 1, looking in the direction indicated by the arrow. Fig. 4 is a top plan in horizontal section on line 4 4, Fig. 1, and portions are broken away in Fig. 4 to reduce the size of the drawing. Fig. 5 is an elevation, largely in section, on line 5 5, Fig. 1, looking inwardly. Figs. 2, 3, 4, and 5 are drawn on a corresponding scale, but on a larger scale than Fig. 1.

My improved conveyer is in the form of a bridge adapted to bridge a working space within a factory or shop or any other space—such, for instance, as that over a path or roadway between separate buildings—and comprising a stationary framework which consists of an upper intermediate section A, two inclined sections B, and two end sections C. The end sections C are arranged at the bottom and at opposite sides, respectively, of the space over which ware or articles are to be conveyed. The upper intermediate section A is arranged at a suitable elevation above and centrally between the end sections C. The two inclined sections B diverge downwardly from opposite ends, respectively, of the section A, extending between the latter and the different end sections C, respectively.

The upper intermediate section A of the stationary framework is provided with two oppositely-arranged parallel and horizontal channels or guideways *a*, as shown very clearly in Fig. 2. The guideways *a* are arranged a suitable distance apart in the same plane horizontally and extend from end to end of the section A.

Each inclined section B of the stationary framework is provided with two parallel outer inclined channels or guideways *b*, arranged a suitable distance apart laterally and oppositely and extending from end to end of the said section B. The said guideways *b* are spaced apart correspondingly with the spacing apart of the guideways *a*, and connect at their upper end, as at *c*, with the different guideways *a*, respectively. Each inclined section B of the stationary framework is provided

also with two parallel inner inclined channels or guideways d , arranged a suitable distance apart laterally and oppositely and extending from end to end of the said section B. The
 5 said guideways d are spaced apart correspondingly with the spacing apart of the guideways a and connect at their upper end, as at f , with the different guideways a , respectively. The guideways b and d of each frame-
 10 work-section B are parallel.

An endless carrier extends longitudinally of the framework-sections A and B, and consequently longitudinally of the aforesaid guideways. The said carrier comprises two suitably-guided parallel endless chains G and
 15 platforms K attached to and arranged at suitable intervals longitudinally of the said chains. The two chains G are arranged a suitable distance apart laterally and are guided by
 20 sprocket-wheels supported from the stationary framework. As shown, the chains G lead over suitably-supported sprocket-wheels E, where the upper section A of the stationary framework adjoins the upper ends of the
 25 downwardly-diverging inclined sections B of the said framework and lead in under suitably-supported sprocket-wheels F, arranged at the lower or outer ends of the said inclined sections. From the wheels F the chains G
 30 lead to and over suitably-supported sprocket-wheels I, arranged at the outer ends of the end sections C of the stationary framework. The lower portions of the chains G lead in under suitably-supported sprocket-wheels
 35 J at the lower or outer ends of the inclined sections B of the stationary framework and over suitably-supported sprocket-wheels L, arranged in under and near the sprocket-wheels E.

40 The sprocket-wheels I, at the outer end of one of the end sections C of the stationary framework, are operatively mounted on a horizontally-arranged shaft M, which is supported in any approved manner, and operatively provided at one end with a spur-gear
 45 m , which meshes with a pinion n , operatively mounted (see Fig. 5) on a shaft N, arranged horizontally and parallel with the shaft M. The shaft N is operatively provided with a
 50 worm-wheel N' , which meshes with a worm O' , formed upon the driving-shaft O, which is operatively provided with a driving-wheel O^2 . It will be observed, therefore, that in the apparatus illustrated speed-reducing
 55 means is employed in transmitting power from the driving-shaft O to the chains G.

The platforms K are arranged at the outer side of the chains G. The platforms K are pivotally connected to the chains G and arranged as required to render them when free
 60 to swing capable of swinging in a vertical plane longitudinally of the chains. Each platform K is arranged to be propelled longitudinally of the hereinbefore-mentioned guideways and extends crosswise of the path of the

endless carrier comprising it. Each platform K is provided at each end with two parallel rollers or laterally and outwardly projecting members K' , arranged a suitable distance apart
 70 widthwise of the platform, as shown very clearly in Fig. 4, and instrumental in guiding the platform during the actuation of the aforesaid carrier, and the said rollers or projecting members K' are spaced apart correspondingly with the spacing apart of adjacent inner and outer inclined guideways b and d of
 75 the inclined sections B of the stationary framework. The rollers or projecting members K' at each end of each platform K are arranged in line horizontally with the different rollers
 80 respectively of the other end of the said platform.

Each platform K has two oppositely-arranged brackets K^2 , arranged at opposite ends, respectively, of the platform. As shown very
 85 clearly in Figs. 2, 3, and 5, each platform K is pivoted at the free ends of its brackets K^2 horizontally to the chains G crosswise of the path of the endless carrier comprising the chains and platforms. The pivotal connections between each platform K and the chains
 90 G comprise pins P, which extend from within the brackets K^2 of the said platforms into lugs g , formed upon the adjacent links of the said chains, and rollers Q are preferably
 95 loosely mounted upon the said pins between the lugs g and the brackets K^2 .

By the construction and arrangement of parts hereinbefore described it will be observed that the rollers or projecting members
 100 K' at each end of each platform K will during the actuation of the endless carrier simultaneously move from the horizontal guideways a into the inclined guideways b and d of
 105 an inclined section B of the stationary framework or from the said inclined guideways simultaneously into the said horizontal guideways, according as the said carrier travels in the one or the other direction. It will be observed also that the platforms K are arranged
 110 and maintained in a horizontal position preparatory and during their passage along the inclined guideways b and d .

Each end section C of the stationary framework of the machine is provided, as shown in
 115 Figs. 1 and 5, with two parallel channels or guideways h , which are arranged a suitable distance apart laterally and extend circumferentially of the sprocket-wheels I of the said framework-section. Each guideway h connects with the adjacent inclined guideways b and d , as shown in Fig. 1. The guideways h of each framework-section C are arranged to actuate the platforms K from their depending
 120 position at the lower portions of the chains G into an upright position during their propulsion along the said guideways on their way to the adjacent guideways b and d .

What I claim is—

1. Conveying apparatus comprising oppo- 130

sitely-arranged parallel and horizontal guideways; two oppositely-arranged parallel outer inclined guideways connecting with the different horizontal guideways respectively; two
 5 oppositely-arranged parallel inner inclined guideways connecting with the different horizontal guideways respectively and parallel with the outer inclined guideways; an endless carrier extending longitudinally of the guideways and comprising pivotally-supported
 10 platforms arranged crosswise of the path of the carrier and at suitable intervals longitudinally of the carrier, which platforms are provided, at each end, with two parallel laterally and outwardly projecting members spaced
 15 apart correspondingly with the spacing apart of the inner and outer inclined guideways and the projecting members of each platform being arranged to move from the horizontal
 20 guideways into the inclined guideways or from the latter into the horizontal guideways according as the said platform, during its propulsion along the guideways by the actuation of the aforesaid carrier, is actuated in
 25 the one or the other direction, and means for actuating the carrier.

2. Conveying apparatus comprising a horizontal guideway; two parallel inclined guideways connecting with the horizontal guideway at one end of the said guideway and a
 30 suitable distance apart longitudinally of and extending outwardly from the said guideway; two parallel inclined guideways connecting with the horizontal guideway at the other
 35 end of the said guideway and a suitable distance apart longitudinally of and extending outwardly from the said guideway and spaced apart correspondingly with the spacing apart of the first-mentioned inclined guideways;
 40 an endless carrier extending longitudinally of the guideways and comprising pivotally-supported platforms arranged crosswise of the path of the carrier and at suitable intervals longitudinally of the carrier, which plat-
 45 forms are provided with two parallel rollers or projecting members spaced apart correspondingly with the spacing apart of the inclined guideways at either end of the horizontal guideway, and the aforesaid rollers or
 50 projecting members of each platform being arranged to engage the different inclined guideways respectively at either end of the horizontal guideway and to move from the inclined guideways at one end of the hori-
 55 zontal guideway into engagement with the horizontal guideway and from the horizontal guideway into engagement with the different inclined guideways respectively at the other end of the horizontal guideway during its
 60 propulsion along the aforesaid guideways by the actuation of the aforesaid carrier, and means for actuating the carrier.

3. Conveying apparatus comprising an intermediate guideway; two parallel inclined
 65 guideways connecting with the intermediate

guideway at one end of the said guideway and a suitable distance apart longitudinally of and extending outwardly from the said guideway; two parallel inclined guideways connecting with the intermediate guideway at the other
 70 end of the said guideway and a suitable distance apart longitudinally of and extending outwardly from the said guideway and spaced apart correspondingly with the spacing apart of the first-mentioned inclined guideways; an
 75 endless carrier extending longitudinally of the guideways and comprising suitably-supported platforms arranged crosswise of the path of the carrier and at suitable intervals longitudinally of the carrier, which platforms
 80 are provided with two parallel rollers or projecting members spaced apart correspondingly with the spacing apart of the inclined guideways at either end of the intermediate guideway, and the aforesaid rollers or projecting
 85 members of each platform being arranged to engage the different inclined guideways respectively at either end of the intermediate guideway and to move from the inclined guideways at one end of the intermediate guide-
 90 way into engagement with the last-mentioned guideway and from the intermediate guideway into engagement with the different inclined guideways respectively at the other end of the said intermediate guideway during
 95 its propulsion along the aforesaid guideways by the actuation of the aforesaid carrier, and means for actuating the carrier.

4. Conveying apparatus comprising an upper intermediate guideway; two parallel in-
 100 clined guideways connecting with the upper guideway at one end of the said guideway and a suitable distance apart longitudinally of and extending outwardly and downwardly from the said guideway; two parallel inclined guide-
 105 ways connecting with the upper guideway at the other end of the said guideway and a suitable distance apart longitudinally of and extending outwardly and downwardly from the said guideway and spaced apart corre-
 110 spondingly with the spacing apart of the first-mentioned inclined guideways, and an endless carrier extending longitudinally of the guideways and comprising pivotally-supported platforms extending crosswise of the path of
 115 the carrier and arranged at suitable intervals longitudinally of the carrier, which platforms are provided with two parallel rollers or projecting members spaced apart correspondingly with the spacing apart of the
 120 inclined guideways at either end of the upper guideway, and the aforesaid rollers or projecting members of each platform being arranged to engage the different inclined guideways respectively at either end of the upper
 125 guideway and to move from the inclined guideways at one end of the upper guideway into engagement with the upper guideway and from the upper guideway into engagement with the different inclined guideways re-
 130

spectively at the other end of the upper guideway during its propulsion along the aforesaid guideways by the actuation of the aforesaid carrier.

- 5 5. Conveying apparatus comprising an upper guideway; two parallel inclined guideways connecting with the upper guideway a suitable distance apart longitudinally of and extending outwardly and downwardly from the
10 said guideway; an endless carrier extending longitudinally of the guideway and comprising pivotally-supported platforms extending crosswise of the path of the carrier and arranged at suitable intervals longitudinally of
15 the carrier, which platforms are provided with two parallel rollers or projecting members spaced correspondingly with the spacing apart of the inclined guideways and the roll-

ers or projecting members of each platform being arranged to engage the different inclined guideways respectively and to move from the inclined guideways into engagement with the upper guideway, or from the upper guideway into engagement with the different inclined guideways respectively, according as the said platform, during its propulsion along the aforesaid guideways by the actuation of the aforesaid carrier, is moved in the one or the other direction. 20 25

In testimony whereof I sign the foregoing specification in the presence of two witnesses. 30

JONATHAN HALEY.

Witnesses:

C. H. DORER,

G. M. HAYES.