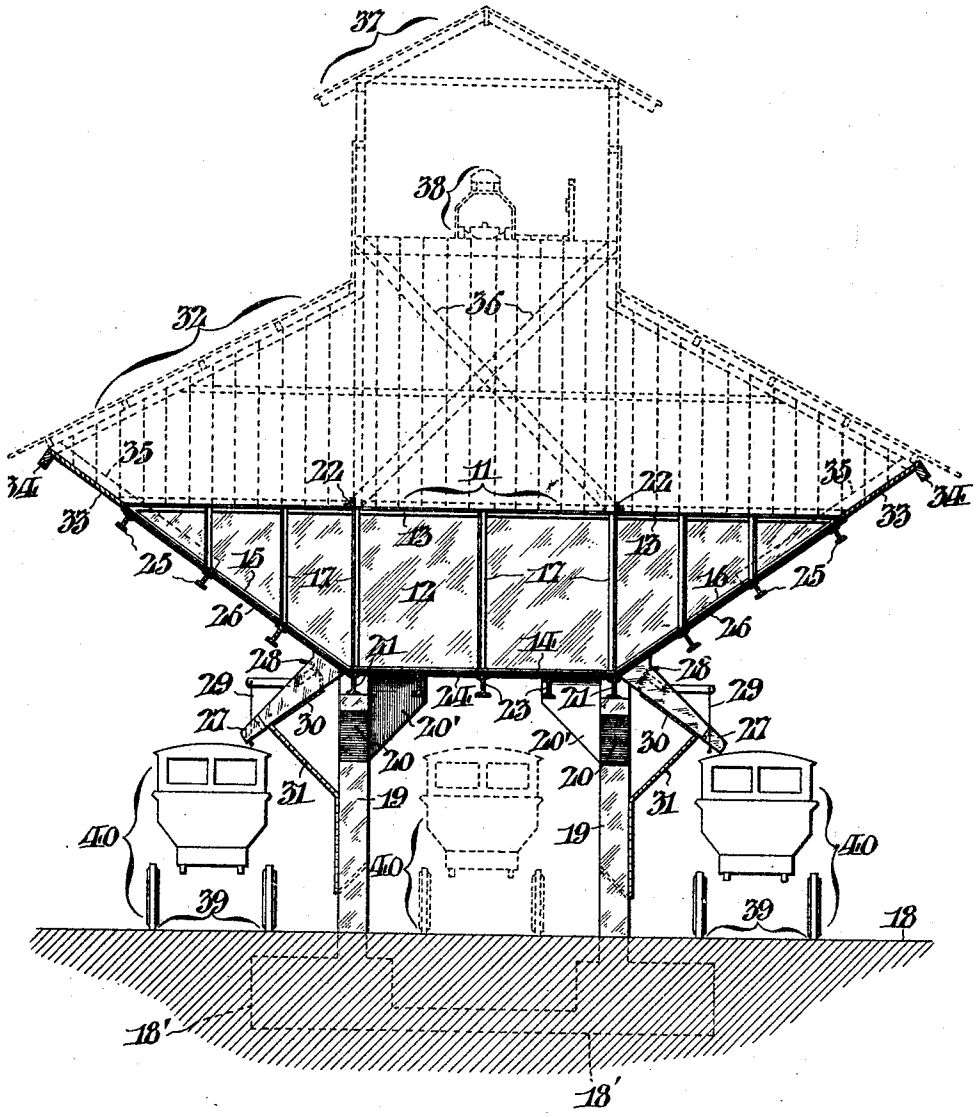
March 16, 1926. 1,576,940

A. WARNER

POCKET OR STORAGE BIN

Filed March 2, 1923 5 Sheets-Sheet 1

FIG. I.



WITNESSES:
John C. Bergner
Alfred E. Tschinger

INVENTOR:
Arthur Warner
BY Fraser & Paul
ATTORNEYS.

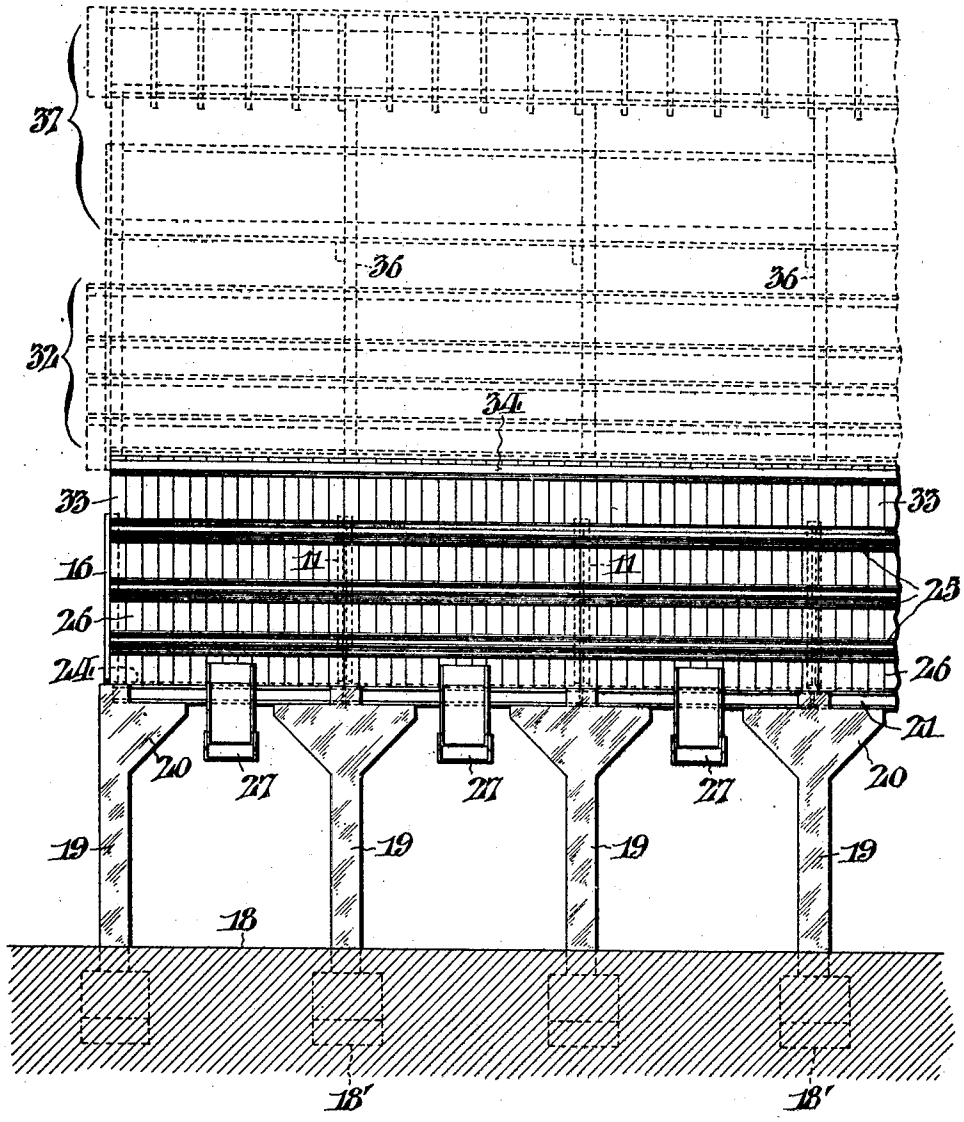
March 16, 1926. 1,576,940

A. WARNER

POCKET OR STORAGE BIN

Filed March 2, 1923 5 Sheets-Sheet 2

FIG. II.



WITNESSES:
John C. Bergner
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INVENTOR:
Arthur Warner,
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March 16, 1926. 1,576,940

A. WARNER

POCKET OR STORAGE BIN

Filed March 2, 1923 5 Sheets-Sheet 3

FIG. III.

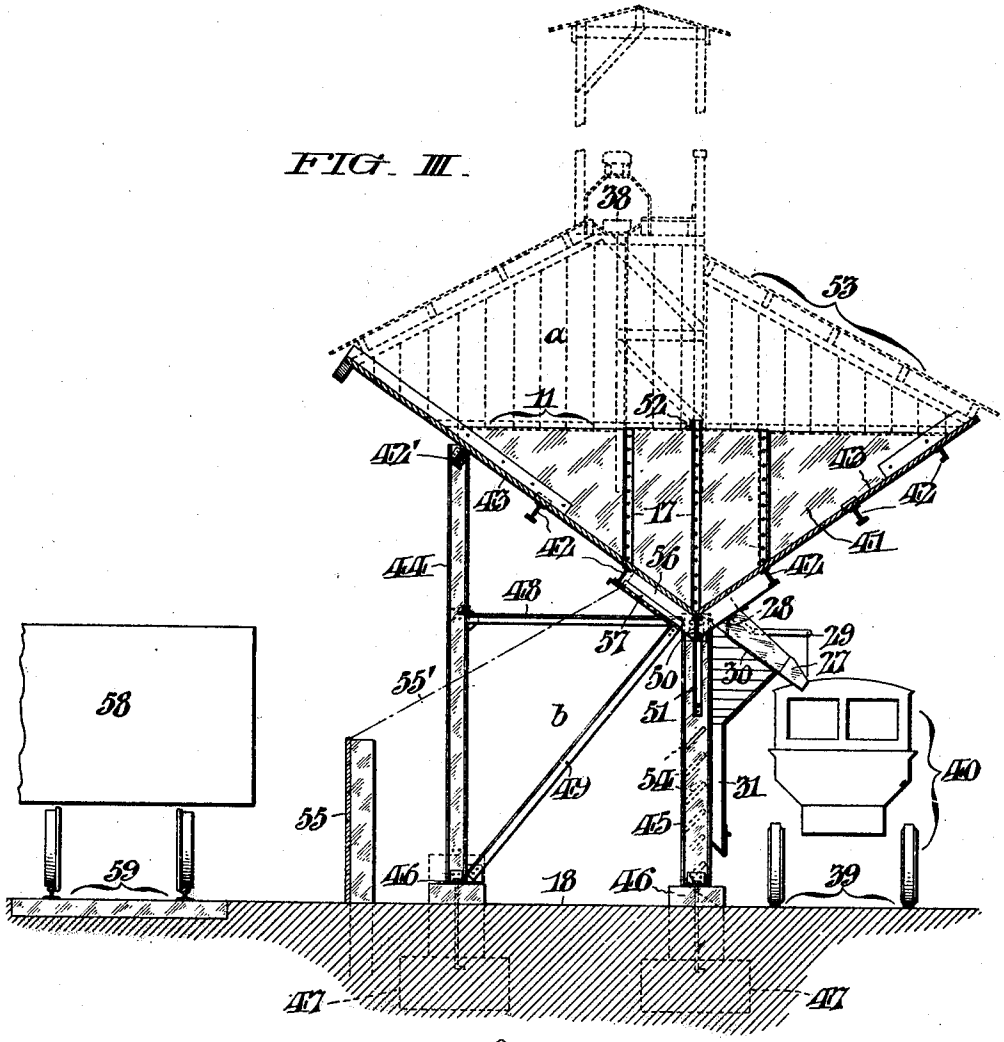
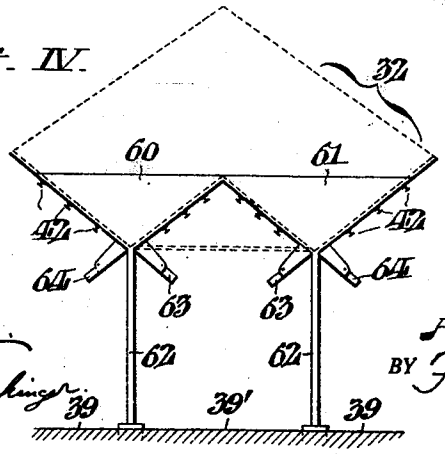


FIG. IV.



WITNESSES.

John C. Bergen

Alfred E. Lockinger

INVENTOR:
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March 16, 1926. 1,576,940

A. WARNER

POCKET OR STORAGE BIN

Filed March 2, 1923 5 Sheets-Sheet 4

FIG. V.

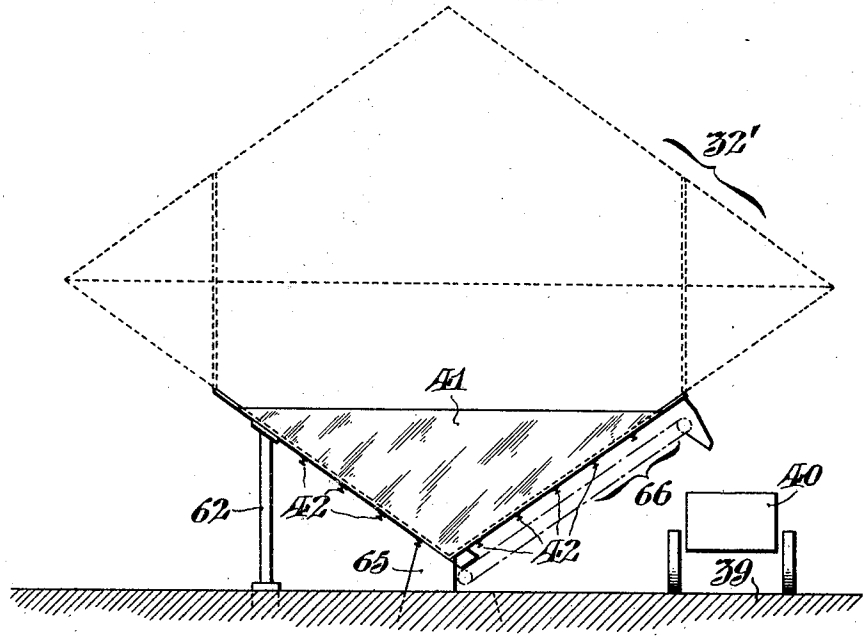


FIG. VI.

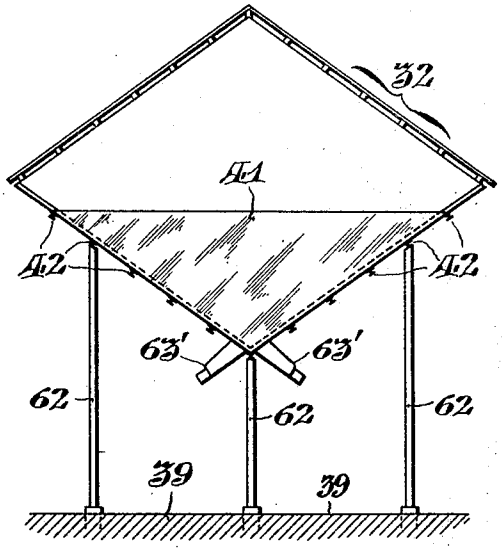
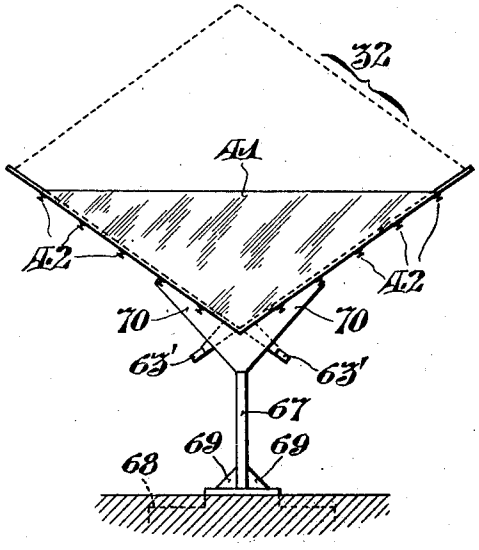


FIG. VII.



WITNESSES:
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INVENTOR:
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March 16, 1926. 1,576,940

A. WARNER

POCKET OR STORAGE BIN

Filed March 2, 1923 5 Sheets-Sheet 5

FIG. VIII.

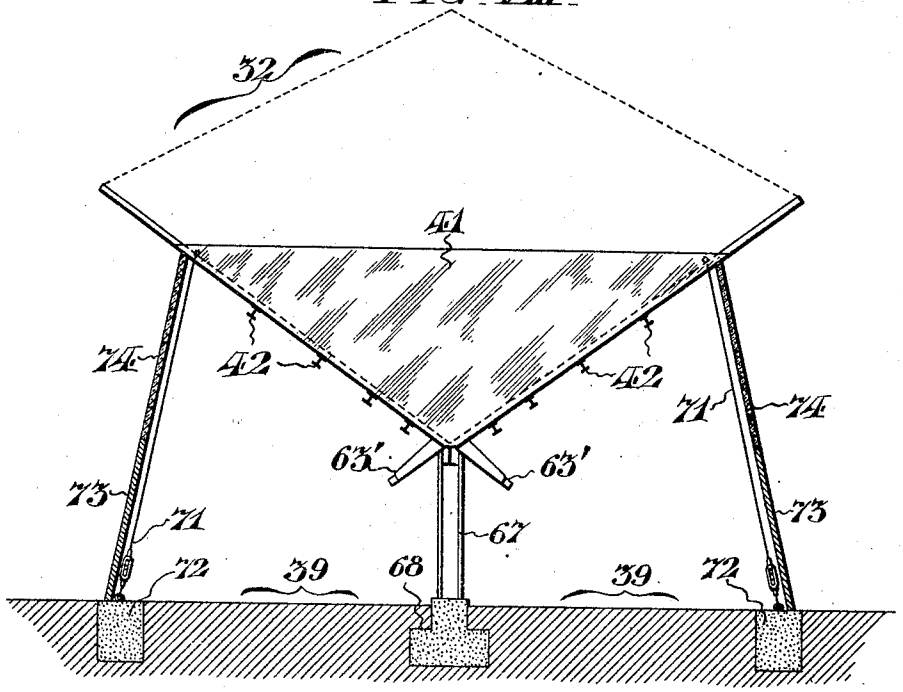


FIG. IX.

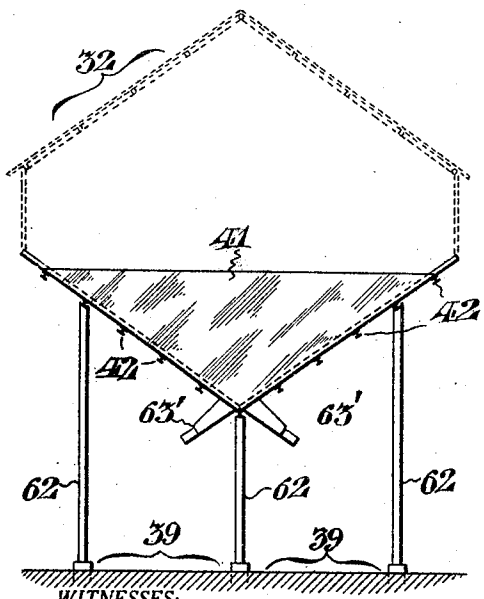
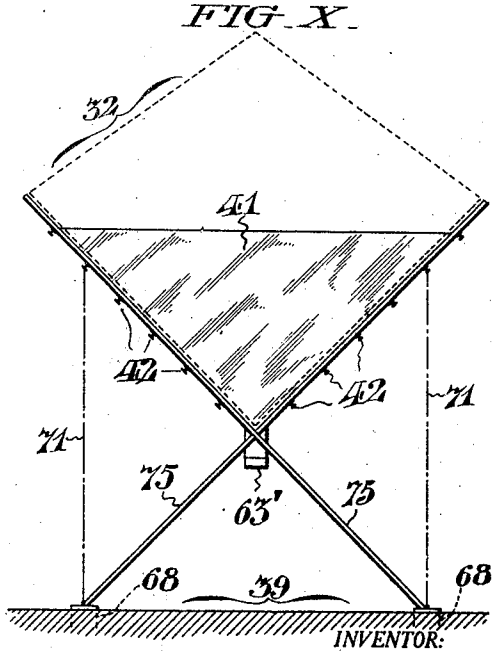


FIG. X.



WITNESSES:
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INVENTOR:
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ATTORNEYS.

Patented Mar. 16, 1926. 1,576,940

UNITED STATES PATENT OFFICE.

ARTHUR WARNER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO SPECIALTY ENGINEERING COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

POCKET OR STORAGE BIN.

Application filed March 2, 1923. Serial No. 622,257.

To all whom it may concern:

Be it known that I, ARTHUR WARNER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Pocket or Storage Bins, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates generally to pocket or storage bins for the containing of more or less graded materials destined to be removed therefrom in predetermined quantities and at different intervals of time.

More particularly the subject matter of the present invention has reference to storage pockets or bins for coal such as are usually provided at coal yards or coaling stations, and from which pockets or bins, coal may be directly chuted into cars, wagons, gondolas, engine tenders and the like without shoveling or manual labor.

The primary object of my invention is to provide a storage pocket or bin for the reception of coal or other broken, crushed or granular material of a novel transverse cross-section which not only increases its capacity but augments its conveniences when compared with the generally accepted constructions at present in use.

Another object of this invention is to provide a storage pocket or bin of what may be conveniently termed "unit" construction, that is to say more specifically, a storage pocket or bin embodying my improvements is of a character that can be extended unit by unit in any desired direction whereby,—space permitting—the capacity of a coal yard or coaling station may be easily increased with a minimum expenditure of material, time and labor.

A further feature of this invention consists in the novel form of storage pocket or bin for coal yards and coaling stations, whereby said yards or stations are less congested by supporting columns and the foundations therefor, with a co-related increase in floor space.

Other objects attained by my invention are the provision of a storage pocket or bin characterized by the fact that the major portion of the dead weight is directed on to shorter supporting columns, ground storage is concentrated to the reclaiming point, and better protection for teams and the like while loading is afforded.

With the foregoing and other objects in view as will be more apparent from the following description my invention consists essentially in constructing a storage pocket or bin with what I preferably term trapezoidal cross section so as to provide opposed downwardly tapering walls, said cross-section being attained by spaced plate girders the obliquely inclined and lower flanges whereof are braced by girts on which the the pocket or bin floor and walls are secured.

In the further disclosure of the invention reference is to be had to the accompanying sheets of drawings, constituting a part of this specification, and in which like characters of reference designate the same or corresponding parts in all the views.

Figure I is an end elevation of a coal pocket or bin embodying the essential features of my invention, the ordinary superstructure being indicated by dotted lines to better distinguish my said invention therefrom.

Figure II is a side elevation of the same.

Figure III is an end elevation of a slightly modified form of the invention that affords a large ground storage capacity.

Figure IV is a diagrammatic end view of the application of my invention to a twin-compartment storage pocket or bin.

Figure V is an end view in outline of a modified manner of supporting the pocket or bin.

Figure VI is a similar outline end view illustrative of the supporting of my novel pocket or bin on three parallel lines of columns.

Figure VII is a like view to the preceding one but exemplifying the supporting of the pocket or bin on a single line of columns.

Figure VIII is illustrative of the application to my invention of an enclosing structure beneath the bin for better protection during the loading of vehicles; and also forming an enclosed shed or garage if need be for storage and privacy.

Figure IX exemplifies a further modification of the invention; and

Figure X illustrates the application to my invention of a cruciform support.

Referring more in detail to the drawings, and specifically to Figures I and II thereof, my novel construction of storage pocket or bin consists of a pair of spaced girders 11, 11—or cantilever trusses—each of which includes a trapezoidal shaped web-plate 12 having parallel upper and lower horizontal edges stiffened by angles 13, 14 respectively, and opposed upwardly inclined or oblique ends similarly stiffened by angles 15, 16. Intermediate the aforesaid oblique ends of each girder 11 are a series of vertical angle braces 17, and it will be obvious to those conversant with the art that all the angles 13, 14, 15, 16 and 17 are duplicated on each face of the web plate 12 in reverse relation and riveted thereto in the well known manner.

In the embodiment of my invention referred to in the preceding paragraph the numeral 18 designates the ground level or floor of a coal yard or station in which are embedded appropriate concrete foundations 18′ having bonded uprights or reinforced columns 19, 19. These uprights or columns 19, 19 are erected at the desired intervals in parallel and aligned relation. Mounted on the buttressed heads 20, of the aforesaid uprights or columns, 19, 19 are I-beams 21 that constitute the bearers for the entire pocket or bin when erected and mounted thereon.

The pocket or bin is erected as follows:—

Trapezoidal girders 11, constructed as hereinbefore set forth, are arranged in spaced relation transversely to the aforesaid I-beams 21 and preferably vertically central with respect to the center lines of opposed uprights or columns 19. The girders 11 are suitably secured rigidly in place by riveting or otherwise permanently connecting them to the top flanges of the I-beams 21 as will be readily understood by those conversant with the art to which this invention appertains. It is also to be here noted that the lower parallel edge of the girders 11 is of a lineal dimension equal to, or substantially the same as, the dimension between the centers of the I-beams 21 for a purpose later on explained. Obviously the I-beams 21 will be of a length to accommodate the required initial lineal dimension of the entire series of pockets or bins, but it will be perfectly clear that the same may be extended in either direction by butting another length of I-beam at either end and connecting the abutted ends by splice plates.

Longitudinal bars or angles 22 are suitably secured or riveted to the top flanges or angles 13 of the girders 11 directly vertical above the centers of the I-beams 21 to aid in maintaining said girders 11, 11 in vertical parallel relation, as well as for a purpose hereafter referred to. Riveted or otherwise securely fixed to the lower flanges or angles 14, 14 and conveniently equispaced relative to the I-beams 21 are girts 23 on which the horizontal floor 24 of the series of pockets or bins 11 is laid. To ensure increased rigidity of the entire structure the outer girts 23 may be embedded—as shown—in the lateral parts 20′ of the buttress heads 20. Similarly spaced girts 25, 25 are likewise securely connected to the obliquely inclined edges of the girders 11 by bolting or riveting the same to the angles 16, 17 as will be readily understood. The horizontal floor 24 as well as the side walls 26, 26 are suitably made of timbers laid and fixed at right angles to the girts 23, 25. Thus it will be easily seen that the spaces intervening the girders 11, 11 constitute pockets or bins, having bottoms or floors 24, side walls 26, 26, and dividing partitions or bulkheads constituted by the web plates 12 of said girders 11, 11.

Chutes 27 are located at the bottom on each side of every individual pocket or bin, said chutes being controlled by gates or doors 28 manually or otherwise operable by draw rods or the like 29. These chutes 27 are also fitted with the usual screens 30, and the gates or doors 28 close or open the discharge outlets from the aforesaid pockets or bins. Beneath each chute 27 there is—or may be—provided a dust box or collector 31 of any appropriate character and construction, said dust boxes or collectors being fitted with controllable outlets or discharges in the well known way.

In the figures under detailed description it will be seen that the superstructure 32 is laterally extended to project somewhat over or beyond the upper edges of the obliquely inclined sides of the pockets or bins and to this end I extend the side walls timbers 26 upwardly at 33 and tie them at their outer ends to longitudinal members 34 as will be readily understood. In addition the extensions 33 may be braced to the girder web plates 12 by bracings 35. Diagonal timbers or members 36, 36 securely and rigidly brace the upper superstructure 37 and in view of the fact that I lay no claim to the form or pattern per se of the said superstructure I have only referred thereto generally. The customary endless conveyor is indicated at 38, and it may be of any usual or preferred type adapted to convey the coal or other material to the respective pockets or bins.

At each side of the structure, as is usual in connection with coal or other material storage structures, is a siding or roadway 39, while intermediate the uprights or columns 19 is a third return siding or roadway, and on said sidings or roadways 39, motor trucks 40 are shown, although it will be ob-

vious said sidings or roadways may be used by any other kind of transporting vehicles or locomotives.

Referring now to Figure III which illustrates a composite overhead and ground storage embodiment of my invention, it will be seen that the girder 11 instead of being trapezoidal in elevational view is triangular in contour, that is to say more specifically the web-plate 41 thereof is substantially triangular in outline. In the drawing it will be observed that I have shown the web plate 41 in the form of an inverted isosceles configuration with vertical angle braces 17 as hereinbefore described with reference to Figures I and II. The bottom of each pocket or bin is built up of girts 42, and floor timbers 43, as before set forth; or steel plates or concrete slabs may be employed if desirable. The manner of supporting this form of my invention is somewhat different however, the understructure including spaced vertical columns 44, 45—conveniently I-beams—anchored at 46 to concrete foundations or bases 47 bedded in the floor or yard 18. These vertical columns 44, 45 are of different heights and are transversely and diagonally braced by angle bars 48, 49 respectively. It is to be observed that the shorter column 45 is of larger section than the longer one 44, and that the upper ends of the longitudinally aligning columns 45 are connected together by I-beams 50 and angle struts 51. On the other hand the longer columns 44 are similarly connected by the upper longitudinal girts 42′ connected to the said columns by angles in the well known way. A longitudinal tie bar or angle 52 is provided across the tops of the beams 11, while the superstructure 53 is constructed and erected over the series of pockets or bins as before described. The gates or doors 28, chutes 27, screens 30 and dust boxes or collectors 31 are all constructed and arranged as hereinbefore described.

In order to provide for proper ground storage I close the space intervening successively aligning columns 45, 45 with inclined timbers 54, 54, and erect a wall or back 55 in spaced relation relative to the columns 44. This wall or back 55 is of appropriate character and strength, while the dotted line 55′ designates the coal line when the ground storage provided thereby is filled with coal. Ingress from the overhead storage *a* to the ground storage *b* is provided for by an outlet 56 controlled by a gate or sliding door 57, and it is to be observed that the wall or back 55 is erected within the shed of said overhead storage *a* so that the ground storage *b* is to a great extent protected from inclement weather. On the other hand the ground storage *b* may be filled direct from wagons, gondolas, or railroad cars,—one being designated 58 on a railroad 59.

Figure IV diagrammatically illustrates a modified structure embodying my invention and comprising aligning twin-storage pockets or bins 60, 61, said structure being supported on spaced columns 62, 62 and provided with inwardly and outwardly directed chutes 63, 64 respectively. Thus it will be readily seen that vehicles on the outer sidings or roadways 39 may be concurrently loaded from opposed individual pockets or bins 60, 61, whereas a vehicle on the center track or roadway 39′ may be loaded from either or both pockets or bins 60, 61, simultaneously and in the latter case effecting an economy in time.

Figure V is a similar diagrammatic showing of a further modified application of this invention. In this instance the storage pockets of bins 41 are constructed as hereinbefore described but are supported near the ground or floor level 39 by a center wall 65 and columns 62. A relatively large superstructure 32′ is shown, in the referred to figure while a fixed or traveling conveyor 66 is provided for purposes of elevating the contents of the storage pockets or bins to a car or wagon 40. This form of my invention may conveniently be termed a semi-ground storage construction and it will be found advantageous where siding facilities are meager and a large storage capacity is desirable.

Figure VI exemplifies the application of my improvements to what may be termed an enclosed construction, the storage pockets or bins being supported by parallel lines of columns 62, 62 between which are the road ways or sidings 39, while the superstructure 32 is of a somewhat more compact formation. Opposed chutes 63′ direct the discharged material to the vehicles to be filled.

Figure VII illustrates a slightly different manner of supporting the storage pockets or bins on a central line of columns 67, said columns being mounted on concrete bases 68, and reinforced by angle brackets 69. Stability and rigidity of the upper structure is secured by forked bracings 70 securely fixed to the columns 67 and girts 42 as will be readily understood by those conversant with the art to which this invention appertains.

In Figure VIII the storage pocket or bin is supported on a wall or central line of spaced columns 67 bedded in concrete foot pieces 68, and the completed structure is appropriately anchored by tension members 71 connecting into concrete blocks 72. Enclosing walls 73 having glazed upper sections 74 may be provided longitudinally at one or both sides of the pockets or bins to provide for ground storage when desired.

Figure IX exemplifies a slightly varied form of superstructure 32 but in all other

respects the construction is substantially the same as shown in Figure VI.

According to the form of my invention shown by Figure X; the storage pockets or bins are supported on cross members 75 anchored to bases 68, while tension members 71 are employed as heretofore explained for ensuring rigidity and stability of the entire structure. In this instance the discharge outlet or chute 63′ is shown as being directly central of the structure or inclined to discharge longitudinally in contradistinction to all the previous showings.

From the foregoing description and an examination of the drawings it will be perfectly clear that when a car, locomotive tender, or wagon is moved into position with respect to any one or more of the chutes 27, 63 or 63′ it can be promptly filled with the required amount of coal from the individual pocket or bin under discharge control of the said chute or chutes. It is particularly noteworthy that by my invention the greater portion of the dead load is directed upon the shorter posts at the juncture of the bottom sides, which greatly economizes in material required for construction. Still further it will be seen that with the several constructions disclosed I am enabled to economize very considerably in building and yard space occupied, while at the same time gaining considerably in protective shedding for teams and so forth.

Obviously the various storage pockets or bins may contain different grades of coal or other material, or different kinds of material, which it is desired to store therein. More or less variation of the exact details of construction is possible without departing from the spirit of the hereinbefore described invention; I desire therefore, not to limit myself to the precise forms illustrated, but include hereby all reasonable variations or modifications of the same susceptible of being construed as covered by the scope of the appended claims.

Having thus described my invention, I claim:

1. A storage pocket for coal or granular material comprising spaced cantilever bulkheads affording declined ends, girts secured to the declined ends and connecting said cantilever bulkheads to effect their rigid connection in parallel relation, flooring traversing the girts, and means for supporting the pocket.

2. A storage pocket for coal or granular material comprising spaced bulkheads of trapezoidal configuration, girts secured across the inclined ends and lower edges of said bulkheads to effect their rigid connection in parallel relation, a floor and side wall traversing the girts, and columnal means for supporting the pocket.

3. A storage pocket for coal or granular material comprising spaced bulkheads of trapezoidal contour the opposed oblique sides whereof converge downwardly, spaced girts traversing the inclined sides and lower edges thereof rigidly connecting said bulkheads in parallel relation, a floor and side walls secured on the girts, and columnal means for supporting the pocket.

4. A storage pocket for coal or granular material comprising spaced bulkheads of trapezoidal configuration, vertical bracings on said bulkheads, spaced girts traversing the inclined sides and bottoms thereof rigidly connecting said bulkheads in parallel relation, floors traversing the girts, and columnal means for supporting the pocket.

5. A storage pocket for coal or granular material comprising spaced bulkheads of trapezoidal configuration, vertical bracings on said bulkheads, spaced girts traversing the inclined sides and bottoms thereof rigidly connecting said bulkheads in parallel relation, floors traversing the girts, columnal means for supporting the pocket, longitudinal tie bars, and means affording support for a covering super-structure on top of the pocket.

6. A storage pocket for coal or granular material comprising spaced bulkheads of trapezoidal configuration, vertical bracings on said bulkheads, spaced girts traversing the inclined sides and bottoms thereof rigidly connecting said bulkheads in parallel relation, floors traversing the girts, columnal means for supporting the pocket, longitudinal spaced tie bars secured to the top flanges of the bulkheads, and controlled discharge outlets for the pocket at the junction of the inclined side walls.

7. A storage pocket for coal or granular material comprising spaced bulkheads of trapezoidal configuration, vertical bracings on said bulkheads, spaced girts traversing the inclined sides and bottom edges thereof rigidly connecting said bulkheads in parallel relation, floors traversing the girts, columnal means for supporting the pocket, longitudinal tie bars affording support for a covering super-structure on top of the pocket, and reversely directed controllable discharge outlets at the lower part of said pocket.

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this 24th day of February 1923.

ARTHUR WARNER.