(No Model.) 2 Sheets—Sheet 1.

J. J. SOUDER.

DUMPING CAR.

No. 343,205. Patented June 8, 1886.

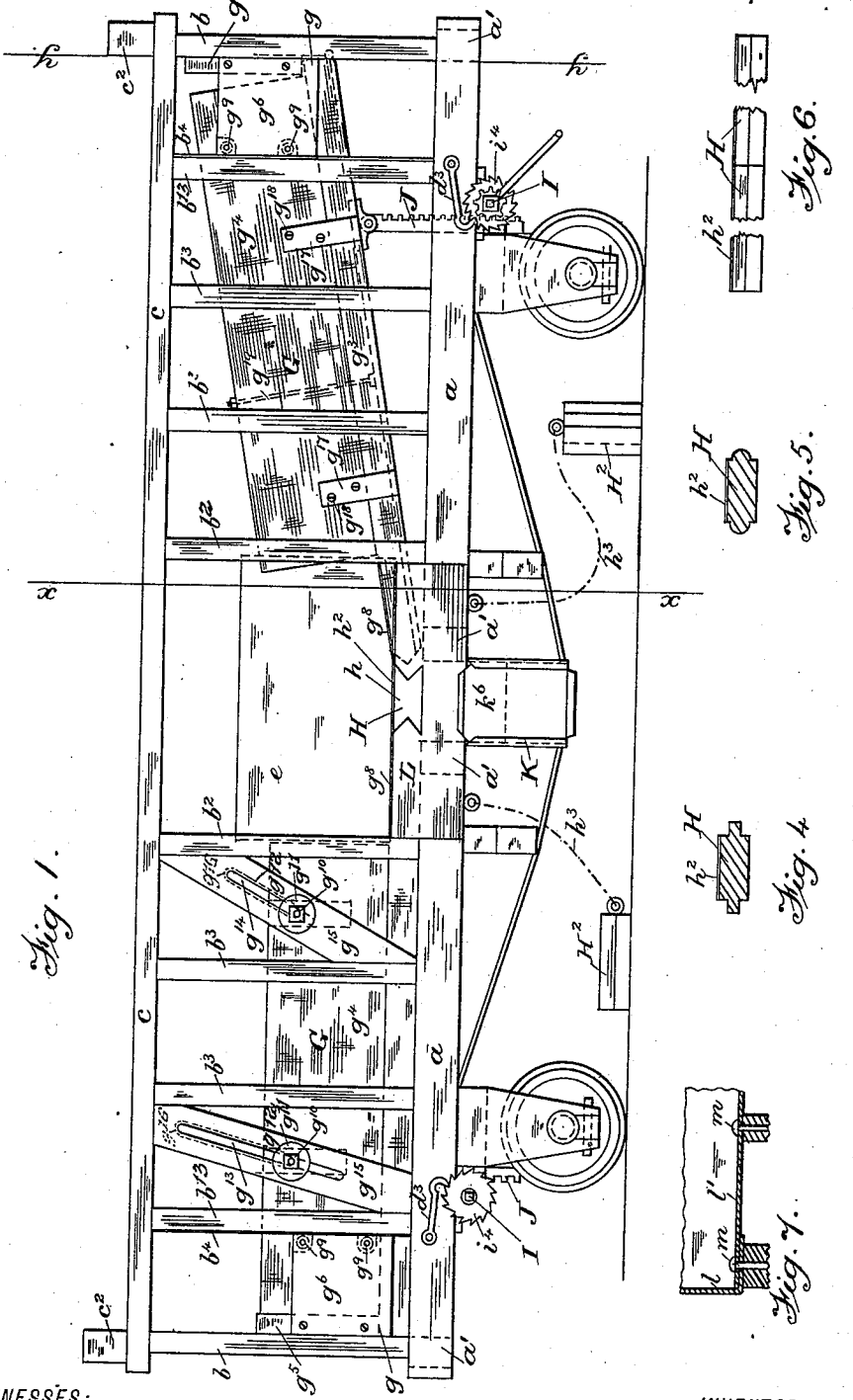

Fig. 1.

Fig. 6.

Fig. 5.

Fig. 4.

Fig. 7.

WITNESSES:

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Jacob J. Souder.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

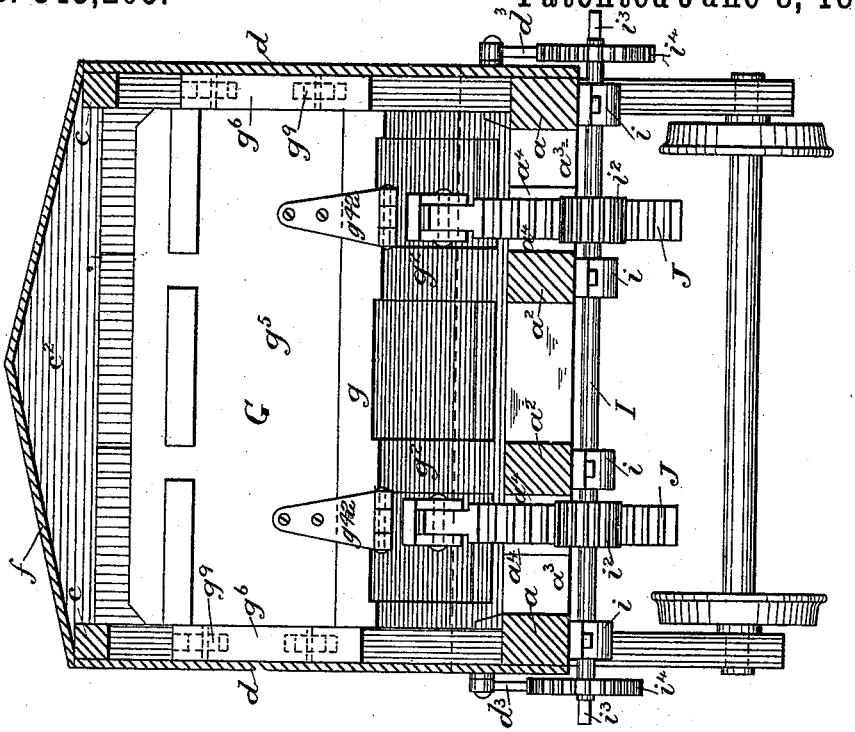
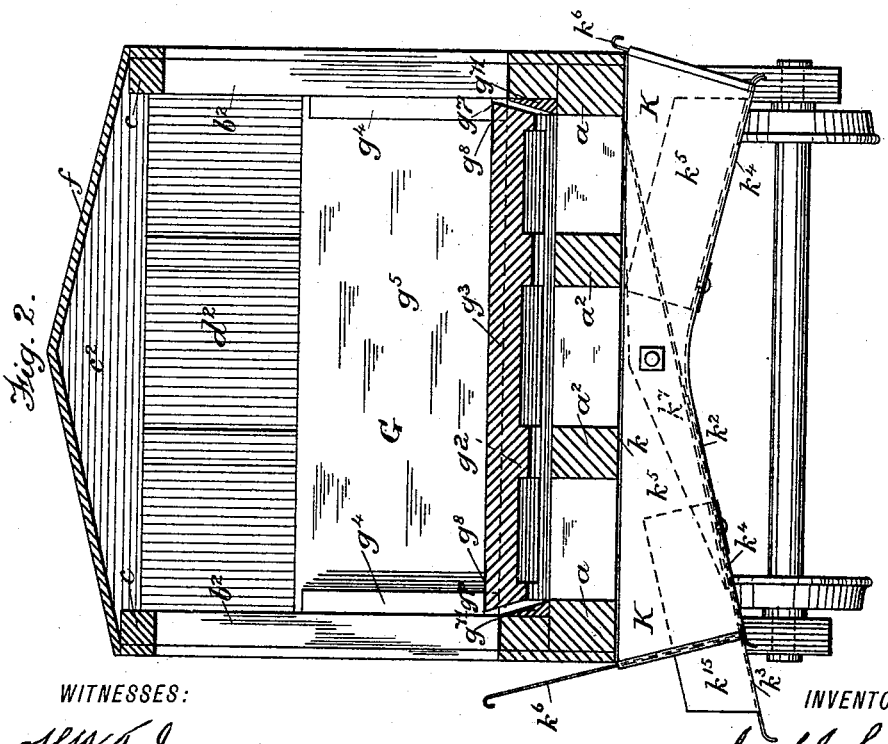


Fig. 2.



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UNITED STATES PATENT OFFICE.

JACOB J. SOUDER, OF WASHINGTON, DISTRICT OF COLUMBIA.

DUMPING-CAR.

SPECIFICATION forming part of Letters Patent No. 343,205, dated June 8, 1886.

Application filed September 2, 1885. Serial No. 176,021. (No model.)

To all whom it may concern:

Be it known that I, JACOB J. SOUDER, a citizen of the United States, residing in Washington, in the District of Columbia, have invented certain new and useful Improvements in Dumping Merchandise-Cars, of which the following is a description.

The object of my invention is to provide convenient and inexpensive means whereby various substances which are ordinarily transported in bulk—such as grain, root-crops, lime, sand, gravel, plaster-of-paris, coals, and the like—may be quickly discharged from the car.

The invention consists in a novel adjustable discharging-receptacle or tilting casing, a novel discharging-chute, a novel adjustable cut-off or closing strip, slide, or key, and in various novel parts and combinations of parts, all as will be hereinafter described and claimed.

Under my construction the frame of the car, embracing the longitudinal sills *a a*, the transverse sills a' a', the intermediate sills or stringers, a^2 a^2, the posts *b b* b^2 b^2, the studs b^3 b^3 b^{13}, the longitudinal beams or plates *c c*, and the transverse beams or plates c^2 c^2 are or may be arranged and connected together in the ordinary well-known manner. The exterior side casings, *d*, the end casings, d^2, the exterior slidable doors, (not shown,) the interior unattached rabbeted doors, *e*, the roof *f*, and its immediate supports are also the same as in most ordinary "freight," "box," or merchandise cars.

In my improvement the floor and the inner side and end casings of the car are made adjustable within the frame of the same, and are of two preferably equal parts or discharging-receptacles, G G, which together cover the entire interior horizontal area of the car, except a narrow space or discharge-opening, *h*, which extends across the same at its mid-length or center. The discharging-receptacles or tilting sections G embrace a frame, which consists of transverse end pieces, *g*, and longitudinal supports or string-pieces g^2; a floor, g^3, which is secured in any approved manner to the frame; side casings, g^4, which are rigidly attached to the floor; end casings, g^5, which are hinged to the outer end of the floor, and retracting and covering slides g^6, which are secured to the ends of the hinged end casings, g^5. At the sides of the frame or floor portion thereof, in that portion which is coincident with the doorway, each of the sections G is provided with a beveled portion or recess, g^7, which, if desired, may be provided with metallic facings, similar to the protecting-strips g^8, which in practice are applied upon the discharging end of the floor. The stud b^{13}, along which the retracting and covering slides g^6 are moved, are also provided with a metallic facing, b^4, and the coincident portion of the retracting and covering slide are provided with anti-friction rollers g^9 g^9. A shaft, I, which extends across the bottom of the car at a point near either truck, and preferably between the truck and the end of the car, is journaled in bearings *i i*, which are rigidly secured to the longitudinal portions of the frame. Upon the shaft I are any desired number of pinions, i^2 i^2, and at each end is a squared portion, i^3, to receive a suitable operating-winch. Near each extremity of the shaft I, outside the plane of the body of the car, the shaft is provided with pinions i^4, to receive pawls or stops i^5, which are suitably connected to the body of the car.

To the bottom of the discharging-receptacles or tilting sections G are pivoted a series of racks, J, which are coincident with the pinions i^2 of the shaft I. The racks are so placed as to be guided upon their rear face by the subsills a^3, and upon their lateral faces by stops a^4 a^4, which are secured to such subsills.

The transverse discharge-opening *h* is preferably of the dovetail form which is represented in the main figure of the drawings; but it may be of the configuration in transverse section which is indicated in Figure 4 or in Fig. 5, or it may be of any other suitable shape, it being requisite only that when the key, closing-strip, or floor-strip H is applied the opening shall be fully closed, and the two tilting sections shall be firmly locked together.

The convertible or two-way discharge-chute K, which will preferably be composed of metallic plates or sheets, is secured by its flanges *k* to the bottom of the car, closing the space therein, which terminates the discharge-opening *h*. The bottom plate, k^2, of the discharge-chute is made highest at the center thereof, as shown, inclining downwardly toward either side of the car. An extension-plate, k^3, is made slidable upon the bottom of

each incline k^4, to vary the height of the point of discharge, the vertical flanges k^{15} upon the slide constituting, when the slide is in its extended position, continuations of the side walls, k^5, of the body of the chute. A closing-slide or cut-off, k^6, is applied in an ordinary manner at the mouth of the chute. A directing-plate, k^7, straight, as represented in Fig. 2, and fitting loosely between the side walls, k^5 k^5, extends, as seen, nearly from end to end of the chute.

The closing plate or key H for the discharge-opening h may, if desired, be composed of two equal sections, as seen in Fig. 6, instead of a single piece, as seen in Fig. 1, and under either construction it will be faced or re-enforced with a sheet or plate, h^2, of metal. Followers H^2, of a form in transverse section corresponding to the shape of the key, may by a short chain, h^3, be suspended from any convenient part of the car.

As represented at the left in Fig. 1, the side casings, g^4, of the receptacle G are provided with lugs or bolts g^{10}, which at one end are secured to such side casings, and which at their outer extremity are provided with a flange, g^{11}, which engages behind the walls g^{12} of slots g^{13} g^{14}, which are formed in braces or supports g^{15}, which are fitted between studs in the space between the inner casing and the outer casing of the car. Under this construction the slots g^{13} and g^{14}, having dissimilar inclinations, as shown, to adapt the securing-lugs to the dissimilar arcs through which the inner and the outer portions of the receptacle are moved, are provided with covering-plates g^{16}. This construction may be employed when extraordinary firmness and strength are required; but I do not restrict myself to it, for the sides and bottom of the receptacle may be firmly bound together by angle-straps g^{17}, which, as seen at the right in Fig. 1, will embrace both these parts, being secured thereto by a series of screws, g^{18}, which will be inserted from the exterior, as represented in the drawings. Additional strength may be imparted by through-bolts g^{19}, extending from the lower or exterior face of the frame of the receptacle upwardly through the floor, and through the side casings from the bottom to the top thereof.

For the transportation of some kinds of commodities it will be desirable to provide receptacles which will not be injured by their contact, and I therefore propose in some instances to combine with the wooden frame, instead of the wooden floor and wooden inner side and end casings contemplated in the foregoing description, sheets of metal. In such construction the metallic sheets, as l l', will be secured by rivets m, directly to the several parts of the frame of the receptacle, the bottom of the same being overlapped by the lower extremities of the vertical portion, and both being secured to the frame together by the same rivets.

In the drawings, Fig. 1 is a side elevation, the exterior casing of the car being removed. Fig. 2 is a transverse vertical section on the line x x of Fig. 1. Fig. 3 is a transverse vertical section on the line y y of Fig. 1. Figs. 4 and 5 are transverse vertical sections of the transverse closing plate or key in modified forms. Fig. 6 is a side view showing the closing plate or key as when made in two end-to-end parts. Fig. 7 is a detail transverse section representing the tilting receptacle as when its floor and vertical portions are composed of metallic sheets.

In the operation of discharging the contents of the car, a follower being pressed against the closing slide or key, the same is moved inwardly until one-half or the whole of the discharge-opening h is uncovered, according as it may be desired to discharge from one only, or from both of the openings of the two-way chute, in the latter case the directing-plate also being removed. In this condition one-half the contents of the car may be discharged without moving the discharging-receptacles or tilting sections from their horizontal position. To complete the discharge, a winch will be applied to one of the squared ends of the shaft I, when the corresponding receptacle will be tilted to any desired inclination, and then retained therein by engagement of the pawls or stops d^3 with the exterior pinions, i^4, of the shaft.

The extension-slides k^3 will be found serviceable when it is desired to conduct the grain or other article into low vehicles or into bags or vessels upon or near the ground.

The directing-plate k^7, as will be apparent, will conduct the entire contents of the car to either side of the same.

It will be noted that the effect of the provision of the hinges g^{12}, by which the end casings, g^5, are connected to the floor g^3 of the receptacle G, is to permit the side casings and and the bottom of the receptacle, when the same is being elevated, to move in a curved line, while the end casings themselves have motion in a vertical plane only, being retained in their vertical position by the engagement of their attached slides g^6 behind the stud or guide b^{13}, which is opposite thereto. The end casings and the sliding covering-plate g^6 thus operate in connection with the stud or stop b^{13} whenever the receptacle is moved upwardly to retract the receptacle, and thus enlarge the discharge-opening h until, when the receptacle has been elevated to its highest point, the area of the opening will be commensurate with the area of the two-way discharge-chute. It will be further noted that the longitudinal parts g^2 of the frame to which the floor g^3 of the receptacle is secured are coincident with the longitudinal sills and stringers of the frame of the car itself, and that when the receptacle is in its horizontal position the longitudinal parts of its frame extend along and at all points rest directly upon corresponding parts of the frame of the car, so that the firmness and solidity of the floor are not at all diminished by reason of its separability from or

non-attachment to the car-frame. It will also be observed that the slides g^6, which project at a right angle from the ends of the end casings, g^5, of the receptacle or pocket G, serve not only to prevent the end casings from being displaced, and, in connection with the stud, guide, or stop b^{13}, to retract the receptacle as it is being tilted, but that they serve also to cover the lateral V-shaped opening which is produced between the end casing and the side casing by the upward movement of the outer end of the receptacle, and thus prevent lateral discharge of any portion of the contained material. This lateral V-shaped opening may be additionally closed by canvas, leather, or other strong flexible material suitably secured to the sides of the opening, and the joint at the junction of the end casing with the floor may be protected by similar means.

It will be apparent from the foregoing description that merchandise-cars of ordinary construction may readily be provided with these dumping-sections, the removal of the ordinary floor and inner casings being the only essentials preliminary to such provision, and it is equally obvious that when provided with the dumping-sections the capacity and suitableness of the car for transportation of miscellaneous articles of freight are nowise affected. When the sections are in their ordinary horizontal position, the intermediate discharging-opening, h, is of a width of four inches only. When the sections have been tilted to their greatest inclination, their edges will each have been retracted a distance of seven inches, so that the width of the discharging-opening as thus enlarged to its fullest extent will be eighteen inches, corresponding with the transverse dimensions of the convertible two-way discharging-chute. At each side of the car, within the doorway, two oppositely-placed holding-jaws, L L, are secured to the sill of the car, the opposite inner terminal portions of the jaws being of a form corresponding to the lateral configuration of the closing-slide H, and serving to guide the slide to its proper position, and to rigidly secure it against lateral displacement. The beveled or recessed portion g^7 in the lateral vertical face of the floor of the receptacle G, when the receptacle is in its horizontal position, rests in contact with and has a solid bearing upon a corresponding oppositely-inclined face, g^{71}, which is formed with or is attached to the holding-jaws L L.

It will be understood that any other approved means may be employed instead of the shaft, rack, and pinion which are hereinbefore described for raising and lowering the dumping-receptacles.

I am aware that it has been proposed to insert within an ordinary box-car or "house-car" two oppositely-placed dumping-receptacles, which rest upon the floor of the car, which are hinged together at the mid-length of the car, and which are provided with discharge-openings, which are closable by revoluble valves, which have their bearings upon the hinge-pin of the dumping-receptacles. I am also aware that it is old to provide upon a car-frame two oppositely-placed eccentrically-pivoted dumping-receptacles, the inner ends of which are ordinarily placed in continuous contact, and which in discharging are depressed between and below the floor-timbers or bed-frame of the car. I am also aware that it has been proposed to provide in a dumping-wagon pivoted longitudinal dumping-sections, which are placed side by side, the edges of such sections being ordinarily closely joined. I am also aware that for many years it has been common to close the opening in the bottom of a hopper-car by means of a door or by means of a slide which has movement below the lower extremity of the hopper. I do not show and I do not desire to claim any of these constructions. I believe, however, that I am the first to provide within a car retractible dumping-receptacles, the first to provide within a car oppositely-placed receptacles, which are placed end to end, and which, when in their ordinary horizontal position, have between them a continuous opening, which extends from side to side of the car, and the first to provide in a car oppositely-placed dumping-sections, between the extremities of which is an opening, which is closable by means of a slide, which is horizontally insertible transversely of the car.

Having described my invention, I claim—

1. The combination, in a railway-car, of a transverse discharging-opening, which extends from side to side of the car, and an interior adjustable discharging-receptacle, which ordinarily rests upon the frame of the car, and which, when tilted, is inclined toward the transverse discharging-opening.

2. The combination, in a railway-car, of an interior adjustable discharging-receptacle, which ordinarily rests upon the frame of the car, and a transverse discharging-opening, which extends from side to side of the car, between the inner end of the discharging-receptacle and the opposite portions of the car.

3. The combination, in a railway-car, of two oppositely-placed discharging-receptacles and a horizontal closing-slide, the closing-slide being transversely insertible between the opposite ends of the receptacles, and the floor of the receptacles in connection with the closing-slide constituting the entire floor of the car.

4. The combination, in a railway-car, of a transversely-insertible closing-slide and two oppositely-placed discharging-receptacles, the floor of the receptacles and the closing-slide constituting the entire floor of the car.

5. The combination, in a railway-car, of a transverse discharging-opening and two oppositely-placed adjustable, retractible, oppositely-discharging receptacles.

6. In a railway-car, an interior discharging-receptacle which is composed of a floor or bottom, two side casings which are rigidly connected to the bottom, and an end casing which is loosely connected to the bottom.

7. In a railway-car, an interior dumping-receptacle, which is provided with a slide which engages behind a fixed portion of the frame of the car, and operates in connection with such fixed portion as the receptacle is moved in the act of dumping to draw the receptacle back from the discharging-opening.

8. In a railway-car, the combination, with two oppositely-placed adjustable discharging-receptacles, which are retracted in the process of discharging their contents, of an intermediate discharging-opening, which is bounded by the receptacles, and which is varied in area as the receptacles are varied in their adjustment.

9. In a railway-car, the combination, with two oppositely-placed adjustable non-pivoted discharging-receptacles, which are retracted in the process of discharging their contents, of an intermediate discharging-opening, which is bounded by the receptacles, and which is varied in area as the receptacles are varied in their adjustment.

10. The combination, with a railway-car, of an interior tilting section, the end casing of which, when the section is tilted, is moved upwardly in a vertical plane.

11. In a railway-car, an interior tilting section, which is provided with an end casing or wall, which is hinged to the bottom or floor portion of the section, and which, by a projection thereon, engages with a fixed portion of the car, and thereby, when the section is being tilted, withdraws the same from the center of the car toward the end thereof.

12. The combination, in a railway-car, of two opposite retractible tilting sections and a closing slide or key, which, when the tilting sections are in their horizontal or non-dumping position, engages each of the sections and locks the same firmly together.

13. In a railway-car, the combination of oppositely-placed tilting sections and a closing slide or key, which engages with each of such tilting sections, as and for the purposes described.

14. In a railway-car, the combination of oppositely-placed tilting sections, a closing slide or key, which engages with such sections when they are in their ordinary position, and oppositely-placed holding-jaws, which engage the closing-slide at its ends and prevent its lateral displacement.

15. The combination, in a railway-car, of two non-pivoted, adjustable, undepressible, unconnected discharging-receptacles or tilting sections, a discharge-opening which extends from side to side of the car between the inner ends of the discharging-receptacles, and a detachable slide, which, when the receptacles are in their horizontal position, is inserted between the ends thereof to close the discharge-opening, whereby a large portion of the contents of the car are dischargeable when the receptacles are in their ordinary untilted position.

16. In a railway-car, the combination of a transverse discharging-opening with a two-way discharging-chute, which is provided with an adjustable directing-plate, which extends along the interior of the chute lengthwise, and which serves to direct the material which falls from the car into the chute to either side of the car.

17. The combination, with the transverse discharging-opening *h*, of a two-way discharging-chute, which is provided with an adjustable directing and reversing plate, and with an adjustable bottom extension-slide.

18. The combination, with a railway-car, of an interior adjustable discharging-receptacle, which is provided in the side of the frame or floor thereof with a beveled or recessed portion, which is inclined inwardly and from the top downwardly.

JACOB J. SOUDER.

Witnesses:
G. S. LYLES,
J. A. HARVEY.